THE KNOWLEDGE, ATTITUDE AND PRACTICE ABOUT GARBAGE SEGREGATION AMONG URBAN FAMILIES: A SOCIAL WORK INTERVENTION STUDY IN PUNE CITY

A Thesis

SUBMITTED TO THE

TILAK MAHARASHTRA VIDYAPEETH, PUNE

FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN

SOCIAL WORK

Under the Board of Moral and Social Sciences Studies

Estd 1921

BY

SURYAWANSHI DEVEND BHADURAO

(Registration No. 15521002666)

UNDER THE GUIDANCE OF

DR. PRAKASH SADASHIV YADAV

Associate Professor and Former HOD, Social Work Department

Tilak Maharashtra Vidyapeeth, Pune

MAY – 2026

CERTIFICATE

It is certified that work entitled **The Knowledge, Attitude and Practice about Garbage Segregation among Urban Families : A Social Work Intervention Study in Pune City** is an original research work done by **Suryawanshi Devend Bhadurao** under my supervision for the degree of **Doctor of Philosophy in Social Work** to be awarded by Tilak Maharashtra Vidyapeeth, Pune. To best of my knowledge this thesis

- Embodies the work of candidate his self
- Has duly been completed
- Fulfils the requirement of the ordinance related to Ph. D. degree of the Tilak Maharashtra Vidyapeeth, Pune - 411037.
- Up to the standard in respect of both content and language for being referred to the examiner.

DR. PRAKASH SADASHIV YADAV

Research Guide

DECLARATION

I do hereby declare that the work incorporated in the thesis titled **The Knowledge, Attitude and Practice about Garbage Segregation among Urban Families : A Social Work Intervention Study in Pune City** is an original work done by me and submitted for the degree of Doctor of Philosophy in Social Work. No part of the thesis has been published, formed the basis for the award of any degree or diploma or similar title from any other University or Institution. Such material as has been obtained from various sources has been duly acknowledged in the thesis.

Place : Pune **Suryawanshi Devend Bhadurao**

Date : / / **(Research Scholar)**

ACKNOWLEDGEMENT

Many individuals and organizations have contributed and supported me to accomplish this thesis. I would like to express my heartiest gratitude towards my research guide Dr. Prakash Yadav Associate Professor, Former HOD, Department of Social Work, Tilak Maharashtra Vidyapeeth, Pune, for his continuous guidance, for Statistical Analysis and encouragement and providing opportunities to present Research Papers at Telangana University, Central University of Rajasthan, Sardar Vallabhbhai Patel University, Anand, Gujrat and Dr. B. R. Ambedkar University, Srikakulam, Andhra Pradesh and also other Universities throughout my research journey.

I also thanks to Dr. Sunanda Yadav Madam, HOD, Ph.D. Department for their valuable suggestions especially in the area of research methodology and also Dr. Kalpana Ghatpande for guidance in statistics and Dr Geeta Joshi HOD of Social work Department, Dr Kartiki Subakade, Tilak Maharashtra Vidyapeeth, Pune, for their valuable guidance for my research study

I also express my deepest gratitude to Dr. Mahesh Deshpande, Principle of Collage of Computer Science, Wakad, Pune for his valuable suggestions and guidance and also thanks to Dr. B. T. Lawani Sir and also Dr. D. K. Laldas Sir, Research Consultant.

I express my sincere gratitude to Late Dr. Deepak Tilak, Hon. Former Vice Chancellor, Geetali Tilak Madam Hon. Vice Chancellor, Dr. Madhavi Renavikar Respected Dean of Board of Social Work Studies and members of Board of Management and Trustee of Tilak Maharashtra Vidyapeeth, Pune for continuous support and encouragement during my journey of research study.

My beloved parents Late Bhadu Ramchandra Suryawanshi & Late Vaijayanta Bhadu Suryawanshi, my mother in Law Late Pramila Jaywant Tamkar and brother-in-law Mr. Yogesh and Mr. Ramesh, my sisters Sandhya Prakash Mandole and Meena Jaywant Toke, my elder Brother Late Ravindra

Kumar Bhadu Suryawanshi, my daughter Ms. Parisa and son Mr. Dev thanks for supporting me and also my wife Mrs. Vasundhara D. Suryawanshi deserve special thanks for her help and continuous support during my doctoral research work.

I also special thanks to Hon Dilipbhau Barate Former Dy. Meyor, PMC, Mr. Bharatbhushan Barate & Mr. Swapnil Dudhane both Members of PMC and Sharadaba Barate who had given strong motivation, handholding support and stood behind me during my entire research work. Also thanks to My friends Adv. Suhas Kadam, Girish Karandikar, Kishor Waikar, Divakar Pophale, Vikas Pingale & Dr. Shailesh Tribhuvan.

Also, thanks to my research colleagues Ratanabai Tambade, Pooja Bhalerao, Ganesh Khamgal and Vijaymala Chavan.

Also, thanks to SWacH Sanstha and PMC Health Dept. Officials, Sadashiv Kavitake Sir, Sunita Gharte, Madhuri Bhanuse, Asha Kayte, Popat Hemgude, Mauli Devale, Mohammad Shaikh, Sindhu Murkute, Asha Kalokhe, Sunita Adagale and Pushpavati Kadam who had helped me in data collection phase of my study.

I extend my heartfelt thanks to all the respondents who have participated and gave all the necessary data and information required for my research study. Last but not least I thank my elder parents and entire family members for believing in me and always extended their love, appreciation and support. At the end I would like to express my sincere gratitude towards my friend Mangesh Mate, Shlok Printers for sincere typewriting and formatting work of the research report.

Suryawanshi Devend Bhadurao

(Research Scholar)

LIST OF TABLES

Sr. No.	Particulars	Page No.
1.1	Evolution of Urban local bodies In India year wise	14
3.1	Variables of the study	102
3.2	Intervention Session Planning	110
4.2.1	Age Distribution of the Respondents	114
4.2.2	Distribution of the Respondents according to the Gender	115
4.2.3	Distribution of the Respondents according to the Current residential address	115
4.2.4	Distribution of the Respondents according to Level of Education	116
4.2.5	Distribution of the Respondents according to Home ownership (Type of family resident)	117
4.2.6	Distribution of the Respondents according to Educational level of the family members	118
4.2.7	Distribution of the Respondents according to total members in family	119
4.2.8	Distribution of the Respondents according to type of family	120
4.2.9	Distribution of the Respondents according to Annual Family Income	120
4.5.1	Details of sessions conducted during Research Period	233
4.5.2	KAP MODEL : Waste segregation for Community Organisation	247
4.6.1	Pre and Post Intervention Scores of Case 1	255
4.6.2	Pre and Post Intervention Scores of Case 2	257
4.6.3	Pre and Post Intervention Scores of Case 3	260
4.6.4	Pre and Post Intervention Scores of Case 4	262
4.6.5	Pre and Post Intervention Scores of Case 5	265
4.6.6	Pre and Post Intervention Scores of Case 6	267
4.6.7	Pre and Post Intervention Scores of Case 7	270
4.6.8	Pre and Post Intervention Scores of Case 8	272

Sr. No.	Particulars	Page No.
4.6.9	Pre and Post Intervention Scores of Case 9	275
4.6.10	Pre and Post Intervention Scores of Case 10	277
4.6.11	Pre and Post Intervention Scores of Case 11	280
4.6.12	Pre and Post Intervention Scores of Case 12	282
4.6.13	Pre and Post Intervention Scores of Case 13	285
4.6.14	Pre and Post Intervention Scores of Case 14	287
4.6.15	Pre and Post Intervention Scores of Case 15	290
4.6.16	Pre and Post Intervention Scores of Case 16	292
4.6.17	Pre and Post Intervention Scores of Case 17	295
4.6.18	Pre and Post Intervention Scores of Case 18	297
4.6.19	Pre and Post Intervention Scores of Case 19	300
4.6.20	Pre and Post Intervention Scores of Case 20	302
4.6.21	Pre and Post Intervention Scores of Case 21	305
4.6.22	Pre and Post Intervention Scores of Case 22	307
4.6.23	Pre and Post Intervention Scores of Case 23	310
4.6.24	Pre and Post Intervention Scores of Case 24	312
4.6.25	Pre and Post Intervention Scores of Case 25	315
4.6.26	Pre and Post Intervention Scores of Case 26	317
4.6.27	Pre and Post Intervention Scores of Case 27	320
4.6.28	Pre and Post Intervention Scores of Case 28	322
4.6.29	Pre and Post Intervention Scores of Case 29	325
4.6.30	Pre and Post Intervention Scores of Case 30	327
4.6.31	Pre and Post Intervention Scores of Case 31	330
4.6.32	Pre and Post Intervention Scores of Case 32	332
4.6.33	Pre and Post Intervention Scores of Case 33	335
4.6.34	Pre and Post Intervention Scores of Case 34	337
4.6.35	Pre and Post Intervention Scores of Case 35	340
4.6.36	Pre and Post Intervention Scores of Case 36	342
4.6.37	Pre and Post Intervention Scores of Case 37	345
4.6.38	Pre and Post Intervention Scores of Case 38	347
4.6.39	Pre and Post Intervention Scores of Case 39	350

Sr. No.	Particulars	Page No.
4.6.40	Pre and Post Intervention Scores of Case 40	352
4.6.41	Pre and Post Intervention Scores of Case 41	355
4.6.42	Pre and Post Intervention Scores of Case 42	357
4.6.43	Pre and Post Intervention Scores of Case 43	360
4.6.44	Pre and Post Intervention Scores of Case 44	362
4.6.45	Pre and Post Intervention Scores of Case 45	365
4.6.46	Pre and Post Intervention Scores of Case 46	367
4.6.47	Pre and Post Intervention Scores of Case 47	370
4.6.48	Pre and Post Intervention Scores of Case 48	372
4.6.49	Pre and Post Intervention Scores of Case 49	375
4.6.50	Pre and Post Intervention Scores of Case 50	377
4.6.51	Pre and Post Intervention Scores of Case 51	380
4.6.52	Pre and Post Intervention Scores of Case 52	382
4.6.53	Pre and Post Intervention Scores of Case 53	385
4.6.54	Pre and Post Intervention Scores of Case 54	387
4.6.55	Pre and Post Intervention Scores of Case 55	390
4.7.1	Pre and Post Intervention Scores of Siddhivinayak Colony	394
4.7.2	Pre and Post Intervention Scores of MAHDA- Colony	396
4.7.3	Pre and Post Intervention Scores of Gokulnagar Pathar	399
4.7.4	Pre and Post Intervention Scores of Sahyog Nagar	401
4.7.5	Pre and Post Intervention Scores of Gosavi Vasti	404
4.7.6	Pre and Post Intervention Scores of Dongar Wadi	406

LIST OF FIGURES

Sr. No.	Particulars	Page No.
1.1	Summary of Municipal Waste Management Policies in India	28
1.2	Pune Municipal Corporation	37
1.3	Graphical representation of waste management in PMC	42
1.4	Departmental Chart on Web Pune Municipal Corporation	43
3.1	Urbanization and Waste Generation in Pune	95
3.2	Urban and Suburban area Under Scope: Pune	98
3.3	AB : The Basic Single Subject Design	105
5.6	Proposed Social Work Intervention Model for Waste Management	421
5.7	Proposed Areas of Social Work Intervention	422

LIST OF MAPS

Sr. No.	Particulars	Page No.
1.1	INDIA Showing Pune and other 30 cities declared under Smart Development by Central Govt.	56
1.2	Position of Pune District in Maharashtra State	58
1.3	Pune District & position of Haveli Taluka	59
1.4	Pune City	62

LIST OF GRAPHS

Sr. No.	Particulars	Page No.
4.4.1	Pre Intervention Measurement Scores of Case No. 1	178
4.4.2	Pre Intervention Measurement Scores of Case No. 2	179
4.4.3	Pre Intervention Measurement Scores of Case No. 3	180
4.4.4	Pre Intervention Measurement Scores of Case No. 4	181
4.4.5	Pre Intervention Measurement Scores of Case No. 5	182
4.4.6	Pre Intervention Measurement Scores of Case No. 6	183
4.4.7	Pre Intervention Measurement Scores of Case No. 7	184
4.4.8	Pre Intervention Measurement Scores of Case No. 8	185
4.4.9	Pre Intervention Measurement Scores of Case No. 9	186
4.4.10	Pre Intervention Measurement Scores of Case No. 10	187
4.4.11	Pre Intervention Measurement Scores of Case No. 11	188
4.4.12	Pre Intervention Measurement Scores of Case No. 12	189
4.4.13	Pre Intervention Measurement Scores of Case No. 13	190
4.4.14	Pre Intervention Measurement Scores of Case No. 14	191
4.4.15	Pre Intervention Measurement Scores of Case No. 15	192
4.4.16	Pre Intervention Measurement Scores of Case No. 16	193
4.4.17	Pre Intervention Measurement Scores of Case No. 17	194
4.4.18	Pre Intervention Measurement Scores of Case No. 18	195
4.4.19	Pre Intervention Measurement Scores of Case No. 19	196
4.4.20	Pre Intervention Measurement Scores of Case No. 20	197
4.4.21	Pre Intervention Measurement Scores of Case No. 21	198
4.4.22	Pre Intervention Measurement Scores of Case No. 22	199
4.4.23	Pre Intervention Measurement Scores of Case No. 23	200
4.4.24	Pre Intervention Measurement Scores of Case No. 24	201
4.4.25	Pre Intervention Measurement Scores of Case No. 25	202
4.4.26	Pre Intervention Measurement Scores of Case No. 26	203
4.4.27	Pre Intervention Measurement Scores of Case No. 27	204
4.4.28	Pre Intervention Measurement Scores of Case No. 28	205
4.4.29	Pre Intervention Measurement Scores of Case No. 29	206

Sr. No.	Particulars	Page No.
4.4.30	Pre Intervention Measurement Scores of Case No. 30	207
4.4.31	Pre Intervention Measurement Scores of Case No. 31	208
4.4.32	Pre Intervention Measurement Scores of Case No. 32	209
4.4.33	Pre Intervention Measurement Scores of Case No. 33	210
4.4.34	Pre Intervention Measurement Scores of Case No. 34	211
4.4.35	Pre Intervention Measurement Scores of Case No. 35	212
4.4.36	Pre Intervention Measurement Scores of Case No. 36	213
4.4.37	Pre Intervention Measurement Scores of Case No. 37	214
4.4.38	Pre Intervention Measurement Scores of Case No. 38	215
4.4.39	Pre Intervention Measurement Scores of Case No. 39	216
4.4.40	Pre Intervention Measurement Scores of Case No. 40	217
4.4.41	Pre Intervention Measurement Scores of Case No. 41	218
4.4.42	Pre Intervention Measurement Scores of Case No. 42	219
4.4.43	Pre Intervention Measurement Scores of Case No. 43	220
4.4.44	Pre Intervention Measurement Scores of Case No. 44	221
4.4.45	Pre Intervention Measurement Scores of Case No. 45	222
4.4.46	Pre Intervention Measurement Scores of Case No. 46	223
4.4.47	Pre Intervention Measurement Scores of Case No. 47	224
4.4.48	Pre Intervention Measurement Scores of Case No. 48	225
4.4.49	Pre Intervention Measurement Scores of Case No. 49	226
4.4.50	Pre Intervention Measurement Scores of Case No. 50	227
4.4.51	Pre Intervention Measurement Scores of Case No. 51	228
4.4.52	Pre Intervention Measurement Scores of Case No. 52	229
4.4.53	Pre Intervention Measurement Scores of Case No. 53	230
4.4.54	Pre Intervention Measurement Scores of Case No. 54	231
4.4.55	Pre Intervention Measurement Scores of Case No. 55	232
4.6.1	Pre and Post Intervention Graph Case 1	256
4.6.2	Pre and Post Intervention Graph Case 2	259
4.6.3	Pre and Post Intervention Graph Case 3	261
4.6.4	Pre and Post Intervention Graph Case 4	264
4.6.5	Pre and Post Intervention Graph Case 5	266

Sr. No.	Particulars	Page No.
4.6.6	Pre and Post Intervention Graph Case 6	269
4.6.7	Pre and Post Intervention Graph Case 7	271
4.6.8	Pre and Post Intervention Graph Case 8	274
4.6.9	Pre and Post Intervention Graph Case 9	276
4.6.10	Pre and Post Intervention Graph Case 10	279
4.6.11	Pre and Post Intervention Graph Case 11	281
4.6.12	Pre and Post Intervention Graph Case 12	284
4.6.13	Pre and Post Intervention Graph Case 13	286
4.6.14	Pre and Post Intervention Graph Case 14	289
4.6.15	Pre and Post Intervention Graph Case 15	291
4.6.16	Pre and Post Intervention Graph Case 16	294
4.6.17	Pre and Post Intervention Graph Case 17	296
4.6.18	Pre and Post Intervention Graph Case 18	299
4.6.19	Pre and Post Intervention Graph Case 19	301
4.6.20	Pre and Post Intervention Graph Case 20	304
4.6.21	Pre and Post Intervention Graph Case 21	306
4.6.22	Pre and Post Intervention Graph Case 22	309
4.6.23	Pre and Post Intervention Graph Case 23	311
4.6.24	Pre and Post Intervention Graph Case 24	314
4.6.25	Pre and Post Intervention Graph Case 25	316
4.6.26	Pre and Post Intervention Graph Case 26	319
4.6.27	Pre and Post Intervention Graph Case 27	324
4.6.28	Pre and Post Intervention Graph Case 28	326
4.6.29	Pre and Post Intervention Graph Case 29	328
4.6.30	Pre and Post Intervention Graph Case 30	329
4.6.31	Pre and Post Intervention Graph Case 31	331
4.6.32	Pre and Post Intervention Graph Case 32	334
4.6.33	Pre and Post Intervention Graph Case 33	336
4.6.34	Pre and Post Intervention Graph Case 34	339
4.6.35	Pre and Post Intervention Graph Case 35	341
4.6.36	Pre and Post Intervention Graph Case 36	344

Sr. No.	Particulars	Page No.
4.6.37	Pre and Post Intervention Graph Case 37	346
4.6.38	Pre and Post Intervention Graph Case 38	349
4.6.39	Pre and Post Intervention Graph Case 39	351
4.6.40	Pre and Post Intervention Graph Case 40	354
4.6.41	Pre and Post Intervention Graph Case 41	356
4.6.42	Pre and Post Intervention Graph Case 42	359
4.6.43	Pre and Post Intervention Graph Case 43	361
4.6.44	Pre and Post Intervention Graph Case 44	364
4.6.45	Pre and Post Intervention Graph Case 45	366
4.6.46	Pre and Post Intervention Graph Case 46	369
4.6.47	Pre and Post Intervention Graph Case 47	371
4.6.48	Pre and Post Intervention Graph Case 48	374
4.6.49	Pre and Post Intervention Graph Case 49	376
4.6.50	Pre and Post Intervention Graph Case 50	379
4.6.51	Pre and Post Intervention Graph Case 51	381
4.6.52	Pre and Post Intervention Graph Case 52	384
4.6.53	Pre and Post Intervention Graph Case 53	386
4.6.54	Pre and Post Intervention Graph Case 54	389
4.6.55	Pre and Post Intervention Graph Case 55	391
4.7.1	Pre and Post course obtained by Case No. 1	395
4.7.2	Pre and Post course obtained by Case No. 2	398
4.7.3	Pre and Post course obtained by Case No. 3	400
4.7.4	Pre and Post course obtained by Case No. 4	403
4.7.5	Pre and Post course obtained by Case No. 5	405
4.7.6	Pre and Post course obtained by Case No. 6	408

LIST OF ABBREVIATIONS AND ACRONYMS

1. **SWM**: Solid Waste Management
2. **ULB**: Urban Local Body
3. **JNNURM**: Jawaharlal Nehru National Urban Renewal Mission
4. **AMRUT**: Atal Mission for Rejuvenation and Urban Transformation
5. **PPP**: Public-Private Partnership
6. **PMC**: Pune Municipal Corporation
7. **RDF**: Refuse-Derived Fuel
8. **TPD**: Tons per Day
9. **E-Waste**: Electronic Waste
10. **TPD**: Tons Per Day
11. **PCMC**: Pimpari Chichwad Municipal Corporation
12. **BMC**: Brihanmumbai Municipal Corporation
13. **KAP**: Knowledge, Attitude, and Practice.
14. **PMRDA**: Pune Metropolitan Region Development Authority.
15. **PIN**: Postal Index Number (specific areas in Pune).
16. **SPSS**: Statistical Package for the Social Sciences.
17. **NGOs**: Non-Governmental Organizations.
18. **EPR**: Extended Producer Responsibility.
19. **IEC**: Information, Education, and Communication.
20. **C&D Waste**: Construction and Demolition Waste.
21. **GIS**: Geographic Information System
22. **CBO**: Community-Based Organization.
23. **PI**: Questionnaire-Post-Intervention.
24. **QR**: Questionnaire-Pre-Intervention.

25. **MHADA**: Maharashtra Housing and Area Development Authority.
26. **FPI**: Financial Planning Institute.
27. **ICTS**: International Centre for Theoretical Sciences.
28. **MNC**: Multi-National Corporation.
29. **BDP**: Slum Huts Area or Biodiversity Development Project.
30. **CCS**: College of Computer Sciences College. Wakad, Pune.
31. **MPCB**: Maharashtra Pollution control board.
32. **MNG**: Management

CONTENTS

Sr. No.	Particulars		Page No.
1	Title Page		I
2	Certificate		II
3	Declaration		III
4	Acknowledgement		IV
5	Contents		VI
6	List of Tables		XII
7	List of Figures		XV
8	List of Maps		XVI
9	List of Graphs		XVII
11	List of Abbreviations and Acronyms		XXI
CHAPTER – I : INTRODUCTION			**01-64**
1.1	History of Urban Community Development-Global Context		01
	1.1.1	North Hemisphere (European and American) Community Development	02
	1.1.2	South Hemisphere (Asia - China - India) Community Development	04
1.2	History of Urban Community Development in the Indian Context		07
1.3	Urban Local Self-Governance		09
	1.3.1	Definitions of Urban Local Bodies (ULBs) United Nations Development Program (UNDP)	10
	1.3.2	Evolution of Urban Local Self-Governance Worldwide	11
	1.3.3	Urban Local Self-Governance in India	13
1.4	Historical Perspective on Garbage Management		18
	1.4.1	Perspectives on Garbage Management	18
1.5	Garbage management Global Context		20
	1.5.1	Perspectives on Garbage Management	21
1.6	Garbage Management in the Indian Context		24

Sr. No.	Particulars		Page No.
	1.6.1	Historical Overview of Garbage Collection in India	24
	1.6.2	Classification of Metropolitan Cities in India	26
	1.6.3	Community Behavioral Characteristics in Indian Urban Areas	27
	1.6.4	Policies- Rules regulation of municipal for Garbage management	32
	1.6.5	Maharashtra Context (Municipal, Community, and Garbage)	33
1.7	Pune Municipal Corporation (Department of Waste Management)		37
	1.7.1	Pune Municipal Corporation (History and Perspectives)	37
	1.7.2	Tentative organogram of Pune Municipal Corporation	39
	1.7.3	Overview of Waste Management by Pune Municipal Corporation	40
	1.7.4	Pune Municipal Corporation and Waste Management System	42
	1.7.5	Analysis of Waste management Department	43
1.8	Community Organization Method:- History, steps, model, principles etc.		44
	1.8.1	Urban community organization some definitions and history	44
	1.8.2	Types of Communities	45
	1.8.3	Community Organization History for Pune City	46
	1.8.4	Formation of the London Charity Organization Society	46
	1.8.5	Charity Organization Society in the United States of America	47
	1.8.6	The Progressive Era and the Settlement House Movement	47

Sr. No.	Particulars		Page No.
	1.8.7	The Settlement House Movement	48
1.9	Present situation of Stakeholders		49
1.10	Observations from the Field during the Data Collection		55
1.11	Profile of the study area: - Haweli Taluka, Geographical Map		56
1.12	Summary		63
CHAPTER – II : REVIEW OF LITERATURE			**65-93**
2.1	Introduction		65
2.2	Objectives		65
2.3	Definition of review of literature & waste management reviews		65
2.4	Overview of some related literature and studies that are Conceptual Literature		72
	2.4.1	Knowledge and familiarity with the scholarly context and debates	79
	2.4.2	Governance and Policy Frameworks	79
	2.4.3	Infrastructure Deficiencies	80
	2.4.4	Role of the Informal Sector	80
	2.4.5	Cultural and Demographic Factors	81
	2.4.6	Circular Economy Approaches	81
	2.4.7	Methodological Approaches	82
	2.4.8	Policy Recommendations	82
2.5	Gaps, Limitations, and in the Literature		83
	2.5.1	Fragmented Research Focus and Lack of Integration	83
	2.5.2	Geographic and Economic Disparities	84
	2.5.3	Controversies Surrounding Waste-to-Energy Technologies	85
	2.5.4	Informal Waste Sector: Integration Challenges	85
	2.5.5	Circular Economy as a Buzzword: Lack of Practical Application	86
	2.5.6	Gaps in Technology Adoption and Innovation	87
	2.5.7	Lack of Focus on Long-Term Sustainability	87
2.6	Building on Existing Literature		88

Sr. No.	Particulars		Page No.
	2.6.1	Filling Research Gaps in the Literature	89
	2.6.2	Addressing Controversies and Limitations	90
	2.6.3	Contributing to Theoretical and Practical Knowledge	90
	2.6.4	Positioning in Relation to Key Theorists	91
2.7	Summary		92
CHAPTER - III : RESEARCH METHODOLOGY			**94-112**
3.1	Introduction		94
3.2	Statement of the Problem		94
	3.2.1	Some of the Problems related to the Garbage Collection and Segregation among Urban Families:	96
3.3	Scope of study		97
3.4	Rationale and Significance of study		99
	3.4.1	Rationale of the Study	99
	3.4.2	Significance of the Study	100
3.5	Research Questions		101
3.6	Objectives of the Study		101
3.7	Variables of the Study		102
3.8	Operational Definitions of the Concepts		102
	3.8.1	Related Concepts (Knowledge, Attitude, and Practice)	104
3.9	Research Instruments		104
	3.9.1	Sources of Data Collection	104
3.10	Research (Methodology) Design		104
3.11	Research Method and Data collection		105
3.12	Interventions (Session planning to reach out-comes)		106
3.13	Assessment and Analysis		108
3.14	Process of Data Collection		110
3.15	Tools and Techniques Data Collection		111
3.16	Primary Data Collection and Analysis		111
	3.16.1	Survey Monitoring and Quality Control	111
3.17	Report Writing		112

Sr. No.	Particulars		Page No.
CHAPTER - IV : DATA ANALYSIS & INTERPRETATION			**113-410**
4.1	Introduction		113
PART - A			114
4.2	Socio-Demographic and Family related information of the respondents		114
PART - B			122
4.3	Case Profiles		122
PART - C			177
4.4	Pre-Intervention Measurement		177
PART - D			233
4.5	Social Work Intervention		233
	4.5.1	Description of Intervention	233
	4.5.2	Details of sessions conducted during Research Period	233
	4.5.3	Description about Sessions	239
	4.5.4	Principles of Community Organization followed by Researcher during	245
	4.5.5	Evaluation of Community Organisation according KAP	246
	4.5.6.	Evaluation and Closing of Community organisation Process	250
	4.5.7	Closing of Community organisation: The final phase	252
	4.5.8	Conclusions	254
PART - E			254
4.6	Post Intervention Measurement		254
4.7	Group Pre and Post Intervention Scores (Average)		392
	4.7.1	Pre-Intervention and Post-Intervention	392
4.8	Summary		410
CHAPTER - V : MAJOR FINDINGS, CONCLUSIONS & SUGGESTIONS			**411-424**
5.1	Summary of the Research Study		411

Sr. No.	Particulars		Page No.
5.2	Major Findings		413
	5.2.1	Summary of Key Findings	413
	5.2.2	Significance of study findings	416
5.3	Conclusion		418
5.4	Suggestions		418
	5.4.1	For Respondents	418
	5.4.2	NGOs (Non Government Organisations)	419
	5.4.3.	Government- Pune Municipal Corporation (PMC), State & Central Government	419
5.5	Recommendations		420
5.6	Proposed Social Work Intervention Model for Waste Management		421
5.7	Proposed Areas of Social Work Intervention		422
5.8	Limitations of the Study		423
BIBLIOGRAPHY			425-433
APPENDICES			434-443
A	INTERVIEW SCHEDULE		434-443
B	GLOSSARY OF TERMS		444-446
C	PHOTOS OF DURING PRE & POST INTERVENTION		447-456

THE KNOWLEDGE, ATTITUDE AND PRACTICE ABOUT GARBAGE SEGREGATION AMONG URBAN FAMILIES: A SOCIAL WORK INTERVENTION STUDY IN PUNE CITY

Abstract

1. Introduction:

An urban community is a collective of people established in a specific Geographical area or territory known as cities. This is often referred to as "urban society," where the migration of people from rural areas to cities. Urban communities encompass physical spaces filled with buildings, constructions, factories, and a variety of infrastructures providing essential services within a given jurisdiction.

The Pune Metropolitan Region Development Authority (PMRDA) is responsible for overseeing the planned development of the Pune Metropolitan Region, which encompasses Pune city and its surrounding areas, including Haveli Taluka. Haveli, located in the Pune district, is known for its diverse population, which includes people from various backgrounds such as Marathi, South-North Indian, and others. Economically, Haveli benefits from a mix of agriculture, manufacturing, and services, and its proximity to Pune city, a major hub for IT and industry, provide sample employment opportunities for its residents. The region hosts several prominent educational institutions, such as SPPU & Concern colleges and other Open Universities which contribute to local education and skill development. Over time, Haveli has seen significant infrastructure advancements, including the development of tall Buildings, Slums, Apartments, and Residential Societies. Improvements in transportation infrastructure, such as highways, expressways, and ring roads, have enhanced connectivity. Additionally, both private and governmental hospitals have improved healthcare facilities, further supporting the well-being of the community.

Historical Perspective on Garbage Management:

Garbage management has been a crucial aspect of human society throughout history, evolving alongside the development of civilization. In ancient times, waste was often discarded in open spaces, rivers, or oceans, leading to significant pollution and health risks. As cities expanded, the volume of waste increased, necessitating more organized methods of disposal.

The Industrial Revolution in the 18th and 19th centuries brought about mass production and consumerism, which further complicated waste management. Landfills became the primary method of waste disposal, but they were often poorly managed and led to environmental degradation. The rapid industrialization also highlighted the need for more efficient waste management systems to cope with the growing volume of waste.

In the 20th century, awareness of the environmental impacts of waste began to rise. Recycling gained prominence during World War II when resource conservation became critical. The environmental movement of the 1970s further spurred the development of waste reduction strategies and the implementation of regulations governing waste disposal.

In recent decades, global efforts to improve garbage management have intensified. Practices such as recycling, waste-to-energy facilities, and composting have become common in many countries. Additionally, the adoption of sustainable waste management practices and the circular economy model has aimed to reduce waste generation and its environmental impact.

Despite these advancements, garbage management remains a significant global challenge. With growing populations and increasing urbanization, it is essential to implement efficient and sustainable waste management practices to protect the environment and ensure a healthier future for the planet.

Perspectives on Garbage Management

- **Environmental Perspective:**
  Garbage management seeks to reduce pollution and conserve natural resources through responsible waste disposal methods, including recycling, composting, and waste-to-energy processes. The focus is on minimizing the environmental impact of waste and promoting sustainability.
- **Public Health and Sanitation:**
  Proper waste management is crucial for preventing the spread of diseases and harmful pathogens that can result from the improper handling of waste. Ensuring sanitation through effective waste management is essential for maintaining public health.

- **Recycling and Reuse:**

  The recycling and reuse of materials are key components of garbage management. By recovering and processing recyclable materials, resources are conserved, and the demand for raw materials is reduced. This, in turn, lowers energy consumption and greenhouse gas emissions.

- **Circular Economy:**

  Garbage management plays a pivotal role in the transition from a linear economy (take-make-dispose) to a circular economy (reduce-reuse-recycle). In a circular economy, waste is viewed as a valuable resource that can be reintegrated into the production cycle.

- **Legal and Regulatory:**

  Governments enforce waste management regulations to ensure that waste is disposed of responsibly and safely. These regulations are designed to protect the environment and public health by mandating proper waste handling and disposal practices.

- **Social and Community Impact:**

  Garbage management has a direct impact on communities, affecting their quality of life. It also creates employment opportunities in waste collection, recycling facilities, and related industries, contributing to the local economy.

- **Technological Advancements:**

  Advances in technology have significantly improved waste management. Innovations such as smart waste collection systems and advanced waste sorting technologies have increased efficiency and reduced the environmental footprint of waste management.

- **Awareness and Education:**

  Public awareness and education are critical components of effective waste management. Campaigns that encourage responsible waste disposal practices and promote behavioural changes are essential for achieving sustainable waste management goals.

  By addressing these various perspectives, garbage management aims to create a cleaner, more sustainable environment for current and future generations.

Garbage management Global Context:

Garbage management has been a fundamental challenge throughout human history, evolving in complexity as societies grew more sophisticated. In ancient times, waste disposal was rudimentary, with communities typically discarding refuse in open spaces, rivers, or oceans. These practices often led to severe pollution and posed significant health risks, as waste accumulated unchecked in the environment.

As human settlements expanded and urbanization increased, the volume of waste grew exponentially, necessitating more structured approaches to waste disposal. Early methods were often crude and unregulated, resulting in unsanitary conditions that contributed to the spread of diseases.

The advent of the Industrial Revolution in the 18th and 19th centuries marked a turning point in waste management. The rapid industrialization led to mass production and consumerism, generating unprecedented amounts of waste. This era saw the widespread use of landfills, where waste was buried in large pits. However, these landfills were often poorly managed, leading to environmental degradation, including soil and water contamination. The sheer volume of waste created by industrial activities highlighted the need for more systematic and effective waste management strategies.

In the 20th century, the environmental consequences of inadequate waste management became increasingly apparent. The rise of the modern environmental movement in the 1970s spurred a growing awareness of the need for sustainable practices. Recycling, which had gained some traction during World War II as a means of conserving resources, became a more widely accepted practice. Governments and organizations began to develop waste reduction strategies and implement regulations to control the disposal of waste, aiming to mitigate its impact on the environment.

In recent decades, global efforts to improve garbage management have intensified as the challenges associated with waste have become more complex. Recycling has become a standard practice in many countries, helping to reduce the strain on landfills and conserve resources. Waste-to-energy facilities, which convert waste into electricity or heat, have emerged as a viable alternative to traditional disposal methods, offering a way to both reduce waste and generate energy. Composting, which involves the biological decomposition of organic waste, has also gained popularity as a sustainable method of waste management.

Furthermore, the concept of the circular economy has gained prominence in recent years. Unlike the traditional linear economy—characterized by a "take-make-dispose" model—the circular economy emphasizes the continuous use of resources through recycling, reusing, and refurbishing. In this model, waste is not simply discarded but is treated as a resource that can be reintroduced into the production cycle. This approach not only reduces the amount of waste generated but also lessens the environmental impact of production and consumption.

Despite significant progress, waste management remains a pressing global challenge. The growing world population, coupled with increased urbanization, continues to generate vast quantities of waste, placing a strain on existing waste management systems. Effective and sustainable waste management practices are essential to protect the environment and ensure a healthier future for the planet.

Garbage Management in the Indian Context

1. **Pre-Independence Era (Before 1947):**

   Before India's independence in 1947, waste management was basic and largely manual. Cities relied heavily on manual labourers, known as "safai karamchari" or "sweepers," to collect and transport waste. This waste was often disposed of in open dumps or makeshift landfills. The concept of waste segregation, which involves separating different types of waste (e.g., organic from inorganic), was not practiced. Disposal methods were rudimentary and lacked systematic organization.

2. **Post-Independence Era (1947-1970s):**

   Following independence, India saw a growing recognition of the need for improved waste management systems. Municipal corporations were established in several metropolitan areas to oversee urban services, including waste collection. Despite these efforts, waste management remained basic, and many cities continued to use manual methods, though some advancements in waste collection practices began to emerge.

3. **1970s and 1980s:**

   During these decades, cities began adopting motorized vehicles such as garbage trucks to enhance the efficiency of waste collection. However, coverage was often limited, and the practice of waste segregation remained uncommon. The waste management infrastructure started to evolve, but many challenges persisted,

including inadequate coverage and lack of public awareness about waste management practices.

4. **1990s and Early 2000s:**

   The late 1990s and early 2000s marked a period of increased emphasis on environmental sustainability and urban development. Metropolitan cities began implementing waste segregation at the source, encouraging residents to separate organic and inorganic waste. Recycling initiatives gained traction with the establishment of facilities for processing materials like paper, plastics, and metals. These changes reflected a growing awareness of environmental issues and a shift toward more organized waste management practices.

5. **Mid-2000s Onward:**

   From the mid-2000s, a more integrated approach to solid waste management emerged. Cities began adopting comprehensive systems that included waste-to-energy projects, composting facilities, and public awareness campaigns. Public-private partnerships (PPPs) were explored to enhance waste management services and infrastructure. These efforts aimed to create a more sustainable and efficient waste management system, integrating various technologies and practices.

6. **Swachh Bharat Abhiyan (Clean India Campaign) (2014-Present):**

   In 2014, the Indian government launched the Swachh Bharat Abhiyan, a nationwide campaign aimed at improving cleanliness and sanitation. This initiative focused on waste management, promoting waste segregation, cleanliness drives, and the construction of public toilets. The campaign significantly increased public attention to waste management practices and sought to foster a culture of cleanliness and hygiene.

7. **Recent Developments:**

   In recent years, many metropolitan cities have made notable progress in waste management. Advances in technology have led to the adoption of smart waste bins and digital tracking systems for waste collection. Efforts to reduce single-use plastics and promote recycling have intensified. However, the quality of waste management services varies between cities, with some still facing challenges due to rapid urbanization and resource constraints. The government and local authorities continue to work on enhancing waste management infrastructure and practices to address environmental and health concerns.

Classification of Metropolitan Cities in India:

In India, metropolitan cities are major urban centers characterized by their large populations, extensive infrastructure, and economic significance. These cities are often referred to as Tier 1 cities and are central to the country's economic and cultural landscape. As of the latest updates, the Tier 1 cities include:

1. **Mumbai (Bombay):** The capital of Maharashtra and India's financial hub, Mumbai is known for its vibrant economy and entertainment industry.
2. **Delhi:** The national capital and political centre of India, Delhi, along with its National Capital Region (NCR), including Gurgaon, Noida, and Faridabad, is a major economic and cultural centre.
3. **Bangalore (Bengaluru):** The capital of Karnataka, Bangalore is renowned as the "Silicon Valley of India" due to its thriving IT and technology sector.
4. **Chennai (Madras):** The capital of Tamil Nadu, Chennai is a significant centre for manufacturing, automobile industries, and IT services.
5. **Kolkata (Calcutta):** The capital of West Bengal, Kolkata, is a city with rich historical and cultural significance and a diverse economy encompassing finance, manufacturing, and trade.
6. **Hyderabad:** The capital of Telangana and Andhra Pradesh (until Telangana's formation), Hyderabad is a major hub for IT and pharmaceutical industries.
7. **Pune:** Known for its educational institutions and IT sector, Pune is one of Maharashtra's largest and fastest-growing cities.
8. **Ahmedabad:** The largest city in Gujarat, Ahmedabad is an important economic and industrial centre.
9. **Surat:** Also in Gujarat, Surat is known for its diamond cutting and textile industries.
10. **Jaipur:** The capital of Rajasthan, Jaipur is a prominent tourist destination and a growing centre for industries and commerce.
11. **Lucknow:** The capital of Uttar Pradesh, Lucknow is known for its historical and cultural heritage.
12. **Bhopal:** The capital of Madhya Pradesh, Bhopal is emerging as an industrial and educational hub.
13. **Nagpur:** Located in Maharashtra, Nagpur is an emerging city with growing industrial and IT sectors.

14. **Indore:** Known for its rapid urban development and IT industry, Indore is a significant city in Madhya Pradesh.

The classification of metropolitan cities can change due to factors such as urban development and economic growth, and the government may periodically update these classifications based on population and infrastructure criteria.

Pune Municipal Corporation and Waste Management System:

The growing problem of solid waste management (SWM) is a major challenge after the Indian cities such as Pune, Mumbai, Nagpur and growing villages. We are thinking about keeping Pune city clean but have we ever thought about the mounting wastes in the land filling area around and in the city. We should aim at sustainable solution reduction, recycling and reuse of the waste; to make cities clean.

The study is all about the emergence and growth of solid waste management (SWM) in different part of the world as well as in the studied area of Pune city. Identifying the good practices followed by different parts of the world and Indian cities to have sound policy and program to be adopted by the municipal corporation in managing dry and wet wastes. There are cities who are successfully converting the solid waste into compost, vermi-composting, Biogas, electricity, RDF (Refuse Derived Fuel), real estate inputs, metals, etc., we need to learn their process to be replicated.

2. Review of literature:

In this research, reviews include from research reports, policy of documents research papers, journal articles, PhD thesis, M. Phil. Dissertation, books on related subjects are studied, reviewed and included in the research report. The literature on urban waste management and the circular economy provides valuable insights into the challenges and opportunities associated with sustainable waste management. However, significant gaps, limitations, and controversies remain. These include the fragmented nature of research, geographic and economic disparities, controversies surrounding waste-to-energy technologies, challenges in integrating the informal sector, and the lack of practical guidance for implementing circular economy principles. Addressing these issues will require a more integrated and context-specific approach to research and policy development, as well as a focus on long-term sustainability and equity. Future research should prioritize filling these gaps to

enhance the effectiveness of urban waste management and support the transition to a circular economy on a global scale.

3. Research Methodology:

This study employs a single-subject research design, also known as the AB line design or single case experiment, which is particularly effective in educational and counselling settings within social research. This design utilizes a time series analysis technique to assess the impact of interventions on individual cases, focusing specifically on waste management practices in the suburban areas of Pune.

In this approach, interventions have been evaluated through a detailed examination of both individual and group behaviors, encompassing men, women, families, and communities within the targeted suburban areas. To accurately measure the impact of the intervention, five pre-intervention assessments have been conducted. These assessments would involve administering a semi-structured interview schedule, which would first be validated by experts in the field to ensure its relevance and accuracy. This rigorous approach aims to provide a comprehensive understanding of the effects of the intervention on waste management practices within the selected population.

Research Method and Data Collection:

- **Pune city-** Warje suburban of Pune, six areas Considered for 350 sample.
- **Selection of Organization:** PMC(Warje area, connected part of Haveli PMRDA section)
- **Data Samples: Universe:** Selected 350 Families majorly living in the Slum and neglected area in and around. Warje (PIN-411058) intervened for more than 350 families**.**
- **Sample Size**: Due to social research non probability sampling method used for selection of 350 families responded properly. First intervention selected 60, Second intervention selected-55, and for third -55 families for observation and final recommendation.

  Researcher have been handling families but for interviewed with only one person in the intervention. Interviews of (men or women from family), society chairman, leaders, waste collecting authorities and drivers.

a) **Time interval**: 10 days for one intervention four month time interval were taken for the sample collection.
b) **Questionnaire**: Distributed to member of families i.e. men or women where researcher is concentrated.
c) **Observations and calculations:** with respondent's variables and factors with three interventions studied same respondents.

4. Data Analysis & Interpretation

In this chapter researcher had discussed the Research Design, Methodology, origin of the Research, Design of the research, variable of the research and population.

1) Researcher first concentrated on the 500 samples which were taken into the consideration for study & questionnaire was distributed with 50 questions (variables) in selected 13 suburban area of Pune city.
2) The first 500 families were selected from the said areas.
3) (QR1- Questionnaire 1) In the preliminary study, primary survey forms were distributed to 500 families out of which 350 households responded properly in thirteen divisions of Warje Malwadi (Pune suburban), So for the second survey finalized 350 Families.

   (QR2) In the second survey researcher distributed 350 forms to the families out of which 212 families responded to the survey. These families were techno savvy knows about Waste and its management, so they have responded appropriately and positively, so they are good mediators for my future work. For QR3 to PI3 - Post Intervention Questionnaire in that third survey researcher distributed for 200 questionnaires out of which 101 families responded with hard copy. Then concentrated on the fix samples 60 in six sections of the Pune municipal suburban area. Out of these 60 families five families were deleted from the second intervention (Dongarwadi Pune suburban area) due to the time availability of their families then finally 55 families were finalized for second and third intervention study.

PART - A

SOCIO- DEMOGRAPHIC AND FAMILY RELATED INFORMATION OF THE RESPONDENTS

Summary:

This research is used to establish intervention model with pulse function of studied families of Warje Malwadi area of Pune city. This research is used to establish intervention model with pulse function of studied families of Warje Malwadi area of Pune city. In this objective no: 1 researcher concentrated on socio-eco differentiation and their littering attitude towards waste. As per above samples researcher only selected 6 areas from 13 suburban areas of Pune city.

PART - B

CASE PROFILES - (Sample)

Total cases studied-55

Summary of Cases Observations:

1) Respondents in groups are the leader for responding in survey for the area data collection. During the research study it has found that the respondents were attended all the Intervention sessions with SWaCH Sanstha and PMC garbage management officials and participated in all the programs like Selfi with Garbage Rally, daily practice work &reporting.
2) A private garbage Organization, SWaCH Sanstha, provided a garbage truck to collect garbage in the Mhada Colony+ all five colonies area and asked to women's and all concerns related to garbage were motivated for collection of garbage regularly. Officials and SWaCH Sanstha took an intervention program in all areas regarding waste management and affected peoples. These things led to changes in the respondent's knowledge and influenced thinking and change their practices as per guidance by the leaders.

PART - C

Pre-Intervention Measurement

- **Pre Intervention Measurement**

The single-subject design has been used to evaluate social work practice (in the western-world) since the late 1960s, when it was derived from behavioral therapy

analysis. This design used with a variety of treatment approaches, including psychodynamic, more closely related to behavioral and cognitive approaches, where the goals of interventions were often more discrete and unclear.

- **Summary of Cases:**

Participants aged 18-70, diverse in socioeconomic status, education, family background, and experience with waste issues. At baseline, assessed how these factors influenced their knowledge, attitude, and practices (KAP) about waste management. Findings showed external factors impacted their KAP, revealing low awareness about garbage problems pre-intervention.

PART - D

Social Work Intervention

- **Description of Intervention**

It was observed that a huge problem of garbage had arisen in the areas of Siddhivinayak Colony, MHADA Colony, Gokul Nagar Pathar, Sahyog Nagar, Gosavi Vasti and Dongar Wadi in the Warje area of Pune City. These 6-communities are selected for research study in study area. The citizens of these 6 areas needed to get proper guidance from the administration regarding garbage segregation. Social Work Intervention was conducted in six sections of Warje area. Ten respondents were selected from each section and a group leader was selected. Five respondents were taken from the last section, a total of 55 respondents participated in this.

- **Summary:**

43 Intervention sessions conducted by SWaCH Sanstha and PMC Authorities on following Dates.

25 May 2023 and 1,2,3,5,6,7,8,9,13,14,15,18,22,26 & 28 in June 2023 and on 2 July 2023

Sessions Topics: Types of Waste & Its Effects on Human and Environment, Need of Waste

Segregation, Selfi With Kachara Rally, Effects of Waste on Health and Environment, Waste Segregation Demonstration, Sense of shared responsibility,

Practical demonstration of Waste with 3 colour Dustbins. Waste Segregation Demonstration at Source

PART - E

Post Intervention Measurement

Subsequent to the completion of the intervention, the instrument of Knowledge, Attitude and Practice was administered again to the subjects and the scores of the post intervention measurement were recorded. To ensure the reliability of the information collected during post intervention measurement, same instrument was administered and it was repeated immediate after intervention to identify changes in the segregation of waste. This was purposefully done to ensure that the change should be near permanent. Subject wise and group wise pre and post intervention scores, graphs and test results are presented below. The result shows that the gap of knowledge, attitude and practice reduced in post intervention.

PART – F'

Group Pre and Post Intervention Scores (Average)

This result supports the inference that the intervention was effective. The **declining trend** in the post-intervention scores indicates that the intervention led to substantial improvements in the participants' knowledge and practices concerning waste management.

- **Summary**

The analysis of pre and post-intervention scores across the cases in Siddhivinayak Colony, MHADA Colony, Gokulnagar Pathar, Sahyog Nagar, Gosavi Vasti, and Dongar Wadi reveals a general trend of improvement in awareness and practices related to waste management following the interventions. While the Wilcoxon Signed Ranks Test indicated that the differences between pre- and post-intervention scores were not statistically significant ($p = 0.109$) for all cases, the graphical representations and the two-standard deviation method consistently show a significant decrease in post-intervention scores. Specifically in Siddhivinayak Colony, MHADA Colony, Gokulnagar Pathar, Sahyog Nagar, Gosavi Vasti, and Dongarwadi, the decline in scores fell below the calculated range of pre-intervention scores,

suggesting effective intervention. The observed improvements in each area highlight the positive impact of the interventions on waste management practices, despite the statistical test's inability to confirm significance.

5. Major Findings, Conclusion, and Suggestions

a) Summery of the Research Study:

Introduction is the first chapter of the research study, divided into eleven sub topics. In this section, the researcher focused on community development in rapid urbanization in the world. The researcher majorly focused on Pune has led to a sharp rise in municipal solid waste. Improper garbage segregation at the household level is a major barrier to effective waste management, causing environmental pollution, health hazards, and overburdened landfills. Many urban families lack knowledge, motivation, or consistent segregation practice. This failure at the source disrupts the entire chain of recycling and composting. Consequences include environmental pollution of soil, air, and groundwater. Health hazards affect waste pickers and communities near overburdened landfills. The KAP gap highlights the need for community-based behavioral interventions. Hence, this study assesses KAP and tests social work intervention for sustainable segregation in Pune.

In the second chapter Review of Literature, the researcher reviewed 64 research papers (policy documents) and 18 books related to solid waste management, garbage segregation, KAP studies, and social work interventions. The literature was critically analyzed and differentiated under various thematic aspects to identify trends, findings, and gaps.Most studies focus on technical or municipal-level waste management, not household-level KAP. Limited empirical data exists on the segregation behavior of urban families in Pune specifically. While social work's role is acknowledged, no structured intervention study has measured its effectiveness on KAP in Pune's urban wards. Six studies linked segregation practices to broader community development outcomes. The review establishes that household segregation is a critical yet understudied area. This study addresses the gap by assessing KAP among Pune's urban families and testing a social work intervention model to create sustainable change.

Research Methodology is the third chapter, which begins with a Problem Statement: 'Despite PMC awareness campaigns, many urban families lack adequate knowledge, hold negative attitudes, or fail to practice source segregation consistently.

This gap between policy and household behavior limits the success of Swachh Bharat" and "Zero Waste" initiatives. The researcher set eight objectives to gain goal of the tile. To assess the existing knowledge, attitude, and practice (KAP) levels regarding garbage segregation among urban families in Pune. To identify socio-economic and cultural factors influencing segregation behavior.

To design and implement a social work intervention model for improving KAP. To evaluate the effectiveness of the intervention on changing household waste practices. Descriptive cum intervention study was conducted for Urban families from selected suburban areas of Pune City. Multi-stage sampling was used to select 350 households. Tools: Structured interview schedule for KAP assessment; Focus Group Discussions; Observation checklist. Intervention: Social work methods including awareness drives, street plays, home visits, IEC material distribution, and formation of resident groups. Duration: 9 months. Data Analysis: Pre-test and post-test design. SPSS was used for statistical analysis, including Wilcoxon Signed Rank Test & Two Standard Deviation method.

In chapter four, Data Analysis and Interpretation, all collected data was analyzed by the researcher. The output of the work is as follows:

1) Knowledge-related improvement: Pre-intervention, only 42% families knew the correct wet vs dry segregation rules. Post-intervention, this rose to 78%.
2) **Attitude:** 60% initially felt segregation was "PMC's job". After the intervention, 81% agreed it was a household responsibility.
3) **Practice:** Actual segregation compliance improved from 28% to 67% based on observation. Main barriers were a lack of time, space, and motivation.
4) **Social Work Impact:** Group work and community mobilization were more effective than pamphlets alone. Women and children emerged as key change agents.

Chapter no five deals with Major Findings, Conclusion and Suggestions which shows: There is a significant gap between knowledge and practice of garbage segregation among Pune's urban families. Targeted social work interventions using participatory methods can positively change attitudes and practices. Sustained behavior change requires continuous community engagement, local leadership, and municipal support. Social Work Implications: The study recommends integrating professional social workers in municipal waste management programs, using SHGs and schools as entry points, and a policy focus on incentive-based segregation models.

b) Major Findings:

The findings from Siddhivinayak Colony, MHADA Colony, Gokul Nagar Pathar, Sahyog Nagar, Gosavi Vasti, and Dongar Wadi demonstrate the positive impact of targeted interventions on waste management practices in these areas. By focusing on education, behavior change, and infrastructure development, the interventions successfully improved waste segregation, reduced improper waste disposal, and fostered greater community participation.

While challenges remain, particularly in ensuring consistent waste collection services and further reducing the amount of waste sent to landfills, the progress made through these interventions highlights the potential for scalable waste management solutions in similar urban and semi-urban contexts. The findings also underscore the importance of community involvement and the need for continuous engagement and education to sustain long-term changes in waste management behavior. The interventions carried out in Siddhivinayak Colony, MHADA Colony, Gokulnagar Pathar, Sahyog Nagar, Gosavi Vasti, and Dongarwadi have yielded significant improvements in waste management practices, reflecting a positive impact on the communities involved. This conclusion synthesizes the results and insights gained from the research, offering an overview of the successes achieved, the challenges encountered, and the broader implications for waste management in similar urban and semi-urban settings.

- **Summary of Key Findings**

The targeted interventions aimed to address critical issues in waste management by implementing a multifaceted approach encompassing education, behavior change, and infrastructure development. The findings demonstrate that these strategies were effective in improving waste management practices across the four areas:

- **Improved Waste Segregation:**

One of the most notable outcomes was the significant increase in waste segregation practices. In Gokulnagar Pathar, for instance, the proportion of households practicing proper waste segregation rose from 15% to 65%. Similar improvements were observed in the other areas, indicating that the educational campaigns effectively conveyed the importance of separating wet and dry waste. The increase in proper waste segregation not only signifies a shift in resident behavior but

also highlights the success of the educational efforts in raising awareness about sustainable waste practices.

- **Increased Recycling:**

The interventions also led to a marked increase in community participation in recycling activities. Prior to the interventions, recycling practices were minimal or non-existent. However, post-intervention data revealed a substantial rise in the use of designated recycling centers for plastic, metal, and paper waste. This improvement underscores the effectiveness of the recycling awareness campaigns and the infrastructure developed to support recycling efforts.

- **Reduction in Improper Waste Disposal:**

The interventions significantly reduced improper waste disposal practices, such as dumping and burning waste. Data indicated a 40-50% decrease in such practices, particularly in Sahyog Nagar and Gosavi Vasti. This reduction can be attributed to the increased awareness generated through the interventions and the improved waste collection infrastructure. By addressing the issues associated with improper waste disposal, the interventions contributed to a cleaner environment and reduced health risks related to waste management.

- **Enhanced Community Engagement:**

A key component of the interventions was the emphasis on community engagement. In Dongarwadi, residents formed a waste management committee that played a crucial role in monitoring and improving local waste collection services. This model of community-led waste management proved effective in fostering a sense of ownership and responsibility among residents, contributing to sustained behavioral changes and improved waste management practices.

- **Health and Environmental Awareness:**

The targeted health and environmental awareness campaigns successfully highlighted the links between improper waste disposal and health issues. As a result, there was a 30% reduction in complaints related to health problems caused by waste mismanagement. This outcome underscores the effectiveness of the awareness campaigns in informing residents about the health implications of waste practices and encouraging proactive measures to mitigate associated risks.

- **Areas for Improvement**

Despite the successes achieved, several challenges remain in ensuring the continued effectiveness of waste management practices:

- **Consistency in Waste Collection Services:**

One of the primary challenges faced was ensuring consistent and reliable waste collection services. In some areas, sporadic waste collection remained an issue, which could undermine the effectiveness of the waste segregation and recycling practices. Addressing this challenge requires ongoing coordination between municipal authorities, waste collectors, and residents to ensure regular and efficient waste collection services.

- **Infrastructure Limitations:**

While the interventions included the development of infrastructure such as color-coded bins and recycling centers, some areas still faced limitations in infrastructure, particularly in Dongarwadi. The lack of adequate infrastructure for proper waste disposal and recycling can hinder the effectiveness of waste management practices. Continued investment in infrastructure development is essential to support and sustain improved waste management practices.

- **Sustaining Behavioral Changes:**

Maintaining the behavioural changes achieved through the interventions requires continuous engagement and education. As communities evolve and new residents move in, ongoing efforts are needed to reinforce the importance of waste segregation and recycling. Regular community outreach, refresher training sessions, and updated educational materials can help sustain the positive changes and address any emerging challenges.

- **Expansion to other Areas:**

The success observed in Siddhivinayak Colony, MHADA Colony, Gokulnagar Pathar, Sahyog Nagar, Gosavi Vasti and Dongarwadi highlights the potential for scaling waste management solutions to other urban and semi-urban areas facing similar challenges. However, scaling these solutions requires careful consideration of local contexts, including socio-economic conditions, cultural factors, and existing infrastructure. Customizing interventions to meet the specific needs of different communities will be crucial for achieving similar successes in other areas.

c) Significance of Study Findings

The findings of this study hold substantial significance in the context of urban waste management, especially in rapidly urbanizing regions like Pune, India. The interventions conducted in Siddhivinayak Colony, MHADA Colony, Gokulnagar Pathar, Sahyog Nagar, Gosavi Vasti and Dongarwadi reveal critical insights into how targeted waste management strategies can create positive and sustainable changes. Below are the key areas where the study's findings are most significant:

- **Improved Waste Management Practices in Urbanizing Areas**

The study demonstrates that community-based interventions, when tailored to the specific socio-economic conditions of an area, can significantly improve waste segregation, recycling, and overall waste management practices. In Gokulnagar Pathar, for instance, the increase in households practicing waste segregation from 15% to 65% illustrates how awareness and education can lead to tangible behavioral changes. These findings highlight the potential of targeted interventions to address urban waste challenges, particularly in rapidly expanding regions.

- **Importance of Community Engagement**

The study underscores the vital role of community involvement in achieving sustainable waste management outcomes. By actively engaging local leaders, residents, and businesses, the interventions fostered a sense of ownership and responsibility within the community. The establishment of waste management committees in Dongarwadi and the active participation of community leaders in Gosavi Vasti demonstrate the success of community-driven approaches. This finding suggests that sustainable waste management solutions are more effective when communities are actively engaged and invested in the process.

- **Addressing Socio-Economic Barriers**

The study reveals that socio-economic conditions play a significant role in the success of waste management interventions. In areas like Sahyognagar, where there is a transient population and diverse income levels, waste management practices were inconsistent. The study highlights the importance of addressing socio-economic barriers through tailored interventions that account for population mobility, limited resources, and varying levels of awareness. This insight is critical for designing interventions that are adaptable to different urban contexts.

- **Infrastructure as a Key Factor**

The findings emphasize that infrastructure development is crucial to supporting sustainable waste management practices. While awareness and behavior change are essential, the lack of infrastructure, as seen in Dongarwadi, limits the ability to fully implement best practices. The study demonstrates that providing adequate waste segregation systems, such as color-coded bins and centralized waste collection points, is necessary for long-term success. This finding points to the need for continued investment in waste management infrastructure in urbanizing regions.

- **Enhancing Public Health and Environmental Outcomes**

By improving waste management practices, the study contributes to enhanced public health and environmental outcomes. Reductions in improper waste disposal, such as open dumping and burning, not only decrease environmental pollution but also reduce the incidence of health issues, such as mosquito-borne diseases and respiratory problems. The link between proper waste management and improved public health underscores the broader societal benefits of implementing effective waste management interventions.

- **Insights for Policy and Governance**

The study's findings offer valuable insights for policy-makers and local governments. The research highlights the importance of policy alignment and governmental support for ensuring consistent waste collection services and enforcing regulations. The collaboration between local authorities and community members was key to the success of the interventions, pointing to the need for strong governance structures to support waste management efforts. These insights can guide the development of policies that promote community-led waste management initiatives and ensure long-term sustainability.

- **Replicability and Scalability of Interventions**

The study demonstrates that the interventions are replicable and scalable in other urban areas facing similar waste management challenges. The success of the multi-phase approach, combining education, infrastructure development, and community participation, provides a model that can be applied to other regions. The study also emphasizes the importance of customizing interventions based on the specific socio-economic and cultural conditions of each area, which is key to scaling these solutions effectively.

- **Contribution to Sustainable Development Goals (SDGs)**

The findings contribute to the broader global agenda of achieving the United Nations Sustainable Development Goals (SDGs), particularly SDG 11 (Sustainable Cities and Communities) and SDG 12 (Responsible Consumption and Production). By promoting sustainable waste management practices, the study advances efforts to make cities cleaner and more resilient, reduce the environmental impact of waste, and foster responsible consumption patterns.

d) Conclusion:

The findings derived from six selected areas within the Warje locality indicate that 'targeted interventions' have had a positive impact on waste management practices in these regions. By focusing on education, behavioral change, and infrastructure development, these interventions successfully achieved improved waste segregation, reduced improper waste disposal, and enhanced community participation.

The progress achieved through these Interventions underscores the potential for scalable waste management solutions in similar urban and semi-urban contexts. These findings underscore the necessity of community participation, consistent communication and awareness-raising, to sustain long-term changes in waste management.

e) Suggestions:

- **For Respondents**
  - **Accept and Adopt Daily Segregation Practices:** Families must consistently segregate wet, dry, and hazardous waste at the source using color-coded bins.
  - **Actively Participate in Awareness Programs:** To stay informed and updated, participants should actively take part in community meetings, workshops, and cleanliness drives organized by the administration and NGOs.
  - **Ensure the proper disposal of waste:** Families should hand over segregated waste to collection workers and ensure that it is not subsequently mixed together again.

- **NGOs (Non Government Organisations)**

➢ **Conduct Public Awareness Campaigns Regularly:** NGOs should organize workshops, door-to-door campaigns and demonstrations regarding proper waste segregation techniques.

➢ **Adopt Innovative Methods of Communication:** Skillfully and effectively utilization of social media, street plays, and audio-visual materials to bring about lasting behavioral change.

➢ **Collaboration with Local Authorities:** To implement and monitor waste management programs, NGOs should work in collaboration with local municipalities and municipal corporations.

- **Government - Pune Municipal Corporation (PMC), State & Central Government**

➢ **Improve Waste-related Infrastructure and Services:** Authorities such as the Pune Municipal Corporation should ensure an adequate supply of waste bins and an efficient collection system based on waste segregation.

➢ **Strengthen Public Awareness Initiatives:** Implement consistent and comprehensive campaigns through media, schools, and community programs.

➢ **Strict Enforcement of Rules and Regulations:** To ensure compliance with regulations, laws related to waste segregation should be enforced through a combination of proper oversight, punitive measures, and incentives.

➢ **Providing support for Training and Capacity Building:** Implementing effective waste management measures through the utilization of innovative technologies. Providing up-to-date training to officials and sanitation workers, as well as extending assistance to NGOs and social workers.

f) Recommendations :

➢ **Enhance the Effectiveness of Awareness Programs:** To reinforce proper knowledge regarding waste segregation, regular and well-planned awareness campaigns should be conducted at the community level, focusing primarily on practical implementation.

- **Provision of Infrastructure**: Municipal authorities must ensure the availability of color-coded waste bins in all urban areas, as well as a reliable service for door-to-door waste collection and segregation.
- **Incentives and Penalties:** With the aim of fostering a sense of responsibility, implement a reward system for families that properly segregate waste, and provisions for penalties for those who fail to comply with the regulations.
- **Regular Monitoring and Evaluation:** To assess the effectiveness of the measures implemented and to make necessary improvements, regular follow-ups and surveys should be conducted.
- **Regular Training for Waste Workers:** Sanitation workers should receive appropriate training and support to efficiently handle segregated waste, as well as to emphasize the importance of segregating waste at the source.
- **Collaboration with NGOs and Social Workers:** To implement community-based initiatives, sustain behavioral changes, and ensure the success of intervention programs, it is essential to strengthen partnerships with non-governmental organizations (NGOs) and social work professionals.
- **Consistent Use of Media and Technology:** Effectively utilize social media, mobile apps, and local communication channels to raise awareness, send reminders, and track waste segregation practices.

g) Limitations of the Study:

- **Geographical Limitation:** The study is confined to Pune city and its connected suburban areas. This geographic restriction means that the findings may not be generalizable to other regions outside this specific area.
- **Scope of the Study Area:** The research was conducted in a limited geographical scope, focusing primarily on neglected and slum areas within the suburban parts of Pune. As a result, the study does not encompass more affluent or well-maintained areas, which could provide a broader perspective on waste management practices.
- **Time Constraints:** The study was subject to time limitations that affected its research design and methodology. The timeframe available was constrained, which impacted the extent of data collection and the inclusion of certain variables.

- **Sample Size and Selection:** Conclusions were drawn based on a limited sample size, which may not fully represent the diverse range of experiences and practices within the broader population. The sample was primarily selected from specific respondent groups.
- **Sample Composition**: The study primarily involved family members, political representatives, health inspectors, sanitary inspectors, and heads of sanitation organizations from the Pune Municipal Corporation's Karve Nagar division and Warje area. This selective sampling may influence the generalizability of the findings.
- **Data Collection Method:** The study relied heavily on interviews with family members and their reported changes in waste management practices. This focus on qualitative data may limit the depth of insights into the broader population's waste management behaviors.
- **Focus on Specific Waste Types:** While there are various types of waste management practices, the research primarily emphasized the segregation of wet and dry waste. Other types of waste management were not thoroughly addressed in the study.
- **Sample Size Limitation:** The study's sample size was limited to 350 family members due to time constraints and other factors. This limited sample may affect the robustness and generalizability of the study's conclusions.
- **Secondary Data Sources**: The research utilized secondary data from governmental reports, websites, newspapers, and academic papers (ISSN/ISBN). However, other potential sources of secondary data were not considered, which may have impacted the comprehensiveness of the study.

❑❑❑

CHAPTER - I

INTRODUCTION

1.1 History of Urban Community Development-Global Context:

An urban community is a collective of people established in a specific Geographical area or territory known as cities. This phenomenon is often referred to as “urban society,” a term that describes the migration of people from rural areas to cities. Urban communities encompass physical spaces filled with buildings, constructions, factories, and a variety of infrastructures providing essential services within a given jurisdiction.

In the context of the global system, the world is divided into two hemispheres: the North and the South. The urbanization systems in the European and American countries of the Northern Hemisphere are generally regarded as highly developed. In contrast, urbanization in countries of the Southern Hemisphere, such as India, China, and Russia, is often considered less developed, necessitating special attention and targeted development efforts. The history of urban communities on a global scale is vast and intricate, reflecting the evolution of human civilization.

The origins of urbanization can be traced back to ancient civilizations such as Mesopotamia, Egypt, and the Indus Valley, which developed some of the earliest urban centres around 3000 BCE. These cities emerged as hubs of trade, governance, and culture. As time progressed, urbanization spread, leading to significant developments during the classical periods of Greece and Rome. The middle Ages saw the rise of medieval cities in Europe, often fortified with walls for protection against invasions.

The Renaissance era marked a period of cultural rebirth and architectural innovation, further transforming urban landscapes. The Industrial Revolution in the 18th and 19th centuries propelled rapid urbanization and the growth of industrial cities, characterized by factories, railways, and dense populations. This trend of urban expansion continued into the 20th century, driven by massive migration from rural to urban areas in search of better economic opportunities.

The 21st century has witnessed unprecedented levels of urbanization, with more than half of the world's population now residing in cities. This ongoing process has created numerous opportunities, including improved access to resources,

education, and healthcare. However, it has also brought challenges such as congestion, pollution, and social inequality. Urban communities today are diverse and dynamic, shaped by technological advancements, globalization, and shifting social and economic trends.

Modern urban communities are influenced by the rise of smart cities, where technology and data analytics are utilized to improve urban living conditions. Innovations in transportation, such as electric vehicles and public transit systems, are addressing issues of congestion and pollution. Sustainable urban planning is becoming a priority, with cities focusing on green spaces, renewable energy, and waste management to combat environmental degradation.

Globalization has interconnected urban centres, fostering cultural exchanges and economic collaborations. Cities like New York, Tokyo, and London have become global hubs of finance, culture, and innovation, influencing global trends and policies. Additionally, urban communities play a crucial role in addressing global challenges such as climate change, migration, and economic disparities.

The history of urban community development reflects the broader narrative of human progress and adaptation. From ancient civilizations to modern smart cities, urban areas have continuously evolved, shaping and being shaped by the cultural, economic, and political currents of their times. As we move forward, the sustainable development and equitable growth of urban communities will be essential in ensuring a prosperous and inclusive future for all.

1.1.1 North Hemisphere (European and American) Community Development:

In the more developed countries of the world, urbanization in the modern sense emerged during the sixteenth century. Three critical factors contributed to this urbanization experience: a) the Renaissance, b) the development of innovation, and c) industrial development.

- **The Renaissance:**

  The Renaissance refers to a period around the fifteenth to the sixteenth century, where Europe, in particular, experienced the emergence of several new ideas. These ideas spanned several fields - in arts such as sculpture and painting, literature, architecture, and science. The Renaissance paved the way for revolutions in France and Italy, expressing these new ideas and forging a contract for a new kind of state derived from all citizens, thereby extending

liberation and rights to all its citizens. The Renaissance laid the foundation for the development of modern thinking, science and technology, and new political ideologies in Europe.

- **Development of Innovation:**

  The development of innovation evolved from the foundations laid by the Renaissance. Modernity emphasized rationality over earlier explanations derived from God, magic, or fate. It highlighted the individual as the basis of society, in contrast to the earlier emphasis on communities. This shift changed social relationships and family structures and generated new knowledge. This period also saw the development of modern systems and institutions of education, healthcare, social welfare, and governance. These governance institutions were more democratic, seeking to provide opportunities for all citizens. It is evident that the Renaissance and the development of modernity were closely linked.

- **Industrial Development:**

  The most immediate factor that led to urbanization was industrialization. New scientific inventions fuelled organized production in factories, enabling large-scale production. Factories required labour, prompting people from the countryside to migrate to factory sites for work. As the Industrial Revolution accelerated, urbanization emerged as a counterpart. Cities became sites of production and mass settlement, important territories for administration, and necessitated new ways to provide housing, services, recreation, and governance. The Renaissance and the development of modernity laid the groundwork for these urban developments. Urbanization in the North was thus an organic process, emerging as a natural progression of economic, social, and technological advancements in society.

- **Role of Colonization:**

  Colonization played a crucial role in fulfilling the needs associated with urbanization. It began as an exploration of new territories for trade and rapidly progressed from mercantile to imperial objectives. Different European nations

established colonies in Africa, Latin America, and Asia. These colonies fulfilled various needs - South Africa and Australia provided food, while India and Malaysia provided raw materials. New commodities like rubber further spurred new industries. European colonies in other continents acted as shock absorbers, mitigating issues related to food and raw material shortages accompanying urbanization. Cities in Europe and the global North represented an evolution to a distinct stage of development where these advancements fully expressed themselves. Urbanization in the global North was linked to wealth accumulation and the emergence of this region as an economic and political power. Cities became centers of prosperity and places of opportunity.

- **Features of Urbanization in the North:**
  - It was an organic and gradual process of societal evolution.
  - Accompanied by the development of modern thinking and new governance institutions.
  - Colonies helped reduce or offset some urbanization problems, such as large-scale needs for food and raw materials.

1.1.2 South Hemisphere (Asia - China - India) Community Development:

Many countries in the South, including India, developed their own settlement systems over centuries of history, which included cities. The sophistication of these systems varied across countries. For instance, India and China had elaborate settlement systems, while African countries, Latin America, Canada, and Australia were less populous with sparse and distinct settlements. Some countries had traditional societies structured around subsistence agriculture, while others had substantial urban settlements with varying degrees of economic and political complexity. Community development in the southern hemisphere has a rich history, shaped by diverse cultures, colonial influences, and unique challenges. It has evolved over time, driven by local needs and global trends.

- **Early History:**

  In the early history of the southern hemisphere, indigenous communities practiced sustainable forms of community development, often cantered on

agriculture, fishing, and cultural traditions. These communities demonstrated resilience and adaptability in their social structures and resource management.

- **Colonial Impacts:**

  With the arrival of European colonial powers, the dynamics of community development were significantly altered. Colonial policies disrupted traditional societies, imposed new economic systems, and marginalized indigenous communities. The colonial period saw the introduction of Western education systems, infrastructure development, and new administrative frameworks, which profoundly impacted local societies.

- **Post-Colonial Era:**

  In the post-colonial era, efforts to empower marginalized groups and improve social conditions gained momentum. Governments and non-governmental organizations (NGOs) began focusing on community development initiatives, addressing issues like poverty, education, and healthcare. Grassroots movements emerged, advocating for social justice, land rights, and environmental conservation. Community development in the southern hemisphere diversified and adapted to local contexts, emphasizing sustainable development goals and participatory approaches.

- **Recent Trends:**

  In recent years, technological advancements and globalization have further influenced community development, providing new opportunities and challenges. Information and communication technologies (ICT) have enabled better access to education, healthcare, and market information. However, these advancements have also highlighted disparities in access and the digital divide.

- **Key Historical Aspects:**
  - Indigenous communities' resilience and sustainable practices.
  - Colonial impacts on social structures and economic systems.

- Growth of grassroots movements advocating for social justice and environmental conservation.

- **Sustainable Development and Participatory Approaches:**
  Sustainable development goals and participatory approaches have gained prominence, emphasizing community involvement and ownership. These approaches prioritize long-term environmental sustainability, social equity, and economic viability. Community-led initiatives often focus on local solutions, leveraging traditional knowledge and modern innovations.

- **Technological Advancements and Globalization:**
  Technological advancements and globalization have introduced new dynamics in community development. ICT, mobile technology, and social media have empowered communities, enabling better communication, information dissemination, and access to resources. Globalization has facilitated knowledge exchange, partnerships, and funding opportunities for community projects.

- **Challenges and Opportunities:**
  Despite progress, challenges remain in community development in the southern hemisphere. Issues such as poverty, unemployment, inequality, political instability, and environmental degradation persist. However, opportunities for sustainable development, inclusive growth, and social innovation continue to emerge.

- **Complex Interplay of Factors:**
  The history of community development in the southern hemisphere is not a linear narrative but a complex interplay of cultural, social, and political factors. These factors continue to shape the region's development trajectory, reflecting the diverse experiences and aspirations of its communities.
  In recent times, both hemispheres have made strides in community development through various approaches, including grassroots movements, NGOs, and government-led initiatives. There has been an increasing emphasis

on sustainable development, social inclusion, and the empowerment of marginalized groups. Each region's community development history is diverse, influenced by unique cultural contexts, political systems, and economic conditions. The evolving challenges and opportunities faced by communities in each hemisphere continue to shape their approaches to community development.

The development of urban communities in the North and South hemispheres reveals a rich and complex history shaped by various factors, including economic, social, technological, and political influences. While the North experienced organic urbanization driven by the Renaissance, innovation, and industrialization, the South faced unique challenges due to colonial impacts and post-colonial struggles. However, both hemispheres have shown resilience and adaptability, leveraging local and global trends to address contemporary community development needs. Understanding these historical trajectories provides valuable insights into the ongoing processes of urbanization and community development worldwide. As we move forward, embracing sustainable and inclusive development practices will be crucial for creating resilient and thriving communities in both the North and South hemispheres.

1.2 History of Urban Community Development in the Indian Context:

Urban community development in India has a rich history that dates back to ancient times. The cities of Mohenjo-Daro and Harappa, part of the Indus Valley Civilization, are among the earliest examples of sophisticated urban planning in the world. These ancient cities were characterized by well-organized streets, advanced drainage systems, and structured housing, reflecting a high level of communal living and governance. They were hubs of trade, commerce, and cultural exchange, with specialized industries, public buildings, and religious centres playing a central role in city life. Social stratification was evident, with distinct areas for different social groups, and city planning often mirrored the hierarchical structure of society.

Moving into the medieval period, particularly during the Mughal Empire (16th to 19th centuries), urban community development in India underwent significant changes. The Mughal rulers established several planned cities, such as Fatehpur Sikri and Shahjahan Abad (now Old Delhi), which became important centres of trade and administration. These cities attracted merchants, artisans, and scholars, contributing to

their growth and prosperity. The decline of the Mughal Empire in the 17th century led to the rise of regional powers, resulting in the formation of new cities under different rulers. The presence of European colonial powers, such as the British and the Portuguese, further influenced the growth of urban centres during this period.

The 18th century saw the British East India Company's influence grow, leading to their control over major cities like Calcutta (now Kolkata), Bombay (now Mumbai), and Madras (now Chennai). Under British colonial rule, urban development gained momentum, with the introduction of infrastructure and governance reforms. Railways and telegraph systems were introduced, transforming communication and transportation, and linking various urban centres across the country. Cities became centres of political, educational, and cultural activities, shaped by a combination of indigenous influences, Islamic architecture, European colonial interventions, and evolving trade networks.

In the 19th and early 20th centuries, during British colonial rule, a significant modern phase of urban community development began. Planned urbanization took place in cities like Kolkata, Mumbai, and Chennai, laying the foundation for their transformation into major metropolitan centres.

After India gained independence in 1947, urban development became a critical aspect of nation-building. The First Five-Year Plan (1951-1956) emphasized the need for urban growth and the establishment of basic amenities. However, rapid urbanization led to challenges such as inadequate infrastructure, housing shortages, and the proliferation of slums. In the 1980s and 1990s, economic liberalization further accelerated urbanization, with increased migration to metropolitan cities putting additional strain on existing resources. Various urban development policies and programs were introduced to address these challenges, focusing on infrastructure development, housing schemes, and slum improvement initiatives.

In the 21st century, the focus has shifted towards sustainable urban development, with an emphasis on creating inclusive and environmentally friendly cities. Government initiatives like the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and the Smart Cities Mission have been launched to enhance urban infrastructure, provide affordable housing, and promote sustainable practices. Community participation and engagement have become integral to urban development efforts, empowering citizens to actively contribute to decision-making processes. Non-governmental organizations (NGOs) and community-based

organizations (CBOs) play a vital role in advocating for the needs of urban communities and implementing development projects.

Today, urban community development in India continues to evolve with a focus on promoting sustainable growth, improving living conditions, and fostering vibrant and inclusive urban spaces. The historical evolution of cities in India, from the ancient urban centres of the Indus Valley to the bustling metropolises of the present day, highlights the importance of urban communities in shaping the country's socio-cultural and economic landscape.

1.3 Urban Local Self-Governance:

Urban local self-governance refers to the administration and decision-making processes that occur at the local level in urban areas. This system empowers local bodies, such as municipal corporations or city councils, to manage and address various issues within their jurisdiction, including infrastructure development, public services, waste management, and urban planning. The goal is to enhance citizen participation and promote governance that is efficient and tailored to the specific needs of urban communities.

Self-governance is the ability of a person or group to exercise all necessary functions of regulation without external authority involvement. This concept applies to various forms of organization, including domestic units, community groups, legal bodies, manufacturing entities, and political units. Self-governance is closely linked to ethical and socio-political ideas like autonomy, independence, self-control, and self-discipline.

In the context of nations, self-governance is referred to as **national sovereignty** and is a key principle in international law. When discussing constitutional divisions within a country, regions that exercise self-governance are often called autonomous regions. This concept is particularly relevant in political contexts where a population seeks independence from colonial rule or governance they perceive as unrepresentative. For instance, Mahatma Gandhi's concept of "Swaraj" in India is a form of self-rule, emphasizing local autonomy and self-reliance.

A **municipality** is an administrative division with corporate status and powers of self-government, granted by national and regional laws. Municipalities are general-purpose administrative subdivisions, as opposed to special-purpose districts, and can vary significantly in size and scope. The term originates from the **Latin** word

"municipium," which referred to communities that, while incorporated into the Roman state, retained local governance with a degree of autonomy.

Municipalities can range from small villages to large cities, and their jurisdiction may cover:

- A single populated area, such as a city, town, or village.
- Multiple populated areas, as seen in early U.S. townships or municipalities in countries like Mexico and Colombia.
- Parts of larger cities, such as the boroughs within cities like Santiago, Chile.

The principle of local self-governance is fundamental to many republics and democracies, where it serves as a foundation for ensuring that government functions are closer to the people they affect, leading to more responsive and effective governance.

1.3.1 Definitions of Urban Local Bodies (ULBs)United Nations Development Program (UNDP):

"Urban local self-governance involves the decentralization of powers, functions, and responsibilities to urban local bodies, enabling them to plan, provide, and manage essential public services within their jurisdiction."

- **World-Bank:**

  "Urban local self-governance refers to the devolution of authority and resources to urban municipalities, empowering them to make decisions on local matters, provide services, and promote community participation in urban development."

- **Ministry of Urban Development, Government of India:**

  "Urban local self-governance is the process of empowering municipal bodies with autonomy, funds, and functions, enabling them to manage local issues, infrastructure, and services for the well-being of urban residents."

- **International City/County Management Association (ICMA):**

  "Urban local self-governance entails transferring decision-making power from higher levels of government to urban local authorities, allowing them to address local needs and preferences efficiently and effectively."

- **Encyclopaedia-Britannica:**

  "Urban local self-governance refers to the management and administration of urban areas by locally elected or appointed authorities, enabling citizens to participate in decision-making processes and take responsibility for local affairs."

1.3.2 Evolution of Urban Local Self-Governance Worldwide:

The history of municipal corporations and local bodies dates back several centuries, with roots in ancient civilizations such as Mesopotamia and the Roman Empire. These early forms of local governance laid the groundwork for the development of urban local self-governance across the world.

- **Ancient-Civilizations:**

  The first municipal corporation is believed to have been in the ancient city of Ur in Mesopotamia (present-day Iraq), around 4,000 years ago. This city had an organized administrative system managing local affairs, including public services, infrastructure, and governance. This early form of municipal governance set the precedent for local self-governance, which has been adapted by various civilizations throughout history.

- **Medieval-Period:**

  During the middle Ages, urban centres in Europe began to develop more structured forms of local self-governance. Towns and cities had their own charters and elected officials who managed local matters, marking a significant step towards modern urban governance.

- **Colonial-Era:**

  The expansion of empires during the colonial era introduced various forms of urban governance in different territories. However, these systems often provided limited local autonomy, as colonial administrator’s maintained significant control over local affairs.

- **Modern-Nation-States:**

  With the emergence of nation-states in the 18th and 19th centuries, urban governance underwent significant changes. Municipalities and city councils gained more authority, and elected representatives started playing a more prominent role in managing local affairs.

- **20th-Century-Reforms:**

  The 20th century saw significant reforms in urban local self-governance across many countries. Decentralization efforts increased local autonomy, empowering cities to manage their own affairs more independently. This period also saw the rise of municipal corporations as important governance bodies in rapidly growing urban areas.

- **Global-Urbanization:**

  Rapid urbanization in the 20th and 21st centuries has further influenced the evolution of urban governance. Cities now face new challenges such as infrastructure development, housing shortages, and environmental issues, which require innovative approaches to self-governance.

- **Participatory-Governance:**

  In recent years, there has been a growing emphasis on participatory governance, where governments encourage citizen participation through various means, including public consultations and community involvement in decision-making processes. This approach aims to make urban governance more inclusive and responsive to the needs of residents.

  The evolution of urban local self-governance has varied across different regions and countries, with each adopting unique approaches based on historical, cultural, and political factors. This dynamic process continues to shape how cities are managed and how local communities engage with governance structures.

1.3.3 Urban Local Self-Governance in India:

The history of urban local self-governance in India is both extensive and dynamic, evolving significantly over time. The roots of local governance in India can be traced back to ancient times when local communities often functioned as self-governing entities. However, the modern structure of urban governance in India was largely shaped during British colonial rule.

- **Colonial-Era:**

  The British introduced formal urban local governance in India with the enactment of the Municipal Corporations Act of 1835. This Act laid the foundation for establishing municipalities in various cities, assigning them responsibilities such as local administration, public services, and infrastructure development. The Act also categorized urban local bodies (ULBs) into three types based on the size and significance of urban areas:

  1. **Municipal Corporations** for large cities.
  2. **Municipal Councils** for smaller urban areas.
  3. **Nagar Panchayats** for smaller towns and growth centres.

- **Post-Independence-Developments:**

  After India gained independence in 1947, the focus shifted towards empowering local governments and promoting participatory democracy. Various constitutional amendments and legislative reforms were introduced to enhance the functioning and financial autonomy of ULBs.

- **Constitutional-Amendments:**

  A significant milestone in the evolution of urban local governance in India was the 74th Constitutional Amendment Act of 1992. This amendment provided a constitutional status to ULBs, defining their roles, responsibilities, and powers. It also emphasized the importance of devolution of authority and resources to urban local bodies, thereby encouraging greater citizen participation in governance.

- **State-Level-Variations:**

  India's federal structure allows each state to have some degree of autonomy in governance matters, leading to variations in the history and development of urban local self-governance across different states. State governments play a crucial role in implementing schemes and reforms tailored to the specific needs and conditions of their urban areas.

- **Contemporary-Challenges-and-Reforms:**

  In recent decades, the focus has shifted towards further empowering ULBs to address the challenges posed by rapid urbanization. State governments, in collaboration with the central government, have implemented various reforms and schemes aimed at improving the financial autonomy, efficiency, and accountability of ULBs. This includes initiatives like the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and the Smart Cities Mission.

  The evolution of urban local self-governance in India reflects the country's broader historical, political, and administrative developments. From ancient self-governing communities to the structured urban local bodies of today, the journey has been marked by efforts to decentralize power, enhance local autonomy, and promote inclusive governance.

Table No. 1.1

Evolution of Urban local bodies In India year wise:

Here is the column table representing the evolution of Urban Local Bodies (ULB) in India:

S.N.	Particulars	Year
1	First municipal corporation in Madras (Chennai)	1688
2	Municipal corporations set up in Mumbai (Bombay) and Kolkata (Calcutta)	1726
3	Mayo's Resolution on democratic decentralization	1870
4	Ripon's Resolution on Local Governance	1882
5	Government of India Local Governance Act	1919
6	Cantonment Act Passed	1924
7	Local Governance Transferable Act	1935

Source: Evolution of Urban Governance in India (historical study)

- **Colonial-Era:**

  During British colonial rule, the concept of municipal governance was introduced in Indian cities to manage growing urban centers and establish a systematic administration. The first municipal corporation in India was established in Madras (now Chennai) in 1688. This was followed by the establishment of municipal corporations in Calcutta (now Kolkata) and Bombay (now Mumbai) in 1726. These early municipal bodies were largely controlled by British administrators, with limited representation for Indian citizens. The primary focus was on maintaining law and order, collecting taxes, and providing basic services to the residents, but the local Indian population had little say in the governance of these bodies.

- **Government of India Act, 1919:**

  The Government of India Act of 1919 introduced a system of "dyarchy," which was a significant step towards local self-government in urban areas. This act allowed for limited local self-governance, where elected representatives could participate in municipal bodies. However, the powers of these elected representatives were restricted, and the overall control remained with the British authorities. Despite its limitations, this act marked the beginning of Indian citizens' involvement in local governance and set the stage for further reforms.

- **Government of India Act, 1935:**

  The Government of India Act of 1935 was a more comprehensive piece of legislation that expanded the scope of local self-government in urban areas. It introduced the concept of elected municipalities with increased powers and responsibilities. This act allowed for greater autonomy of local bodies and provided more opportunities for Indian citizens to participate in governance. The act also laid the foundation for the modern system of municipal governance in India, with clearer definitions of the roles and functions of urban local bodies.

- **Post-Independence Era:**

  After India gained independence in 1947, the Indian Constitution was adopted in 1950, which established a three-tier system of government: central, state, and local. Part IX and Part IXA of the Constitution specifically deal with municipalities and Panchayats (local self-governments), respectively. The focus was on decentralizing governance and empowering local bodies to manage urban and rural areas effectively. However, the actual implementation of local governance was uneven across different states, with varying degrees of success.

- **74th Constitutional Amendment Act, 1992:**

  The 74th Constitutional Amendment Act of 1992 was a landmark reform that provided constitutional status to urban local bodies (ULBs) and aimed to strengthen their autonomy and functional capabilities. The amendment mandated regular elections for municipalities, reserved seats for marginalized groups such as Scheduled Castes, Scheduled Tribes, and women, and devolved powers, functions, and finances to ULBs. This amendment significantly enhanced the role of municipalities in urban governance, making them more accountable and responsive to the needs of the urban population. It also emphasized the need for transparency, citizen participation, and effective service delivery.

- **Jawaharlal Nehru National Urban Renewal Mission (JNNURM):**

  Launched in 2005, the JNNURM was a major initiative aimed at improving urban infrastructure and governance in cities and towns with a population of over 100,000. The mission sought to address issues such as inadequate infrastructure, urban poverty, and inefficient governance. JNNURM focused on integrated development, with projects ranging from water supply and sanitation to housing and transportation. The mission also encouraged local bodies to undertake reforms that would improve their financial health and governance capacities.

- **Atal Mission for Rejuvenation and Urban Transformation (AMRUT):**
  Launched in 2015, AMRUT focuses on providing basic services such as water supply, sewerage, and urban transport to improve the quality of life in small and medium-sized towns. AMRUT emphasizes the development of infrastructure that directly impacts citizens' daily lives, with a strong focus on sustainable development and environmental management. The mission promotes the use of technology and innovation in urban planning and management, ensuring that cities and towns are better equipped to handle future challenges.

- **Smart Cities Mission:**
  Initiated in 2015, the Smart Cities Mission aims to develop 100 smart cities across India by leveraging technology and improving urban infrastructure. The mission focuses on creating sustainable and inclusive urban spaces by integrating various aspects of urban planning, governance, and service delivery. Smart cities are envisioned as hubs of innovation, with modern infrastructure, efficient public services, and a high quality of life for residents. The mission encourages the use of digital technologies and data-driven decision-making to enhance urban management and address issues such as traffic congestion, waste management, and public safety.

  Today, India's urban local self-governance system is a significant part of its governance structure, with municipalities and municipal corporations playing a crucial role in providing essential services, infrastructure development, and addressing the needs of urban residents. The continuous evolution of urban local self-governance in India reflects the country's efforts to empower local communities, promote participatory governance, and ensure that cities and towns are equipped to meet the challenges of rapid urbanization. The reforms and initiatives taken over the years have contributed to the development of more accountable, transparent, and efficient urban local bodies, which are better positioned to respond to the diverse needs of India's urban population.

1.4 Historical Perspective on Garbage Management:

Garbage management has been a crucial aspect of human society throughout history, evolving alongside the development of civilization. In ancient times, waste was often discarded in open spaces, rivers, or oceans, leading to significant pollution and health risks. As cities expanded, the volume of waste increased, necessitating more organized methods of disposal.

The Industrial Revolution in the 18th and 19th centuries brought about mass production and consumerism, which further complicated waste management. Landfills became the primary method of waste disposal, but they were often poorly managed and led to environmental degradation. The rapid industrialization also highlighted the need for more efficient waste management systems to cope with the growing volume of waste.

In the 20th century, awareness of the environmental impacts of waste began to rise. Recycling gained prominence during World War II when resource conservation became critical. The environmental movement of the 1970s further spurred the development of waste reduction strategies and the implementation of regulations governing waste disposal.

In recent decades, global efforts to improve garbage management have intensified. Practices such as recycling, waste-to-energy facilities, and composting have become common in many countries. Additionally, the adoption of sustainable waste management practices and the circular economy model has aimed to reduce waste generation and its environmental impact.

Despite these advancements, garbage management remains a significant global challenge. With growing populations and increasing urbanization, it is essential to implement efficient and sustainable waste management practices to protect the environment and ensure a healthier future for the planet.

1.4.1 Perspectives on Garbage Management

- **Environmental Perspective:**

  Garbage management seeks to reduce pollution and conserve natural resources through responsible waste disposal methods, including recycling, composting, and waste-to-energy processes. The focus is on minimizing the environmental impact of waste and promoting sustainability.

- **Public Health and Sanitation:**

  Proper waste management is crucial for preventing the spread of diseases and harmful pathogens that can result from the improper handling of waste. Ensuring sanitation through effective waste management is essential for maintaining public health.

- **Recycling and Reuse:**

  The recycling and reuse of materials are key components of garbage management. By recovering and processing recyclable materials, resources are conserved, and the demand for raw materials is reduced. This, in turn, lowers energy consumption and greenhouse gas emissions.

- **Circular Economy:**

  Garbage management plays a pivotal role in the transition from a linear economy (take-make-dispose) to a circular economy (reduce-reuse-recycle). In a circular economy, waste is viewed as a valuable resource that can be reintegrated into the production cycle.

- **Legal and Regulatory:**

  Governments enforce waste management regulations to ensure that waste is disposed of responsibly and safely. These regulations are designed to protect the environment and public health by mandating proper waste handling and disposal practices.

- **Social and Community Impact:**

  Garbage management has a direct impact on communities, affecting their quality of life. It also creates employment opportunities in waste collection, recycling facilities, and related industries, contributing to the local economy.

- **Technological Advancements:**

  Advances in technology have significantly improved waste management. Innovations such as smart waste collection systems and advanced waste

sorting technologies have increased efficiency and reduced the environmental footprint of waste management.

- **Awareness and Education:**

  Public awareness and education are critical components of effective waste management. Campaigns that encourage responsible waste disposal practices and promote behavioural changes are essential for achieving sustainable waste management goals.

  By addressing these various perspectives, garbage management aims to create a cleaner, more sustainable environment for current and future generations.

1.5 Garbage management Global Context:

Garbage management has been a fundamental challenge throughout human history, evolving in complexity as societies grew more sophisticated. In ancient times, waste disposal was rudimentary, with communities typically discarding refuse in open spaces, rivers, or oceans. These practices often led to severe pollution and posed significant health risks, as waste accumulated unchecked in the environment.

As human settlements expanded and urbanization increased, the volume of waste grew exponentially, necessitating more structured approaches to waste disposal. Early methods were often crude and unregulated, resulting in unsanitary conditions that contributed to the spread of diseases.

The advent of the Industrial Revolution in the 18th and 19th centuries marked a turning point in waste management. The rapid industrialization led to mass production and consumerism, generating unprecedented amounts of waste. This era saw the widespread use of landfills, where waste was buried in large pits. However, these landfills were often poorly managed, leading to environmental degradation, including soil and water contamination. The sheer volume of waste created by industrial activities highlighted the need for more systematic and effective waste management strategies.

In the 20th century, the environmental consequences of inadequate waste management became increasingly apparent. The rise of the modern environmental movement in the 1970s spurred a growing awareness of the need for sustainable practices. Recycling, which had gained some traction during World War II as a means of conserving resources, became a more widely accepted practice. Governments and

organizations began to develop waste reduction strategies and implement regulations to control the disposal of waste, aiming to mitigate its impact on the environment.

In recent decades, global efforts to improve garbage management have intensified as the challenges associated with waste have become more complex. Recycling has become a standard practice in many countries, helping to reduce the strain on landfills and conserve resources. Waste-to-energy facilities, which convert waste into electricity or heat, have emerged as a viable alternative to traditional disposal methods, offering a way to both reduce waste and generate energy. Composting, which involves the biological decomposition of organic waste, has also gained popularity as a sustainable method of waste management.

Furthermore, the concept of the circular economy has gained prominence in recent years. Unlike the traditional linear economy—characterized by a "take-make-dispose" model—the circular economy emphasizes the continuous use of resources through recycling, reusing, and refurbishing. In this model, waste is not simply discarded but is treated as a resource that can be reintroduced into the production cycle. This approach not only reduces the amount of waste generated but also lessens the environmental impact of production and consumption.

Despite significant progress, waste management remains a pressing global challenge. The growing world population, coupled with increased urbanization, continues to generate vast quantities of waste, placing a strain on existing waste management systems. Effective and sustainable waste management practices are essential to protect the environment and ensure a healthier future for the planet.

1.5.1 Perspectives on Garbage Management

- **Environmental Perspective:**

  Garbage management from an environmental perspective focuses on reducing pollution and conserving natural resources. Effective waste management practices, such as recycling, composting, and waste-to-energy processes, are essential in minimizing the environmental impact of waste. These methods aim to reduce the amount of waste that ends up in landfills, thereby preventing soil and water contamination, reducing greenhouse gas emissions, and conserving resources by reusing materials.

- **Public Health and Sanitation:**

  The connection between waste management and public health is profound. Improper waste handling can lead to the spread of diseases and the proliferation of harmful pathogens. Inadequate waste management practices, such as open dumping or unregulated landfills, can create breeding grounds for pests and contribute to air and water pollution, which in turn can lead to serious health issues. Proper garbage management ensures that waste is collected, treated, and disposed of in a manner that protects public health and maintains sanitation standards.

- **Recycling and Reuse:**

  Recycling and reuse are central to modern waste management. By recovering and processing recyclable materials, we can conserve natural resources and reduce the need for raw materials, which often involve environmentally destructive extraction processes. Recycling not only conserves resources but also reduces energy consumption and lowers greenhouse gas emissions associated with manufacturing new products from raw materials. Additionally, the reuse of materials extends their life cycle, further reducing waste and the demand for new resources.

- **Circular Economy:**

  The circular economy represents a transformative shift in how we approach waste and resource management. Unlike the traditional linear economy, which is based on the "take-make-dispose" model, the circular economy aims to keep resources in use for as long as possible. This is achieved through practices such as recycling, reusing, and refurbishing products. In a circular economy, waste is seen not as an end product but as a valuable resource that can be reintegrated into the production cycle. This approach not only reduces the volume of waste generated but also minimizes the environmental impact of production and consumption.

- **Legal and Regulatory:**

  Effective garbage management is supported by a robust legal and regulatory framework. Governments play a crucial role in enforcing waste management

regulations that ensure responsible disposal practices. These regulations may include mandates for recycling, restrictions on certain types of waste, and guidelines for the safe disposal of hazardous materials. By setting and enforcing standards, governments help to ensure that waste is managed in a way that protects both the environment and public health.

- **Social and Community Impact:**

  Garbage management has a direct impact on communities. Poor waste management can lead to unsanitary conditions, which can affect the quality of life in a community. Conversely, well-managed waste systems contribute to cleaner, healthier living environments. Additionally, waste management provides significant employment opportunities, from waste collection and processing to recycling and waste-to-energy operations. These jobs not only support local economies but also contribute to the overall well-being of communities.

- **Technological Advancements:**

  Technological innovations have significantly improved the efficiency and effectiveness of waste management. Advances such as smart waste collection systems, which use sensors to monitor waste levels and optimize collection routes, and sophisticated waste sorting technologies, which automate the separation of recyclable materials from waste, have made waste management more efficient and less labour-intensive. These technologies help to reduce the environmental impact of waste management by optimizing resource use and minimizing waste generation.

- **Awareness and Education:**

  Public awareness and education are critical to the success of any waste management strategy. Educating the public about the importance of responsible waste disposal, the benefits of recycling, and the principles of the circular economy can lead to significant behavioural changes. Awareness campaigns and educational programs can empower individuals and

communities to make informed decisions about waste, ultimately contributing to more sustainable waste management practices.

By considering these various perspectives, garbage management aims to create a sustainable and cleaner environment for current and future generations. Effective waste management is not only essential for protecting the environment but also for promoting public health, supporting local economies, and ensuring a high quality of life for all.

1.6 Garbage Management in the Indian Context

1.6.1 Historical Overview of Garbage Collection in India

1. **Pre-Independence Era (Before 1947):**

   Before India's independence in 1947, waste management was basic and largely manual. Cities relied heavily on manual labourers, known as "safai karamchari" or "sweepers," to collect and transport waste. This waste was often disposed of in open dumps or makeshift landfills. The concept of waste segregation, which involves separating different types of waste (e.g., organic from inorganic), was not practiced. Disposal methods were rudimentary and lacked systematic organization.

2. **Post-Independence Era (1947-1970s):**

   Following independence, India saw a growing recognition of the need for improved waste management systems. Municipal corporations were established in several metropolitan areas to oversee urban services, including waste collection. Despite these efforts, waste management remained basic, and many cities continued to use manual methods, though some advancements in waste collection practices began to emerge.

3. **1970s and 1980s:**

   During these decades, cities began adopting motorized vehicles such as garbage trucks to enhance the efficiency of waste collection. However, coverage was often limited, and the practice of waste segregation remained uncommon. The waste management infrastructure started to evolve, but many challenges persisted, including inadequate coverage and lack of public awareness about waste management practices.

4. **1990s and Early 2000s:**

   The late 1990s and early 2000s marked a period of increased emphasis on environmental sustainability and urban development. Metropolitan cities began implementing waste segregation at the source, encouraging residents to separate organic and inorganic waste. Recycling initiatives gained traction with the establishment of facilities for processing materials like paper, plastics, and metals. These changes reflected a growing awareness of environmental issues and a shift toward more organized waste management practices.

5. **Mid-2000s Onward:**

   From the mid-2000s, a more integrated approach to solid waste management emerged. Cities began adopting comprehensive systems that included waste-to-energy projects, composting facilities, and public awareness campaigns. Public-private partnerships (PPPs) were explored to enhance waste management services and infrastructure. These efforts aimed to create a more sustainable and efficient waste management system, integrating various technologies and practices.

6. **Swachh Bharat Abhiyan (Clean India Campaign) (2014-Present):**

   In 2014, the Indian government launched the Swachh Bharat Abhiyan, a nationwide campaign aimed at improving cleanliness and sanitation. This initiative focused on waste management, promoting waste segregation, cleanliness drives, and the construction of public toilets. The campaign significantly increased public attention to waste management practices and sought to foster a culture of cleanliness and hygiene.

7. **Recent Developments:**

   In recent years, many metropolitan cities have made notable progress in waste management. Advances in technology have led to the adoption of smart waste bins and digital tracking systems for waste collection. Efforts to reduce single-use plastics and promote recycling have intensified. However, the quality of waste management services varies between cities, with some still facing challenges due to rapid urbanization and resource constraints. The government

and local authorities continue to work on enhancing waste management infrastructure and practices to address environmental and health concerns.

1.6.2 Classification of Metropolitan Cities in India:

In India, metropolitan cities are major urban centers characterized by their large populations, extensive infrastructure, and economic significance. These cities are often referred to as Tier 1 cities and are central to the country's economic and cultural landscape. As of the latest updates, the Tier 1 cities include:

1. **Mumbai (Bombay):** The capital of Maharashtra and India's financial hub, Mumbai is known for its vibrant economy and entertainment industry.
2. **Delhi:** The national capital and political centre of India, Delhi, along with its National Capital Region (NCR), including Gurgaon, Noida, and Faridabad, is a major economic and cultural centre.
3. **Bangalore (Bengaluru):** The capital of Karnataka, Bangalore is renowned as the "Silicon Valley of India" due to its thriving IT and technology sector.
4. **Chennai (Madras):** The capital of Tamil Nadu, Chennai is a significant centre for manufacturing, automobile industries, and IT services.
5. **Kolkata (Calcutta):** The capital of West Bengal, Kolkata, is a city with rich historical and cultural significance and a diverse economy encompassing finance, manufacturing, and trade.
6. **Hyderabad:** The capital of Telangana and Andhra Pradesh (until Telangana's formation), Hyderabad is a major hub for IT and pharmaceutical industries.
7. **Pune:** Known for its educational institutions and IT sector, Pune is one of Maharashtra's largest and fastest-growing cities.
8. **Ahmedabad:** The largest city in Gujarat, Ahmedabad is an important economic and industrial centre.
9. **Surat:** Also in Gujarat, Surat is known for its diamond cutting and textile industries.
10. **Jaipur:** The capital of Rajasthan, Jaipur is a prominent tourist destination and a growing centre for industries and commerce.
11. **Lucknow:** The capital of Uttar Pradesh, Lucknow is known for its historical and cultural heritage.
12. **Bhopal:** The capital of Madhya Pradesh, Bhopal is emerging as an industrial and educational hub.

13. **Nagpur:** Located in Maharashtra, Nagpur is an emerging city with growing industrial and IT sectors.
14. **Indore:** Known for its rapid urban development and IT industry, Indore is a significant city in Madhya Pradesh.

The classification of metropolitan cities can change due to factors such as urban development and economic growth, and the government may periodically update these classifications based on population and infrastructure criteria.

1.6.3 Community Behavioral Characteristics in Indian Urban Areas:

Community behaviors in Indian urban areas reflect the diversity of cultures and socioeconomic backgrounds. Common behavioral traits include:

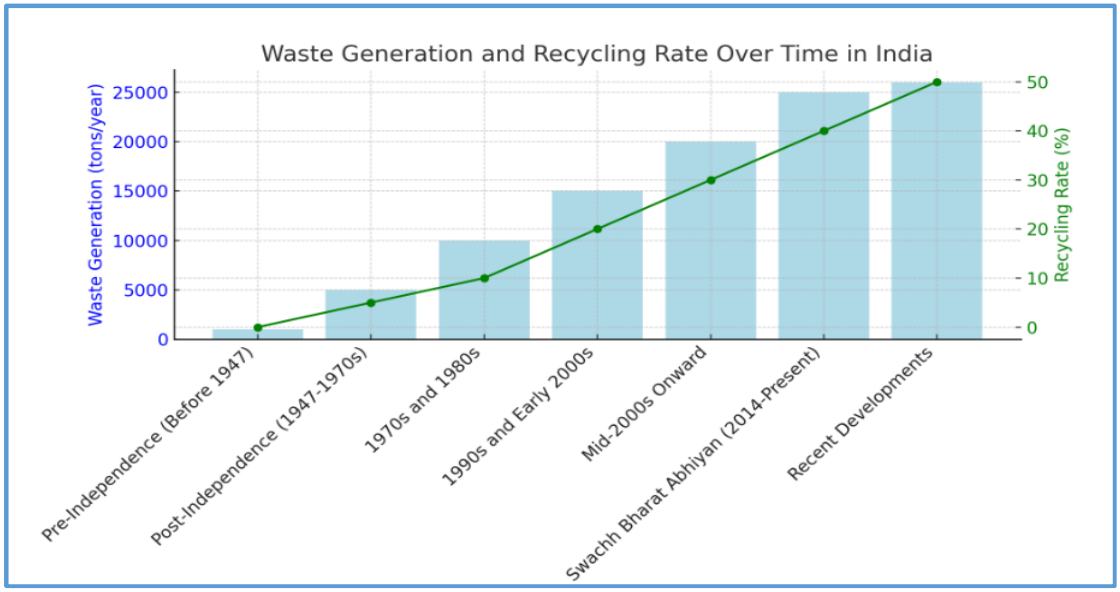
1. **Cultural Festivals and Celebrations:** Urban areas in India are vibrant with cultural festivals and celebrations, including religious and national holidays. These events often involve community gatherings, traditional music, dance, and rituals.
2. **Religious Practices:** Urban communities are diverse, with various religious groups actively participating in religious practices and visiting places of worship. Festivals and religious events play a significant role in community life.
3. **Street Food and Culinary Diversity:** The diversity of street food in urban areas is notable. Communities gather at food stalls and markets to enjoy a wide range of cuisines, fostering a shared culinary culture.
4. **Family and Social Gatherings:** Family ties are strong in urban India, with frequent family gatherings, weddings, and social events that reinforce familial and community bonds.
5. **Community Service and Volunteering:** Urban communities often engage in volunteering and community service activities, such as cleaning drives and educational initiatives, reflecting a sense of social responsibility.
6. **Public Transportation Etiquette:** In busy urban areas, residents adhere to etiquettes on public transportation, such as queuing, giving seats to the elderly, and maintaining cleanliness.
7. **Environmental Awareness:** Growing environmental awareness has led to increased participation in activities like waste segregation, cleanliness drives, and tree planting initiatives.

8. **Youth and Technology:** Urban youth are typically tech-savvy, using digital platforms for education, socializing, and entertainment. Technology plays a significant role in their daily lives.
9. **Education and Aspiration:** Education is highly valued, and communities prioritize academic achievements as a means to upward mobility and professional success.
10. **Traffic and Congestion:** Urban areas often experience traffic congestion, and residents adapt by developing driving skills and navigating crowded streets.
11. **Multilingualism:** Urban areas are linguistically diverse, with many residents speaking multiple languages, including regional languages, Hindi, and English.
12. **Gender Roles and Norms:** While urban areas may be more progressive compared to rural areas, traditional gender norms and expectations still influence community behaviours.

These characteristics can vary widely between different urban areas and evolve with social, economic, and cultural changes. Urban India is dynamic, blending traditional values with modern influences.

Figure No. 1.1

Summary of Municipal Waste Management Policies in India



Source: Secondary data TOI

Here is the column chart that represents waste generation and recycling rates over time in India. The chart combines a bar chart for waste generation (in tons per

year) and a line chart for recycling rates (in percentage) to provide a clear comparison of the trends across different eras.

1. **Expansion and Challenges:**

- **Urbanization and Waste Generation:** Over the decades, rapid urban expansion in India has led to increased municipal waste generation. Initially, only major metropolitan areas were a concern, but now even tier-2 and tier-3 cities face significant waste management challenges. The traditional reliance on landfills is becoming less viable as natural resources become scarcer and waste volumes increase.

2. **Role of Technology and Policy:**

- **Technological and Policy Factors:** Effective waste management relies not only on technology but also on government policies, legal frameworks, and financial resources. While technological solutions are crucial, the implementation of policies and regulations plays an equally important role in managing waste effectively.

3. **Historical Perspective:**

- **Early Efforts:** Waste management in India has evolved significantly. Initially, waste was managed with minimal formal systems, relying on cultural practices of reuse and reduction. Over time, as urbanization and consumerism increased, so did waste generation, prompting the need for more structured waste management practices.

4. **Evolution of Policies:**

- **1970s-1980s:** Early policies focused on composting and waste treatment but were not systematically implemented. During this period, the Five Year Plans emphasized composting and provided financial assistance for setting up composting plants.
- **1990s:** The focus shifted to integrating informal waste workers and improving waste collection and recycling methods. Key developments included the formation of the National Waste Management Council and recommendations from the Bajaj Committee.

- **2000s:** The Municipal Solid Waste (Management and Handling) Rules, 2000, introduced scientific waste disposal techniques. However, implementation was inconsistent, and rules often lacked comprehensive coverage of different waste types.
- **2010s:** The introduction of new rules like the Plastic Waste Management Rules, 2011, and E-Waste Rules, 2011, aimed to address specific waste types. Despite these efforts, challenges remained in enforcement and comprehensive waste management.
- **Recent Developments:** The Solid Waste Management Rules, 2016, revised and expanded earlier regulations, including detailed guidelines for segregation and management of various waste types. Despite improvements, issues like informal sector exclusion and inconsistent implementation persist.

5. **Legal and Regulatory Framework:**

- **Constitutional and National Policies:** India's Constitution provides a framework for environmental protection, granting municipalities responsibility for waste management. Various national policies, including the National Environment Policy (2006) and the Clean India Mission (2014), emphasize waste management's importance.
- **Challenges in Implementation:** While regulations exist, enforcement is often weak. Issues include inadequate monitoring, lack of accountability, and ineffective penalties. Lessons from other countries highlight the need for stricter enforcement and better coordination among regulatory bodies.

6. **Future Directions:**

- **Stronger Regulations and Public Participation:** Effective waste management requires stricter regulations, improved public awareness, and active participation. There's a need for more comprehensive and enforceable rules, especially for emerging waste types like electronic and plastic waste.
- **Job Creation and Economic Opportunities:** Proper implementation of waste management rules could create significant job opportunities, particularly in rural areas. Investment in waste management not only addresses environmental concerns but also supports economic development.

- **Explanation**

The summary highlights that India faces significant challenges in managing municipal waste due to rapid urbanization, increasing waste generation, and outdated disposal methods. Although there have been efforts to develop and implement various waste management policies over the decades, issues like poor enforcement and lack of comprehensive coverage persist.

- **Historical Context:** Initially, waste management was informal and based on cultural practices. With urbanization, the need for formal policies grew, leading to the development of various regulations over time. However, many policies were not effectively implemented or lacked the necessary scope.
- **Recent Developments:** Newer rules aimed to address specific waste types and improve management practices. Despite these advancements, challenges in enforcement and coordination among regulatory bodies remain.
- **Future Directions:** To improve waste management, India needs stricter regulations, better public participation, and a focus on comprehensive enforcement. Proper implementation of these rules could also provide economic benefits and job opportunities.

This explanation provides a concise overview of the evolution, current status, and future needs of municipal waste management policies in India.

India's municipal waste management has evolved significantly due to rapid urbanization and increased waste generation. Historically, waste was managed informally, but as urban areas expanded and consumption patterns changed, formal policies became necessary. Initial efforts in the 1970s and 1980s focused on composting and basic waste treatment, but significant advancements came in the 1990s and 2000s with new regulations addressing specific waste types like plastics and electronics. Despite the introduction of the Municipal Solid Waste Management Rules in 2000 and subsequent revisions, implementation remains inconsistent, hindered by weak enforcement and lack of comprehensive coverage. Recent policies have aimed to address these gaps by emphasizing segregation and better management practices, but challenges persist. Moving forward, India requires stricter regulations, improved public participation, and better coordination among regulatory bodies to effectively manage waste and support sustainable development.

India's approach to municipal waste management has evolved significantly over recent decades due to urban expansion and increased waste generation. Initially,

waste management was informal and focused on basic practices like composting. As urban areas grew and consumption patterns changed, formal policies became essential. The 1990s and 2000s saw the introduction of regulations addressing specific waste types, including plastics and electronics. Despite these efforts, implementation has been inconsistent, largely due to weak enforcement and inadequate coverage. Recent policies have aimed to improve waste management through better segregation practices and the inclusion of various waste streams. However, challenges remain, such as the need for stricter regulations, enhanced public participation, and improved coordination among regulatory bodies. For effective waste management and sustainable development, India must address these issues through more rigorous enforcement and comprehensive policies.

1.6.4 Policies- Rules regulation of municipal for Garbage management:

The expansion of urban areas in India has significantly increased over the past decades. This growth, along with changing consumption patterns and industrialization, has led to a substantial rise in municipal waste generation. Smaller cities like Pune, Hyderabad, and Bangalore are now contributing to the environmental challenges posed by urbanization.

The traditional practice of landfill disposal is still widely used, even as natural resources become scarcer. Although technology is considered essential for waste management, other factors like government policy, legal frameworks, financial allocation, and social and cultural contexts are equally important but often overlooked.

Recognizing the importance of sustainable development, this paper examines the municipal solid waste management system in India, highlighting the gaps in policy formulation and implementation. It also compares India's practices with those of countries that have excelled in waste management, suggesting a way forward.

India has a long history of waste management, with cultural practices of "reuse" and "reduce" deeply ingrained. However, with rapid urbanization and consumerism, waste generation has increased significantly. According to a 2016 report by the Ministry of Environment, Forest, and Climate Change (MOEF&CC), India is projected to generate 135 million tonnes of waste by 2040, up from 62 million tonnes in 2016.

The country faces challenges in managing this waste due to inadequate implementation of existing regulations. While India has comprehensive environmental legislation, enforcement is often weak, leading to ineffective waste management. The study emphasizes the need for a more robust regulatory framework and stricter enforcement to address these challenges.

Learning from other countries like Japan, Germany, and Singapore, where strict enforcement of waste management rules has led to success, the paper argues for a similar approach in India. The study calls for a systematic investigation into waste management regulations, linking legislation, economics, and environmental policy to chart a future course of action.

The paper also discusses the historical evolution of waste management policies in India, noting that despite the presence of numerous rules and regulations, the implementation has been lacking. The paper concludes by emphasizing the need for better coordination among regulatory bodies, stricter enforcement of rules, and increased public participation in waste management. The study suggests that addressing these issues could create significant job opportunities in the waste management sector, contributing to sustainable development.

1.6.5 Maharashtra Context (Municipal, Community, and Garbage):

a) History:

Maharashtra, one of India's most economically and culturally significant states, has a rich and complex history of urbanization. The evolution of urban centers in Maharashtra spans several centuries and is marked by various dynasties, rulers, and economic activities. Here's an overview of its urbanization history:

1. **Ancient Period:** Maharashtra has had urban centers since ancient times, with cities like Paithan (Pratishthana), Nasik, and Ter mentioned in texts like the Puranas and travelogues. The region was known for trade and commerce, with connections to the Silk Road.
2. **Medieval Period:** During the medieval period, important cities and towns emerged. The Yadav dynasty established Devagiri (now Daulatabad) as their capital. This era saw the construction of fortresses, including those in Pune and Raigad. The Vijayanagara Empire, with its capital in Hampi, Karnataka, also influenced trade and urbanization in the region, connecting it to other parts of South India.

3. **Maratha Empire:** The 17th-century Maratha Empire significantly impacted urbanization in Maharashtra. Pune, under the rule of the Peshwas, became the political and cultural centre of the empire. Other cities like Nagpur and Satara also developed during this period.
4. **British Colonial Period:** The arrival of the British marked another phase of urbanization. Mumbai (then Bombay) became the capital of the Bombay Presidency and a major hub for trade and commerce. The British introduced modern urban planning concepts and developed infrastructure in Mumbai.
5. **Industrialization:** Maharashtra played a key role in India's industrialization. Cities such as Mumbai, Pune, Nasik, and Nagpur became major industrial hubs, with diverse industries, including textiles, manufacturing, and information technology.
6. **Urban Expansion:** The late 20th and early 21st centuries saw significant urban expansion in Maharashtra. Mumbai's metropolitan area grew substantially, and Pune emerged as a major IT and education hub.
7. **Smart Cities:** Recently, several cities in Maharashtra, including Pune, Nagpur, and Nasik, have been designated as "Smart Cities," with initiatives aimed at improving urban infrastructure, transportation, and quality of life.
8. **Challenges:** Urbanization in Maharashtra has brought challenges such as housing shortages, transportation issues, environmental degradation, and socioeconomic disparities. Today, Maharashtra is one of India's most urbanized states, featuring a mix of historic cities, bustling metropolises, and emerging urban centers. Its urbanization story reflects the state's economic vibrancy and cultural diversity.

b) Municipal Corporation History:

The history of municipal corporations in Maharashtra reflects a progression from earlier forms of local governance to modern urban management structures. Here's an overview of the establishment and evolution of municipal corporations in the state:

1. **Pre-Independence Era:** Before India's independence in 1947, urban areas in Maharashtra were administered by local bodies known as "municipal committees" or "municipal councils." These bodies had limited powers and responsibilities compared to modern municipal corporations.

2. **Post-Independence Period:** After independence, there was a shift towards more effective urban governance, leading to the establishment of municipal corporations in several cities.
3. **Mumbai (Bombay) Municipal Corporation:** The Municipal Corporation of Greater Mumbai (MCGM), commonly known as the Brihan-Mumbai Municipal Corporation (BMC), was established in 1888 during British colonial rule. It serves Mumbai and is one of the largest and wealthiest municipal corporations in India.
4. **Other Municipal Corporations:** As cities in Maharashtra grew, additional municipal corporations were established to address the increasing demands of urban governance. Notable examples include Pune Municipal Corporation (PMC), Nagpur Municipal Corporation (NMC), Thane Municipal Corporation, and Navi Mumbai Municipal Corporation (NMMC).
5. **Legal Framework:** The Maharashtra Municipal Corporation Act, 1949, governs the establishment and functioning of municipal corporations in the state. This legislation outlines the powers, functions, and organizational structure of municipal corporations, which are responsible for urban planning, infrastructure development, sanitation, public health, and local taxation.
6. **Municipal Elections:** Periodic municipal elections elect representatives (corporators) to the municipal corporation's governing body, responsible for local decision-making.
7. **Municipal Commissioner:** Each municipal corporation is headed by a Municipal Commissioner, an Indian Administrative Service (IAS) officer appointed by the state government, responsible for day-to-day administration.
8. **Revenue Sources:** Municipal corporations generate revenue through property taxes, water charges, trade licenses, and other fees, as well as receiving grants from state and central governments.
9. **Urban Development Challenges:** Municipal corporations, particularly in Mumbai and Pune, face challenges such as rapid urbanization, infrastructure development, affordable housing, and environmental sustainability.

c) Maharashtra State Municipal Corporation and Garbage Collection Policies:

Municipal corporations in Maharashtra implement various policies and practices for garbage collection and solid waste management to address urban challenges and promote cleanliness. Here's a summary of common policies:

1. **Door-to-Door Collection:** Municipal corporations typically provide door-to-door garbage collection services for households, commercial establishments, and industrial units. Collection vehicles, such as compactor trucks, visit designated points at regular intervals.
2. **Waste Segregation:** Many municipal corporations promote waste segregation at source, encouraging residents to separate waste into wet (organic) and dry (non-organic) categories. Separate bins for different types of waste facilitate this process.
3. **Collection Bins:** Public garbage bins are strategically placed in residential areas, markets, and commercial districts, often color-coded or labelled to indicate the type of waste that should be deposited.
4. **Collection Schedule:** Municipal corporations establish regular collection schedules for neighbourhoods or wards, informing residents of collection days to ensure timely waste disposal.
5. **Biomedical Waste Management:** Special attention is given to the disposal of biomedical waste in areas with hospitals and clinics, with strict guidelines for safe handling and disposal.
6. **Bulk Waste Collection:** Provisions are made for the collection of large items such as furniture and appliances. Residents can request pick-up services for these items.
7. **Awareness Campaigns:** Municipalities conduct awareness campaigns and public education programs to promote waste segregation, responsible disposal, and the hazards of littering.
8. **Legal Enforcement:** Fines and penalties may be imposed for littering and illegal dumping to deter violations of waste disposal regulations.
9. **Waste Processing Facilities:** Larger municipal corporations have established waste processing and treatment facilities, including composting plants, recycling units, and waste-to-energy plants.

10. **Recycling Initiatives:** Some municipalities promote recycling and offer incentives for the collection of recyclable materials such as paper, plastics, glass, and metals, often collaborating with recycling agencies and NGOs.
11. **Community Participation:** Community involvement is encouraged, with residents' associations and local groups working with municipalities to maintain cleanliness in their neighbourhoods.
12. **Monitoring and Reporting:** Digital platforms or mobile apps may be used for residents to report waste-related issues or request services like bulk waste collection.

These policies and practices can vary among municipal corporations within Maharashtra and are continually evolving to address changing urbanization trends and environmental concerns.

Figure No. 1.2

Pune Municipal Corporation



Source: Maharashtratoday.co.in/Pune-mahanagar-palika.jpg

1.7 Pune Municipal Corporation (Department of Waste Management):

1.7.1 Pune Municipal Corporation (History and Perspectives):

The Pune Municipal Corporation (PMC) has a rich history that dates back to the pre-independence era and has played a significant role in the urban development

of Pune, one of Maharashtra's largest and most prominent cities. Here's an overview of the history of the Pune Municipal Corporation:

- **Pre-Independence Era:**

  The origins of municipal governance in Pune can be traced back to the British colonial period. In 1858, during British rule, the Pune Municipal Corporation was established under the Bombay District Municipal Act. The primary objective was to improve urban infrastructure and services in the city.

- **Early Developments:**

  In its early years, the Pune Municipal Corporation focused on providing basic amenities such as sanitation, water supply, and public health services. The corporation was responsible for the development and maintenance of roads, public buildings, and markets.

- **British Influence:**

  During British rule, Pune was an important military and administrative centre. The city's infrastructure and urban planning were influenced by British architecture and town planning principles.

- **Post-Independence Period:**

  After India gained independence in 1947, the Pune Municipal Corporation continued its efforts to modernize and develop the city's infrastructure. Urban planning and development became essential aspects of the corporation's responsibilities.

- **Rapid Urbanization:**

  Pune experienced significant urbanization and industrialization in the post-independence era. The city attracted migrants from various parts of India, leading to population growth and increased demands for urban services.

- **Educational Hub:**

  Pune's status as an educational hub also began to emerge during this period, with the establishment of numerous educational institutions and universities. The Pune Municipal Corporation played a role in supporting the growth of the education sector.

- **Cultural and Economic Growth:**

  Pune's cultural and economic significance continued to grow, with the city becoming a centre for arts, literature, music, and industry. Pune's diverse cultural heritage was fostered and celebrated.

- **Administrative Reforms:**

  Over the years, the Pune Municipal Corporation underwent administrative reforms to improve governance and service delivery. The corporation adopted modern technologies and practices for urban planning and development.

- **Local Elections:**

  Pune residents have participated in local elections to elect representatives to the Municipal Corporation. These elected representatives, known as corporation members, are responsible for decision-making on local issues and policies.

- **Infrastructure and Development:**

  In recent decades, the Pune Municipal Corporation has focused on infrastructure development, including roads, public transportation, waste management, and environmental conservation. The city has expanded its footprint and modernized its services to meet the needs of a growing population.

- **Smart City Initiatives:**

  Pune has also been selected as one of the Smart Cities under the Indian government's Smart Cities Mission. This initiative aims to improve urban infrastructure, services, and the quality of life for residents.

1.7.2 Tentative organogram of Pune Municipal Corporation:

Mayor

- Deputy Mayor (if applicable)
- City Council
- Council Members
- Municipal Commissioner (Chief Executive Officer)
- Deputy Municipal Commissioner
- Department Heads (e.g., Public Works, Finance, Health, Planning)
- Managers and Supervisors

- Staff and Employees
- City Clerk
- Records and Documentation
- City Attorney
- Legal Team
- Chief Financial Officer
- Finance Department
- Chief Engineer
- Public Works Department
- Engineering Division
- Maintenance Division
- Chief Health Officer
- Health Department
- Sanitation Division
- Health Services Division
- Planning Director
- Planning Department
- Zoning Division
- Urban Planning Division
- Public Information Officer

1.7.3 Overview of Waste Management by Pune Municipal Corporation:

The Pune Municipal Corporation (PMC) manages a comprehensive waste management system to handle the city's significant waste generation. Here's an overview with some explanation of the key points:

1. **Daily Waste Formation:**Pune generates approximately 1,600 to 1,700 tons of solid waste each day. This vast amount reflects the city's growing population and urban activities.
2. **Door-to-Door Collection:** PMC has deployed 160 trucks for door-to-door waste collection, which gather an average of 198 tons of waste daily. This service ensures that waste is regularly collected from households, reducing the chances of littering and environmental pollution.
3. **Waste Containers and Compactor Buckets:** The city is equipped with 563 containers and 116 compactor buckets strategically placed around Pune. These

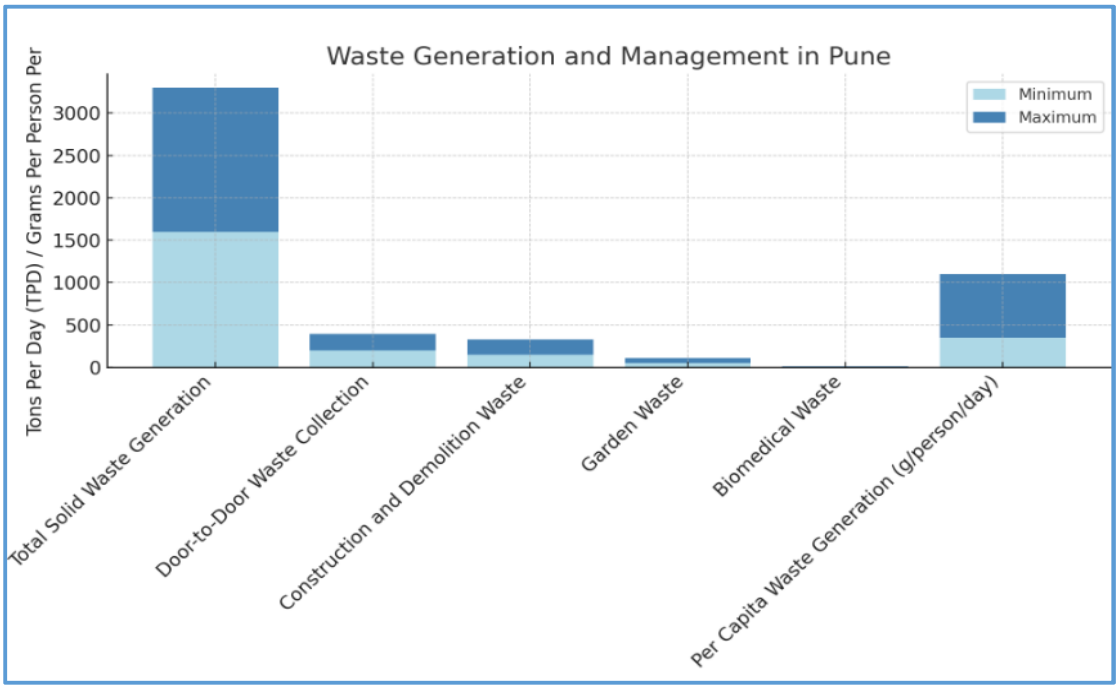
are used for collecting and temporarily storing waste before it is transported to processing facilities, helping to keep the city clean.

4. **Per Capita Waste Formation:** On average, each ward in Pune generates 350 to 750 grams of waste per person per day. This variation depends on the population density and activities within each ward.
5. **Construction and Demolition Waste:**Pune generates 150 to 180 tons of construction and demolition waste daily. This type of waste, which includes debris from building sites, requires specialized handling and disposal.
6. **Garden Waste:** The city produces 50 to 60 tons of garden waste each day. This waste, consisting of leaves, branches, and other organic materials, is often processed into compost or used in other eco-friendly ways.
7. **Biomedical Waste:**Pune generates 5 to 6 tons of biomedical waste daily. Proper management of this waste is crucial to prevent health hazards, and it is handled with stringent protocols to ensure safe disposal.
8. **Initiatives in Waste Collection and Processing:** The PMC regularly undertakes initiatives to improve the collection and processing of various waste streams, ensuring that the waste management system evolves with the city's needs.
9. **Construction and Demolition Waste Management:** The PMC has set up systems to efficiently collect and process construction and demolition waste, reducing its environmental impact.
10. **E-Waste Collection:** Electronic waste (e-waste) collection is a growing focus area for the PMC, as electronic devices often contain hazardous materials that need to be handled carefully.
11. **Sanitary Waste:** The PMC has specific processes for the collection and disposal of sanitary waste, ensuring it is managed in a hygienic manner.
12. **Garden Waste Management:** In addition to collection, the PMC processes garden waste into compost or mulch, promoting sustainable waste management practices.
13. **Waste Processing Plants:**Pune has established waste processing plants that handle different types of waste, converting them into usable products like compost, energy, or recycled materials.

14. **Plastic Waste Management:** Plastic waste, a significant environmental concern, is collected and processed to minimize pollution. The PMC is actively working on reducing plastic waste through various initiatives.

Figure No. 1.3

Graphical representation of waste management in PMC



Source: Pune municipal web.

1.7.4 Pune Municipal Corporation and Waste Management System:

The growing problem of solid waste management (SWM) is a major challenge after the Indian cities such as Pune, Mumbai, Nagpur and growing villages. We are thinking about keeping Pune city clean but have we ever thought about the mounting wastes in the land filling area around and in the city. We should aim at sustainable solution reduction, recycling and reuse of the waste; to make cities clean.

The study is all about the emergence and growth of solid waste management (SWM) in different part of the world as well as in the studied area of Pune city. Identifying the good practices followed by different parts of the world and Indian cities to have sound policy and program to be adopted by the municipal corporation in managing dry and wet wastes. There are cities who are successfully converting the solid waste into compost, vermi-composting, Biogas, electricity, RDF (Refuse

Derived Fuel), real estate inputs, metals, etc., we need to learn their process to be replicated.

Figure No. 1.4

Departmental Chart on Web Pune Municipal Corporation



Source: Web, pmc.gov.in/en/all-departments/ (Showing Solid Waste management)

1.7.5 Analysis of Waste management Department:

Overview of Waste Management by Pune Municipal Corporation:

1) Pune generates 1600 -1700 tons of solid waste per day.
2) 160 trucks collect waste door-to-door, collecting an average of 198 tons per day.
3) 563 containers and 116 compactor buckets dispersed around Pune.
4) Ward wise average- 350 to 750 gram per capita per day
5) Construction and demolition waste generation –150-180 TPD
6) Garden waste generation – 50-60 TPD
7) Biomedical waste – 5-6 TPD
8) Initiatives in the collection and processing of the different waste streams by the municipal corporation taken regularly.

9) Construction and Demolition Waste

10) E-Waste Collection

11) Sanitary Waste

12) Garden Waste

13) Waste Processing Plants

14) Plastic Waste

1.8 Community Organization Method:- History, steps, model, principles etc.:

1.8.1 Urban community organization some definitions and history:

As defined in various books and by different authors, community organization is a "process." This process represents a movement, which may be conscious or unconscious, voluntary or involuntary, beginning with the identification of a problem or objective and culminating in the solution of the problem or attainment of the identified objective(s) by the community. From start to finish, this process involves a series of steps that, although distinct, may overlap in real practice. The sequence of these steps or stages may also vary depending on the specific context in which they are applied.

There are many different ways of identifying communities. The following definitions and examples provide an understanding of the various ways the term "community" is used:

1. **Local Community**: A group of people living in a particular local area, often sharing common ownership. Examples include villages and districts where a specific clan holds communal ownership of land and resources. Another example is when a group of people acquires land and lives together as a community, sharing resources and governed by an agreed set of rules to ensure peace and order. An example is the group of Baan-Bans relocated to the island of Rabi in Fiji from their home, Ocean Island, due to phosphate mining depletion.
2. **Group of Nations**: A community can also refer to a group of nations with common interests, such as the Commonwealth of Nations, which consists of 54 countries voluntarily forming a community of nations with shared interests.
3. **Residential District**: This refers to an area where people live in private residences, typically a small town or part of a city composed mostly of

residents. This area is often called a residential suburb, consisting of a diverse ethnic population and people of various walks of life and religious beliefs.

4. **Group of Organisms Sharing an Environment**: A community may consist of individuals who, though separate beings, are interconnected and interdependent in various ways, often sharing similar values and goals. In this way, a group can operate together as a community, distinct from the lives of each of its members. A community is both a collective of individuals and the separate lives within it.
5. **Community Boundaries**: Communities create bonds among some people while excluding others, thereby implying and creating a boundary between "us" and "them," inside and outside the group. This boundary is usually marked symbolically through various features like flags, tribal totems, provinces, dances, languages, etc. For example, we have the Samba community and the Tianna community.

1.8.2 Types of Communities:

When people think about communities, they often think of a geographical location such as a town, suburb, or even a small section of a suburb. There might be multiple communities within the same town. Sometimes a community may extend beyond a town, including rural areas or closely linked towns. All communities are dynamic in nature, interacting, evolving, and changing due to larger political and economic forces as well as internal and external influences. The meaning of community might vary for each member, as each person has a unique understanding. There can be many kinds of communities, such as:

1. Local Community
2. Ethnic Community
3. Community of Scholars, Intellectuals
4. Community of Values
5. Professional Community (e.g., Legal Community, Medical Community)
6. International Community
7. Religious Community
8. Polynesian/Melanesian/Micronesian Community
9. Political Community

1.8.3 Community Organization History for Pune City:

The history of community organization has its roots in the late nineteenth century. The Industrial Revolution in England in the mid-1800s transformed the economy from agrarian to industrial, leading to rapid urbanization and prompting rural populations to move to urban areas in search of livelihoods. Urban areas with industries became centres for exploitation, sickness, accidents, disabilities, unemployment, and other socioeconomic issues. Families struggling to survive had limited options in these circumstances, such as government relief, private charity, or begging. The prevailing belief was that poverty and distress were due to individual weaknesses and deficiencies.

1.8.4 Formation of the London Charity Organization Society:

When a particular area experienced economic distress, many workers were rendered unemployed. In response, several groups emerged to alleviate poverty and help affected individuals and families, primarily through private charity and philanthropy. These groups often worked autonomously, with little coordination among themselves, leading some individuals and families to receive help from multiple charity groups. The need for a coordinated effort among these groups became apparent, leading to the formation of the first Charity Organization Society (COS) in London in 1869, aimed at "Organizing Charitable Relief and Repressing Mendacity" (Roof, 1972). The COS focused on helping self-respecting families struggling to avoid destitution and organizing and coordinating charities to make the best use of resources (ibid.).

The COS emphasized a scientific approach to systematically identifying and registering applicants for charity and supervising the administration of charity. This method distinguished between those who genuinely required charity and those who did not. The COS believed that indiscriminately giving out charity without thoroughly examining the real causes of poverty could lead to permanent dependency and create a class of people reliant on charity for survival. As a result, the COS thrived in England during this period, maintaining systematic and centralized records of charity-seekers through registration bureaus, emphasizing thorough and objective investigation, and focusing on coordination among various charities.

The COS's primary objective was not merely to provide charity but to help individuals or families gain self-reliance and self-sufficiency. Through its activities,

each COS became the nerve centre of information, updates, and referrals for various services within the community. By 1875, the COS had established several offices with effective coordination among them. Charity Organization Societies, therefore, intervened in low-income and impoverished urban communities to identify individuals and families needing essential services. By addressing the effects of poverty on individuals through systematic support, the COS aimed to strengthen emerging urban communities.

1.8.5 Charity Organization Society in the United States of America:

The London COS served as a model for the United States, which in 1877 was in its fourth year of a severe economic depression and industrial strife. This period was marked by starvation, suicides, hopelessness, and destitution. In Buffalo, New York, Episcopal rector Rev. Stephen Humphreys Gurleen, T. Guilford Smith, and a group of friends decided to start the first COS in their city. Their objectives were to bring order to the chaos created by the numerous charities in the city by offering district conferences where agencies could discuss common problems and coordinate their efforts and to conduct careful investigations of appeals for help and establish a city-wide registration of applicants.

The COS believed that by implementing a rational system of scientific charitable administration, cyclical poverty could be addressed, and deserving poor individuals could receive support to regain self-reliance, rather than providing charity to undeserving individuals who might become dependent and idle. The COS did not concern itself with the larger, structural causes of poverty, such as economic factors that induce poverty.

1.8.6 The Progressive Era and the Settlement House Movement

The Progressive era of the 1880s, characterized by a new wave of economic thought, questioned the forces of capitalism and their impact on labour and human life. Large groups of unemployed people protested against the capital and advocated for social reform. These were working people facing poverty due to no fault of their own, influenced by industrialization, unemployment, urbanization, and immigration induced by capitalism. They demanded that charity focus not on individual causes but on addressing the social causes of poverty. It was in this socio-political context that the "Settlement House Movement" emerged.

The goal of the Settlement Houses was to meet the immediate needs of the working class in their neighbourhoods by providing services and basic reform. This collaborative practice emphasized community building and social action.

1.8.7 The Settlement House Movement

Toynbee Hall in Whitechapel was the first university settlement house established in London in 1884 by a group of middle-class London reformers, initiated by Samuel Barnett. Barnett believed that settlement houses were "places where richer students could live alongside, learn about, and contribute to the welfare of much poorer people." Settlement workers, mainly middle-class reformers (often women volunteers), would locate themselves in houses in urban, poor, working-class neighbourhoods. They conducted research in surrounding communities and offered services such as language classes, childcare, healthcare, and meeting spaces.

Inspired by this idea, social reformers in the United States began establishing settlement houses in response to growing industrial poverty. The purpose of American settlement houses was to ease the transition of immigrant workers into the labour force and help them assimilate middle-class American values. The Neighbourhood Guild in New York was the first American settlement house, founded by Stanton Coit in 1886. This was followed by the establishment of Hull-House in Chicago in 1889 by Jane Addams and Ellen Starr. In 1893, nurse and progressive reformer Lilian Wald founded the Henry Street Settlement in New York. By the 1890s, there were at least 400 settlement houses in the United States, with forty percent in industrial towns like Boston, Chicago, and New York.

A notable feature of the settlement house movement was that many leadership positions (in nearly half of the USA settlement houses) were held by women, which was unusual at the time when women were not commonly seen as leaders in business or government. Settlement workers were progressive in their approach, aiming to gain insights about poverty by directly experiencing the conditions under which the poor lived. They also aimed to enable the poor to form organizations to improve their situation and, in some cases, build workers' organizations to advocate for reform. This approach marked a significant departure from nineteenth-century charity, where the wealthy maintained clear boundaries and upheld their superiority over the poor.

The Settlement House movement was at its peak around the 1920s. By locating themselves in urban poor working-class neighbourhoods, the Settlement

Houses accomplished a great deal. Hull-House in Chicago provided education (classes in history, art, and literature), services (crèche, kindergarten, play centres), and recreational activities (music, drama, and social clubs) to the immigrant community. It also conducted research, for example, documenting the link between tuberculosis and poor housing and its effect on community health. Its initiatives led to the enactment of factory inspection laws, child labour laws, and other social policies in the state of Illinois. Hull-House also established a working relationship with local governments to enhance service provision in poor working-class neighbourhoods, setting up a juvenile protection agency and a Bureau of Social Welfare. These actions significantly influenced the development of social work and the community organization field.

The Charity Organization Societies and Settlement Houses played significant roles in the development of the field of social work. While both aimed to address poverty, their approaches differed. The COS focused on individual causes of poverty and systematic charitable administration, while the Settlement House Movement emphasized addressing social causes of poverty and promoting community action. Both movements laid the foundation for community organization, which continues to evolve and adapt to the changing needs of society.

1.9 Present situation of Stakeholders:-

Researcher was dealing with the Community Dwellers, Representative Urban Housing Society, Government Officers, Local Political Leaders, Representative of Workers from unorganized sector. Their work details are mentioned in following points related to the study area.

A) Community Dwellers:

"Community dwellers" refers to individuals or groups of people who reside within a specific geographic area such as Pune city, Suburban area connected to Pune city with different community. These individuals are an integral part of that community and play various roles in its social, economic, and cultural life. Here are a few definitions and characteristics associated with community dwellers related to the suburban area of Pune city.

- **Residential Community Members:**

  Community dwellers are individuals who live in a Pune suburban area locality Warje, Malwadi, Vitthal Nagar, MHADA colony (migrated from city slum area), Gokulnagar Pathar (Migrated from slum, business related middle level families), Gosavi Vasti& Dongarwadi (Ramnagar slum area) where community living on a permanent or long-term basis. They may own or rent homes within the community and have a vested interest in the well-being and development of that area.

- **Inhabitants of a Geographical Area:**

  Community dwellers are connected by their shared physical location, such as a neighbourhood, town and hill top or (suburban) rural area connected with Pune Municipal Corporation. Their interactions, relationships, and shared experiences are influenced by this common geographical context.

- **Social Interactions:**

  Community dwellers often engage in social interactions and relationships with one another. These interactions can include friendships, neighbourly relationships, and participation in community activities and organizations.

- **Community Participation:**

  Community dwellers may participate in community activities, events, and initiatives. They might join neighbourhood associations, volunteer for local causes, or contribute to the betterment of their community in various ways.

- **Cultural and Social Diversity:**

  Communities are often diverse in terms of culture, ethnicity, age, socioeconomic status, and other factors. Community dwellers can encompass a wide range of backgrounds and experiences.

- **Shared Interests and Concerns:**

  Community dwellers often share common interests, concerns, and issues related to their community. These can include matters like safety, education, infrastructure, healthcare, and environmental sustainability.

- **Sense of Belonging:**

  Being a part of a community often provides individuals with a sense of belonging and identity. Community dwellers may identify with and take pride in their community's culture and history.

- **Roles andResponsibilities:**

  Community dwellers may take on various roles and responsibilities within their community, such as being parents, employees, business owners (Marwari, Fruit suppliers, Handcart vendors, door to door suppliers of vegetables), local leaders (corporate, group leaders, arbitrator) or advocates for specific cases.

- **Community Development:**

  They may contribute to the development and improvement of the community through activities like community organizing, participating in local governance, or supporting community development projects.

- **Challenges and Needs:**

  Like any group of people, community dwellers may face challenges and have various needs. These can range from access to quality services to addressing social issues within the community.

  In essence, community dwellers are the people who make up the fabric of a community, and their interactions, contributions, and shared experiences play a vital role in shaping the character and dynamics of that community. Understanding the needs and perspectives of community dwellers is often crucial in community development, social work, and urban planning.

B) Urban Housing society:

Creating a connection between an urban housing society and a suburban area can have several implications and considerations, including transportation, infrastructure, and community integration. Here are some steps and considerations to connect an urban housing society with a suburban area.

- **Transportation Infrastructure:**

  Evaluate the existing transportation infrastructure in both the urban housing society and suburban area. Identify gaps and areas that need improvement.

- **Public Transportation:**

  Consider implementing or improving public transportation options like buses, trams, or commuter trains to connect the two areas. This can help reduce traffic congestion and make commuting easier.

- **Road Network:**

  Ensure that there are well-maintained roads and highways that connect the urban and suburban areas. If necessary, invest in road expansion or upgrades to accommodate increased traffic.

- **Cycling and Walking Paths:**

  Create dedicated cycling and walking paths or lanes to encourage environmentally friendly commuting between the urban and suburban areas.

- **Shared Mobility Services:**

  Promote ridesharing services like Uber or Lyfty, OLA, MERU in the Pune area and encourage carpooling to reduce the number of vehicles on the road. Metro is powerfully developed by the central and state governments within the PMC area.

- **Community Engagement:**

  Engage with the residents of both the urban housing society and the suburban area to gather input and address concerns related to the connection. Their input is crucial for successful integration.

- **Commercial and Retail Integration:**
  Consider incorporating commercial and retail spaces along transportation routes to serve both communities and create economic opportunities.

- **Zoning and Land Use Planning:**
  Review and, if necessary, revise zoning and land use regulations to accommodate the increased connectivity. This may involve mixed-use developments that combine residential, commercial (Malls, Business Hub, Marts developed), and recreational spaces.

- **Safety and Security:**
  Ensure that safety measures, such as adequate lighting and surveillance, are in place along transportation routes to enhance security for residents.

- **Environmental Impact Assessment:**
  Assess the environmental impact of increased connectivity and take steps to mitigate any adverse effects, such as pollution or habitat disruption.

- **Infrastructure Funding:**
  Explore various funding options for green development around the developing roads, including public-private partnerships, grants, and taxes, to finance the necessary infrastructure improvements.

- **Sustainability and Green Initiatives:**
  Promote sustainability by incorporating green infrastructure with smart walking track (Gym tools fitted for exercise), such as green spaces developed by the local leaders of PMC, parks, and sustainable building practices, into the development.

- **Traffic Management:**
  Implement traffic management strategies like traffic signals now in recent days increased by the traffic officers, roundabouts, and for speed limits small

roads have speed barkers to avoid the accidents in Warje-Gokulnagar area to ensure smooth flow and safety on the connecting routes.

- **Emergency Services Access:**
  Ensure that emergency services have easy access to both the urban housing society and suburban area. Police force as well as PMC area officers provide to the local people with various methods (Regular fire brigade, security at various levels by self and private agencies, state security service sector).

- **Data and Technology Integration:**
  Utilize technology to improve transportation management handled with foot path development, bicycle roads, walking tracks with physic- tools also focuses on traffic monitoring systems handled by the signals and smart traffic lights on heavy traffic roads.

- **Community Programs:**
  Creating programs and initiatives to foster a sense of community between the urban and suburban residents, Carp-orators of that area arranged big and small programs as per their native festivals, Joint events and social activities.

- **Long-Term Planning:**
  Develop a long-term plan for sustainable growth and connectivity (e.g.Chandni chowk now called as NDA chowk developed smartly), taking into account future population trends in Pune city connected with the studied area and developed as per infrastructure needs for futuristic advancements.
  Connecting an urban housing society with a suburban area requires careful planning, coordination, and investment. It should aim to enhance the quality of life for residents in both areas while promoting sustainable development and efficient transportation. Collaboration between local governments, urban planners, and the community is essential to achieve a successful connection.

C) Government offices and Officers working in Warje-Malwadi (Haveli Taluka) area:

- Lokpratinidhi – at Warje Malwadi-Ward head-sanitary head supervisor-assistants- associated workers)

D) Political leaders around the study area (Haveli Taluka) with their work:

Haveli Taluka leaders, Corporation members (Corporators), ZP members, Panchayats-members, MLA, etc.

E) Workers association in and around the Warje-Malwadi (Haveli Taluka) area and their specific work.

1.10 Observations from the Field during the Data Collection:

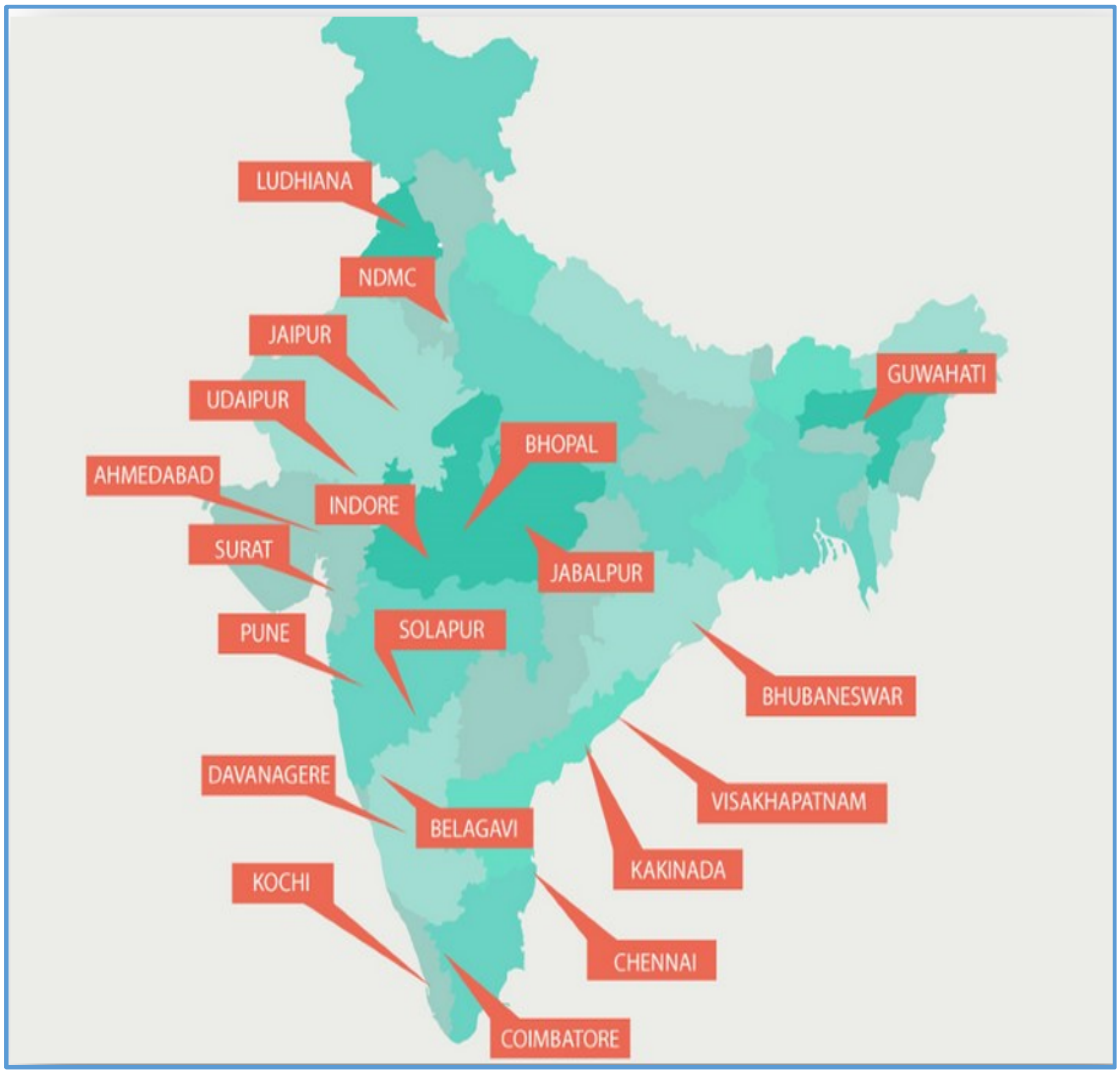
1. Participant behaviours: Note the actions, reactions, and interactions of participants in their natural environment.
2. Environmental factors: Observe the physical and social context in which participants interact, including layout, lighting, noise levels, and cultural norms.
3. Social dynamics: Record the relationships, power structures, and communication patterns among participants.
4. Patterns and trends: Identify recurring themes, habits, or anomalies in participant behaviour or environmental factors.
5. Unexpected events: Document any unforeseen incidents, conflicts, or crises that may arise during fieldwork.
6. Sensory details: Record sensory impressions, such as sights, sounds, smells, tastes, and textures, to create a rich and immersive description of the field site.
7. Emotional tone: Note the emotional atmosphere and how it shifts throughout the observation period.
8. Participant perspectives: Gather insights into participants' thoughts, feelings, and motivations through informal conversations or interviews.
9. Fieldworker's reflections: Record personal thoughts, biases, and reactions to the observation experience, acknowledging potential influences on data collection.

10. Methodological challenges: Document any difficulties or limitations encountered during fieldwork, such as access issues or participant fatigue.
11. Remember to approach fieldwork with an open mind, flexibility, and a systematic recording procedure to ensure comprehensive and reliable data collection.

1.11 Profile of the study area: - Haweli Taluka, Geographical Map

Map No. 1.1

INDIA Showing Pune and other 30 cities declared under Smart Development by Central Govt.



Courtesy:Downtoearth.org.in/news/newer-and-smarter-remaking-of-the-old-cities.

India's demographic profile is marked by its vast and diverse population. As of the latest update in September 2021, here are some key demographic features of the country:

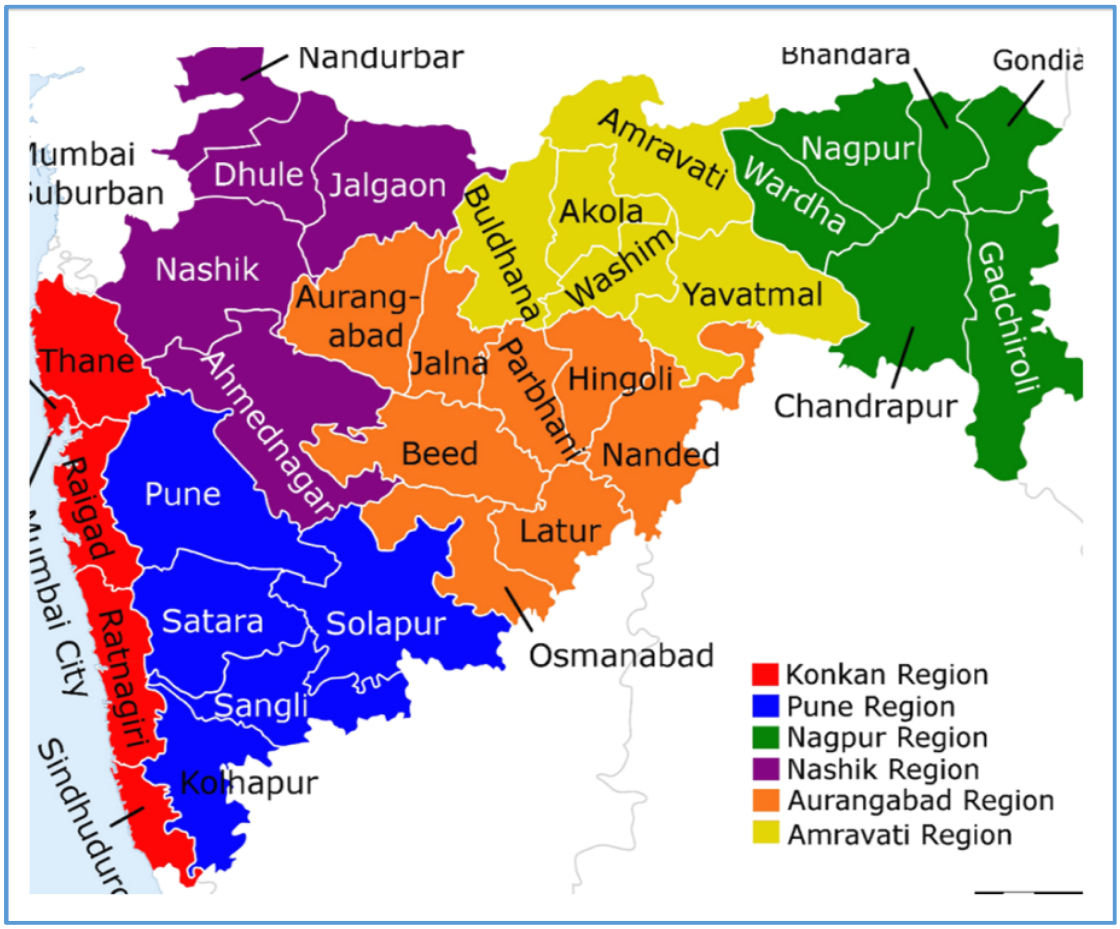
- Population: India is the second-most populous nation globally, with over 1.3 billion people. The population is highly diverse, encompassing a wide range of ethnicities, languages, and cultures.
- Age Structure: India has a predominantly young population, with a significant proportion under the age of 30. This youthful demographic presents both opportunities and challenges for the country's development.
- Languages: Linguistic diversity is a hallmark of India, with hundreds of languages spoken across the country. Hindi and English are widely used for administrative and business purposes.
- Religions: India is renowned for its religious diversity, with major religions including Hinduism, Islam, Christianity, Sikhism, Buddhism, and Jainism, among others.
- Rural-Urban Divide: While a large segment of India's population resides in rural areas, urbanization is steadily increasing. As of 2021, about 35% of the population lived in urban regions, and this trend continues to grow.
- Gender Ratio: India has a skewed gender ratio, with more males than females. Addressing this imbalance remains a significant social concern.
- Economic Activity: The Indian economy is diverse, spanning agriculture, manufacturing, and services. Major urban centres serve as hubs for various industries and services.
- Challenges: India faces several challenges, including population growth, unemployment, and healthcare, education, and income inequality. Effectively managing these issues is essential for the country's sustainable development.
- Urbanization: The trend of urbanization is accelerating, with many people migrating to cities in search of better opportunities. This has led to the development of smart cities.

Regarding smart cities, India has been actively pursuing the Smart Cities Mission, an initiative launched by the government to develop 100 smart cities across the country. These cities aim to leverage technology and data to enhance infrastructure, services, and the overall quality of life for residents. Key initiatives

include improved transportation systems, efficient waste management, advanced healthcare, and sustainable energy practices.

Map No. 1.2

Position of Pune District in Maharashtra State



Courtesy:wiki/File: Maharashtra Districts.png (Region wise)

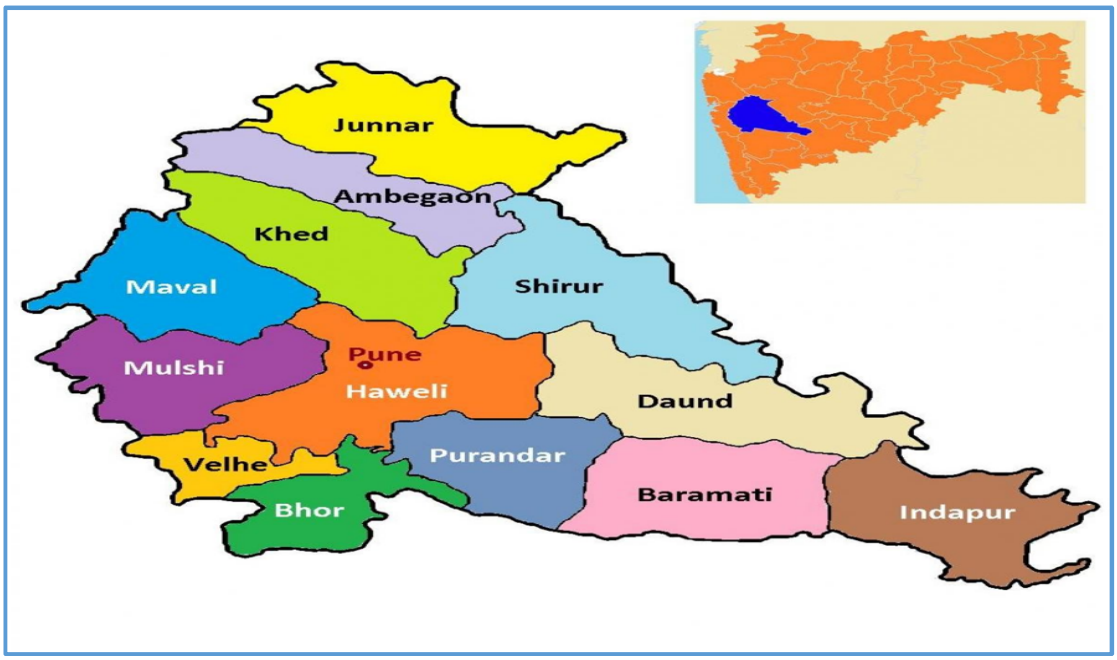
Maharashtra, a state in western India, has a diverse demographic profile and significant urbanization. Here are key points regarding Maharashtra's demography and urbanization:

- **Population**: As of the last update in September 2021, Maharashtra was one of India's most populous states, with over 112 million residents. The population has likely grown since then.
- **Urbanization**: Maharashtra is highly urbanized, with several major cities and urban centres. Mumbai, the state capital, is not only the largest city in Maharashtra but also the most populous city in India. Other prominent cities include Pune, Nagpur, Nasik, and Aurangabad.

- **Economic Hub**: Maharashtra is the economic powerhouse of India, contributing significantly to the country's GDP. Mumbai, in particular, is the financial and commercial centre of India, home to the Bombay Stock Exchange (BSE) and numerous corporate headquarters.
- **Language and Diversity**: Marathi is the official language of Maharashtra, and Marathi's constitute the majority of the population. However, the state is also known for its cultural and linguistic diversity, with various communities, languages, and religions coexisting.
- **Migration**: Maharashtra has a history of attracting migrants from different parts of India and the world, drawn by economic opportunities and vibrant urban life. This migration has contributed to its diverse population and cultural tapestry.
- **Education and Healthcare**: The state has a well-developed educational infrastructure, including prestigious institutions like the University of Mumbai and IIT Bombay. Additionally, Maharashtra has a robust healthcare system with many renowned hospitals and medical colleges.
- **Challenges**: Despite its economic prosperity, Maharashtra faces challenges related to urbanization, such as infrastructure development, affordable housing, traffic congestion, and environmental sustainability.

Map No. 1.3

Pune District & position of Haveli Taluka



Courtesy: Maps-Pune.com/Pune-district-map-Taluka-wise

Taluka Haweli is a subdivision of the district of Pune, Maharashtra. The Pune Municipal Corporation & Pimpri Chinchwad Municipal Corporation, Pune are at the centre of & entirely surrounded by the Taluka for administrative purposes. [2] The region of Pune Metropolitan Region has claimed the major part of the same.

Pune district, located in the state of Maharashtra, India, is known for its diverse demographics and rapid urbanization.

- **Population:** The Taluka had a population of 2,435,581 in the year 2011. Out of this, 1,823,950 people lived in urban areas and 611,631 lived in rural areas. This indicates that the majority of the people in Taluka Haveli, approximately 74.88% of the population, reside in urban areas. The sex ratio of Taluka Haveli is 850 females per thousand males per 1000 males. District had a significant population, with a mix of urban and rural residents. The population has been rapidly increasing over the coming years due to speedy migration towards Pune.
- **Urbanization:** Pune has experienced substantial urbanization, primarily due to its emergence as an IT and educational hub. Pune city, in particular, has seen a rapid expansion of urban areas, leading to increased demand for infrastructure and services. Haweli area is highly impacted with this changes.
- **Education Hub**: Pune is home to numerous educational institutions, including prestigious universities and colleges so lot of students migrated from rural sector to the Pune from. This has attracted students and professionals from across the country, contributing to its urban growth.
- **Employment Opportunities:** The district's urbanization has been driven by the presence of IT parks (HINJEWADI, BOPODI, MAGARPATA, and NAGAR ROAD), industrial zones, and a growing service sector. It has become a significant employment hub, attracting people from various regions.
- **Cultural Diversity:** Pune's demographics are culturally diverse, with people from different parts of India residing here. This diversity is reflected in the city's food, festivals, and languages spoken.
- **Infrastructure Challenges:** Rapid urbanization has also posed challenges in terms of infrastructure development, including traffic congestion, water supply, and waste management distribution and segregation.

- **Pune and Suburban Area Expansion:**Pune, a city in India, has been experiencing significant suburban area expansion in recent years. This expansion is driven by various factors, including population growth, urbanization, and economic development. Many neighbouring areas and towns around Pune have witnessed the construction of residential complexes, commercial hubs, and infrastructure development to accommodate the growing population and the increasing demand for housing and amenities.

  Some key suburban areas that have seen notable expansion around Pune include Pimpri-Chinchwad, Wakad, Hinjewadi, Aundh, and Hadapsar, among others. These areas have become attractive for real estate investment due to their proximity to the city centre, job opportunities, and improved connectivity through road networks and public transport.

  However, rapid suburban expansion also brings challenges such as increased traffic congestion, strain on public services, and environmental concerns. Local authorities and urban planners need to carefully manage this growth to ensure sustainable development, efficient infrastructure, and a high quality of life for residents.

  Pune has experienced significant development since 2000. Some key aspects of this development include:

- **Real Estate Boom:** The real estate sector has seen substantial growth with the development of residential complexes, commercial spaces, and integrated townships. Areas like Kharadi, Wagholi, and Hadapsar have seen rapid urbanization.
- **Education and Research**: Pune remains a hub for education and research institutions. The establishment of educational and research centers has continued, cementing its status as an educational hub.
- **Automobile Manufacturing:**Pune has attracted major automobile manufacturers like Tata Motors, Bajaj Auto, and Mercedes-Benz, contributing to its industrial development.

  Cultural and Entertainment Scene: Pune's cultural and entertainment scene has also evolved with the opening of malls, multiplexes, restaurants, and art galleries. It hosts various cultural festivals and events throughout the year.

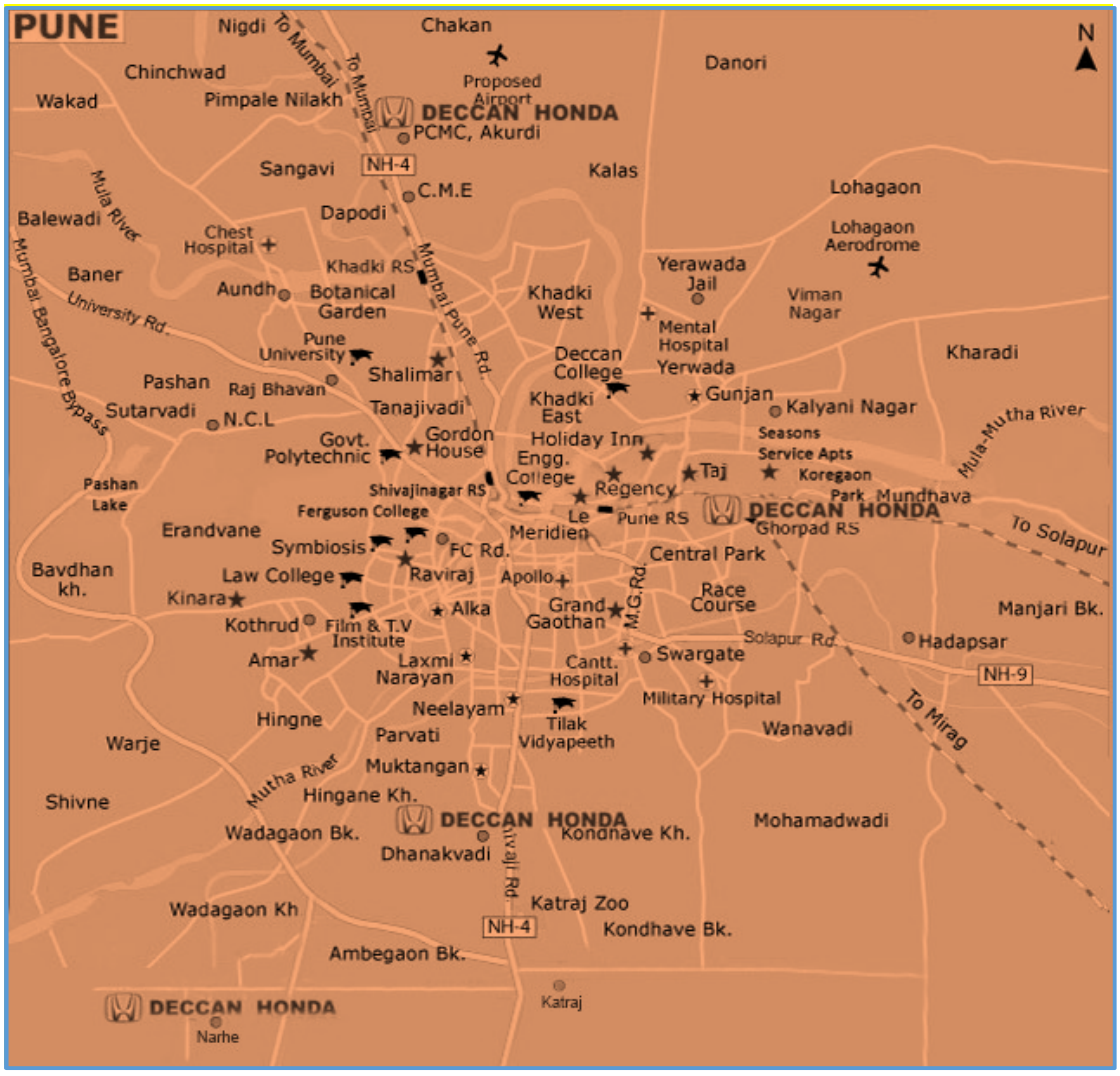
- **Smart City Initiatives:**Pune has been working on smart city initiatives to enhance urban living, including the use of technology to improve public services and infrastructure.
- **Environmental Concerns:** Rapid development has led to environmental concerns, such as air pollution and water scarcity, which the city authorities are addressing through various sustainability initiatives.

  Pune's development since 2000 reflects its transformation from a historical city to a thriving metropolis with a blend of modern amenities and cultural heritage.

Map No 1.4

Pune City

(Connecting with suburban area Haveli-Mulashi-Shirur Taluka places)



Source: Deccan Honda road MAP

The Pune Metropolitan Region Development Authority (PMRDA) is responsible for the planned development of the Pune Metropolitan Region, which includes Pune city and its surrounding areas. Haveli is one of the Talukas (administrative subdivisions) in the Pune district and falls under the jurisdiction of the PMRDA. If you have specific questions about these areas, please feel free to ask.

Based on data available from various sources about the suburban areas connected with Pune city, particularly Haveli Taluka, here is some general demographic information:

- **Population**: Haveli Taluka has a diverse population, including people from various backgrounds, such as Marathi, North Indian, and others.
- **Language**: Marathi is the primary language spoken in this region. However, due to the diverse population, people also converse in various other languages, including Hindi and English.
- **Religion**: Haveli has become home to people from various linguistic and cultural backgrounds. The population practices a mix of religions, including Hinduism, Islam, Christianity, Sikhism, and others.
- **Economy**: The economy in this region is diverse, with a mix of agriculture, manufacturing, and service sectors. Its proximity to Pune city, which has a thriving IT and industrial sector, provides numerous employment opportunities for residents.
- **Education**: Haveli Taluka is home to various educational institutions, including Bharati, Sinhgad, Sahyadri, Tilak MU and MIT-WPU, which contribute to the education and skill development of its residents.
- **Infrastructure**: Over the years, there have been significant improvements in infrastructure, including the development of tall buildings, apartments, towers, and societies. The region also boasts enhanced road networks, such as highways, expressways, and ring roads, as well as improved transportation and healthcare facilities, with both private and governmental hospitals and buildings.

1.12 Summary:

The Pune Metropolitan Region Development Authority (PMRDA) is responsible for overseeing the planned development of the Pune Metropolitan Region, which encompasses Pune city and its surrounding areas, including Haveli Taluka.

Haveli, located in the Pune district, is known for its diverse population, which includes people from various backgrounds such as Marathi, South-North Indian, and others. Marathi is the primary language spoken, but the region also features conversations in Hindi and English due to its multicultural nature. The religious landscape is similarly varied, with practices including Hinduism, Islam, Christianity, Sikhism, Buddhism and more.

Economically, Haveli benefits from a mix of agriculture, manufacturing, and services, and its proximity to Pune city, a major hub for IT and industry, provides ample employment opportunities for its residents. The region hosts several prominent educational institutions, such as SPPU & Concern colleges, D.Y.PATIL & Concern UNIVERSITIES, SYMBIOSIS and concern colleges, Bharati Vidyapeeth, Tilak Maharashtra University, Sinhgad Institute, Sahyadri College, and MIT World Peace University, which contribute to local education and skill development.

Over time, Haveli has seen significant infrastructure advancements, including the development of tall buildings, apartments, and residential societies. Improvements in transportation infrastructure, such as highways, expressways, and ring roads, have enhanced connectivity. Additionally, both private and governmental hospitals have improved healthcare facilities, further supporting the well-being of the community.

❑❑❑

CHAPTER - II

REVIEW OF LITERATURE

2.1 Introduction:

Review of the Literature is the crisp and benefiting to topic being studied. References are found to be appropriately acknowledged and supporting the research finding.

In this research, reviews include from research reports and research reports, policy of documents research papers journal articles, Ph.D. thesis, M.Phil. Dissertation, books on related subjects are studied, reviewed and included in the research report. Following are some review of available research studies.

Introduction:

Review of the Literature is more clear and beneficial for the subject under study. The references are properly acknowledged and the research findings are supported.

In this research study Research Reports, Policy Papers, Research Papers, Journals, Articles, Ph.D Thesis, M.Phil. Dissertation are included, books on related subjects are studied, reviewed and included in the research report. Some of the available research studies are reviewed as follows.

2.2 Objectives:

1. Summarize and synthesize the existing research, theories and evidence on a topic
2. Demonstrate your knowledge and familiarity with the scholarly context and debates
3. Identify the gaps, limitations or controversies in the literature
4. Develop a theoretical framework and methodology for your own research
5. Position your work in relation to other researchers and theorists

2.3 Definition of review of literature & waste management reviews:

1. **By Olivia Valdes** "A literature review summarizes and synthesizes the existing scholarly research on a particular topic. Literature reviews are a form of academic writing commonly used in the sciences, social sciences, and

humanities. However, unlike research papers, which establish new arguments and make original contributions, literature reviews organize and present existing research. As a student or academic, you might produce a literature review as a standalone paper or as a portion of a larger research project."

2. **By the University of Edinburg** "A literature review is a piece of academic writing demonstrating knowledge and understanding of the academic literature on a specific topic placed in context. A literature review also includes a critical evaluation of the material; this is why it is called a literature review rather than a literature report. It is a process of reviewing the literature, as well as a form of writing."

3. **By Shona McCombes**"A literature review is a survey of scholarly sources on a specific topic. It provides an overview of current knowledge, allowing you to identify relevant theories, methods, and gaps in the existing research that you can later apply to your paper, thesis, or dissertation topic."

4. **By M. M., Qamar, S., &Sethy, T. "**This research paper offers a thorough examination of solid waste management in India, addressing the current status, challenges, and opportunities within the field. The review underscores the critical importance of sustainable practices for environmental protection and public health. It identifies significant obstacles such as infrastructure limitations, governance issues, and environmental impacts, while also highlighting potential solutions through integrated management approaches, technological advancements, and community involvement. The insights provided serve as valuable guidance for policymakers and practitioners in developing effective waste management strategies that are both sustainable and practical in the Indian context.

5. **By Deeksha Dev.** Provides a historical account of waste management regulations in India, focusing on the evolution of laws and policies to address the challenges of waste generation and disposal. The study highlights how technological advancements and changing lifestyles have significantly altered the volume and nature of waste, necessitating stricter and more comprehensive

regulatory frameworks. Despite having various regulations in place for different types of waste, such as electronic, plastic, agricultural, and biomedical waste, the paper notes that improper waste management continues to pose significant environmental and public health risks due to inadequate implementation.

The study critically analyses the current waste management guidelines, policies, and rules, along with past court interventions, to suggest future actions for improving waste management through legal means. The research is based on secondary data from reports, publications, and policy documents, providing an in-depth understanding of the regulatory landscape in India. The findings emphasize that while India has been proactive in framing waste management legislation, the lack of effective enforcement remains a major obstacle in resolving the issues related to waste disposal.

6. **By Banerjee et.al** discusses the critical need for effective solid waste management (SWM) in India, particularly in the 21st century, when environmental safety and public health are paramount. The study highlights the diverse types of solid waste (SW) generated in the country, including municipal solid waste (MSW), electronic waste (e-waste), radioactive solid waste (RSW), hospital solid waste (HSW), and agricultural solid waste (ASW). Each type of waste presents unique challenges due to its volume, composition, and potential environmental and health hazards.

   The review emphasizes the importance of raising societal awareness to reduce solid waste generation and discusses various SWM techniques, ranging from traditional methods to modern technologies like refuse-derived fuel (RDF), pyrolysis, and incineration. The paper also analyses the advantages and limitations of these methods, highlighting the need for innovative and efficient approaches to minimize the harmful effects of solid waste on the environment.

   The authors conclude that a systematic approach to SWM, incorporating both conventional and advanced techniques, is essential to manage the increasing volumes of waste in India and to mitigate its environmental impact**.**

7. **Wilson's** paper provides a historical review of the evolution of waste and resource management (WaRM) from 1970 to 2020 and offers insights into

future priorities up to 2030. The study emphasizes the significant impact that effective WaRM can have on reducing plastic pollution in oceans, mitigating global warming, and contributing to sustainable development goals (SDGs).

The review outlines the early focus on technical solutions and strict legal frameworks in the Global North, which successfully brought hazardous and municipal solid wastes under control. However, attempts to apply these technologies in the Global South often failed due to institutional and financial limitations. From 1990 onwards, the approach evolved to integrate technical, governance, and financial aspects, promoting inclusivity and sustainability. This highlights the progress made in waste management globally, but also points out the ongoing challenges, particularly in the Global South, where a significant portion of the population still lacks access to waste collection, and much of the collected waste is improperly disposed of. The paper identifies three critical policy priorities for all countries: securing sustainable financing, rethinking recycling practices, and implementing worldwide extended producer responsibility with enforceable measures.

8. **By Kumar, A., & Agrawal**, A. addresses the challenges of Municipal Solid Waste Management (MSWM) in India, where rapid population growth, high urban density, changing lifestyles, and diverse cultural practices have exacerbated waste management issues. The study provides a comprehensive overview of the current status of solid waste management in India, identifying key challenges such as unsorted waste at the source, social and cultural barriers, inadequate assessment, ineffective strategies, and poor implementation of government policies.The review highlights the need for improved waste treatment and recycling strategies tailored to the specific composition of Indian solid waste. It emphasizes the importance of both centralized and decentralized approaches to waste management, suggesting that municipalities, along with informal sector workers and private agencies, must collaborate to develop effective solutions. The ultimate goal is to achieve long-term sustainability in MSWM for Indian cities by leveraging scientific treatment processes and creating opportunities for better waste management practices.

9. **By Agamuthu, P., & Babel**,reviews the evolution of waste management in Asia over the past fifty years, identifying key issues and challenges. It notes that waste generation has risen across the continent, though Japan and Korea have recently seen a decline. The predominant waste composition is organic, particularly kitchen waste.

   The study highlights the transition from traditional landfilling to waste-to-energy technologies in some countries, although many developing nations still rely heavily on landfills and open dumps. Major concerns include dumpsite management, the role of the informal sector, waste collection, open burning, and food waste. Recycling technologies and rates have improved in several countries such as India, Indonesia, Japan, Malaysia, Singapore, South Korea, Thailand, and Vietnam. The paper discusses the evolving drivers behind waste management practices in Asia and provides recommendations for achieving sustainable waste management across the region.

10. **Amasuomo and Baird's** paper explores the concept of waste and its management, focusing on definitions, historical contexts, and best practices. The study highlights that the classification of waste can be subjective; a substance is considered waste based on the owner's perception. This means that while one person might see a substance as waste, another might view it as a valuable resource.

    The authors used a descriptive desktop approach, reviewing peer-reviewed publications, environmental reports, and books to address their research questions. They argue for a clear definition of waste, which is essential for effective regulation and management. This clarity is crucial for establishing appropriate waste management practices and regulations.

11. **Bansod, H. S., &Deshmukh P.**his systematic review by Bansod and Deshmukh emphasizes the critical importance of proper biomedical waste (BMW) management in healthcare settings. The paper outlines that BMW includes a variety of infectious and hazardous materials generated in hospitals, healthcare facilities, and related industries. The proper identification, segregation, and scientific treatment of this waste are essential to prevent the spread of infections to healthcare workers, patients, and the surrounding

community. The review discusses the detailed guidelines provided by the Biomedical Waste Management Rules, 2016, in India, which include categories of BMW, color-coding for containers, labelling, and standards for waste treatment facilities like incinerators and autoclaves. The rules are designed to minimize environmental pollution by ensuring that BMW is handled without adversely affecting human and environmental health. The authors emphasize the need for healthcare professionals to be well-informed and to adopt the correct attitudes toward BMW management. They also highlight the importance of collective teamwork, government support, and continuous monitoring to achieve effective BMW disposal. The paper advocates for environmentally friendly methods and protocols to ensure a green and clean environment, underscoring the significance of proper BMW management in public health and environmental protection.

12. **Gallego, Frago, and Gonzales** examines the ongoing challenges of solid waste management in the Philippines. The country faces a growing waste problem, exacerbated by weak enforcement of laws, a shortage of sanitary landfills, and improper waste disposal practices. The authors discuss the Ecological Solid Waste Management Act of 2000 (RA 9003) as a key legislative response, emphasizing the importance of waste segregation, proper disposal, and waste diversion. The article highlights the need for envisioning a trash-free Philippines, which requires not only effective governance but also active public participation and awareness. Valorisation, the process of converting waste into resources, is suggested as a potential solution to both solid waste management and the depletion of natural resources. However, the success of these initiatives hinges on good governance and the collaboration of all stakeholders in the country.

13. **By Duque-Acevedo, Belmonte-Ureña, Cortés-García, and Camacho-Ferre** examines the evolution, approaches, and alternative uses of agricultural waste over a period of 87 years, with a focus on scientific research produced between 1931 and 2018. Using a Bibliometric method and data from Scopus, the authors analysed 3,148 articles to trace trends in the utilization and

transformation of agricultural waste, particularly focusing on its role in circular economy and bio economy practices.

The study highlights that agricultural waste research gained prominence in the last 13 years, with countries like the United States, India, and China leading in the number of studies. The primary focus has been on the use of agricultural residues from cereal crops such as wheat and corn. The paper underscores the significant shift in research approaches due to evolving global energy and environmental policies, emphasizing that new technological advancements have contributed to more sustainable waste management practices. The review illustrates how international regulations on sustainable development are transforming agricultural practices, promoting resource efficiency, and reducing environmental impacts.

14. **This systematic review by Andeobu, Wibowo, and Grandhi**: focuses on the rapidly increasing issue of e-waste generation in the Asia Pacific region. The study critically analyses the e-waste management practices in major e-waste-producing countries, such as Australia, China, India, Indonesia, and Malaysia, from 2005 to 2020. Due to the presence of hazardous materials in e-waste, improper disposal and recycling can lead to severe environmental and health consequences. The review highlights that despite efforts, the e-waste management practices in these countries need significant enhancement. The study recommends adopting best practices to address the growing e-waste challenge effectively, emphasizing the need for stronger policies and improved recycling infrastructures across the region.

15. This systematic review by **Ahmed, Hasan, and Islam** examines the urban solid waste management practices in Bangladesh from a circular economy perspective. The study reviews 13 research papers, published between 1994 and 2022, to summarize the methodologies used, challenges in waste management, and policy suggestions. The review identifies key issues related to governance, demographics, infrastructure, and culture as the root causes of waste management problems. The policy recommendations emphasize public intervention, technological innovation, and NGO involvement. The study

highlights the need for future research to explore the integration of circular economy principles into urban waste management in Bangladesh.

2.4 Overview of some related literature and studies that are Conceptual Literature:

Review existing literature on waste management interventions, including successful case studies from similar contexts. This will help you understand what strategies have worked in the past and how they can be adapted to your specific situation.

1. This research shows the related concepts, definitions and classifications about solid waste management and composting. Solid Waste Management **According to IyyankiMuralikrishna and ValliManickam from Research Gate (December, 2017), "Without an effective and efficient waste management program, the waste generated from various human activities, both industrial and domestic, can result in health hazards and have a negative impact on the environment.".** An effective and efficient waste management program is a way for an area to have a clean and safe environment. The researchers have formulated a way to accomplish the aim of **IyyankiMuralikrishna and ValliManickam.** Treatments and disposal methods depends on the type of problem that any municipal has. Residents or any responsible citizen of the community are able to conduct an appropriate solution for the sake of their environment. Based on their research, it is also said that various human activity can result a negative impact that can also cause health hazards to the residents. Proper discipline and awareness of residents is needed. Nowadays, the main problem of everybody about solid waste management is the lack of discipline of some people, which causes growing rate of garbage problems that also affects air pollution, water and soil contamination, floods and excessive breeding of rodents and vermin.

2. However, **Taguti, and e'tal(2017)** claimed that, **"Biodegradable materials are substituting the conventional materials in many different applications. Among these, an important class is the biodegradable polymers, also known as eco-friendly polymers mainly due to their ability to erode fast by composting without any toxic effect."** Solid waste management can be

done in different eco-friendly ways. Some of these are: Creating less waste through reusing, rehoming for waste removal and refining footprint example is using plastic bags from mall and using it again instead of throwing it away, as well as plastic cups that can be used as pot of plants or people could try and sell the reusable products.

3. **Barthod, and e'tal(2017)** Another way is composting as waste removal, where in waste can be put in compost pit, will decompose, and eventually turn into fertilizer. Also, food waste can be fed to farm animals like cows, pigs and goats rather than throwing it. Composting and vermicomposting are examples of eco-friendly ways of solid waste management that can turn biodegradable wastes into fertilizer that nourishes the soil condition. Composting is valuable as potting media and soil conditioner as they increase plant available nutrient contents from the wastes, while decreasing leaching, and heavy metal mobility. It can also reduce the carbon footprint from the human activities that produce greenhouse gases emissions during waste degradation.

4. **Neugebauer, Sołowiej, (April 2017**).Organic household waste containing food remnants (citrus fruit and vegetable peels, fat, dairy products, etc.) can determine what can be composted in home gardens. Compost pit can be done into different ways, in a pit dug in the ground and in a container and can be placed in the backyard and a vacant lot. It can also be beneficial to everyone in the area. Benefits and Long Term Effects of Composting Compost is one of the important organic amendments that can be used in attaining sustainability in soil and in the environment.

5. The analysis made by US Environmental Protection Agency of the impact of compost production and use in greenhouse gas (GHG) makes use of modelling programs that are currently used for understanding soil carbon balances. The study reveals that compost can have minimal effect on some emissions related to compost manufacture and some potential sequestration associated with end use **(Brown 2017).** Compost pit can control the carbon footprint that an area can produce. It can also limit the negative ways on disposing garbage that can pollute the environment like burning of the garbage. Related Studies improper

waste disposal is one of the existing problems that the Philippines is facing right now with difficulty as humans are the root of this problem. There are several studies conducted throughout the past years that deduced the importance of proper waste disposal in the community and the effects of improper disposal of the waste to the community, environment, and the health of the residents. All of these are introduced in this section.

6. According to **KhylleTumala** (January 2015) from her study in the effects of improper waste disposal in the Philippines, **"Improper waste disposal is one of the biggest environmental issues here in the Philippines. It caused bigger problems that affect not only the environment but also the health and life of the people. This problem may be resolve or it will remain problem to the country in the next few years".** A law in the Philippines approved by the Office on the President on January 26, 2001 was created in response to the rapidly growing rate of garbage problems in the country caused by improper waste disposal. Unfortunately, even though there is a law, improper waste disposal in the Philippines was ranked 3rd as top source of water contamination in a study on February 2015. Waste disposal is different from waste management. Proper waste disposal is needed to properly execute waste management.

7. Waste Management refers to the recycling, processing, transport, assortment, and monitoring of waste products. The waste products are mainly of three types: solid, liquid or in gas state. Solid waste commonly is known as non-biodegradable waste **(UK Essays, 2015).** Their study cantered on the waste hierarchy or **3R's** – **reduce, reuse, recycle** – and explored waste management as a concept and effect of waste disposal. Without properly executing waste disposal, difficulty in waste management also emerge. It is also proven that human activities and lack of discipline are the main reason of improper waste disposal that makes the problem difficult to resolve.

8. One of the significant studies that can also be applied to this research is the "**Environmental Impacts of Improper Solid Waste Management in Developing Countries: A Case Study of Rawalpindi City"(Ejaz, Akhtar,**

and e'tal2010), which discussed and highlighted the main causes of improper solid waste management in developing countries like improper ways of waste disposal. An inefficient municipal solid waste management system may create serious negative environmental impacts like infectious diseases, land and water pollution, obstruction of drains and loss of biodiversity.

9. Furthermore, **Marianne and Fred Sandford (2015)** also claimed that improper hazardous waste disposal doesn't just contaminate soil and the local water supply, but it can also pollute the air. An area with a reputation for a toxic environment can also be susceptible to lower property values, so not following proper disposal procedures can even affect the cost of houses' properties. Long term execution of improper waste disposal of municipal wastes can affect soil and water properties and productivity. It also produces lethal gases such as carbon monoxide and methane gas. Disposal of refuse without proper supervision often amounts damage to the environment and ultimately to the human body system.

10. A public health physician, **Professor Akin Osibogun**, justified that improperly disposed refuse has both direct and indirect health effects to humans which were observed in the study of how improper waste disposal damages health **(Obama, 2015).** Excessive breeding of rodents and vermin like rats, cockroaches, mosquitoes, and flies are the direct health effects caused by improper disposal as those vermin transmit diseases like leptospirosis, Lassa fever and salmonellosis from rats; malaria from mosquitoes, shigellosis and diarrheal diseases from flies. Indirect health effects, on the other hand, include the contamination of water and soil from leachate – a very harmful liquid mixture of chemicals that forms as water flows from a contaminated area.

11. Another study, which is about effects of improper garbage disposal **(Boehlke, 2017),** also implied that humans are not the only ones who are affected but also animals. As water can be contaminated, marine life is also in danger. When wastes cluster and form algal bloom, it can suffocate and contaminate

everything near it – may it be a habitat which includes corals or an organism like fishes, molluscs, etc.

12. However, a study in Ecuador which cantered around the development of organic fertilizers from food market waste and urban gardening by composting **(Jara-Samaniego, and e'tal 2017)** can reduce the effects of improper waste disposal and even prevent the pile up of wastes. Biodegradable wastes can be used for agricultural purposes because of the high concentration that can be found on organic matters and nutrients contents of the wastes like in food market and urban gardening wastes that can be managed and recycled through composting obtaining end products like compost or fertilizer. Synthesis The study shows how significant proper waste disposal is in a community. From the related studies and literature, the researchers reviewed, they are able to determine and clarify the causes and possible effects of improper waste disposal in the community, to the environment, and to the residents of the barangay the researchers are studying. With the help of these studies, the researchers were able to revise a concept or idea about waste disposal and composting. Composting is a simple way of segregating waste to recycle and help the soil to be more fertile for future use which can also reduce the effects of improper waste disposal and management.

Those studies were able to help people and readers to widen their knowledge regarding to proper waste disposal. Improper waste disposal is contributing in the worsening condition of the waste management that affects the environment in the Philippines. This problem may remain and worsen over time or it can be resolved, a Philippine law has been created and signed as a solution for this problem, but it seems that it has not been effective since Philippines got a bad ranking for a water contamination based in a study. Composting can contribute to lessen the water contamination caused by the leachate as composting can make an area instead of contaminated into a fertile one.

The royal society open science is the world's leading independent universal journal. The journal's coverage is international in focus and extends to all aspects of waste management and segregation. Pune is the Second level Metropolitan city its suburban area& boundaries increased gradually since 1950. Lot of the rural sectors are connected with the Pune city since previous

some years; **PMRDA** was established in **31st March 2015** for development of connected suburban area. In this review of literature researcher want to take for searching research gap.

13. **Royal Society Open Sciences: Challenges and opportunities associated with waste management in India. March 2017:** Volume 4 issue 3: Article written by: **Kumar, Stephen, Geoff Fowlerand e'tal.** In this journal researchers focuses on India faces major environmental challenges associated with waste generation and inadequate waste collection, transport, treatment and disposal. Current systems in India cannot cope with the volumes of waste generated by an increasing urban population, and these impacts on the environment and public health. The challenges and barriers are significant, but so are the opportunities. This paper reports on an international seminar on 'Sustainable solid waste management for cities: opportunities in South Asian Association for Regional Cooperation **(SAARC)** countries' organized by the Council of Scientific and Industrial Research-National Environmental Engineering Research Institute and the Royal Society.

    A priority is to move from reliance on waste dumps that offer no environmental protection, to waste management systems that retain useful resources within the economy. Waste segregation at source and use of specialized waste processing facilities to separate recyclable materials has a key role.

14. **World Journal of Environmental Biosciences: 2013 e-ISSN 2277- 8047: Volume 2, Issue 2: Page: 89-99: Municipal Solid Waste Management:** A Case Study of Phursungi Plant, Pune by **Mane A. V. and ParveenAnjum.** This article focuses on Solid-waste management, which is a major challenge in front of urbanization throughout the world. This Solid waste management is associated with controlling the generation, storage, collection, transfer and transport, processing and disposal of solid wastes in a manner that is in accordance with the best principles of sustainability. It includes all administrative, financial, legal, planning and engineering functions involved in the solutions. The present case study is based on one of such solid waste treatment plants located at Phursungi, Pune. The plant is using multiproduct

recycling and waste minimization **(MPRWM)** techniques. The principle of the process is to extract usable, commercially viable end products out of the municipal solid waste **(MSW)** and create a processed remnant of less than 20% of the input volume, for the landfills. The people are demanding to shift the plant elsewhere to maintain healthy conditions in the area.

15. **The World Bank: September 20, 2018: What a Waste:** An Updated Look into the Future of Solid Waste Management: An update to a previous edition, the 2018 report projects that rapid urbanization, population growth, and economic development will push global waste to increase by 70% over the next 30 years – to a staggering 3.40 billion tons of waste generated annually.

16. **Journal of Emerging Technologies and Innovative Research: Volume 7 Issue 6June-2020,e-ISSN: 2349-5162:'Automated Garbage Collection Rover'** in this paper Author-**Rohan PradipNaik, Professor Bhagirathi V. , AbhishekUmesh**: In this paper authors mentioned Efficient and cost-effective waste management is a requisite for major institutions all around the globe. Outdoor cleaning is labour intensive and thus adds up to the overall employment cost of the institution, which is a bane. Through our waste accumulating robot, we look to address and automate the outdoor waste cleaning process, thus providing an efficient and tangible way of managing such a tedious task.

17. **Elsevier: Volume 144:** Waste Management is devoted to the presentation and discussion of information on solid waste generation, characterization, minimization, collection, separation, treatment, and disposal, as well as manuscripts that address waste management. Also this article focuses on policy, education, and economic and environmental assessments. The journal addresses various types of solid wastes including municipal (e.g., residential, institutional, and commercial), agricultural, and special (e.g., construction and demolition, household hazardous, sewage sludge, and non-hazardous industrial) wastes.

18. **International Journal of Computer Applications (ISSN-0975–8887) Volume100– No.10, August-2014-24, in this paper Dr.NitinMundhe, Dr.Jaibhai (SPPU Pune):**They said in their assessment of Municipal Solid Waste Management of Pune City using Geospatial Tools Solid waste management is among the basic essential services provided by municipal authorities in the country to keep cities clean. Due to industrialization, rural to urban migration and high growth rate of population have induced rapid urbanization in developing countries.

2.4.1 Knowledge and familiarity with the scholarly context and debates:

The management of urban waste is a growing global challenge, intensified by rapid urbanization, industrialization, and population growth. Traditional waste management practices, largely based on linear models of consumption—"take, make, dispose"—are increasingly unsustainable. In response, the concept of the circular economy (CE) has gained prominence as a transformative framework for waste management. The circular economy emphasizes waste reduction, reuse, and recycling to minimize environmental impact and promote sustainable development. This review synthesizes findings from recent literature on urban waste management and the role of the circular economy in addressing these challenges.

2.4.2 Governance and Policy Frameworks:

Coracero, and e'tal(2021). Governance plays a critical role in determining the effectiveness of urban waste management systems. Studies emphasize that strong governance structures are essential for implementing effective waste management policies and ensuring compliance. Inadequate governance can lead to fragmentation of responsibilities between different agencies and a lack of coordination, which hampers waste management efforts. Key components of effective governance include clear policy frameworks, adequate funding, and the establishment of monitoring and enforcement mechanisms.

For example, many countries have implemented waste management legislation and policies that focus on reducing landfill usage, promoting recycling, and encouraging waste-to-energy conversion **(Pariatamby& Babel, 2023).** However, the effectiveness of these policies often depends on their implementation at the local level. Local governments play a crucial role in tailoring national policies to the

specific needs of their communities. Studies highlight that decentralized governance models, where local authorities have more control and responsibility over waste management, can lead to more effective and context-specific solutions **(Ahmed, and e'tal, 2023).**

2.4.3 Infrastructure Deficiencies:

The lack of adequate waste management infrastructure is a major obstacle in urban areas worldwide. The literature indicates that in many regions, the existing infrastructure is insufficient to handle the growing volumes of waste generated by urban populations **(Coracero, and e'tal,2021).** In many developing countries, waste is often disposed of in open dumps or poorly managed landfills, leading to significant environmental and health risks. Common problems include inadequate collection systems, insufficient capacity of waste treatment facilities, and a lack of sanitary landfills.

In developed countries, infrastructure challenges are often related to the need to modernize existing facilities to support advanced waste management technologies, such as waste-to-energy plants and material recovery facilities. The transition to circular economy practices requires significant investment in new infrastructure and technology, as well as the retrofitting of existing facilities to accommodate more sustainable waste management practices **(Pariatamby& Babel, 2023).**

2.4.4 Role of the Informal Sector:

In many regions, particularly in developing countries, the informal sector plays a critical role in urban waste management. Informal waste workers, often operating outside formal systems, are responsible for collecting, sorting, and recycling significant amounts of waste, especially materials such as plastics, metals, and paper **(Amasuomo& Baird, 2016).** However, their contributions are frequently undervalued, and they operate under poor working conditions without the benefits of formal employment.

Research highlights the need to integrate the informal sector into formal waste management systems to improve efficiency and working conditions. Formalization efforts should include providing informal workers with access to resources, training, and legal protection, which can enhance their contribution to waste management and promote more sustainable practices **(Islam , and e'tal, 2021)**. Integrating the informal

sector into the circular economy framework is particularly important, as it can help maximize material recovery and reduce waste.

2.4.5 Cultural and Demographic Factors:

Cultural attitudes and demographic factors significantly influence waste generation and management practices. In many societies, waste disposal habits are deeply ingrained and can be difficult to change. For instance, the preference for single-use products and the lack of awareness about the environmental impact of waste contribute to increasing waste volumes and improper disposal practices **(Islam, 2022).** In some cultures, waste is seen as something to be disposed of quickly and cheaply, leading to resistance against more sustainable practices like waste segregation and recycling.

Demographic trends, such as urbanization and population growth, further exacerbate waste management challenges. Rapid urbanization in many parts of the world has led to increased waste generation, putting additional pressure on already strained waste management systems. The literature suggests that public education and awareness campaigns are crucial for changing waste disposal behaviors and promoting a more sustainable approach to waste management **(Ahmed, and e'tal, 2023).**

2.4.6 Circular Economy Approaches:

The circular economy concept has emerged as a promising solution to the challenges of urban waste management. Unlike the traditional linear economy, which is based on the extraction, use, and disposal of resources, the circular economy emphasizes keeping materials in use for as long as possible through recycling, reusing, and repurposing **(Duque-Acevedo , and e'tal, 2020).** This approach reduces the demand for virgin resources, minimizes waste generation, and lowers environmental impacts.

Implementing circular economy practices in urban waste management requires significant changes in policy, infrastructure, and public behavior. Governments need to create incentives for businesses and consumers to engage in circular practices, such as designing products for longevity, reparability, and recyclability **(Amasuomo & Baird, 2016).** Additionally, investments in recycling and waste-to-energy technologies are essential for supporting circular economy initiatives.

2.4.7 Methodological Approaches:

The literature on urban waste management and the circular economy utilizes a variety of methodological approaches, including quantitative, qualitative, and mixed-methods research. Quantitative studies often focus on measuring waste generation trends, recycling rates, and the effectiveness of waste management policies **(Pariatamby& Babel, 2023).** Qualitative research, on the other hand, explores the experiences and perspectives of stakeholders, such as government officials, waste workers, and residents, to understand the social and cultural dimensions of waste management **(Islam, 2022).**

Mixed-methods research is particularly valuable for providing a comprehensive understanding of the complex factors influencing waste management. By combining quantitative data with qualitative insights, researchers can explore both the measurable outcomes of waste management policies and the underlying factors that affect their success **(Ahmed, and e'tal, 2023).** This approach allows for a more holistic analysis of the challenges and opportunities associated with urban waste management and the circular economy.

2.4.8 Policy Recommendations:

Several policy recommendations emerge from the literature to improve urban waste management and facilitate the transition to a circular economy. First, strengthening governance structures and improving coordination between different levels of government is crucial. Decentralized governance models that empower local authorities can lead to more effective waste management solutions tailored to the needs of specific urban areas **(Ahmed, and e'tal, 2023).**

Second, investments in waste management infrastructure are necessary to support the transition to a circular economy. This includes building new facilities for recycling, composting, and waste-to-energy conversion, as well as upgrading existing infrastructure to handle the increased demand for sustainable waste management practices **(Pariatamby& Babel, 2023).**

Third, formalizing the informal waste sector and providing support to informal waste workers can improve the efficiency of waste management systems and promote more equitable outcomes **(Islam &Hasan, 2021).** By recognizing the contributions of informal workers and integrating them into formal systems, governments can enhance material recovery rates and reduce environmental impacts.

Finally, public education and awareness campaigns are essential for changing cultural attitudes towards waste and promoting sustainable behaviours. These campaigns should focus on the importance of waste segregation, recycling, and reducing the use of single-use products **(Islam, 2022).** Engaging the public in waste management efforts is critical for achieving long-term success in creating a circular economy. The literature on urban waste management and the circular economy highlights the complexity of the challenges faced by cities worldwide. Weak governance, inadequate infrastructure, cultural practices, and rapid urbanization all contribute to the inefficiencies in waste management. However, the circular economy offers a promising framework for addressing these challenges by promoting waste reduction, material reuse, and recycling.

Successful implementation of circular economy principles requires coordinated efforts from governments, businesses, and the public. Investments in infrastructure, policy reforms, and public education are critical to facilitating the transition to a more sustainable waste management system. Future research should continue to explore innovative approaches to waste management and circular economy practices, particularly in the context of rapidly growing urban populations and changing consumption patterns.

2.5 Gaps, Limitations, and in the Literature:

The body of literature on urban waste management and circular economy (CE) is vast and insightful, yet several gaps, limitations, and controversies exist that hinder the full realization of effective waste management strategies globally. Identifying and addressing these shortcomings is crucial for advancing research and implementing practical solutions that foster sustainability in urban environments.

2.5.1 Fragmented Research Focus and Lack of Integration:

One of the primary gaps in the literature is the fragmented nature of research on urban waste management and circular economy principles. Studies often focus on specific aspects of waste management, such as recycling, landfill management, or waste-to-energy initiatives, without considering the interconnectedness of these components. This soloed approach leads to a lack of comprehensive understanding and integration of various waste management strategies within the circular economy framework.

For example, research focusing on recycling practices in urban areas may not adequately address how these practices interact with waste reduction strategies or how recycled materials are reintegrated into production systems. Similarly, studies on landfill management may overlook the potential of waste diversion methods, such as composting or waste-to-energy technologies, which are integral to circular economy models. This lack of integrated research limits the development of holistic waste management strategies that encompass the full lifecycle of materials. Much of the existing literature focuses on technical and infrastructural solutions while underemphasizing the socio-cultural and behavioural dimensions of waste management. Without considering the human factors, such as consumer behaviour, public awareness, and cultural attitudes towards waste, the implementation of circular economy principles may be ineffective or incomplete.

2.5.2 Geographic and Economic Disparities:

Another significant limitation in the literature is the geographic and economic disparity in waste management research. Much of the scholarly work on urban waste management and circular economy practices is concentrated in high-income countries, particularly in Europe and North America. This focus overlooks the unique challenges faced by low- and middle-income countries **(LMICs),** where waste management infrastructure is often inadequate, and informal waste sectors play a significant role in material recovery.

In LMICs, urban waste management is often characterized by open dumping, burning, and limited access to formal waste collection services. These countries face distinct challenges, such as rapid urbanization, limited financial resources, and weak governance structures, which are not adequately addressed in the literature. Consequently, many of the solutions proposed in high-income contexts, such as advanced recycling technologies or waste-to-energy plants, may not be feasible or appropriate in LMICs due to economic and infrastructural constraints. The literature tends to generalize solutions without accounting for the socio-economic diversity across regions. For instance, while waste segregation at the source is often recommended as a best practice, its implementation may be difficult in areas where access to basic services, such as clean water and sanitation, is already limited. These disparities underscore the need for more context-specific research that considers the varying socio-economic, cultural, and environmental conditions of different regions.

2.5.3 Controversies Surrounding Waste-to-Energy Technologies:

Waste-to-energy **(WTE)** technologies, which involve converting waste materials into usable forms of energy, have emerged as a controversial topic within the literature. Proponents of WTE argue that it provides a viable solution for reducing the volume of waste sent to landfills, while also generating renewable energy. However, critics highlight several limitations and environmental concerns associated with WTE technologies.

One of the major controversies is the potential environmental impact of WTE plants, particularly in terms of air pollution. Incineration, a common WTE technology, can release harmful pollutants, including dioxins, furans, and heavy metals, which pose health risks to nearby communities. Additionally, there is concern that promoting WTE could undermine efforts to reduce waste generation and promote recycling, as it creates an incentive to maintain a steady supply of waste for energy production.

The literature also reveals a lack of consensus on the long-term sustainability of WTE technologies. While some studies emphasize the benefits of WTE in reducing landfill use and generating energy, others argue that the focus should be on waste reduction and material recovery rather than energy generation. This ongoing debate reflects a broader tension between different approaches to achieving circular economy goals—whether to prioritize energy recovery from waste or to focus on reducing waste generation and maximizing material reuse.

2.5.4 Informal Waste Sector: Integration Challenges:

The role of the informal waste sector is another area of contention and limitation within the literature. In many urban areas, particularly in LMICs, the informal sector plays a crucial role in waste collection, sorting, and recycling. However, informal waste workers often operate outside formal regulatory frameworks and face significant health and safety risks. Despite their contributions, the informal sector is frequently marginalized in discussions about urban waste management and circular economy policies.

There is a growing recognition of the need to integrate the informal sector into formal waste management systems. However, the literature highlights several challenges associated with this integration. Formalizing the informal sector requires addressing issues such as labour rights, health and safety regulations, and access to

social protections, which can be difficult to implement in contexts where informal work is deeply entrenched.

Efforts to formalize the informal sector may inadvertently disrupt existing waste management systems, particularly in regions where informal workers are responsible for a significant portion of material recovery. The literature points to the need for a more nuanced approach that recognizes the value of the informal sector while also working to improve working conditions and integrate informal workers into broader circular economy initiatives.

2.5.5 Circular Economy as a Buzzword: Lack of Practical Application:

While the circular economy has gained widespread attention as a framework for sustainable waste management, there is a growing concern that it is often used as a buzzword without a clear understanding of how to implement it in practice. The literature reveals that many discussions of circular economy principles remain theoretical, with limited guidance on how to translate these ideas into concrete actions.

One of the key challenges is that the circular economy concept is broad and encompasses a wide range of activities, from recycling and reuse to product design and industrial symbiosis. This breadth can make it difficult for policymakers, businesses, and communities to identify specific actions they can take to contribute to the circular economy. Additionally, the literature points out that many of the examples of successful circular economy initiatives are concentrated in high-income countries with well-developed infrastructure, making it difficult to replicate these models in other contexts.

There is also a lack of consensus on the metrics and indicators that should be used to measure progress towards circular economy goals. Without standardized methods for assessing circular economy initiatives, it is challenging to evaluate their effectiveness or to compare results across different regions and sectors. The literature calls for more empirical research that focuses on the practical application of circular economy principles and provides clear guidelines for implementation in diverse contexts.

2.5.6 Gaps in Technology Adoption and Innovation:

Technological innovation is frequently cited as a key driver of progress in urban waste management and the circular economy. However, there are significant gaps in the adoption and scaling of new technologies across different regions and sectors. The literature highlights that while high-income countries are increasingly adopting advanced waste management technologies, such as smart waste collection systems, automated sorting facilities, and waste-to-energy plants, many LMICs continue to rely on outdated and inefficient methods.

This technological divide presents a significant barrier to achieving circular economy goals on a global scale. The literature points out that the lack of access to modern waste management technologies in LMICs is often due to financial constraints, limited technical expertise, and inadequate infrastructure. As a result, many urban areas in LMICs remain reliant on informal waste management practices, which are often less efficient and more environmentally damaging than formal systems.

Even in regions where advanced technologies are available, there are challenges associated with their adoption and integration into existing waste management systems. For example, the introduction of new recycling technologies may require changes to waste collection and sorting practices, as well as investments in new infrastructure. The literature calls for more research on the barriers to technology adoption and the development of strategies to overcome these challenges, particularly in low-resource settings.

2.5.7 Lack of Focus on Long-Term Sustainability:

A recurring limitation in the literature is the lack of attention to the long-term sustainability of urban waste management and circular economy initiatives. Many studies focus on short-term solutions, such as improving waste collection efficiency or increasing recycling rates, without considering the broader implications for sustainable development. There is a need for more research that takes a long-term perspective and considers the environmental, social, and economic impacts of waste management practices over time.

The literature points out that while circular economy principles are often promoted as a solution to environmental challenges, there is limited discussion of how these principles align with other sustainability goals, such as social equity and

economic development. For example, efforts to promote recycling and material recovery may have unintended consequences for vulnerable populations, such as informal waste workers, who rely on waste for their livelihoods. The literature calls for a more holistic approach to urban waste management that considers the intersections between environmental sustainability, social justice, and economic development.

The literature on urban waste management and the circular economy provides valuable insights into the challenges and opportunities associated with sustainable waste management. However, significant gaps, limitations, and controversies remain. These include the fragmented nature of research, geographic and economic disparities, controversies surrounding waste-to-energy technologies, challenges in integrating the informal sector, and the lack of practical guidance for implementing circular economy principles. Addressing these issues will require a more integrated and context-specific approach to research and policy development, as well as a focus on long-term sustainability and equity. Future research should prioritize filling these gaps to enhance the effectiveness of urban waste management and support the transition to a circular economy on a global scale.

2.6 Building on Existing Literature:

Your research stands on the foundation laid by various studies that have explored urban waste management and circular economy principles. By synthesizing existing knowledge, your work will expand on the contributions made by prominent scholars:

- **Agamuthu and Babel (2023)** analysed waste management trends in Asia, focusing on the transition from landfilling to waste-to-energy solutions. Your research builds on this by exploring broader global trends and investigating how circular economy principles can accelerate the shift from traditional waste management methods to more sustainable practices worldwide.
- **Bansod and Deshmukh (2020)** provided an in-depth review of biomedical waste management, emphasizing the importance of policy frameworks and infrastructure development. You extend this work by applying these concepts to the broader context of urban waste management, particularly focusing on the challenges of integrating biomedical waste into a circular economy framework.

- **Amasuomo and Baird (2016)** questioned the very definition of waste and how societal and individual perceptions influence waste classification. Your research aligns with this by incorporating behavioural theories to understand how cultural and social norms impact waste generation, segregation, and recycling behaviours in urban settings.
- **Duque-Acevedo et al. (2020)** highlighted the evolution of agricultural waste management and the role of circular economy policies in transforming waste into resources. Your research builds on this by applying circular economy principles to urban waste streams and exploring how resource recovery can be enhanced in urban environments through innovative policies and technologies.

2.6.1 Filling Research Gaps in the Literature:

Your research addresses several gaps identified in the existing literature on urban waste management and circular economy:

- **Lack of Integration of Circular Economy in Urban Waste Management**: While studies such as those by Coracero et al. (2021) and Ahmed et al. (2023) have focused on waste management in specific regions or countries, there is limited research on how circular economy principles can be systematically integrated into urban waste management on a global scale. Your research addresses this gap by developing a theoretical framework that links circular economy concepts with urban waste management practices, offering a comprehensive approach that can be applied across diverse urban contexts.
- **Limited Focus on Social and Cultural Dimensions**: Existing research has often focused on technical and policy aspects of waste management, such as Bansod and Deshmukh's (2020) emphasis on biomedical waste rules. However, there has been less attention paid to the social and cultural dimensions that influence waste generation and recycling behaviors. Your work fills this gap by incorporating behavioural theories to understand the role of societal norms, individual attitudes, and cultural practices in shaping waste management outcomes.
- **Need for Holistic, Multi-Stakeholder Approaches**: Many studies have focused on individual aspects of waste management, such as policy implementation (e.g., Coracero et al., 2021) or technological innovations (e.g., Duque-Acevedo et al., 2020). However, there is a lack of research that

considers the interconnectedness of various stakeholders, including governments, private sector players, informal workers, and citizens. Your research addresses this gap by adopting a systems-thinking approach that emphasizes collaboration and coordination among all relevant stakeholders to achieve sustainable urban waste management.

2.6.2 Addressing Controversies and Limitations:

Your research also seeks to address some of the controversies and limitations found in the existing literature:

- **Controversies Surrounding Waste-to-Energy**: Agamuthu and Babel (2023) pointed out the challenges and controversies related to waste-to-energy technologies, particularly in developing countries. Critics argue that these technologies may not be environmentally friendly or economically viable. Your research engages with this debate by exploring how circular economy principles can be applied to ensure that waste-to-energy solutions are part of a broader, sustainable waste management strategy, rather than being seen as a standalone solution.
- **Limitations in Policy Implementation**: Many studies, including those by Bansod and Deshmukh (2020) and Coracero et al. (2021), have highlighted the difficulties in implementing waste management policies effectively. Your work adds to this discussion by identifying the institutional and governance challenges that hinder the successful integration of circular economy principles in urban waste management, and by proposing policy recommendations to overcome these obstacles.

2.6.3 Contributing to Theoretical and Practical Knowledge:

Your research contributes to both theoretical and practical knowledge in the following ways:

- **Advancing Circular Economy Theory**: By applying circular economy principles to urban waste management, your research contributes to the growing body of literature on the circular economy. It extends the application of circular economy theory beyond industrial production and resource efficiency to include the management of complex urban waste streams.

- **Innovating Urban Waste Management Practices**: Practically, your research offers new insights into how urban waste management systems can be redesigned to align with circular economy principles. It provides actionable recommendations for policymakers, waste management professionals, and urban planners to improve waste segregation, recycling, and resource recovery in urban areas.
- **Bridging the Gap between Theory and Practice**: Your work bridges the gap between theoretical concepts and real-world applications by developing a comprehensive framework that can guide the implementation of circular economy initiatives in urban waste management. This framework is informed by both academic research and practical case studies, ensuring that it is grounded in real-world experiences and challenges.

2.6.4 Positioning in Relation to Key Theorists:

In positioning your research, it is essential to relate it to key theorists in the fields of urban waste management, circular economy, and environmental behaviour:

- **Ellen MacArthur Foundation**: Your research aligns with the principles of the circular economy as promoted by the Ellen MacArthur Foundation, which advocates for redesigning systems to eliminate waste and promote the continual use of resources. By applying these principles to urban waste management, your research contributes to the ongoing dialogue about how circular economy strategies can be implemented in various sectors, including waste management.
- **ArjenWals and Environmental Behaviour**: By incorporating behavioural theories such as the Theory of Planned Behaviour, your research resonates with scholars like ArjenWals, who emphasize the importance of environmental education and behavioural change in achieving sustainability. Your work adds to this conversation by exploring how urban residents' attitudes and behaviours can be influenced to promote waste reduction and recycling.
- **Tim Jackson and Ecological Economics**: Tim Jackson's work on ecological economics and sustainable development informs your research, particularly in the context of how economic systems can be restructured to prioritize environmental sustainability. Your research contributes to this field by

exploring how circular economy principles can be integrated into urban waste management to create more sustainable urban economies.

This research positions itself at the intersection of urban waste management, circular economy, and environmental behaviour, contributing to both academic knowledge and practical solutions for sustainable urban development. By engaging with existing literature, addressing gaps and controversies, and proposing innovative frameworks and methodologies, your work offers valuable insights for scholars, practitioners, and policymakers alike.

2.7 Summery :

In this chapter researcher has done extensive review of literature and incorporated in the thesis. Research Reports, Policy Papers, Research Papers, Journals, Articles, Ph.D Thesis, M.Phil. Dissertation are included, books on related subjects are studied, reviewed and included in the research report.

References:

- Agamuthu, P., & Babel, S. (2023). Waste management developments in the last five decades: Asian perspective. *Waste Management & Research, 41*(12). https://doi.org/10.1177/0734242X231199938
- Ahmed, Z., Hasan, M. K., & Islam, J. (2023). Urban waste management and circular economy in Bangladesh: A systematic review. *Journal of International Environmental Application & Science, 18*(2), 55-63.
- Amasuomo, E., & Baird, J. (2016). The concept of waste and waste management. *Journal of Management and Sustainability, 6*(4), 88. https://doi.org/10.5539/jms.v6n4p88
- Andeobu, L., Wibowo, S., &Grandhi, S. (2021). A systematic review of e-waste generation and environmental management of Asia Pacific countries. *Sustainability, 13*(9), 4967. https://doi.org/10.3390/su13094967
- Banerjee, P., Hazra, A., Ghosh, P., Ganguly, A., Murmu, N. C., & Chatterjee, P. K. (2019). Solid waste management in India: A brief review. In *Waste management and resource efficiency* (pp. 1027-1049). Springer. https://doi.org/10.1007/978-981-10-7290-1_86

- Bansod, H. S., &Deshmukh, P. (Year). Biomedical waste management and its importance: A systematic review. *Cureus*. https://doi.org/10.7759/cureus.
- Coracero, E. E., Gallego, R. J., Frago, K. J., & Gonzales, R. J. (2021). A long-standing problem: A review on the solid waste management in the Philippines. *Indonesian Journal of Social and Environmental Issues (IJSEI), 2*(3), 213-220. https://doi.org/10.47540/ijsei.v2i3.144
- Dave, D. (2022). Journey of waste management regulations in India: A historical account. *CRDEEP Journals*. Centre for Rural Development Ecology and Environment Protection (CRDEEP). https://doi.org/10.13140/RG.2.2.14106.11200
- Duque-Acevedo, M., Belmonte-Ureña, L. J., Cortés-García, F. J., & Camacho-Ferre, F. (2020). Agricultural waste: Review of the evolution, approaches and perspectives on alternative uses. *Global Ecology and Conservation, 22*, e00902. https://doi.org/10.1016/j.gecco.2020.e00902
- Hanson, B., Stall, S., Peng, G., & other authors. (2023, October 31). Garbage in, garbage out: Mitigating risks and maximizing benefits of AI in research. *Nature*. https://doi.org/10.1038/d41586-023-03316-8
- Joshi, R., & Ahmed, S. (2016). Status and challenges of municipal solid waste management in India: A review. Cogent Environmental Science, 2(1), 1139434. https://doi.org/10.1080/23311843.2016.1139434
- Priti, &Mandal, K. (2019). Review on evolution of municipal solid waste management in India: Practices, challenges and policy implications. Journal of Material Cycles and Waste Management, 21(4), 1263–1279. https://doi.org/10.1007/s10163-019-00883-5
- S k, M. M., Qamar, S., &Sethy, T. (2023). Solid waste management in Indian perspectives: A comprehensive review. *Journal Name*, *12*(1), 35-45.
- Wilson, D. C. (2020). Learning from the past to plan for the future: An historical review of the evolution of waste and resource management 1970–2020 and reflections on priorities 2020–2030 – The perspective of an involved witness. *Waste Management & Research*, *38*(7), 663-677. https://doi.org/10.1177/0734242X20945334

❑❑❑

CHAPTER - III

RESEARCH METHODOLOGY

3.1 Introduction:

Research methodology in social work is a systematic process that involves designing, conducting, and analysing studies to address social issues and improve the well-being of individuals, families, and communities. The process begins with identifying a specific social problem or question, followed by a thorough literature review to understand existing knowledge and gaps. Researchers then select an appropriate methodology, which can be qualitative, quantitative, or mixed-methods, depending on the nature of the research. Data collection methods vary, including interviews, surveys, observations, and case studies, with an emphasis on ethical practices and protecting participants' rights. Once data is gathered, researchers analyses it using either qualitative techniques (such as thematic coding) or quantitative methods (like statistical analysis). The findings are interpreted in the context of the research question, contributing new insights to the field. Finally, social work research is applied and shared through reports, academic publications, and presentations to inform practice, influence policies, and advocate for social change, ensuring that the research has a real-world impact.

3.2 Statement of the Problem:

- **Identify the Problem**

The rapid migration from rural to urban areas has significantly increased in recent decades, leading to various urban challenges. In India, the percentage of people living in urban areas has grown from 20% in 1961 to 40% in 2017. This shift has contributed to the fast-paced growth of cities, particularly those transitioning into second-level metropolitan cities, like Pune. Pune's urbanization has been accelerated due to its proximity to Mumbai and its booming IT sector, which has attracted people from across the country and even internationally. As the city expands, including the unplanned suburban areas around it, managing waste collection and segregation has become a major issue for local authorities.

Pune is connected to its sister city, PimpriChinchwad, and as its boundaries continue to grow due to government policies, so do the challenges of maintaining

cleanliness and proper waste management. The city's rapid urbanization has led to increased population density, construction, and infrastructure development, which in turn has created more waste. Improper waste disposal, pollution, and the lack of effective garbage segregation have become pressing concerns. As more people move to Pune for education, work, and better opportunities, the city's waste management system is under strain. This includes dealing with garbage collection, sorting recyclable materials, and managing waste drainage, all of which are essential to maintaining the city's quality of life amidst its rapid urban growth.

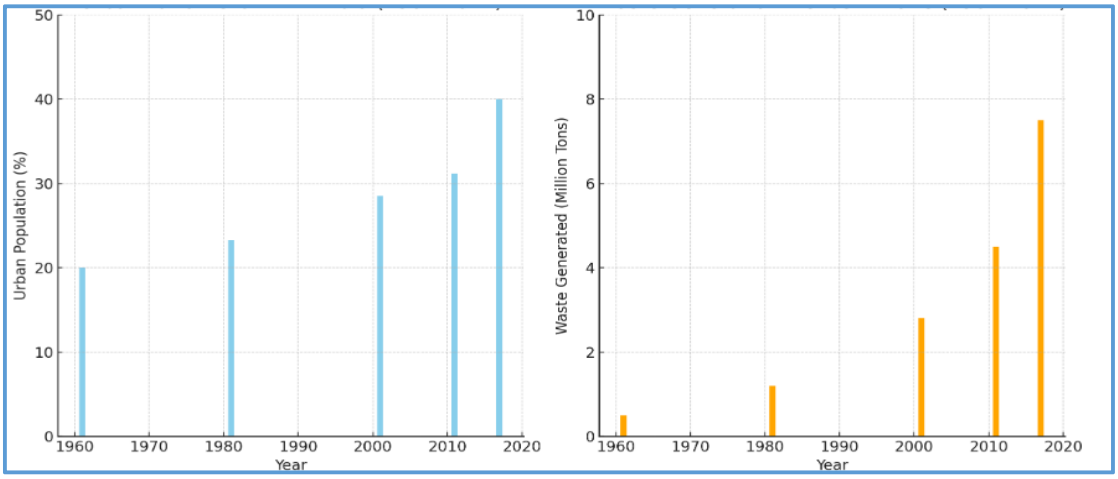
Efforts are being made to address these waste management challenges by improving segregation and distribution practices, particularly in suburban areas where unstructured growth has made garbage collection more difficult. The focus is on finding solutions that can help manage the increasing amounts of waste more efficiently, ensuring that Pune can continue to thrive as a rapidly urbanizing and important city in India.

We can represent the quantitative data related to urbanization and the resulting challenges, such as waste generation as follows: -

1. **Urbanization Growth over Time:** Show the increase in the urban population percentage from 1961 to recent years.
2. **Waste Generation Trends:** Illustrate the correlation between urbanization and the increase in waste generation in Pune.
3. **Segregation Challenges:** Visualize the proportion of waste that is improperly disposed of or not segregated.

Figure No. 3.1

Urbanization and Waste Generation in Pune



Source: Population inclination at left vs. Waste management shown in fig.3.1

3.2.1 Some of the Problems related to the Garbage Collection and Segregation among Urban Families:

- No work opportunities at local level and due to poor economic conditions, peoples Migrated towards Pune city and connected Suburban area.
- No proper educational opportunities available in rural sector of the various states, so peoples are migrated towards second level metropolitan city Pune.
- Garbage problem arrived in front of the urbanization administration due to lack of knowledge and attitude.
- Boundaries of the Pune city increased by the Government time to time so Extra efforts are required from Administration.
- Due to migrated peoples (unskilled workers) attitude garbage problem is not taken seriously.
- Urban area as well as suburban area of Pune City facing big problem of Garbage collection and segregation.
- Pune Municipal Corporation takes aggressive part in the garbage collection and segregation but community living around the suburban area not responded properly.
- Common problem is arrived in Maharashtra (Nagpur, Mumbai, Navi Mumbai, Thane, Kalyan-Dombivali and their connected corporations,
- Kolhapur, Solapur, Hyderabad, Andhra Pradesh & Telangana, Bihar, Rajasthan etc.)
- The severity of the above problems is more the researcher has undertaken the research study entitled Knowledge, Attitude & Practice about Garbage segregation among families living in area of the Pune city.
- Lack of Infrastructure: In many suburban areas around Pune, there is insufficient infrastructure for proper waste management, including a lack of dustbins, garbage trucks, and recycling facilities, which exacerbates the garbage problem.
- Unplanned Urbanization: Rapid, unplanned urbanization has led to overcrowded neighbourhoods, making it difficult to implement systematic garbage collection and segregation practices.

- Health Hazards: The improper disposal of garbage has resulted in unsanitary living conditions, leading to an increase in health issues such as the spread of diseases, especially in densely populated suburban areas.
- Cultural and Behavioral Factors: Cultural beliefs and behaviors contribute to the lack of participation in waste segregation practices. People may not prioritize cleanliness due to ingrained habits or lack of awareness.
- Government Initiatives: Although the Pune Municipal Corporation (PMC) has initiated various campaigns and programs to promote waste segregation and recycling, the reach of these initiatives has been limited in suburban and rural areas.
- Public-Private Partnerships: There is potential for improved waste management through public-private partnerships, yet these opportunities remain underutilized in many parts of Pune.
- Environmental Impact: The accumulation of unsegregated waste is leading to environmental degradation, including soil and water pollution, which impacts both urban and rural areas surrounding Pune.
- Economic Burden: The cost of managing waste in a rapidly expanding city places a significant financial burden on local governments, which are already struggling to keep up with the growing population.
- Inconsistent Regulations: Inconsistent enforcement of waste management regulations across different regions of Pune and neighboring areas leads to gaps in the effectiveness of garbage collection and segregation efforts.

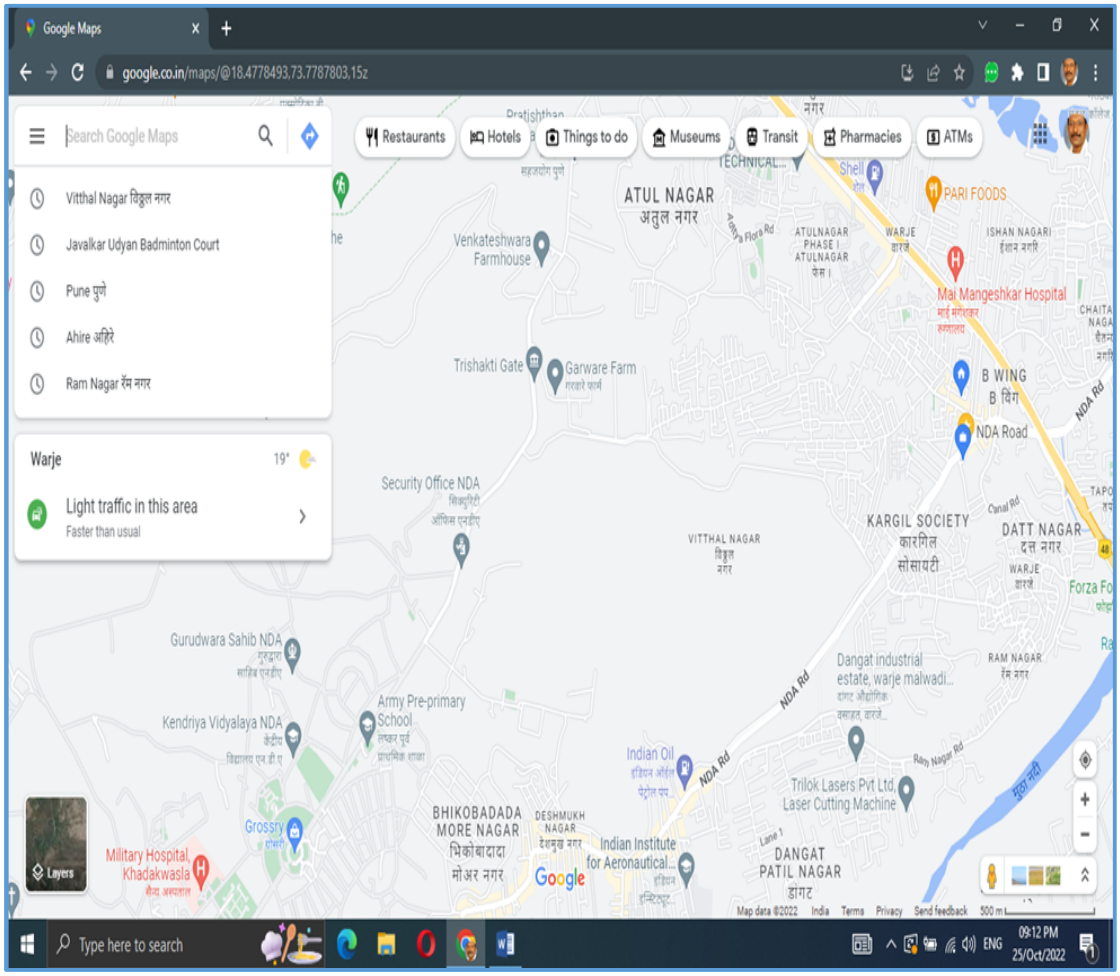
3.3 Scope of Study:

The geographical area chosen for the said study have been the Suburban area of Pune city. The respondents have been the families from urban area lives in the Society, apartments, personal homes, slum area etc. The said study has limitation such as properly maintained societies, apartments and homes were dropped from survey but where waste was scattered on road and surroundings are considered in the survey. This study stated problem regarding waste and its management about garbage segregation attitude and practices. The focus of this study is the suburban area of Pune city, which presents a diverse and representative sample of the urban environment. This region encompasses a variety of living conditions, including well-maintained

residential societies, modern apartments, individual homes, and informal settlements such as slum areas. By including these varied residential settings, the study aims to capture a comprehensive understanding of waste management practices across different socio-economic and living environments.

Figure No. 3.2

Urban and Suburban area Under Scope: Pune



MAP: Showing Warje, Pune area for study.

- **Geographical scope:**

  The study is concentrated on specific suburban areas within Pune city, particularly those connected to the Haveli Taluka. Initially, the research encompassed neighbourhoods such as Warje-Ramnagar, Gokul Nagar, Sahyog Nagar-Vitthalnagar, Popularnagar, Popular Colony, and Dnyanesh Society. However, after conducting preliminary surveys, some areas were excluded due to criteria related to the extent of waste management issues. As a result, the study's focus was refined to include Siddhivinayak Colony, MHADA Colony, Gokulnagar Pathar, Sahyog Nagar, Gosavi Vasti, and

Dongarwadi. This selection provides a diverse representation of residential environments and varying waste management conditions, facilitating a thorough analysis of garbage segregation practices and waste management challenges in the suburban region of Pune city.

- **Respondent Demographics and Scope:**

  The study targeted respondents who were members of families residing in the selected areas, specifically individuals aged 18 years and older. This included both men and women, ensuring a broad representation of perspectives on waste management practices and attitudes.

- **Content Scope**

  The study focused on evaluating knowledge, attitudes, and practices related to garbage collection and segregation. Specifically, it assessed how residents understand waste management, their attitudes towards garbage segregation, and their actual practices concerning waste disposal. The scope of the study encompassed both the management of waste within the immediate residential areas and the broader surroundings included in the study.

3.4 Rationale and Significance of study:

3.4.1 Rationale of the Study

The primary rationale behind this study is to address the pressing issue of garbage management within Pune city by examining the existing rules, regulations, and policies at various levels. This includes an analysis of global standards, national frameworks, state-level directives in Maharashtra, and local policies implemented by the Pune Municipal Corporation. The study would critically evaluate both the policies that have been effectively implemented and those that remain in draft or are yet to be enforced.

By focusing on these aspects, the study aims to identify gaps in the current waste management system and highlight areas where improvements are needed. Understanding the discrepancies between established regulations and actual practices can provide valuable insights into why certain policies may be falling short and how they can be adapted to better serve the needs of the urban population.

3.4.2 Significance of the Study:

The significance of this study is underscored by the pressing need to address the garbage management challenges in Pune city. A preliminary survey, often referred to as a "Monkey survey," has highlighted that garbage management is a major concern in the urban areas of Pune. This issue affects the city's aesthetic appeal, public health, and overall quality of life. Pune, known for its historical and cultural significance, faces the challenge of maintaining its beauty amidst growing urbanization and population influx.

To tackle this problem effectively, it is essential to re-evaluate and fundamentally revise the waste management processes in place. The study aims to provide a comprehensive analysis that can contribute to the development of more effective waste management strategies.

- **The specific significance of this study includes**:

- **Enhancing Knowledge**: The study have been instrumental in improving respondents' understanding of garbage collection and segregation practices. By providing detailed insights into current waste management protocols and their effectiveness, the study would help residents become more informed and proactive in their waste management efforts.
- **Promoting Moral Values:**Pune city attracts a diverse population, including individuals from various backgrounds and professions. It is crucial to in still a strong sense of responsibility and moral values related to waste management among all residents. This study would emphasize the importance of adopting sustainable practices and encourage a cultural shift towards responsible waste disposal.
- **Guiding Policy and Practice:** The findings of this study would serve as a valuable resource for governmental bodies, local authorities, non-governmental organizations (NGOs), and social societies involved in waste management. The study would provide actionable recommendations and insights that can guide the development and implementation of more effective garbage collection and segregation activities. It would also help in identifying best practices and successful strategies from other regions that could be adapted to Pune's context.

  This study aims to provide a detailed analysis of waste management practices and policies, address critical issues in garbage collection and segregation, and

contribute to the overall improvement of waste management systems in Pune city. By bridging the gap between policy and practice, the study seeks to foster a cleaner, healthier, and more sustainable urban environment.

3.5 Research Questions:

1. How do factors such as family background, peer influence, economic conditions, environmental context, addiction, and personal habits related to cleanliness impact waste management practices in the community?
2. What are the different types of waste, and how can garbage be classified based on biodegradability, recyclability, and hazardous content?
3. How does the lifestyle of families in the study area influence their waste management behaviors and attitudes toward cleanliness?
4. To what extent are community members aware of the importance of garbage segregation, and how knowledgeable are they about proper waste disposal practices?
5. Do community residents manage their waste independently, or do they rely on external support for garbage handling and disposal?
6. What are the underlying causes of improper waste disposal, and what are the adverse effects of uneven garbage spread on community health and well-being?
7. How effective can social work interventions be in improving waste management practices and raising awareness among community members?

3.6 Objectives of the Study:

1. To examine the socio-economic backgrounds of families and analyses their intentional or unintentional behaviors related to littering.
2. To evaluate the role and awareness of households in slum or underserved areas concerning waste generation and its associated health impacts.
3. To investigate attitudes and perceptions towards environmental stewardship in waste management and assess community mind-sets.
4. To assess the level of awareness regarding proper waste segregation and distribution within society.
5. To analyse the effectiveness and efficiency of waste distribution systems managed by various agencies.

6. To enhance societal awareness on proper waste disposal practices through the development of targeted suggestions and research-based initiatives.
7. To formulate social work interventions aimed at producing actionable recommendations for policy improvement.
8. To develop and propose models for effective waste classification to optimize waste management practices.

3.7 Variables of the Study:

Table No. 3.1

Variables of the study

Sr. No.	Independent Variables	Dependent Variables
1	Age group	Family head or any one
2	Level of Education	Employment Opportunities
3	Employment Opportunities	Considering migration.
4	Income	Social and Economic Situation
5	Knowledge and Attitude about Garbage Segregation and Distribution	Practices about Garbage Segregation and Distribution
6	Practices	Leaving conditions
7	Access with Administrative systems	Collection and Distribution
8	Family Background	Methods of Segregation
9	Types of Community	Residence (Flat, Row house, Homes, Slum huts)
10	Type of Family	Living style and level of Awareness
11	Social Maturity	Behavior and pattern, Attitude about level of Awareness about Segregation etc.

3.8 Operational Definitions of the Concepts:

Social Intervention: In social work, social intervention refers to the process through which a social worker engages with individuals, families, groups, or communities to address specific needs or issues. An intervention plan is developed

based on a thorough assessment of the client's situation, aiming to achieve the most effective outcomes for the client's well-being and development.

- **Family:** A family is a group of individuals connected by marriage, blood, or adoption, who live together as a single household and interact within their social roles, which typically include spouses, parents, children, and siblings.
- **Urbanization:** Urbanization describes the process by which populations move from rural areas to urban centres, resulting in significant changes to the physical and social structure of cities and towns. This process includes both demographic shifts and transformations in the built environment.
- **Population:** Population refers to the total number of individuals residing in a specific geographic area, such as a city, region, or country. Governments often use censuses to gather, analyse, and publish data on the size and characteristics of the resident population within their jurisdiction.
- **Garbage (Waste):** Garbage, also known as waste, encompasses unwanted materials or substances discarded by individuals. It is often used interchangeably with municipal solid waste and can include litter and improperly disposed of waste products.
- **Types of Waste:** Modern waste management systems classify waste into several types:
- **Municipal Waste:** Includes household waste, commercial waste, and demolition debris.
- **Hazardous Waste:** Consists of industrial waste that poses significant risks to health and the environment.
- **Biomedical Waste:** Comprises clinical waste generated by healthcare facilities, including items contaminated with bodily fluids.
- **Segregation:** Waste segregation involves categorizing waste into distinct groups, primarily dry and wet. Dry waste includes materials such as paper, metals, and glass, while wet waste refers to organic materials, often generated from food preparation, which are typically damp and heavier. Waste segregation is distinct from waste sorting, which may involve further categorization after initial segregation.

3.8.1 Related Concepts (Knowledge, Attitude, and Practice):

- **Knowledge:** Understanding of waste management and its environmental and health implications. Studies show that inadequate knowledge about waste disposal contributes to environmental pollution and health hazards, often leading to unsafe waste management practices.
- **Practice**: Refers to the actual behaviours and actions taken towards waste management. Effective waste management practices are promoted through environmental education and community action programs, which are crucial for improving public safety and environmental health.
- **Attitude:** Reflects individuals' perceptions and responses to waste management issues. Research indicates that factors such as lack of education, income levels, and residential planning significantly influence attitudes towards waste disposal, impacting the frequency and manner of waste management practices.

3.9 Research Instruments:

3.9.1 Sources of Data Collection:

- **Primary Data:**

  Men or Women from family participated in the Garbage awareness program from mentioned area of Pune city.

  Leaders, Contractors, PMC officers (Sanitary Inspectors) from Pune area.
- **Secondary Data:**

  Books, Journals, Newspapers, Reporters, Opinions, Internet (Blogs, Campaign channels, Social Media) Discussions,

3.10 Research (Methodology) Design:

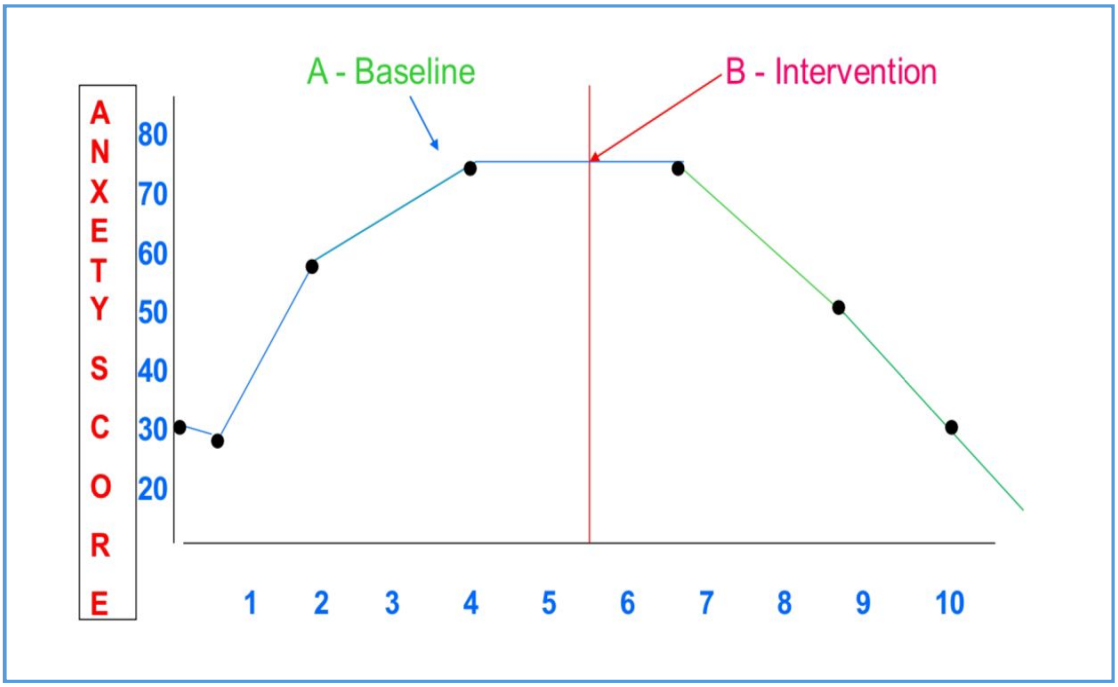
This study employs a single-subject research design, also known as the AB line design or single case experiment, which is particularly effective in educational and counselling settings within social research. This design utilizes a time series analysis technique to assess the impact of interventions on individual cases, focusing specifically on waste management practices in the suburban areas of Pune.

In this approach, interventions have been evaluated through a detailed examination of both individual and group behaviors, encompassing men, women,

families, and communities within the targeted suburban areas. To accurately measure the impact of the intervention, five pre-intervention assessments have been conducted. These assessments would involve administering a semi-structured interview schedule, which would first be validated by experts in the field to ensure its relevance and accuracy. This rigorous approach aims to provide a comprehensive understanding of the effects of the intervention on waste management practices within the selected population.

Figure No. 3. 3

AB : The Basic Single Subject Design



3.11 Research Method and Data Collection:

Selection of study area: After identifying the specific groups or communities researcher want to target with your intervention. This could include households, businesses, schools, or local communities.

- **Pune city-**

  Warje Malwadi suburban of Pune comparing too many areas (Ramnagar and Sahyog Nagar -Vitthal Nagar, Gokulnagar & Societies Popular Nagar and Popular Colony with Dnyanesh Societies): Considered for 350 samples.

- **Selection of Organization:**

  PMC (Pune Municipal Corporation and Warje Malwadi area, connected part of Haveli PMRDA section)

- **Data Samples: Universe:** Selected **350** Families (living in the Pune city majorly living in the (Slum and neglected area in and around) Warje, Warje - Malwadi Pune (PIN- 411058) intervened for more than 350 families.
    a) **Sample Size**: Due to social research non probability sampling method used for selection of 350 families responded properly. First intervention selected 60, Second intervention selected - 55, and for third - 55 families for observation and final recommendation.
    Researcher have been handling families but for interviewed with only one person in the intervention. Interviews of (men or women from family), society chairman, leaders, waste collecting authorities and drivers.
    b) **Time interval**: 10 days for one intervention four month time interval were taken for the sample collection.
    c) **Questionnaire**: Distributed to member of families i.e. men or women where researcher is concentrated.
    d) **Observations and Calculations:** with respondent's variables and factors with three interventions studied same respondents.

3.12 Interventions (Session planning to reach out-comes):

Intervention research for garbage typically involves developing and implementing strategies to reduce, manage, and mitigate the negative impacts of garbage on the environment, public health, and society as a whole. Garbage, or solid waste, includes various types of discarded materials such as plastics, paper, organic waste, and more. Effective intervention research in this area aims to minimize waste generation, encourage proper disposal, promote recycling and reuse, and explore innovative solutions for waste management. Here are some steps and strategies that intervention research for garbage could involve as follows:

1. **Waste Minimization Education:** Raise public awareness about the importance of waste minimization through educational campaigns, workshops, seminars, and online resources. Teach individuals and communities about the benefits of reducing consumption, reusing items, and making informed purchasing decisions.
2. **Recycling Programs:** Design and implement comprehensive recycling programs that include proper collection, sorting, and processing of recyclable

materials. Establish collection points, recycling centers, and collaborate with industries that can use recycled materials.

3. **Composting Initiatives:** Promote composting as a way to manage organic waste. Encourage households, communities, and businesses to compost food scraps and yard waste, reducing the amount of waste that ends up in landfills.
4. **Waste Separation at Source:** Implement waste separation programs that encourage individuals to sort their waste into different categories such as recyclables, non-recyclables, and hazardous waste. This facilitates easier recycling and proper disposal
5. **Incentives and Penalties:** Introduce incentives for individuals and businesses that actively participate in waste reduction and recycling programs. Conversely, impose fines or penalties for improper waste disposal, encouraging compliance with waste management regulations.
6. **Litter Clean-up Campaigns:** Organize regular clean-up drives in public spaces, parks, beaches, and streets to remove litter and raise awareness about the impact of improper waste disposal on the environment.
7. **Plastic Reduction Initiatives**: Target the reduction of single-use plastics through bans or restrictions on plastic bags, straws, and other disposable items. Promote the use of alternatives such as reusable bags and containers.
8. **Technology and Innovation**: Explore innovative waste management technologies such as waste-to-energy conversion, landfill gas capture, and advanced recycling techniques that can turn waste into valuable resources.
9. **Community Engagement**: Involve local communities, non-governmental organizations (NGOs), and businesses in designing and implementing waste reduction initiatives. Collaborate with community leaders and stakeholders to ensure effective implementation.
10. **Policy Development:** Advocate for and contribute to the development of local and national waste management policies that support sustainable waste practices, including extended producer responsibility (EPR) programs and waste reduction targets.
11. **Research and Data Collection:** Conduct ongoing research to assess the effectiveness of interventions, gather data on waste generation and disposal patterns, and identify areas for improvement.

12. **Partnerships and Collaboration:** Collaborate with government agencies, NGOs, businesses, and academia to pool resources, knowledge, and expertise for more impactful intervention strategies. Intervention research for garbage is a multidisciplinary effort that requires collaboration across various sectors to address the complex challenges associated with waste management. Successful interventions can lead to reduced environmental pollution, improved public health, and a more sustainable future.

3.13 Assessment and Analysis:

1. Intervention research for garbage, also known as waste management intervention research, involves implementing strategies and initiatives to address issues related to waste generation, collection, disposal, and recycling. The goal is to minimize the negative environmental and health impacts of garbage while promoting sustainable waste management practices. Here are some steps and approaches that could be part of intervention research for garbage:
   - **a.** Evaluate the current waste management practices in the target area, including waste generation methods, disposal methods, recycling awareness, and the types of waste being generated.
   - **b.** Identify key challenges and bottlenecks in the existing waste management system.
   - **c.** Analyse the socio-economic and cultural factors that influence waste generation and disposal behaviors.
2. **Stakeholder Engagement:**
   - **a.** Engage with local communities, government agencies, non-governmental organizations, and other relevant stakeholders to gather insights and perspectives on waste management challenges.
   - **b.** Collaborate with waste management companies, recycling facilities, and technology providers to understand their capabilities and limitations.
3. **Intervention Design:**
   - **a.** Develop a comprehensive waste management plan that addresses the identified challenges.
   - **b.** Design interventions that focus on waste reduction at the source, efficient collection systems, proper disposal, and increased recycling rates.

c. Consider the implementation of technology-based solutions such as smart waste bins, waste-to-energy plants, and digital platforms for waste tracking.

4. **Education and Awareness:**
   a. Conduct educational campaigns to raise awareness about the importance of responsible waste disposal and recycling.
   b. Provide information on waste separation, composting, and the environmental consequences of improper waste management.
5. **Infrastructure Development:**
   a. To suggest for invest in the development of waste collection infrastructure, including strategically placed bins and collection points. (With the help of Corporators and Local Leaders, Government officers, Agencies)
   b. To suggest to PMC offices about Establishment of recycling centers and facilities to process different types of recyclable materials.
6. **Policy and Regulation:**
   a. Work with local governments to develop and enforce waste management regulations and policies.
   b. Implement incentives and penalties to encourage compliance with waste management practices.
7. **Monitoring and Evaluation:**
   a. Regularly monitor the progress of the interventions and collect data on waste generation, segregation, collection rates, recycling rates, and environmental impacts.
   b. Use the collected data to assess the effectiveness of the interventions and make necessary adjustments.
8. **Continuous Improvement:**
   a. Based on the evaluation results, refine the interventions and strategies to improve their effectiveness over time.
   b. Stay updated with advancements in waste management technologies and approaches to ensure the interventions remain relevant and efficient.
9. **Community Participation:**

   Involve local communities in the planning and implementation of waste management interventions to ensure they are culturally appropriate and align with community needs.

10. Research and Innovation:

Explore innovative waste management solutions such as waste-to-energy technologies, biodegradable packaging, and circular economy approaches.

Overall, intervention research for garbage requires a holistic approach that combines technical, social, and policy measures to create sustainable waste management systems that minimize the environmental impact of waste while benefiting local communities and economies.

Table: 3.2

Intervention Session Planning

Sr. No.	Intervention Session Planning	Sessions
	PHASE---1(Knowledge Base)	
1	Screening of Men-Women-Group-Society and Community using attitude practice scale.	02
2	Knowledge and acknowledgement process for above	02
3	Awareness session on dry and wet in various target area	15
	PHASE—2 (Attitude base)	
4	Session on attitude related to waste, health, Environment, and indicators	02
5	To make positive attitude for Garbage collection and distribution	7
	PHASE-3 (Practice-learning)	
6	Skill training to family member for collection and distribution	4
7	Counselling individual and group	10
8	Referral service if necessary	5

Source: Designed by researcher

3.14 Process of Data Collection:

- **Interview Schedule & Process:** A designed structured interview schedule for men or women (distributed with age, income and living standard) in the area of Pune city for garbage collection and segregation.

- **Structured interview & Information collected from Garbage collecting participants**

  (PMC officers, Leaders, Garbage collection vehicle drivers, NGO's working for garbage collection)

- **Survey and Image Collections**.

  Experiment and observation table and charts designed and developed for data collection and changes have been recorded from decided samples.

  Newspapers, Paper cuttings, Discussions, Books, Journals, Previous published Material taken for study.

3.15 Tools and Techniques Data Collection :

The research instrument have been tested in representative manner which have been targeted after the social intervention and counselling program.

Quantitative data have been tested for relations and tests have been taken for intervention.

3.16 Primary Data Collection and Analysis:

Primary data samples shall be collected and finalized in first six-twelve months.

3.16.1 Survey Monitoring and Quality Control:

Monitoring and quality control plan for interview activities was developed. Study protocols have been followed for big data as well as for experimental data with close monitoring. Investigator improve the data quality by taking regular feedback information have been additional benefit for the researcher for cross checking information.

A. Ethical concerns in Research:

- Pre-permissions have been regularly taken from the involving members and then questionnaire have been provided to family member.
- Interview have been taken in maintaining the confidentiality of collected information.

- Also, researcher would give the freedom to the respondents to withdraw from research study any time so 10% extra samples have been chosen for the study and observation experiment.
- The assurance of about the no harm has given to the Respondents.
- The Collected Data will be used for Research Study only.

B) Data Processing:

- Tools such as SPSS-MS EXCEL be preferred for structured database to enter the collected data.
- Incorrect entries avoided or dropped from the collected data base and accurate interpretation and responses recorded and evaluated for conclusion and recommendations.
- Prior to data entry data validation, responses have been checked with feedback system.
- Data errors have been removed before the entry verified, cleaned and clear data have been taken into consideration for tabulation and report writing.
- Coding, Encoding and decoding taken into the consideration before tabulation. Responses categorized in proper manner with coding, noncoding, interviews with proper coding frame.

3.17 Report Writing:

Data analysis and reporting phase is the final phase of the study. The data analysis involved shaping of the data in terms of frequency, ranges, average analysis, etc. Alito indicators/variables generated based on interview, survey instruments. Also, to identify any underlying trends in the dataset the dataset was stratified, and cross tabulated.

❑❑❑

CHAPTER - IV

DATA ANALYSIS & INTERPRETATION

4.1 Introduction:

In this chapter researcher had discussed the Research Design and methodology, origin of the Research, Design of the research, variable of the research, population and sample of the research, tools for data collection, procedure for data collection, statistical analysis done in research work, data analysis is considered to be important step and heart of the research work. In the beginning or at the pre intervention stage data is raw in a nature but after it is arranged in certain format or in a meaningful order this row data takes the form of the information. The most critical essential supporting pillar of the research are the analysis and interpretation of the data. With the help of interpretation step one is able to achieve a conclusion from set of gathered data. Interpretation has two major aspects namely establishing continuity in the research through linking the results of given study with those of another and the establishment of some relationship with the collected data. Interpretation is very useful tool for this intervention study with which factors explained with observed by the researcher in course of the presentation analysis interpretation of studied post intervened final 55 samples.

When it comes to developing a model, after all these studies it is felt that it needs to be completely permanent and then in this final conclusion some things are thought to be perfect. As per the above study, an ideal model should be effective and socially connected to all level families.

1. Researcher first concentrated on the 500 samples which were taken into the consideration for study & questionnaire was distributed with 50 questions (variables) in selected 13 suburban area of Pune city.
2. The first 500 families were selected from areas connected to Haveli Pune city, some parts of the city are fully integrated, where the basic facilities of waste management are in good shape, while the families living in neglected, Slum area families are easily differentiated by the issues related to improvement.
3. QR1) In the preliminary study, primary survey forms were distributed to 500 families out of which 350 households responded properly in thirteen divisions of Warje Malwadi (Pune suburban), of which 175 householders were distributed

online with Google form they responded in proper manner. So for the second survey finalized 350 Families.

QR2) In the second survey researcher distributed 350 forms to the families out of which 212 families responded to the survey & 81 families surveyed in online mode with Google form. These families were techno savvy knows about Waste and its management, so they have responded appropriately and positively, so they are good mediators for my future work.

QR3-PI3) in third survey researcher distributed for 200 questionnaires out of which 101 families responded with hard copy. Here online mode is deleted from the third survey and then concentrated on the fix samples 60 in six sections of the Pune municipal suburban area. Out of these 60 families five families were deleted from the second intervention (Dongarwadi Pune suburban area) due to the time availability of their families then finally 55 families were finalized for second and third intervention study.

PART - A

4.2 Socio-Demographic and Family related information of the respondents

Objective No: 1

To understand the socio-economic background of the family and their behavior related to scattering intentionally or unintentionally.

Table No. 4.2.1

Age Distribution of the Respondents

Age Group	Frequency	Percentage
18 to 30	20	36.37
31 to 40	13	23.64
41 to 50	12	21.81
51 above	10	18.18
Total	**55**	**100**

The above table shows that the distribution of the respondents according to their age group. It clears that the 20 (36.37) percent of the respondents are belongs from the age group of 18 to 30 years. Also the 13 (23.63) percent of the respondents are belongs to the age group of 31 to 40 years. Besides it the 12 (21.81) percent of

the respondents are belongs from the age group of 41 to 50 years and the 10 (18.18) percent of the respondents are belongs from the age group of 51 years and above.

Table concludes that majority 36.67 percent of the respondents are belongs from the 31 to 40 years age.

Table No. 4.2.2

Distribution of the Respondents according to the Gender

Gender	Frequency	Percentage
Male	12	21.81
Female	43	78.18
Total	**55**	**100**

The above table shows that the distribution of the respondents according to their gender. It clears that the 12 (21.81) percent of the respondents are belongs from the Male gender and 43 (78.81) percent of the respondents are belongs from the Female gender.

Table concludes that the majority 78.81 percent of the respondents are belongs from the Female Gender and they are actively involved in the process of Garbage segregation.

Table No. 4.2.3

Distribution of the Respondentsaccording to the Current residential address

Selected area for Study	Frequency	Percent	Valid Percent	Cumulative Percent
Siddhivinayak Colony	10	18.2	18.2	18.2
Mhada Colony	10	18.2	18.2	36.4
Gokul Nagar, Pathar	10	18.2	18.2	54.5
Sahayog Nagar	10	18.2	18.2	72.7
Gosavi Vasti, Ramnagar	10	18.2	18.2	90.9
Dongarwadi Ramnagar	5	9.1	9.1	100.0
Total	**55**	**100.0**	**100.0**	

Source: primary survey data

The above table shows that the distribution of the respondents selected from six sub-divisions of Pune Division. Considering time and study, 55 totals are selected from neglected divisions. Out of these 55 total five divisions, 10 families i.e. 91% families are from five divisions while nine percent families are from five divisions. The rest belong to one division, that division is called Dongarwadi-Ramnagar, it is known as the most neglected division

The table concludes that after conducting three consecutive surveys, 55 families were taken for post intervention study, most of these families are from the neglected and slum areas.

Table No. 4.2.4

Distribution of the Respondents according to Level of Education.

Education distribution	Frequency	Percent	Valid Percent	Cumulative Percent
Primary (0-4)	9	16.4	16.4	16.4
Secondary (10th)	29	52.7	52.7	69.1
Higher Secondary(12th)	9	16.4	16.4	85.5
Graduate (12+3)	4	7.3	7.3	92.7
Above graduate	4	7.3	7.3	100.0
Total	**55**	**100.0**	**100.0**	

Source: primary survey data

The above table shows that the distribution of respondents according to the level of Education of the interviewee. It is found that 16 percent of respondents have education up to 4th standard while 53% have education up to 10th and 16% have education up to 12th i.e. 85% of respondents are less educated and only fifteen percent of respondents are above degree who are graduates or Those up to 12th were preferentially used as aids for intervention studies.

The above table Concludes that considering in this socio economic curriculum study out of total 55 respondents only 45 respondents are educated up to twelfth and only ten respondents are educated beyond twelfth so keeping in mind that this section is useful in terms of study the intervention study was extended there.

Table No. 4.2.5

Distribution of the Respondents according to Home ownership

(Type of family resident)

Residence wise distribution	Frequency	Percent	Valid Percent	Cumulative Percent
Traditional Plot (Old) - House / Bungalow / Building	5	9.1	9.1	9.1
Flat – Rented	4	7.3	7.3	16.4
Separate sitting house	1	1.8	1.8	18.2
Small – House/Rooms (from Govt. Scheme)	10	18.2	18.2	36.4
Own tiny house/ rooms (Blighted area)	35	63.6	63.6	100.0
Total	**55**	**100.0**	**100.0**	

Source: primary survey data

The above table shows that, the 55 households are divided according to the type of residence, only 9% of the families have own a detached house or a generation house, while 60% of the people live in small flats on lease, but the number of people living in government scheme MHADA Colony, small homes, encroached houses is 82% in this study

The above table concludes that the main respondents are 82 percent, it can be studied why Pune Municipal Corporation is neglected in this section. 82% of the households were found to be negligent in waste management. In the same neglected section, people deliberately littered various places in the morning and evening and dumped plastic bags the nearby PMC drains.

Table No. 4.2.6

Distribution of the Respondents according to Educational level of the family members

Level of education	Frequency	Percent	Valid Percent	Cumulative Percent
1st to 10th	17	30.9	30.9	30.9
11th to 12th	19	34.5	34.5	65.5
Degree & above	19	34.5	34.5	100.0
Total	**55**	**100.0**	**100.0**	

Source: primary survey data

The above table shows that the overall level of education shows that only 65% of the families are educated up to 12th standard that means the respondent is less educated but his family has a good level of education only 31%people are primary educated while 34 percent people are up to 12th standard. 33% of educated and uneducated families also have graduates.

The above table concludes that out of total 55 families there are 17 families with people below 10th standard in the house and 19 families with education below 12th standard. Remaining 19 families have good educational level but living in neglected areas, their attitude towards waste management is also seen to be neglected. Therefore, it was decided to pay attention to the said families in waste management and out of total 350 first survey, only 55 families were selected from different six divisions and it was decided to study their attitudes, knowledge and practices at this place.

Table No. 4.2.7

Distribution of the Respondents according to total members in family

Number of the members in family	Frequency	Percent	Valid Percent	Cumulative Percent
1	1	1.8	1.8	1.8
2	3	5.5	5.5	7.3
3	11	20.0	20.0	27.3
4	27	49.1	49.1	76.4
5	8	14.5	14.5	90.9
6	4	7.3	7.3	98.2
8	1	1.8	1.8	100.0
Total	**55**	**100.0**	**100.0**	

Source: primary survey data

The above table shows that the number of family members, 85% of the families are two to five members, very large families are only 9% and 6 percent of the families are one or two members.

The table concludes that 85% of the families have between two and five members and 50% of the families have four members, but since these families are busy with their day-to-day work, they are not responding properly to waste management and therefore littering is seen to be high. Since the garbage was to be thrown on the street and thrown outside, the number of dustbins in their house was less, instead they felt ready to collect the garbage in big plastic bags and throw it out.

Table 4.2.8

Distribution of the Respondents according to type of family

Family type	Frequency	Percent	Valid Percent	Cumulative Percent
Nuclear family	39	70.9	70.9	70.9
Joint-extended family	14	25.5	25.5	96.4
Single parent family	1	1.8	1.8	98.2
Childless family	1	1.8	1.8	100.0
Total	**55**	**100.0**	**100.0**	

Source: primary survey data

The above table shows that, when divided according to family size, 96% of the families are joint type/nuclear type while 4% are single type (single parent or childless).

The above table concludes that 96% of the households are neglecting in waste management and separation of wet waste into dry waste. A large family with less space at home tends to throw their waste on the street or other places instead of putting it in the dustbin, while the remaining two families are found to be turning it on.

Table No. 4.2.9

Distribution of the Respondents according to Annual Family Income

Income Rs/year	Frequency	Percent	Valid Percent	Cumulative Percent
3 Lacs to 6 Lacs Rs	54	98.2	98.2	98.2
6 Lacs to 9 Lacs Rs.	1	1.8	1.8	100.0
Total	**55**	**100.0**	**100.0**	

Source: primary survey data

The above table shows that the annual income of the studied family, 98% family income is between 3 Lacs to 6 Lacs while two percent family income is between 6 lacs to 9 Lacs, i.e. the total family income is lower which number is higher here.

The table concludes that 8% of the families are seen to give importance to daily work to live their daily life, so household waste is not their main problem, so they are seen to dispose of the waste in public places, on road, corner of the public places, while leaving for work or after coming from work, so the study has mainly taken the families of the neglected areas.

Summary:

Socio economic study of the Families which were living in the Pune city (Warje Malwadi area) are objects in this study. Pune is the second level metro Politian city growing vastly with various reasons such as industrialization, migration, Information and technology sector, top quality education. Facilities and services provided by the Pune municipal corporation regularly impacted by the peoples which were living in suburban area sector of the Pune city. Public Services provided by the municipal corporation such as street light, waste management, water supply, drainage system quickly affected due to the migrated peoples. Researcher concentrated on the problem of garbage and stake holders of the question with social intervention study. The increase in the number of peoples in growing city area usually influenced to the public services so systematic data collection and analysis occurrence of this research uses the intervention analysis to reach towards outcome. Intervention analysis is the time series analysis to model data that is determined by the presence of an intervention. Intervention analysis is one of the time series analysis to model data that are affected by the occurrence of a particular event in a short period of time, such as accidents, natural disasters, and promotions. This research is used to establish intervention model with pulse function of studied families of Warje Malwadi area of Pune city. This research is used to establish intervention model with pulse function of studied families of Warje Malwadi area of Pune city. In this objective no: 1 researcher concentrated on socio-eco differentiation and their littering attitude towards waste. As per above samples researcher only selected 6 areas from 13 suburban areas of Pune city. Their awareness, attitude, behavior and practice is perfectly followed the questionnaire in inverse direction.

PART-B

4.3 Case Profiles

Case No : 1

1. **Name:** ABC
2. **Gender:** Female
3. **Age:** 40
4. **Locality in the Warje, Pune:** Siddhivinayak Colony
5. **Education:** Master Graduate
6. **Language:** Marathi, English
7. **Nature of Work:** Computer Teacher
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 6 Lacs to 9 Lacs Rs.
11. **Availability of Dustbins:** No- family use plastic bags.
12. **Problems occurred due to non-management of garbage:** Even if the wet and dry waste is given separately, the waste workers throw it mixed while dumping the truck.
13. **Place to deliver garbage:** Private Vehicle
14. **Observations:** Respondent is group leader of Respondents for data collection for this area. During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfi with Garbage rally etc. and information was listened carefully. She was aware about garbage harmfulness and aware about garbage segregation.

Case No : 2

1. **Name:** BCD
2. **Gender:** Female
3. **Age:** 52
4. **Locality in the Warje, Pune:** Siddhivinayak Colony
5. **Education:** Primary
6. **Language:** Marathi, Hindi
7. **Nature of Work:** House Wife
8. **Family type:** Joint Extended
9. **No of Members:** 5
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of Dustbins:** No - family use plastic bags.
12. **Problems occurred due to non-management of garbage:** As the garbage truck does not come regularly, the wet garbage is stored in the house and smells.
13. **Place to deliver garbage:** Private Vehicle and also outside
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials. She took participation to distribution of two big dustbins for wet and dry garbage segregation for the private garbage trucks. She understood the information about the garbage segregation and she practiced well.

Case No : 3

1. **Name:** CDE
2. **Gender:** Male
3. **Age:** 30
4. **Locality in the Warje, Pune:** Siddhivinayak Colony
5. **Education:** Graduate
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Nuclear
9. **No of Members:** 3
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of Dustbins:** No - use plastic bags.
12. **Problems occurred due to non-management of garbage:** The garbage truck does not come every day.
13. **Place to deliver garbage:** Private Vehicle and also outside
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials. He took participation to distribution of two big dustbins for wet and dry garbage segregation for the private garbage trucks and also participated in selfie with garbage rally. He understood the information about the garbage segregation and his practice changed.

Case No : 4

1. **Name:** DEF
2. **Gender:** Female
3. **Age:** 38
4. **Locality in the Warje, Pune:** Siddhivinayak Colony
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family Type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of Dustbins:** No - all use plastic bags.
12. **Problems occurred due to non-management of garbage:** Garbage truck comes in every three to four days. So if smelly garbage isput outside our flat, big rats and dogs come to eat it.
13. **Place to deliver garbage:** Private Vehicle and also outside
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials. She took participation to distribution of two big dustbins for wet and dry garbage segregation for the private garbage trucks. She understood the information about the garbage segregation.The behavior and thinking of the respondent changed and the waste was segregated properly.

Case No : 5

1. **Name:** EFG
2. **Gender:** Female
3. **Age:** 35
4. **Locality in the Warje, Pune:** Siddhivinayak Colony
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of Dustbins:** No - family use plastic bags.
12. **Problems occurred due to non-management of garbage:** There is no provision in the garbage truck for wet and dry waste.
13. **Place to deliver garbage:** Private Vehicle and also outside
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions. She took participation to distribution of two big dustbins for wet and dry garbage segregation for the private garbage trucks. She understood the information about the garbage segregation. The respondent got information about waste management of Pune Municipal Corporation and practiced accordingly.

Case No : 6

1. **Name:** FGH
2. **Gender:** Female
3. **Age:** 29
4. **Locality in the Warje, Pune:** Siddhivinayak Colony
5. **Education:** Higher Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Joint Extended
9. **No of Members:** 5
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - all use plastic bags.
12. **Problems occurred due to non-management of garbage:** Garbage truck comes only once or twice a week but for collecting monthly money never misses the time and date.
13. **Place to deliver garbage:** Private Vehicle and also outside
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions. She took participation to distribution of two big dustbins for wet and dry garbage segregation for the private garbage trucks. She understood the information about the garbage segregation. There was a change in the respondent. She collected the garbage from her home with segregation properly and put the garbage in the garbage truck.

Case No : 7

1. **Name:** GHI
2. **Gender:** Male
3. **Age: 40**
4. **Locality in the Warje, Pune:** Siddhivinayak Colony
5. **Education:** Graduate
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - family use plastic bags.
12. **Problems occurred due to non-management of garbage:** No authorities come for waste awareness and garbage related information in our area.
13. **Place to deliver garbage:** Private Vehicle and also outside
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions of PMC officials. She took participation to distribution of two big dustbins for wet and dry garbage segregation for the private garbage trucks. She got the information from PMC officials and SWaCH Santha about the garbage segregation. So the opinion of the respondent changed and practices changed.

Case No : 8

1. **Name:** HIJ
2. **Gender:** Female
3. **Age: 28**
4. **Locality in the Warje, Pune:** Siddhivinayak Colony
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 3
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - family use plastic bags.
12. **Problems occurred due to non-management of garbage:** The garbage truck should come daily and on time as the disease can spread by storing wet waste.
13. **Place to deliver garbage:** Private Vehicle and also outside
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions of PMC officials. She took participation to distribution of two big dustbins for wet and dry garbage segregation for the private garbage trucks. Due to the intervention of the administration, garbage trucks started arriving daily, which changed the views of the respondent and they started segregation of waste and practiced it properly.

Case No : 9

1. **Name:** IJK
2. **Gender:** Male
3. **Age: 70**
4. **Locality in the Warje, Pune:** Siddhivinayak Colony
5. **Education:** Higher Secondary
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Single Parent
9. **No of Members:** 1
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - family use plastic bags.
12. **Problems occurred due to non-management of garbage:** PuneMunicipal Corporation has not given us information and leaflets for waste segregation till date.
13. **Place to deliver garbage:** Private Vehicle and also outside
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions of PMC officials. She took participation to distribution of two big dustbins for wet and dry garbage segregation for the private garbage trucksOfficials of waste management department of Pune Municipal Corporation and SWaCH Sanstha held a meeting here and gave information and pamphlets regarding waste. This influenced the respondent's views and resulted in a change in practices.

Case No : 10

1. **Name:** JKL
2. **Gender:** Male
3. **Age: 27**
4. **Locality in the Warje, Pune:** Siddhivinayak Colony
5. **Education:** Graduate
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - family use plastic bags.
12. **Problems occurred due to non-management of garbage:** Wet and dry waste are deposited together in the garbage vehicle.
13. **Place to deliver garbage :** Private Vehicle and also outside
14. **Observations**: During the research study it has found that the respondent has attended all the Intervention sessions of PMC officials. He took Initiative to distribution of two big dustbins for wet and dry garbage segregation for the private garbage trucks. Officials of waste management department of Pune Municipal Corporation and SWaCH Sanstha held a meeting here to regularize the garbage vehicle and gave information and pamphlets regarding waste. As a result of the meeting, garbage trucks became regular and changed the respondent's waste segregation practice.

Case No : 11

1. **Name:** KLM
2. **Gender:** Female
3. **Age: 24**
4. **Locality in the Warje, Pune:** Mhada Colony
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Joint Extended
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** Our members dump their garbage in the colony without collecting it because garbage pickers do not come regularly.
13. **Place to deliver garbage:** Outside the Mhada colony
14. **Observations:** Respondent is group leader of respondents for the area for data collection. During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials and participated in the Selfie with Garbage Rally. A private garbage Organization, SWaCH Sanstha, provided a garbage truck to collect garbage in the Mhada Colony area and asked women garbage collectors to collect garbage regularly.Officials and SWaCH Sanstha took an intervention program here regarding waste management and it affected the people. These things led to changes in the respondent's knowledge and influenced thinking and changed practices.

Case No : 12

1. **Name:** LMN
2. **Gender:** Female
3. **Age: 30**
4. **Locality in the Warje, Pune:** Mhada Colony
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** Garbage collectors don't come regular, so people throw garbage downstairs.
13. **Place to deliver garbage:** Below the building or outside the Mhada colony.
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials. A private garbage Organization, SWaCH Sanstha, provided a garbage truck to collect garbage in the Mhada Colony area and asked women garbage collectors to collect garbage regularly. Officials and SWaCH Sanstha also took an intervention program here regarding waste management. As private garbage collectors became regular, Respondent's thinking changed and practices changed.

Case No : 13

1. **Name:** MNO
2. **Gender:** Male
3. **Age: 40**
4. **Locality in the Warje, Pune:** Mhada Colony
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Nuclear
9. **No of Members:** 3
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** Private women were hired to collect the garbage but they came for a week.
13. **Place to deliver garbage:** Below the building oroutside the mhada colony.
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials. A private garbage Organization, SWaCH Sanstha, provided a garbage truck to collect garbage in the Mhada Colony area and asked women garbage collectors to collect garbage regularly. Officials and SWaCH Sanstha also took an intervention program here regarding waste management. The private women waste pickers who were assigned to collect the garbage did a good job. So that the respondent impressed and segregated the waste. A positive impact on the respondent resulted in a positive change in his attitudes and practices.

Case No : 14

1. **Name:** NOP
2. **Gender:** Male
3. **Age: 35**
4. **Locality in the Warje, Pune:** Mhada Colony
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** Respondent don't have garbage bins, so they put garbage in plastic bags.
13. **Place to deliver garbage:** Below the building
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials. A private garbage Organization, SWaCH Sanstha, provided a garbage truck to collect garbage in the Mhada Colony and Officials and SWaCH Sanstha also took an intervention program here regarding waste management. Private garbage pickers were provided for garbage collection. **Dustbins were allocated for storing wet and dry waste**. This affected the respondent resulting in better waste segregation and positive impact on the respondent's performance.

Case No : 15

1. **Name:** OPQ
2. **Gender:** Female
3. **Age: 30**
4. **Locality in the Warje, Pune:** Mhada Colony
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 3
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - family use plastic bags.
12. **Problems occurred due to non-management of garbage:** Some people throw garbage down from their window.
13. **Place to deliver garbage:** Below the building
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials and participated in the Selfie with Garbage Rally. A private garbage Organization, SWaCH Sanstha, provided a garbage truck to collect garbage in the Mhada Colony and Officials and SWaCH Sanstha also took an intervention program here regarding waste management. Private garbage pickers were provided for garbage collection.Two dustbins were provided to the residents of the Mhada colony to separate wet and dry waste. Information about the bad effects of waste and waste collection led to a change in respondent's thinking and a change in action.

Case No : 16

1. **Name:** PQR
2. **Gender:** Female
3. **Age: 35**
4. **Locality in the Warje, Pune:** Mhada Colony
5. **Education:** Primary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Joint Extended
9. **No of Members:** 6
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - family use plastic bags.
12. **Problems occurred due to non-management of garbage:** Pune municipal corporation officials never come here to give information about waste management.
13. **Place to deliver garbage:** Below the building
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials. A private garbage Organization, SWaCH Sanstha, provided a garbage truck to collect garbage in the Mhada Colony and Officials and SWaCH Sanstha also took an intervention program here regarding waste management. Private garbage pickers were provided for garbage collection.Dustbins were provided to the residents of the Mhada colony to separate wet and dry waste. The impact of the program on waste management undertaken by the waste management officer of the Pune municipal corporation and the officer of the SWaCH Sanstha had a positive effect on the respondent's practice.

Case No : 17

1. **Name:** QRS
2. **Gender:** Female
3. **Age:** 31
4. **Locality in the Warje, Pune:** Mhada Colony
5. **Education:** Primary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 3
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - family use plastic bags.
12. **Problems occurred due to non-management of garbage:** Instead of storing garbage in the house and getting sick, we throw it in the garbage outside.
13. **Place to deliver garbage:** Below the building
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials. A private garbage Organization, SWaCH Sanstha, provided a garbage truck to collect garbage in the Mhada Colony and Officials and SWaCH Sanstha also took an intervention program here regarding waste management. Private garbage pickers were provided for garbage collection.Dustbins were provided to the residents of the Mhada colony to separate wet and dry waste. The intervention program conducted at Mhada Colony led to a change in respondent's thinking and a change in practice.The respondent segregated the wet and dry waste and started putting the waste into the garbage vehicle.

Case No : 18

1. **Name:** RST
2. **Gender:** Female
3. **Age:** 29
4. **Locality in the Warje, Pune:** Mhada Colony
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Joint Extended
9. **No of Members:** 6
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - family use plastic bags.
12. **Problems occurred due to non-management of garbage:** It is necessary to inform the citizens about the waste and to arrange the garbage vehicle.
13. **Place to deliver garbage:** Below the building
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials. A private garbage Organization, SWaCH Sanstha, provided a garbage truck to collect garbage in the Mhada Colony and Officials and SWaCH Sanstha also took an intervention program here regarding waste management. Private garbage pickers were provided for garbage collection.The introduction of the garbage truck and the introduction of waste management program led to a change in the thinking of respondent and a change in practices.

Case No : 19

1. **Name:** STU
2. **Gender:** Female
3. **Age: 26**
4. **Locality in the Warje, Pune:** Mhada Colony
5. **Education:** Higher Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 3
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - family use plastic bags.
12. **Problems occurred due to non-management of garbage:** PuneMunicipal Corporation does not pick up the garbage accumulated outside Mhada colony despite repeated complaints.
13. **Place to deliver garbage:** Below the building
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials. A private garbage Organization, SWaCH Sanstha, provided a garbage truck to collect garbage in the Mhada Colony and Officials and SWaCH Sanstha also took an intervention program here regarding waste management.Garbage stored outside Mhada Colony was picked up by PMC Garbage truck and regular garbage collection was arranged. This led to a change in the respondent's thinking and a change in action and practices. The respondent segregated the wet and dry waste and put the waste into the garbage vehicle.

Case No : 20

1. **Name:** TUV
2. **Gender:** Female
3. **Age: 37**
4. **Locality in the Warje, Pune:** Mhada Colony
5. **Education:** Primary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - family use plastic bags.
12. **Problems occurred due to non-management of garbage:** People in our colony do not know that wet and dry waste is separated.
13. **Place to deliver garbage:** Below the building
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials. A private garbage Organization, SWaCH Sanstha, provided a garbage truck to collect garbage in the Mhada Colony and Officials and SWaCH Sanstha also took an intervention program here regarding waste management.Guidance information was given to the people to segregate wet and dry waste. This increased the knowledge of Respondent and improved practice by influencing action.

Case No : 21

1. **Name:** UVW
2. **Gender:** Female
3. **Age:** 45
4. **Locality in the Warje, Pune:** Gokulnagar Pathar
5. **Education:** Graduation
6. **Language:** Marathi
7. **Nature of Work:** Private Service
8. **Family type:** Joint Extended
9. **No of Members:** 8
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - they use plastic bags.
12. **Problems occurred due to non-management of garbage:** Garbage piled up on the roadside near the entrance to gokul nagar pathar is not picked up despite many written complaints.
13. **Place to deliver garbage:** Throws rode side
14. **Observations:** Respondent studied BSW and works as a social worker and was group leader of Respondents at that place for data collection. During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc.She participated in the Selfie with Garbage Rally and due to it she got private garbage truck for her area by SWaCH Sanstha. All the women welcomed the garbage truck by drawing pangolins and showering flowers. Garbage accumulated along the road of Gokulnagar Pathar for several days was picked up by the Pune Municipal Corporation's garbage truck. This led to a change in the attitude of the respondent and a change in knowledge leading to good practice for waste segregation. Respondent was aware about garbage harmfulness and respondent was spread information about garbage segregation to other residents.

Case No : 22

1. **Name:** VWX
2. **Gender:** Male
3. **Age: 35**
4. **Locality in the Warje, Pune:** Gokulnagar Pathar
5. **Education:** Higher Secondary
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Joint Extended
9. **No of Members:** 5
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - they use plastic bags.
12. **Problems occurred due to non-management of garbage:** We have no idea about the Pune Municipal Corporation's waste disposal practices.
13. **Place to deliver garbage:** Throws rode side
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc. Respondent participated in the Selfie with Garbage Rally and due to it she got private garbage truck for her area by SWaCH Sanstha. Information about garbage segregation was given to the people by authorities of PMC waste management to segregate wet and dry waste. This increased the knowledge of Respondent and improved practices by influencing action.

Case No : 23

1. **Name:** WXY
2. **Gender:** Female
3. **Age: 24**
4. **Locality in the Warje, Pune:** Gokulnagar Pathar
5. **Education:** Higher Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - they use plastic bags.
12. **Problems occurred due to non-management of garbage:** Citizens of our area do not segregate waste.
13. **Place to deliver garbage:** Throws rode side
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc. Respondent participated in the Selfie with Garbage Rally and due to it she got private garbage truck for her area by SWaCH Sanstha. On behalf of SWaCH Sanstha and Pune Municipal Corporation, citizens of Gokulnagar Pathar area were informed about segregation of wet and dry waste and leaflets about waste segregation were distributed. This led to a positive change in their actions and practices by adding to their knowledge.

Case No : 22

1. **Name:** XYZ
2. **Gender:** Female
3. **Age: 35**
4. **Locality in the Warje, Pune:** Gokulnagar Pathar
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Joint Extended
9. **No of Members:** 5
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - they use plastic bags.
12. **Problems occurred due to non-management of garbage:** Due to the lack of coordination between PuneMunicipal Corporation waste management department and garbage workers, garbage piles up on the Gokulnagar Pathar.
13. **Place to deliver garbage:** Throws rode side.
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc. Respondent participated in the Selfie with Garbage Rally and due to it she got private garbage truck for her area by SWaCH Sanstha.

    A meeting regarding waste management was held at Gokulnagar Pathar in coordination with Pune Municipal Waste Management Department Officers and SWaCH Sanstha. Citizens were informed about waste segregation. The garbage accumulated on the Gokulnagar Pathar was picked up by the garbage truck of Pune Municipal Corporation. This added to the knowledge of the respondents and led to their positive practice of waste segregation.

Case No : 25

1. **Name:** ZAB
2. **Gender:** Female
3. **Age: 65**
4. **Locality in the Warje, Pune:** Gokulnagar Pathar
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Nuclear
9. **No of Members:** 3
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - they use plastic bags.
12. **Problems occurred due to non-management of garbage:** Gokulnagar Pathar is neglected by the authorities regarding the garbage problem.
13. **Place to deliver garbage:** Throws rodeside.
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc. Respondent participated in the Selfie with Garbage Rally and due to it she got private garbage truck for her area by SWaCH Sanstha. All the women welcomed the garbage truck by drawing Rangolis and showering flowers.

    Pune Municipal Waste Management Department Officers and SWaCH Sanstha held a meeting regarding waste management and waste segregation at Gokulnagar Pathar. Citizens were informed about waste segregation. The garbage accumulated on the Gokulnagar Pathar was picked up by the garbage truck of Pune Municipal Corporation. This led to a change in the respondent's thinking and a change in his attitude. So he represented about the waste problem.

Case No : 26

1. **Name:** ZBC
2. **Gender:** Female
3. **Age: 42**
4. **Locality in the Warje, Pune:** Gokulnagar Pathar
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Private Job
8. **Family type:** Joint Extended
9. **No of Members:** 5
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - they use plastic bags.
12. **Problems occurred due to non-management of garbage:** Garbage trucks do not come regularly to Gokulnagar Pathar.
13. **Place to deliver garbage:** Throws rode side
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc. Respondent participated in the Selfie with Garbage Rally and due to it she got private garbage truck for her area by SWaCH Sanstha.

    Garbage truck was started at Gokulnagar Pathar. All the women welcomed the garbage truck by drawing Rangolis and showering flowers. Arrangements were made for the garbage truck to come regularly. This led to a change in practices, adding to the knowledge of Respondent.

Case No : 27

1. **Name:** ZCD
2. **Gender:** Male
3. **Age:** 28
4. **Locality in the Warje, Pune:** Gokulnagar Pathar
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Private Job
8. **Family type:** Nuclear
9. **No of Members:** 3
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins**: No - they use plastic bags.
12. **Problems occurred due to non-management of garbage:** We hired a private garbage truck. But it comes only once in a week. Due to which the citizens throw garbage outside and the stench spreads.
13. **Place to deliver garbage:** Throws rode side.
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc. Respondent participated in the Selfie with Garbage Rally and due to it she got private garbage truck for her area by SWaCH Sanstha. All the women welcomed the garbage truck by drawing Rangolis and showering flowers.

    Garbage truck was started at Gokulnagar Pathar. The garbage accumulated in this area was also picked up by the garbage truck of Pune Municipal Corporation and arrangements were made for the garbage truck to come regularly. This led to a change in the attitude of the respondent increasing his confidence in the PMC administration and resulted good practice of waste segregation.

Case No : 28

1. **Name:** ZDE
2. **Gender:** Female
3. **Age: 30**
4. **Locality in the Warje, Pune:** Gokulnagar Pathar
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Private Service
8. **Family type:** Joint Extended
9. **No of Members:** 5
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - they use plastic bags.
12. **Problems occurred due to non-management of garbage:** PuneMunicipal Corporation is not serious about the garbage problem at Gokulnagar Pathar.
13. **Place to deliver garbage:** Throws rode side.
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc. Respondent participated in the Selfie with Garbage Rally and due to it she got private garbage truck for her area by SWaCH Sanstha. All the women welcomed the garbage truck by drawing Rangolis and showering flowers.

    Gokulnagar Pathar is a BDP (BIO DIVERSITY PARK) area. So PMC has some limitations for development. Therefore, a garbage truck was started in this area on behalf of SWaCH Sanstha and the garbage problem of the citizens of this area was solved. The garbage accumulated in this area was also picked up by the garbage truck of Pune Municipal Corporationthe introduction of garbage trucks has improved waste disposal practices by adding to people's attitude.

Case No : 29

1. **Name:** ZEF
2. **Gender:** Female
3. **Age: 26**
4. **Locality in the Warje, Pune:** Gokulnagar Pathar
5. **Education:** Graduation
6. **Language:** Marathi
7. **Nature of Work:** Private Service
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - they use plastic bags.
12. **Problems occurred due to non-management of garbage:** The authorities have not informed us about the types of waste. So citizens mix wet and dry waste and throw it outside.
13. **Place to deliver garbage:** Throws rode side.
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc. Respondent participated in the Selfie with Garbage Rally and due to it she got private garbage truck for her area by SWaCH Sanstha. All the women welcomed the garbage truck by drawing Rangolis and showering flowers.

    On behalf of SWaCH Sanstha and Pune Municipal Corporation, citizens of Gokulnagar Pathar area were informed about segregation of wet and dry waste and leaflets about waste segregation were distributed. The information received on waste segregation led to a positive change in the knowledge of respondent and also a positive change in practices.

Case No : 30

1. **Name:** ZFG
2. **Gender:** Female
3. **Age:** 23
4. **Locality in the Warje, Pune:** Gokulnagar Pathar
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Private Job
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - they use plastic bags.
12. **Problems occurred due to non-management of garbage:** PuneMunicipal Corporation needs to create public awareness regarding the separation of wet and dry waste at Gokulnagar Pathar.
13. **Place to deliver garbage:** Throws rode side.
14. **Observations:** during the research study it has found that the respondent has attended all the intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, selfie with garbage rally etc. Respondent participated in the selfie with garbage rally and due to it she got private garbage truck for her area by SWaCH Sanstha. All the women welcomed the garbage truck by drawing rangolis and showering flowers.

    Pune Municipal Corporation and SWaCH Sanstha organized a program for citizens of Gokulnagar Ppathar area and informed about segregation of wet and dry waste and distributed leaflets about waste segregation. The information received on waste segregation led to a positive change in the knowledge of respondent and also a positive change in the attitude and practices.

Case No : 31

1. **Name:** ZGH
2. **Gender:** Male
3. **Age: 27**
4. **Locality in the Warje, Pune:** Sahyog Nagar
5. **Education:**Graduation
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Nuclear
9. **No of Members:** 2
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - she use plastic bags.
12. **Problems occurred due to non-management of garbage:** There is no garbage truck coming to Sahyog Nagar, so wet and dry garbage is dumped near the sides of the houses.
13. **Place to deliver garbage:** Throws anywhere and throws near Vitthal Nagar Chowk also
14. **Observations:** Respondent is leader of respondent group for the area for the data collection. During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials and got information about garbage management system of PMC. So she took lead to enlighten other women for garbage segregation in that area. She also participatedSelfie with Garbage rally and got garbage truck to that area from SWaCH Sanstha. All the women welcomed the garbage truck by drawing Rangolis and showering flowers.Respondent was aware about garbage harmfulness and aware about waste segregation.Sahyog Nagar falls in BDP zone. Therefore, there are some limitations for the municipal corporation to work here. But due to the pressure of all the respondents, the administration had to take steps regarding the waste issue.Garbage accumulated at Sahyog Nagar for a year was picked up by the garbage truck of Pune Municipal Corporation before the Garbage Rally, so this area was cleaned and all the respondents participated in the Garbage Rally. So the administration had to solve the waste problem.

Case No : 32

1. **Name:** ZHI
2. **Gender:** Female
3. **Age: 28**
4. **Locality in the Warje, Pune:** Sahyog Nagar
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclar
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - she use plastic bags.
12. **Problems occurred due to non-management of garbage:** Wet and dry waste can be segregated only if the garbage truck starts. Currently all the citizens throw the mix waste together near Vitthal Nagar Chowk.
13. **Place to deliver garbage:** Throws near Vitthal Nagar Chowk
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials and got information about garbage management system of PMC. Respondent also participated **Selfie with Garbage rally** and got garbage truck to that area from SWaCH Sanstha. All the women welcomed the garbage truck by drawing Rangolis and showering flowers. Respondent was aware about garbage harmfulness and aware about waste segregation.

    Sahyog Nagar falls in BDP zone. Therefore, there are some limitations for the municipal corporation to work here. Garbage accumulated at Sahyog Nagar for a year was picked up by the garbage truck of Pune Municipal Corporation before the Garbage Rally. Garbage truck was started and people were informed about waste segregation. So there was a change in the attitude of the people of this area and the Respondent also. And there was a positive change in the practices of segregation.

Case No : 33

1. **Name:** ZIJ
2. **Gender:** Female
3. **Age: 35**
4. **Locality in the Warje, Pune:** Sahyog Nagar
5. **Education:** Secondary
6. **Language:** Marathi & Hindi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclar
9. **No of Members:** 5
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** We have no idea about waste segregation.
13. **Place to deliver garbage:** Throws near Vitthal Nagar Chowk
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials and got information about garbage management system of PMC. Respondent also participated **Selfie with Garbage rally** and got garbage truck to that area from SWaCH Sanstha. All the women welcomed the garbage truck by drawing Rangolis and showering flowers. Respondent was aware about garbage harmfulness and aware about waste segregation.

    Sahyog Nagar falls in BDP zone. All thegarbage accumulated at Sahyog Nagarwas picked up by the garbage truck of Pune Municipal Corporation before the Garbage Rally. A program on waste management and waste segregation was conducted by PMC officials and SWaCH Sanstha, thus influencing the perception of the people and the respondent to improve the practice of waste segregation.

Case No : 34

1. **Name:** ZJK
2. **Gender:** Female
3. **Age: 28**
4. **Locality in the Warje, Pune:** Sahyog Nagar
5. **Education:** Secondary
6. **Language:** Marathi & Hindi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** We throw the wet and dry waste together in the Vitthal Nagar Chowk. Once a week, the Pune municipal corporation vehicle picks up the garbage.
13. **Place to deliver garbage:** Throws near house or Vitthal Nagar Chowk
14. **Observations:** Sahyog Nagar is in the BDP zone. During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials and got information about garbage management system of PMC. Respondent also participated **Selfie with Garbage rally** and got garbage truck to that area from SWaCH Sanstha and charged 60 rupees per month. All the women welcomed the garbage truck by drawing Rangolis and showering flowers.

    All the garbage accumulated at Vitthal Nagar Chowk and Sahyog Nagar was picked up by the garbage truck of Pune Municipal Corporation before the Garbage Rally.Punitive action was taken against persons dumping waste elsewhere. Due to this, the accumulation of garbage in Vitthal Nagar Chowk was stopped. Due to intervention of garbage segregation Respondents and citizens started segregation and put the garbage into garbage truck.

Case No : 35

1. **Name:** ZKL
2. **Gender:** Female
3. **Age: 30**
4. **Locality in the Warje, Pune:** Sahyog Nagar
5. **Education:** Secondary
6. **Language:** Marathi & Hindi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** Every night, vegetable sellers are seen dumping the leftover vegetables in Vitthal Nagar Chowk.
13. **Place to deliver garbage:** Throws near house or Vitthal Nagar Chowk
14. **Observations:** Sahyog Nagar is in the BDP zone. During the research study it has found that the respondent has attended all the Intervention sessions organized by SWaCH Sanstha and PMC garbage management officials. Respondent also participated **Selfie with Garbage rally** and got garbage truck to that area from SWaCH Sanstha and charged 60 rupees per month. All the women welcomed the garbage truck by drawing Rangolis and showering flowers.

    All the garbage accumulated at Vitthal Nagar Chowk was picked up by the garbage truck of Pune Municipal Corporation.Fines were imposed on vegetable vendors who dumped leftover vegetables in Vitthal Nagar Chowk. Therefore, the problem of waste accumulating in this area was solved. Respondent and Citizens took the initiative to segregate the waste and their practices changed.

Case No : 36

1. **Name:** ZLM
2. **Gender:** Female
3. **Age: 22**
4. **Locality in the Warje, Pune:** Sahyog Nagar
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 2
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** PMC garbage vehicle should be started immediately at Sahyog Nagar. Private organizations charge money for garbage collection. This work belongs to PMC.
13. **Place to deliver garbage:** Throws near Vitthal Nagar Chowk
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials and got information about garbage management system of PMC. Respondent also participated **Selfie with Garbage rally** and got garbage truck to that area from SWaCH Sanstha. All the women welcomed the garbage truck by drawing Rangolis and showering flowers. Respondent was aware about garbage harmfulness and aware about waste segregation.

    Sahyog Nagar falls in BDP zone. Therefore, there are some limitations for the municipal corporation to work here. PMC does not have enough manpower for waste management. Therefore, a garbage truck was started in the Sahyog Nagar area by SWaCH Sanstha and the problem of garbage was resolved. With the help of the Pune Municipal Corporation, Respondent and women took the initiative to create awareness about waste segregation.This led to a change in people's attitudes and practices.

Case No : 37

1. **Name:** ZLM
2. **Gender:** Female
3. **Age: 28**
4. **Locality in the Warje, Pune:** Sahyog Nagar
5. **Education:** Higher Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** If the garbage truck is started in Sahyog Nagar area with your cooperation, our garbage problem can be solved.
13. **Place to deliver garbage:** Throws near house or Vitthal Nagar Chowk
14. **Observations:** Respondent made a suggestion to start a garbage trucks in the Sahyog Nagar**.** During the research study it has found that the respondent has attended all the Intervention sessions organized by SWaCH Sanstha and PMC garbage management officials. Respondent also participated **Selfie with Garbage rally** and got garbage truck to that area from SWaCH Sanstha and charged 60 rupees per month. Respondent also welcomed the garbage truck by drawing rangolis and showering flowers.

    There was a change in the respondent's attitude and practice after receiving information about waste segregation and the introduction of the garbage truck.

Case No : 38

1. **Name:** ZNO
2. **Gender:** Male
3. **Age: 55**
4. **Locality in the Warje, Pune:** Sahyog Nagar
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Joint Extended
9. **No of Members:** 5
10. **Yearly income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** There is no coordination between PuneMunicipal Corporation waste management department and garbage workers so garbage accumulated in ourarea.
13. **Place to deliver garbage:** Throws rodeside
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc. Respondent participated in the Selfie with Garbage Rally and due to it respondent got private garbage truck for her area by SWaCH Sanstha.

    A meeting regarding waste management was held at Sahyog Nagar in coordination with Pune Municipal Waste Management Department Officers and SWaCH Sanstha. Respondent took initiative for waste segregation program. The garbage truck of PMC picked up the garbage accumulated there. Information about waste segregation provided by the administration changed the attitude and practice of Respondent.

Case No : 39

1. **Name:** ZOP
2. **Gender:** Female
3. **Age: 40**
4. **Locality in the Warje, Pune:** Sahyog Nagar
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** We don't know the types of waste. If a private garbage truck is started in Sahyog Nagar, we can take the initiative for waste segregation.
13. **Place to deliver garbage:** Throws near Vitthal Nagar Chowk
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials and got information about garbage management system of PMC. Sahyog Nagar falls in BDP zone. Respondent also participated **Selfie with Garbage rally** and got garbage truck to that area from SWaCH Sanstha. All the women welcomed the garbage truck by drawing rangolis and showering flowers

    A program was held at Sahyog Nagar on behalf of PMC and SWaCH Sanstha on types of waste, segregation of waste. Respondent participated in this. The respondent represented for segregation after the garbage truck was in operation. It increased the Respondent's knowledge. There was a change in his attitude and a change in segregation practices.

Case No : 40

1. **Name:** ZPQ
2. **Gender:** Female
3. **Age:** 30
4. **Locality in the Warje, Pune:** Sahyog Nagar
5. **Education:** Higher Secondary
6. **Language:** Marathi
7. **Nature of Work:** Private Job
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** No one officers visited and no public awareness program has been done in Sahyog Nagar that wet and dry waste is segregated.
13. **Place to deliver garbage:** Throws rode side.
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc. Respondent participated in the Selfie with Garbage Rally and due to it respondent got private garbage truck for her area by SWaCH Sanstha.

    A meeting regarding waste management was held at Sahyog Nagar in coordination with Pune Municipal Waste Management Department Officers and SWaCH Sanstha. Respondent participated in the waste segregation program. Appropriate information about waste segregation has resulted in a change in respondent's attitude and practices towards waste segregation.

Case No : 41

1. **Name:** ZQR
2. **Gender:** Female
3. **Age:** 55
4. **Locality in the Warje, Pune:** Gosavi Vasti
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Joint Extended
9. **No of Members**: 6
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - we use plastic bags.
12. **Problems occurred due to non-management of garbage:** Private organizations collect garbage only twice a week in our Gosavi Vasti area.
13. **Place to deliver garbage**: Throws anywhere
14. **Observations:** Respondent is group leader of respondents for the area for data collection. During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc. and information was listened carefully.

    A meeting was held in Gosavi Vasti area on behalf of Pune Municipal Corporation Waste Management Department and SWaCH Sanstha. Garbage trucks were made regular in this. Respondent was aware about garbage harmfulness and took initiative to spread the information about garbage segregation. Therefore, the opinion of the respondent changed and the segregation of waste became better.

Case No : 42

1. **Name:** ZRS
2. **Gender:** Female
3. **Age:** 40
4. **Locality in the Warje, Pune:** Gosavi Vasti
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Joint Extended
9. **No of Members**: 6
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - we use plastic bags.
12. **Problems occurred due to non-management of garbage:** If the waste authorities are asked to pick up the waste piled up around, they take several days to take action.
13. **Place to deliver garbage**: Throws anywhere
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc.

    A meeting was held in Gosavi Vasti area on behalf of Pune Municipal Corporation Waste Management Department and SWaCH Sanstha.The sanitary inspector of this area was instructed to redress the grievances of the concerned people immediately and people informed about garbage segregation. Therefore, the opinion of the respondent changed and he took participation for waste segregation.

Case No : 43

1. **Name:** ZST
2. **Gender:** Female
3. **Age: 30**
4. **Locality in the Warje, Pune:** Gosavi Vasti
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** Women in Gosavi Vasti should be informed about segregation of wet and dry waste.
13. **Place to deliver garbage:** Throws to open area
14. **Observations:** Gosavi vasti falls in the Gavani zone. During the research study it has found that the respondent has attended all the Intervention sessions of SWaCH Sanstha and PMC garbage management officials and got information about garbage management system of PMC. Respondent also participated **Selfie with Garbage rally.** Respondent was aware about garbage harmfulness and aware about waste segregation.

    A program on waste management and waste segregation was conducted by PMC officials and SWaCH Sanstha in the Gosavi Vasti.The women of this area were given a demonstration on waste segregation by showing them the types of waste. This influenced the women and helped to improve segregation.

Case No : 44

1. **Name:** ZTU
2. **Gender:** Male
3. **Age: 25**
4. **Locality in the Warje, Pune:** Gosavi Vasti
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Nuclear
9. **No of Members**: 3
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - we use plastic bags.
12. **Problems occurred due to non-management of garbage:** Even if we separate the wet and dry waste, the garbage workers put it together in the vehicle.
13. **Place to deliver garbage**: Throws anywhere
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials, Selfie with Garbage rally etc.

    A meeting was held in Gosavi Vasti area on behalf of Pune Municipal Corporation Waste Management Department and SWaCH Sanstha. In the meeting, the sanitary inspector of the area and the waste collectors were instructed to collect the waste with segregation. Two large dustbins were provided for waste segregation. Citizens were informed about waste segregation. So there was a positive change in their practice. Therefore, the opinion of the respondent changed and he took participation for waste segregation.

Case No : 45

1. **Name:** ZTV
2. **Gender:** Female
3. **Age: 22**
4. **Locality in the Warje, Pune:** Gosavi Vasti
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members :** 2
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** It is necessary to take programs for waste segregation from waste authorities of PMC.
13. **Place to deliver garbage:** Throws to open area
14. **Observations:** Gosavi Vasti falls in the Slum Eradication and Rehabilitation(Gavani)zone. During the research study it has found that the respondent has attended all the Intervention sessions of SWaCH Sanstha and PMC garbage management officials and got information about garbage management system of PMC. Respondent also participated **Selfie with Garbage rally.**

    A program on waste management and waste segregation was conducted by PMC officials and SWaCH Sanstha in the Gosavi Vasti. The women of this area were given a demonstration on waste segregation by showing them the types of waste. Information from the program on waste information increased women's knowledge of waste segregation and made the practice positive. Respondent was also aware about garbage waste segregation.

Case No : 46

1. **Name:** ZVW
2. **Gender:** Female
3. **Age: 23**
4. **Locality in the Warje, Pune:** Gosavi Vasti
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 3
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** Garbage collection workers do not carry garbage every day.
13. **Place to deliver garbage:** Throws to open area
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions of SWaCH Sanstha and PMC garbage management officials and got information about garbage management system of PMC. Respondent also participated **Selfie with Garbage rally.**

    Gosavi Vasti falls in the Slum Eradication and Rehabilitation (Gavani) zone. A program on waste management and waste segregation was conducted by PMC officials and SWaCH Sanstha in the Gosavi Vasti. The sanitary inspector of the area and the waste collectors were instructed to collect the waste regularly and every day with segregation. The program resulted in a positive change in the attitudes of the respondents and citizens towards the practice of waste segregation.

Case No : 47

1. **Name:** ZWX
2. **Gender:** Female
3. **Age:** 35
4. **Locality in the Warje, Pune:** Gosavi Vasti
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** There is no guidance meeting for waste problem in Gosavi Vasti by authorities.
13. **Place to deliver garbage:** Throws to open area
14. **Observations:** Gosavi Vasti falls in the Slum Eradication and Rehabilitation (Gavani) zone. During the research study it has found that the respondent has attended all the Intervention sessions conducted by SWaCH Sanstha and garbage management officials and Respondent also participated in the Selfie with Garbage Rally.

    A program on waste management and waste segregation was conducted by PMC officials and SWaCH Sanstha in the Gosavi Vasti. Demonstration on waste segregation by showing them types of waste also conducted. This resulted in a positive change in the knowledge, attitude and practice of the Respondents and citizens.

Case No : 48

1. **Name:** ZXY
2. **Gender:** Female
3. **Age: 40**
4. **Locality in the Warje, Pune:** Gosavi Vasti
5. **Education:** Secondary
6. **Language:** Marathi & Hindi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** Public awareness should be created to segregate wet and dry waste in Gosavi Vasti.
13. **Place to deliver garbage:** Throws to open area
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions with SWaCH Sanstha and PMC and got information about garbage management system of PMC. Respondent also participated **Selfie with Garbage rally.**

    Waste management and waste segregation program was conducted by PMC officials and SWaCH Sanstha in the Gosavi Vasti and showed demonstration on waste segregation by showing them the types of waste. Information about waste segregation increased respondent's knowledge of waste segregation and made the practice positive.

Case No : 49

1. **Name:** ZYZ
2. **Gender:** Female
3. **Age: 25**
4. **Locality in the Warje, Pune:** Gosavi Vasti
5. **Education:** Primary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members**: 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - we use plastic bags.
12. **Problems occurred due to non-management of garbage:** Due to slum, our area is neglected by officials of PMC so garbage truck comes irregularly in Gosavi Vasti.
13. **Place to deliver garbage**: Throws anywhere
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions of SWaCH Sanstha and PMC garbage management officials and also took part in the Selfie with Garbage rally.

    Pune Municipal Corporation Waste Management Department held a meeting in the Gosavi Vasti area with SWaCH Sanstha. The sanitary inspector of this area was instructed to focus on complaints of people immediately. It was decided to regularize garbage trucks. The information about garbage segregation was given the people of area. This resulted in a positive change in the knowledge, attitude and practice of the respondents.

Case No : 50

1. **Name:** ZAZ
2. **Gender:** Female
3. **Age: 28**
4. **Locality in the Warje, Pune:** Gosavi Vasti
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Private Job
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** There is no coordination between the Pune municipal corporation authorities and private waste collection agencies regarding waste collection.
13. **Place to deliver garbage:** Throws rodeside
14. **Observations:** During the research study it has found that the respondent has attended all the Intervention sessions of SWaCH Sanstha and PMC officials. Respondent participated in the Selfie with Garbage Rally of awareness.

    Pune Municipal Waste Management Department Officers and SWaCH Sanstha arranged a Garbage awareness meeting at Gosavi Vasti. Respondent Group leader has requested to report every problem to authorities. This led to a change in respondent'sattitude, knowledge and practices. Respondent took initiative in the waste segregation program.

Case No : 51

1. **Name:** ZBZ
2. **Gender:** Female
3. **Age: 45**
4. **Locality in the Warje, Pune:** Dongarwadi
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** Waste management department and the private waste collection agencies have no coordination among them. So no officer comes to our area.
13. **Place to deliver garbage:** Throws anywhere and backside of the sulabha souchalay.
14. **Observations:** Dongarwadi came in the Slum Eradication and Rehabilitation Zone (Gavani).Respondent is group a leader of respondents for the area for data collection. During the research study it has found that the respondent has attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC garbage management officials. Respondent had taken part in theSelfiewith Garbage rally.

    On behalf of Pune Municipal Corporation Waste Management Department and SWaCH Sanstha, a program on waste management and segregation was conducted at Dongarwadi. In this, people were shown demonstrations for waste segregation, as these areas have small narrow lanes and narrow roads so garbage truck and small garbage carts were provided and garbage collection workers were appointed. Thereby creating a positive change in the attitude and practice of respondents and people. So respondent became aware about garbage harmfulness and took initiative to spread the information about garbage segregation.

Case No : 52

1. **Name:** ZCZ
2. **Gender:** Female
3. **Age: 35**
4. **Locality in the Warje, Pune:** Dongarwadi
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 5
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** No one comes to collect garbage in Dongarwadi area, which creates mosquitoes and bad smell.
13. **Place to deliver garbage:** Throws backside of common toilets
14. **Observations:** Dongarwadi came in the Slum Eradication and Rehabilitation Zone (Gavani). During the research study it has found that the respondent has attended all the Intervention sessions by SWaCH Sanstha and PMC officials.

PMC Waste Management Department and SWaCH Sanstha conducted a program on waste management and segregation at Dongarwadi. Demonstrations for waste segregation showed here. Garbage piles in the area were removed and cleaned. This reduced the problem of mosquitoes and insects in this area. So it created a positive change in the attitude and practices of respondent. So Respondent became aware about garbage segregation and practiced well.

Case No : 53

1. **Name:** ZDZ
2. **Gender:** Female
3. **Age: 28**
4. **Locality in the Warje, Pune:** Dongarwadi
5. **Education:** Graduate
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Joint Extended
9. **No of Members:** 5
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** We don't know how to separate wet and dry waste no one authorities come to explain here.
13. **Place to deliver garbage:** Throws near to common toilets
14. **Observations:** Dongarwadi came in the Slum Eradication and Rehabilitation Zone (Gavani). During the research study it has found that the respondent has attended the Intervention sessions organized by SWaCH Sanstha and PMC Waste Management Department.

    PMC Waste Management Department and SWaCH Sanstha conducted a program on waste management and segregation at Dongarwadi. Demonstrations for waste segregation showed here. It created a positive change in the knowledge, attitude and practices of respondent. So Respondent became aware about garbage segregation of wet and dry garbage.

Case No : 54

1. **Name:** ZEZ
2. **Gender:** Female
3. **Age: 30**
4. **Locality in the Warje, Pune:** Dongarwadi
5. **Education:** Primary
6. **Language:** Marathi
7. **Nature of Work:** House Wife
8. **Family type:** Nuclear
9. **No of Members:** 4
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** Garbage trucks do not come in Dongarwadi areas and garbage workers also.
13. **Place to deliver garbage:** Throws anywhere and also backside of the sulabha souchalay.
14. **Observations:** Respondent is group a leader of respondents for the area for data collection. During the research study it has found that the respondent attended all the Intervention sessions like meetings of SWaCH Sanstha and PMC Respondent took part in the Selfie with Garbage rally of garbage awareness.
    Dongarwadi came in the Slum Eradication and Rehabilitation Zone (Gavani). PMC Waste Management Department and SWaCH Sanstha arranged a program on waste management and segregation at Dongarwadi. People were shown demonstrations for waste segregation, this area has small narrow lanes and narrow roads so garbage truck and small garbage carts were provided and garbage collection workers were appointed. Due to effect of this a positive change came in the attitude and practice of respondents and people. So Respondent took initiative to spread the information about garbage segregation.

Case No : 55

1. **Name:** ZFZ
2. **Gender:** Male
3. **Age: 30**
4. **Locality in the Warje, Pune:** Dongarwadi
5. **Education:** Secondary
6. **Language:** Marathi
7. **Nature of Work:** Job
8. **Family type:** Jointed Extended
9. **No of Members:** 3
10. **Yearly Income:** 3 Lacs to 6 Lacs Rs
11. **Availability of dustbins:** No - respondent use plastic bags.
12. **Problems occurred due to non-management of garbage:** Piles of wet and dry mixed garbage have been lying in the Dongarwadi areas since several months.
13. **Place to deliver garbage:** throws directly on the piles of garbage
14. **Observations:** Dongarwadi is in the Slum Eradication and Rehabilitation Zone (Gavani). During the research study it has found that the respondent has attended all the Intervention sessions arranged by SWaCH Sanstha and PMC Waste Management Department officials.

    PMC Waste Management Department and SWaCH Sanstha conducted a program on waste management and segregation at Dongarwadi. Garbage piles in the area were removed and cleaned by PMC. Demonstrations for waste segregation showed here. So it created a positive change in the knowledge, attitude and practices of respondent. So Respondent became aware about garbage segregation and practiced well and this changed the respondent's habit of dumping waste anywhere.

PART - C

4.4 Pre-Intervention Measurement

The single-subject design has been used to evaluate social work practice (in the western world) since the late 1960s, when it was derived from behavioral theroy analysis. Although this design can be used with a variety of treatment approaches, including psychodynamic, it is more closely related to behavioral and cognitive approaches, where the goals of interventions are often more discrete and unclear. With this in mind, mixed waste prevention and waste segregation promotion methods were used in this case.

Single case designs apply the logic of time series designs to the evolution of practice effectiveness in a single case. Such designs involve obtaining repeated measurements of the client system with respect to specific outcome indicators of the target problem.Trends in the target problem are measured repeatedly before initiating a specific intervention, and these repeated measures are continued after the intervention begins to see if a sustained pattern of improvement in the target problem begins shortly after the intervention begins.

The logic of a single case design requires that the measures be taken frequently enough so that the likelihood of any external factors having an effect is low. After assessing the needs of people aged 18 to 70, 55 citizens were found to be less knowledgeable, the research strategically addressed citizens' questions and doubts, and established an agreement or consent for their participation in the research process through mutual understanding.

Initially, baseline data were collected at specific time intervals (10 days in a month), time (morning, afternoon, evening) to examine whether there is any change in knowledge levels, attitudes and practices. Then the intervention techniques presented. The baseline data required repeated measures of the dependent variable.

- **About the cases:**

All participants were between the ages of 18 and 70, had different socio-economic backgrounds, educational backgrounds and family backgrounds. They also had differences in their history of waste problems. The impact of all these variables on the level of knowledge, attitude and practice was considered at the baseline stage. An attempt was also made to find out whether their KAP was affected by external variables through the baseline.

Case No. 1:

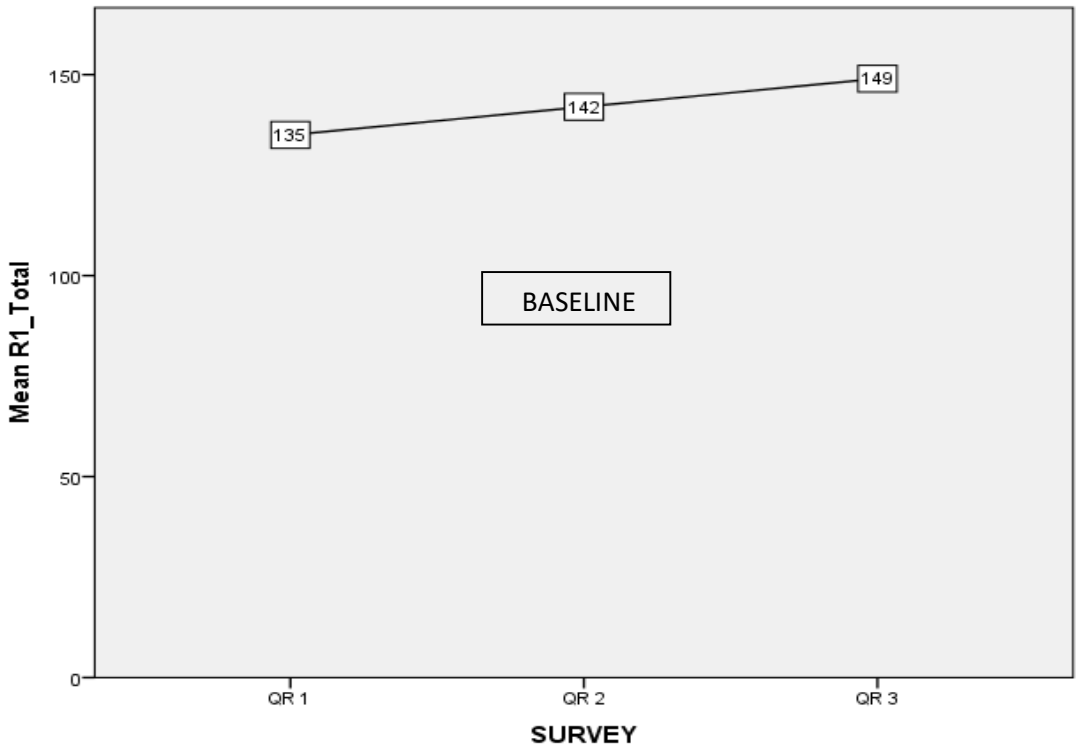
This woman lives in a divided family and she is 40 years old. She was completely unaware of waste segregation, but had some knowledge about vigilance. She is a post-graduate and works as a part time computer instructor and her family annual income is between rupees 6 to 9 Lacs.

In baseline data collection process, researcher used to visit Siddhivinayak Colony in the morning, afternoon, or evening depending on the availability of case on Sunday and Thursday at the same location.

While collecting the baseline it was observed that she was busy in household work, filling fresh and cooperative in the morning as compared to afternoons and evenings. The Pre Intervention measurement scores are presented in Graph No. 4.4.1.

Graph No. 4.4.1

Pre Intervention Measurement Scores of Case No. 1



Case No. 2:

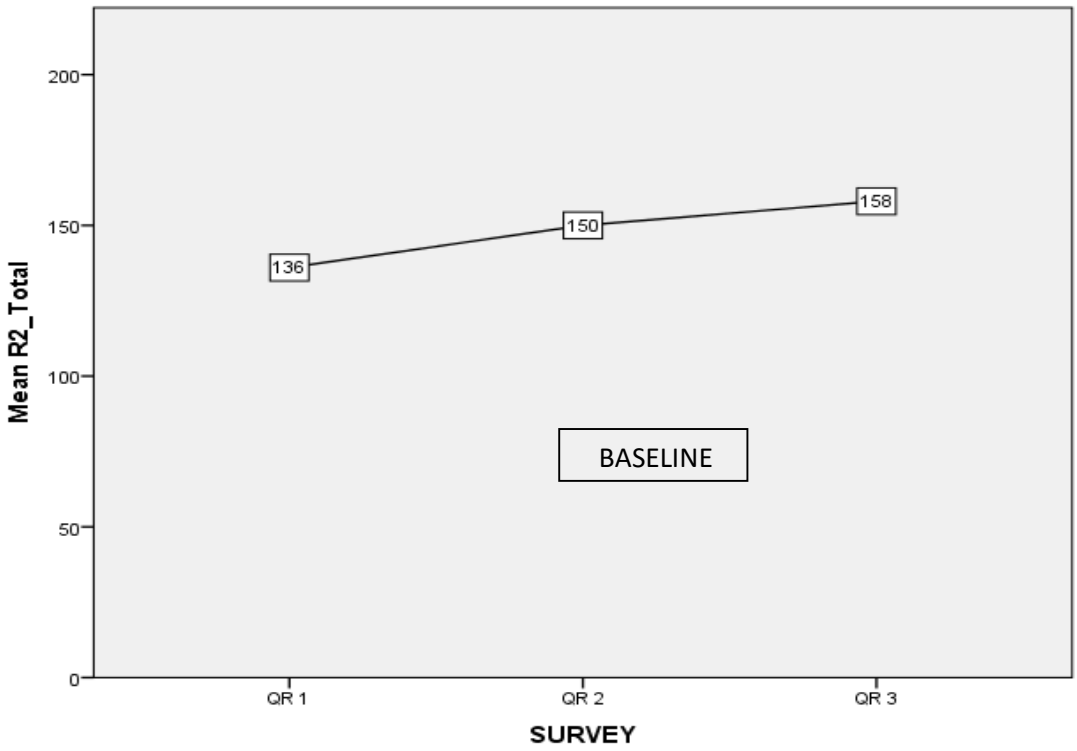
This woman was 52 years old and speaks Marathi and Hindi. She has completed primary education and is a housewife in a joint extended family. There are five people living in the house and the family income is between rupees 3 to 6 Lacs. She does not have dustbins and stores waste in plastic bags. The private garbage truck comes irregularly. This causes garbage to accumulate in the house and creates a bad smell, as a result of which they throw the garbage on the roadside.

In baseline data collection, researcher used to visit Siddhivinayak Colony in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline it was observed that she had no knowledge about waste. She was busy in household work, filling fresh to talk in the morning. The Pre Intervention measurement scores are presented in Graph No 4.4.2

Graph No. 4.4.2

Pre Intervention Measurement Scores of Case No. 2



Case No. 3:

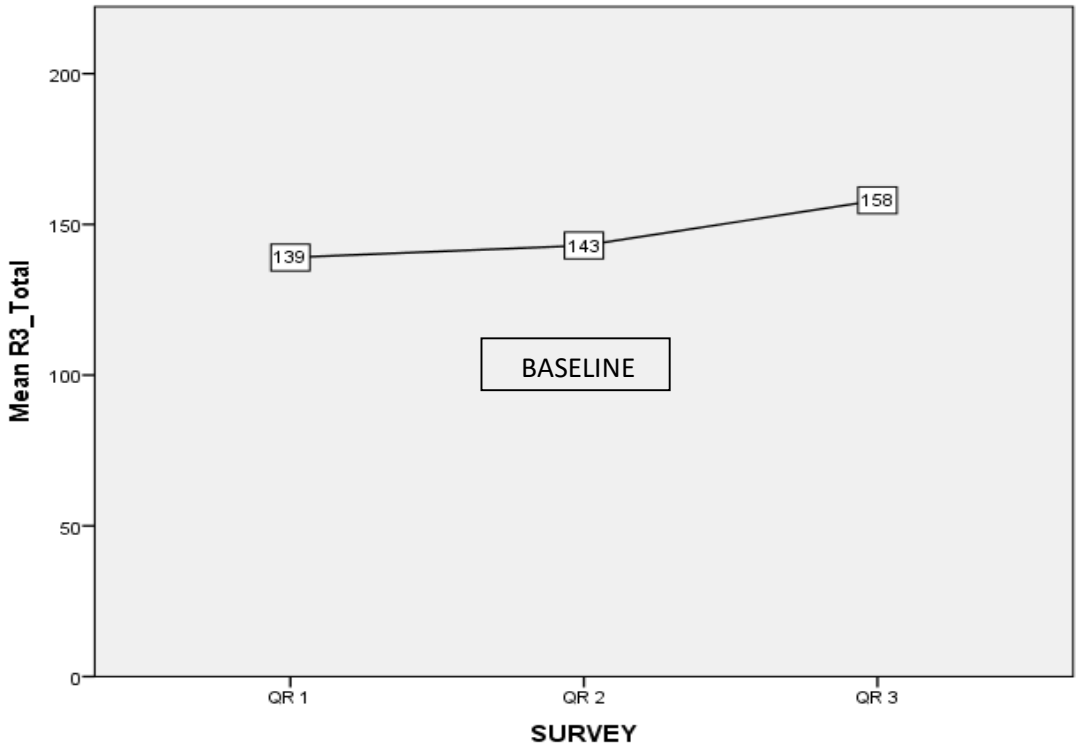
He was a 30-year-old man and has completed secondary education through Marathi medium. Four people live in family and their annual income is between rupees 3 to 6 Lacs. The garbage truck comes every two to three days. He does not havedustbins andstores waste in plastic bags. The private garbage truck comes irregularly. This causes garbage to accumulate in the house and creates a bad smell, as a result of which they throw the garbage on the roadside.

In baseline data collection process, researcher used to visit Siddhivinayak Colony in the morning, afternoon and evening depending on the availability of case.

While collecting the baseline it was observed that he was unaware about garbage. He was busy in work, and available to talk in the evenings. The Pre Intervention measurement scores are presented in Graph No. 4.4.3.

Graph No. 4.4.3

Pre Intervention Measurement Scores of Case No. 3



Case No. 4:

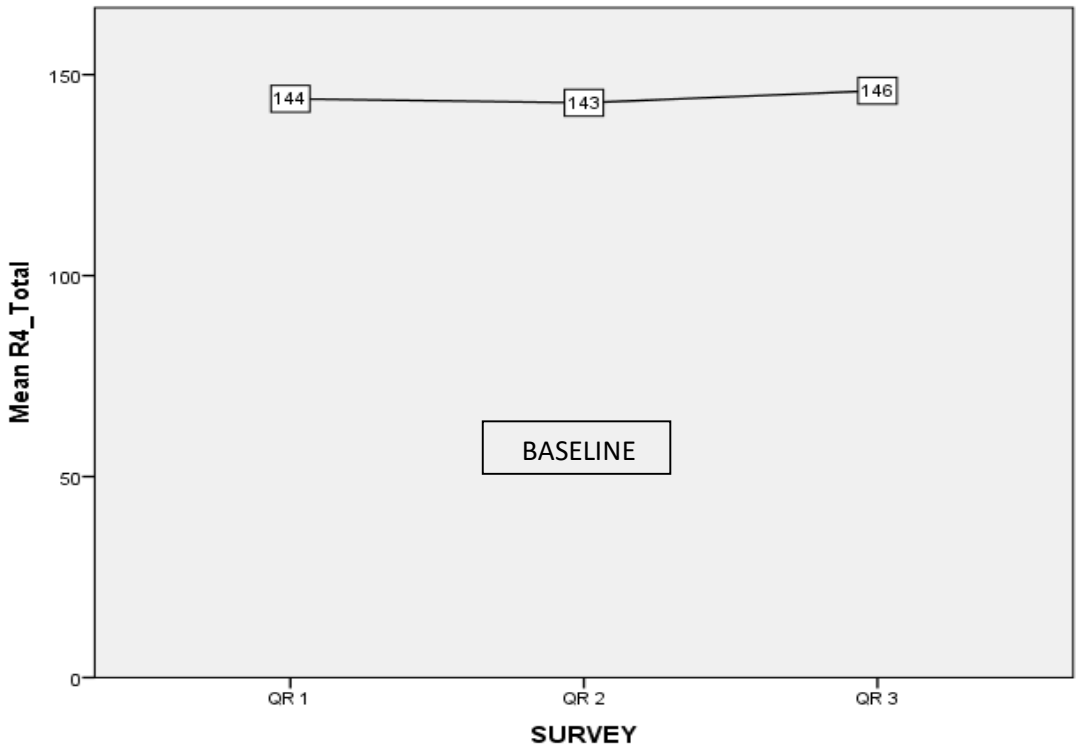
This woman was 38 years old and speaks Marathi. She has completed secondary education and is a housewife in a nuclear family. There are fourmembers living in the house and the family income is between rupees 3 to 6 Lacs. The garbage truck comes every two to three days. Due to the foul smell of the garbage, they throw the garbage in the open space in front of the house, due to which rats and stray dogs gather there and disturb others.

In baseline data collection, researcher used to visit Siddhivinayak Colony in the morning, afternoon and also in the evening depending on the availability of caseat the same place.

While collecting the baseline it was observed that her KAP level low. She was busy in household work, filling fresh to talk in the morning and afternoon. The Pre Intervention measurement scores are presented in Graph No.4.4.4.

Graph No. 4.4.4

Pre Intervention Measurement Scores of Case No. 4



Case No. 5:

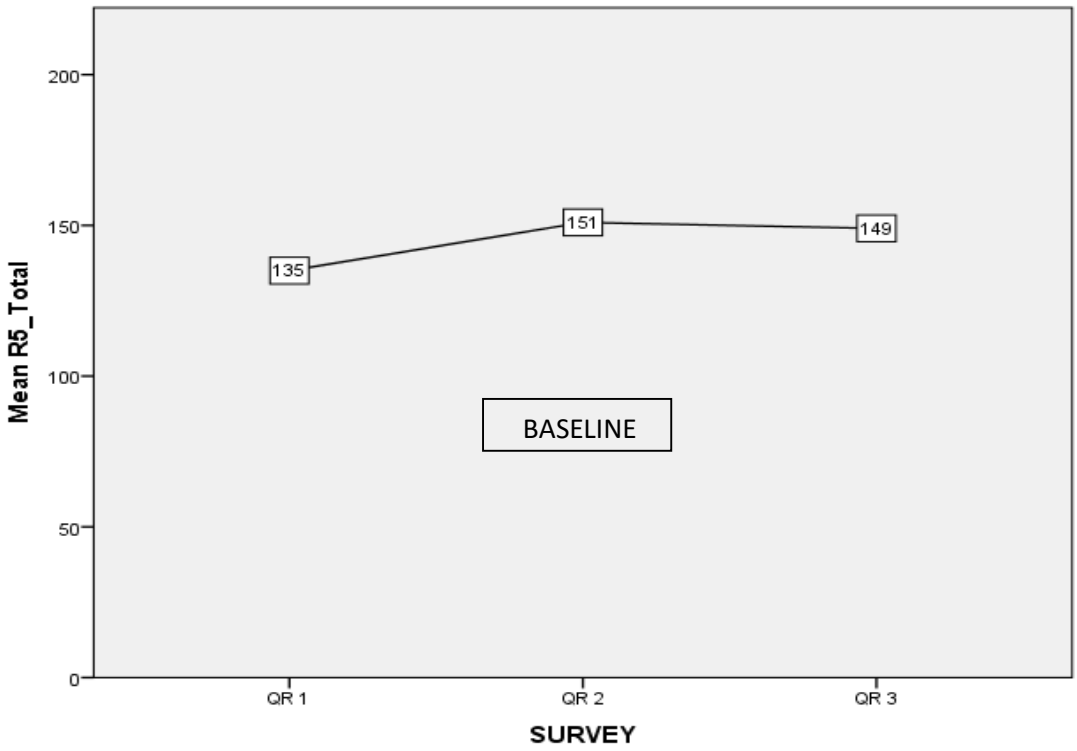
This woman was 35 years old and speaks Marathi. She has completed secondary education and she is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. The family always uses plastic bags. The garbage truck does not have a system for storing wet and dry waste, so they mix the waste and throw it on the roadside or in a private garbage vehicle.

In baseline data collection, researcher used to visit Siddhivinayak Colony in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline it was observed that she was busy in household work, filling fresh to talk in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.5.

Graph No. 4.4.5

Pre Intervention Measurement Scores of Case No. 5



Case No. 6:

This woman was 29 years old and speaks Marathi. She has completed higher secondary education and she is a housewife in a joint extended family. There are 5 people living in the house and the family income is between rupees 3 to 6 Lacs. She does not have garbage dustbins, so she uses plastic bags.The garbage truck comes once or twice a week, but never misses the time and date for monthly payment collection. She put the collected mixed waste in a private garbage vehicle and also throw it out.

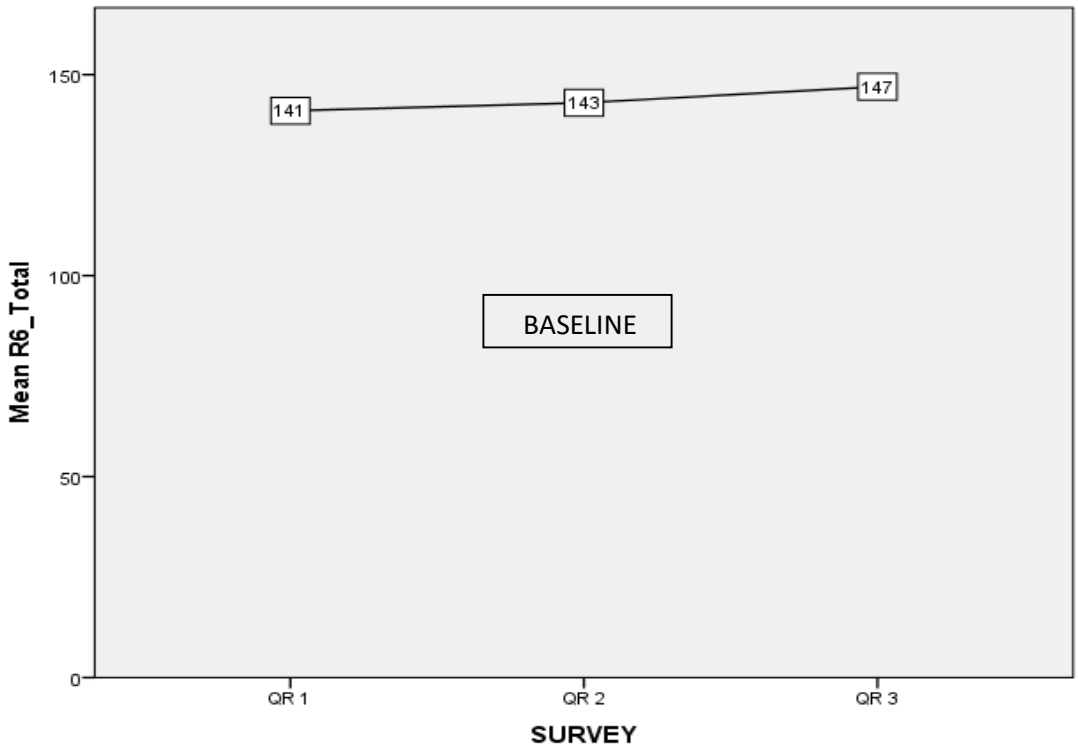
In baseline data collection, researcher used to visit Siddhivinayak Colony in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline, it was found that she was unaware of the risks of waste. She was busy in household work, filling fresh to talk in the afternoon.

The Pre Intervention measurement scores are presented in Graph No. 4.4.6.

Graph No. 4.4.6

Pre Intervention Measurement Scores of Case No. 6



Case No. 7:

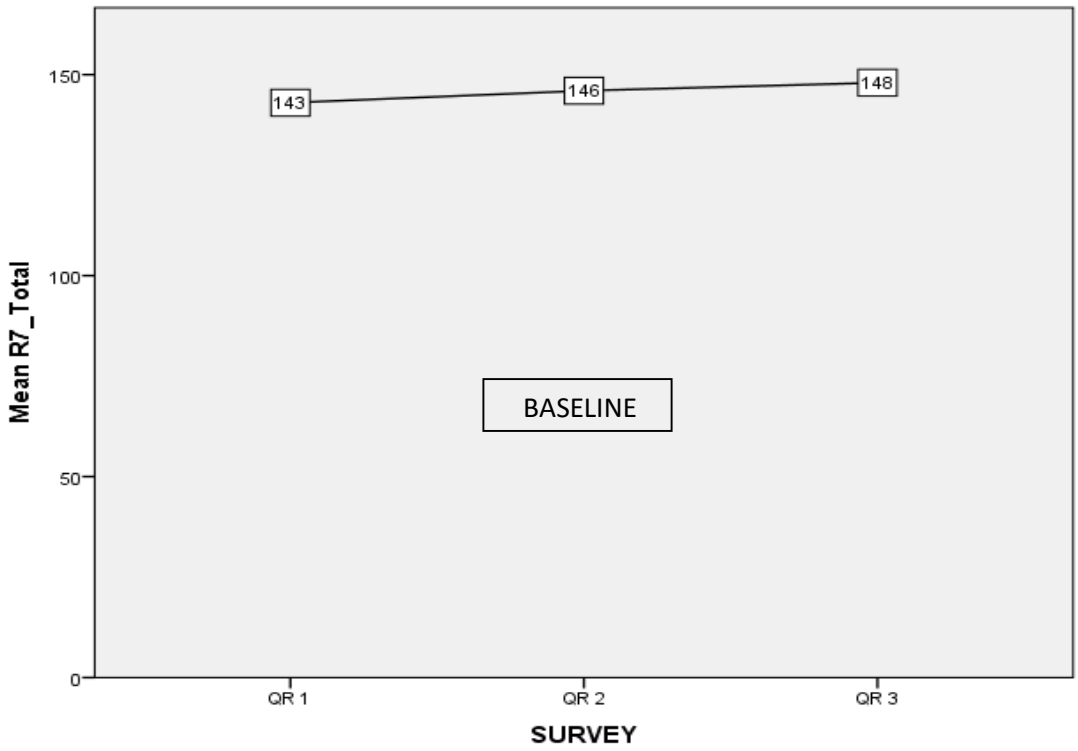
This man was 40 years old and speaks Marathi and Hindi. He is agraduate and lives in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. He is not aware of waste segregation and uses plastic bags for that. No officials have come to his area for waste awareness and information related to waste. So he throws mixed waste in private garbage vehicles and also outside his area.

In baseline data collection, researcher used to visit Siddhivinayak Colony in the morning, afternoon, or evening depending on the availability of caseat the same place.

During collecting the baseline it was observed that he was busy in work, filling fresh to talk in the evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.7.

Graph No. 4.4.7

Pre Intervention Measurement Scores of Case No. 7



Case No. 8:

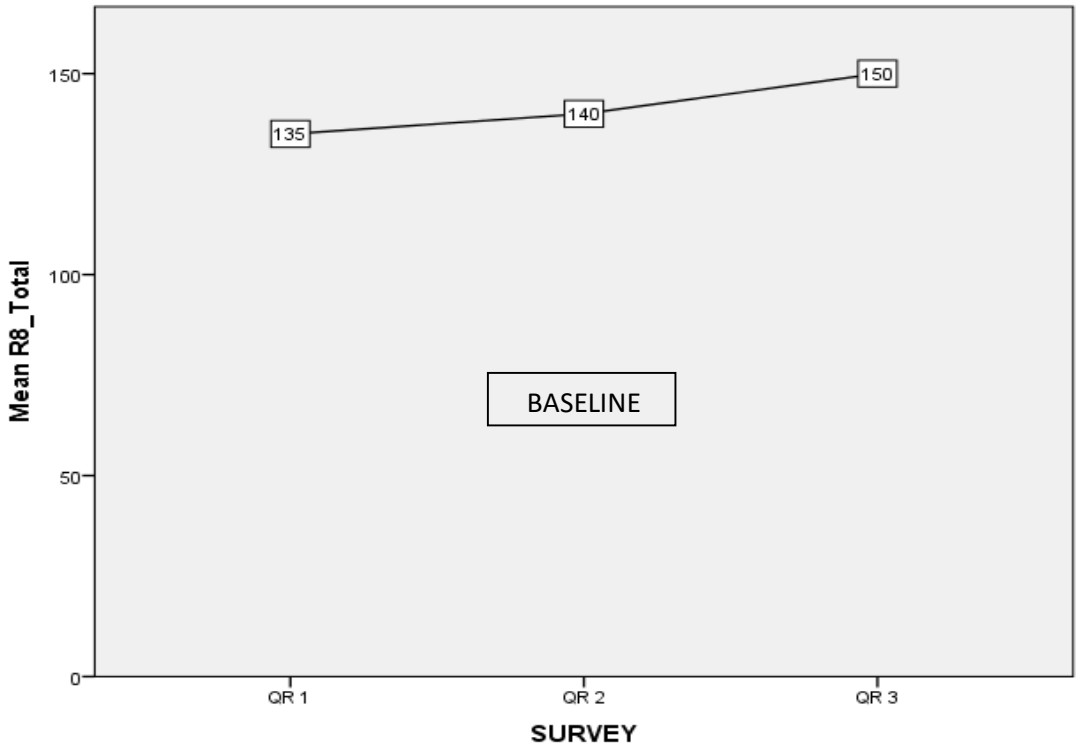
This woman was 28 years old and speaks Marathi. She has completed secondary education and she is a housewife in a nuclear family. There are three people living in the house and the family income is between rupees 3 to 6 Lacs. She does not know about separating wet and dry waste. So she collects it in plastic bags. The garbage truck does not come to her area every day and on time, so she throws it in the private garbage vehicle or out of her area.

In baseline data collection, researcher visited Siddhivinayak Colony in the morning, afternoon, or evening depending on case availability at the same location.

While collecting the baseline it was observed that the level of KAP was less.She was busy with housework, freshening up for the morning conversation. The Pre Intervention measurement scores are presented in Graph No. 4.4.8.

Graph No. 4.4.8

Pre Intervention Measurement Scores of Case No. 8



Case No. 9:

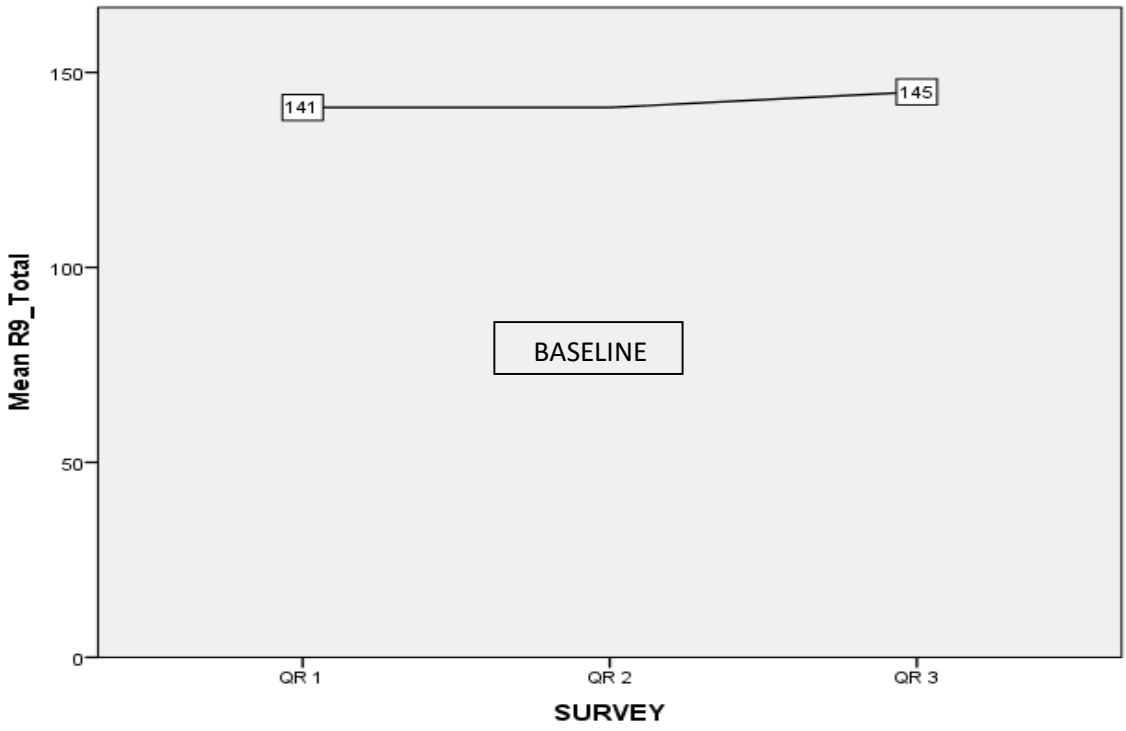
This man was 70 years old and speaks Marathi. He has completed higher secondary education and he lives in a single parent family. His family income is between rupees 3 to 6 Lacs. He uses plastic bags to throw garbage. He is not aware about waste segregation. He cleared that Pune Municipal Corporation has not provided him any information or leaflets for waste segregation till date. So he throws the garbage in the private garbage vehicles or near the available places.

In baseline data collection, researcher used to visit Siddhivinayak Colony in the morning, afternoon, or evening depending on the availability of case at the same area.

While collecting baselines, it appeared that he was busy with work, fresh to talk in the morning and evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.9.

Graph No. 4.4.9

Pre Intervention Measurement Scores of Case No. 9



Case No. 10:

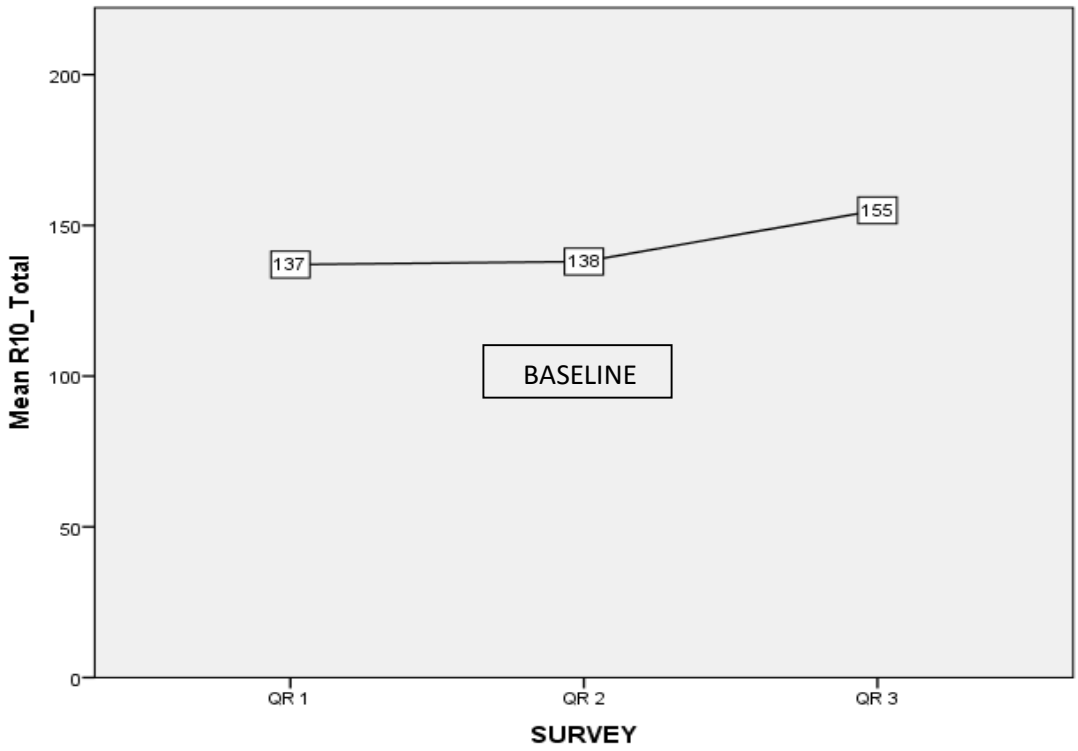
This man was 27 years old and speaks Marathi. He is a graduate and doing a job and living in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. He does not have a dustbin and stores waste in plastic bags. The private garbage truck comes irregularly. This causes garbage to accumulate in the house and creates a bad smell, as a result of which he throws the garbage on the roadside.

In baseline data collection, researcher used to visit Siddhivinayak Colony in the morning, afternoon, or evening depending on the availability of caseat the same locality.

While collecting the baseline it was observed that level of KAP was low. He was busy in his work, filling fresh to talk in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.10.

Graph No. 4.4.10

Pre Intervention Measurement Scores of Case No. 10



Case No. 11:

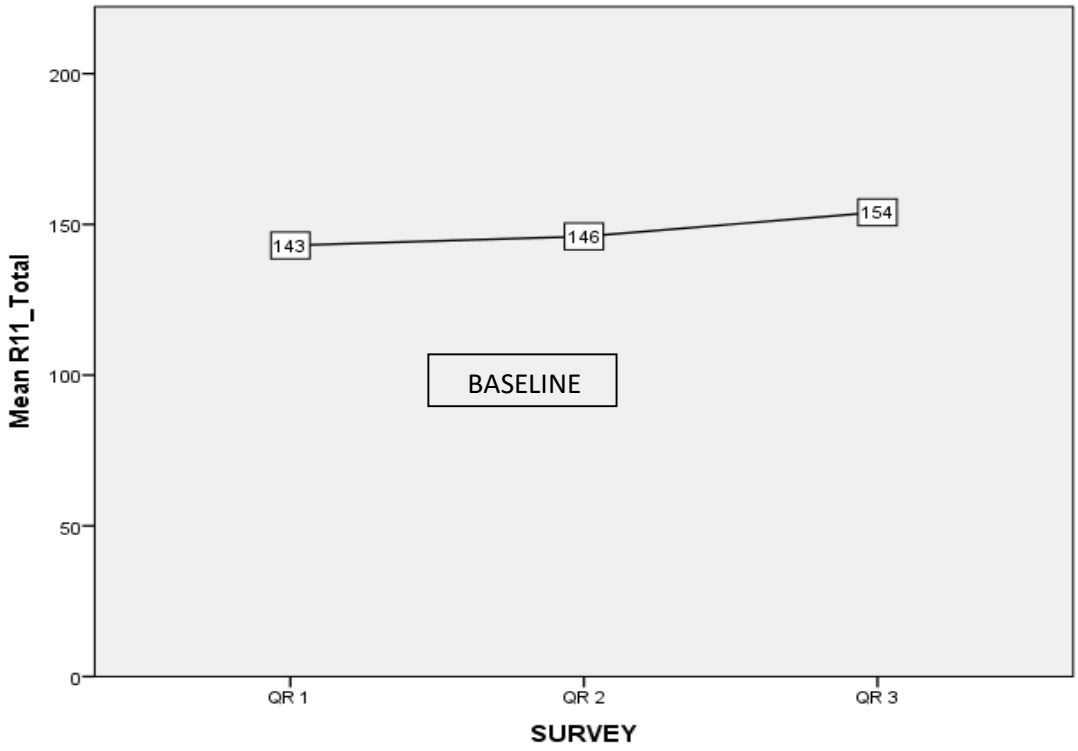
This woman was 24 years old and speaks Marathi. She has completed secondary education and is a housewife in a joint extended family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. She does not have a dustbin and stores waste in plastic bags. The private garbage truck not comes in her area. This causes garbage to accumulate in the house and creates a bad smell, as a result of which she throws the garbage near the roadside.

In baseline data collection, researcher used to visit MHADA Colony in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline, it was found that the level of awareness was low. She was busy with housework, and fresh to talk in the morning. The Pre Intervention measurement scores are presented in Graph 4.4.11.

Graph No. 4.4.11

Pre Intervention Measurement Scores of Case No. 11



Case No. 12:

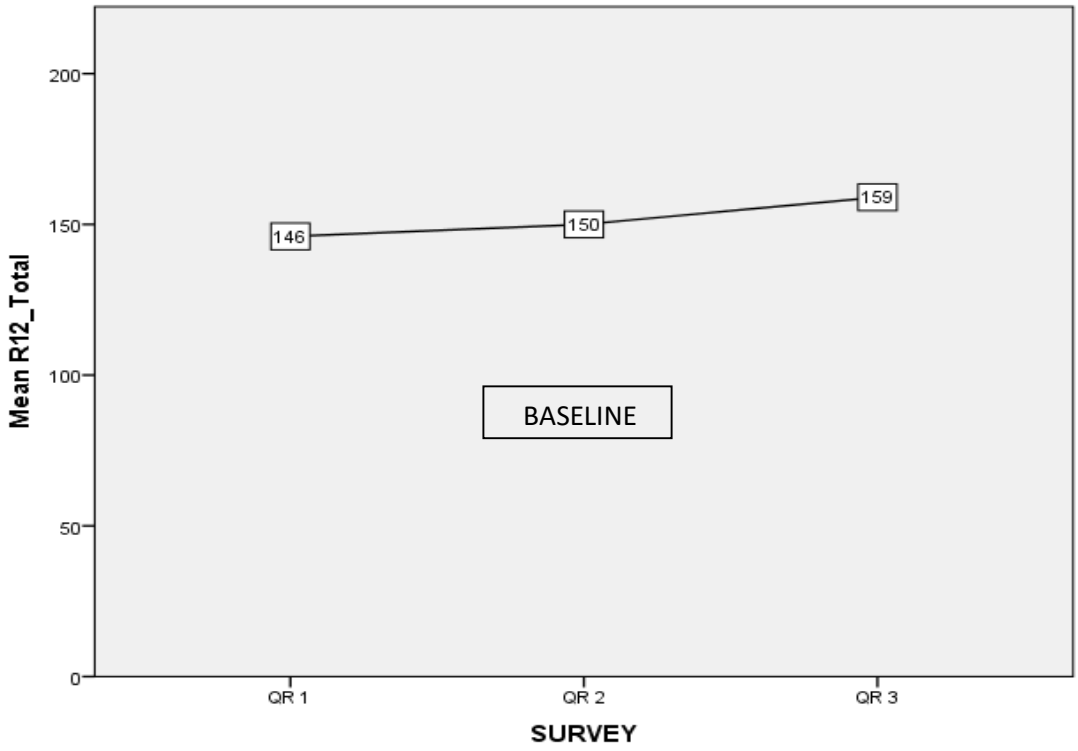
This woman was 30 years old and answered in Marathi. She has completed secondary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. She does not have knowledge about garbage segregation and she hasno dustbins, so she uses plastic bags to throw her waste. Garbage collectors don't come regularly, so she throws waste under the building or outside the MHADA colony.

In baseline data collection, researcher used to visit MHADA colony in the morning, afternoon, or evening depending on the availability of caseat the same area. While collecting the baseline it was observed that she had no information about waste.

She was busy in household work and freeto talk in the morning and evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.12.

Graph No. 4.4.12

Pre Intervention Measurement Scores of Case No. 12



Case No. 13:

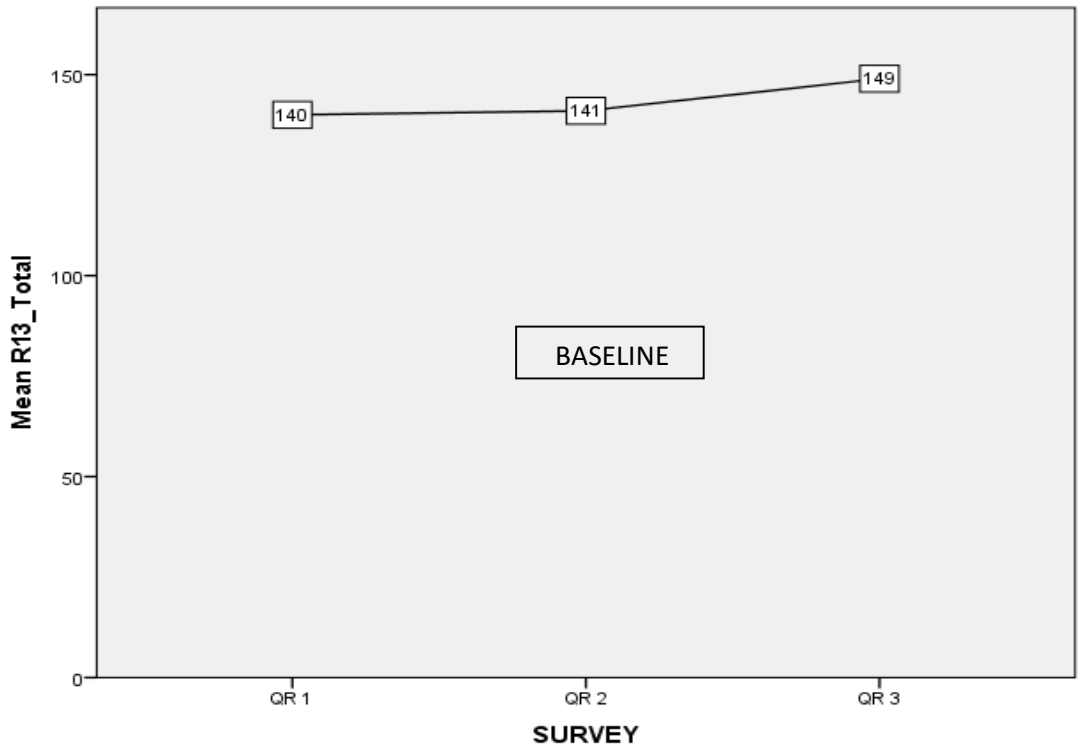
This man is 40 years old and speaks Marathi. He has completed secondary education,works and lives in a nuclear family. There are three people living in the house and the family income is between rupees 3 to 6 Lacs. He is not aware of the harmfulness of waste and does not use dustbins and stores waste in plastic bags. Garbage trucks do not come to MHADA colony. Due to this, waste accumulates in the house and creates bad smell, as a result he throws the waste on the roadside.

In baseline data collection, researcher used to visit MHADA Colony in the morning, afternoon, or evening depending on the availability of caseat the same place.

During baseline collection, it was found that KAP level was low. He was busy with his work, available to talk in the evenings rather than in the mornings and afternoons. The Pre Intervention measurement scores are presented in Graph No. 4.4.13.

Graph No. 4.4.13

Pre Intervention Measurement Scores of Case No. 13



Case No. 14:

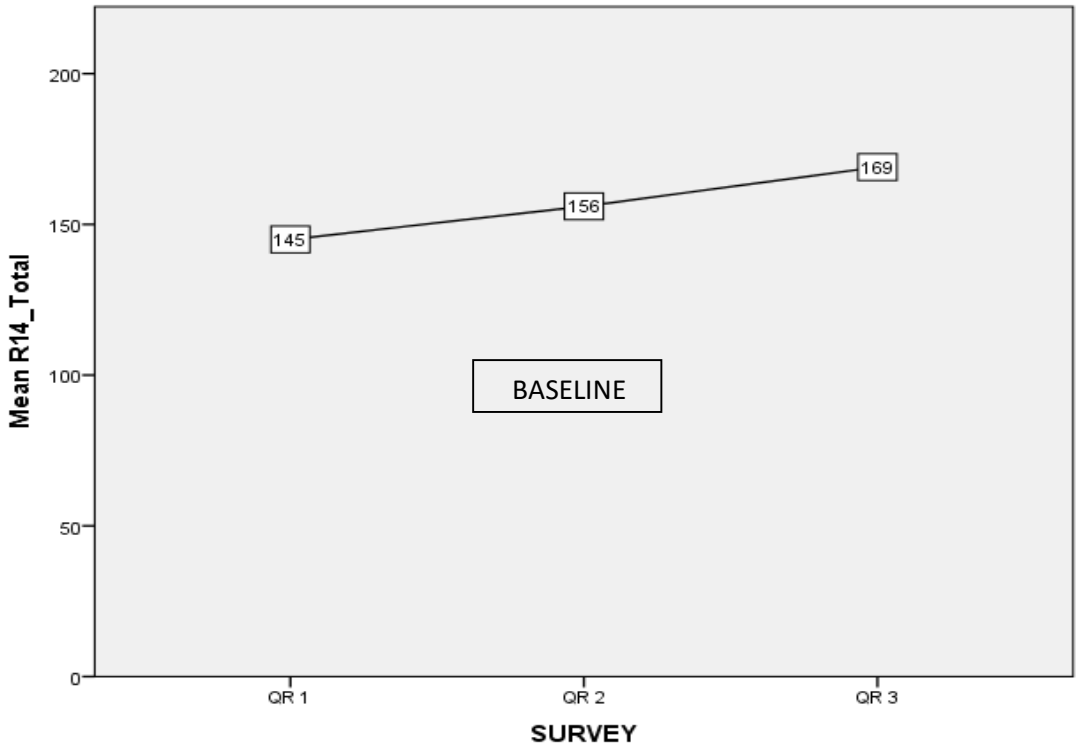
This man was 35 years old and answered in Marathi. He has completed secondary education, works and lives in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. The respondent does not know about sorting waste.The respondent does not have garbage bins, so he puts the waste in plastic bags and throws it under the building.

In baseline data collection, researcher used to visit MHADA Colony in the morning, afternoon and evening depending on the availability of case at the colony.

While collecting the baseline, it was observed that the KAP level was low. He was busy with his work, fresh to talk in the evening. The Pre Intervention measurement scores are presented in Graph 4.4.14.

Graph No. 4.4.14

Pre Intervention Measurement Scores of Case No. 14



Case No. 15:

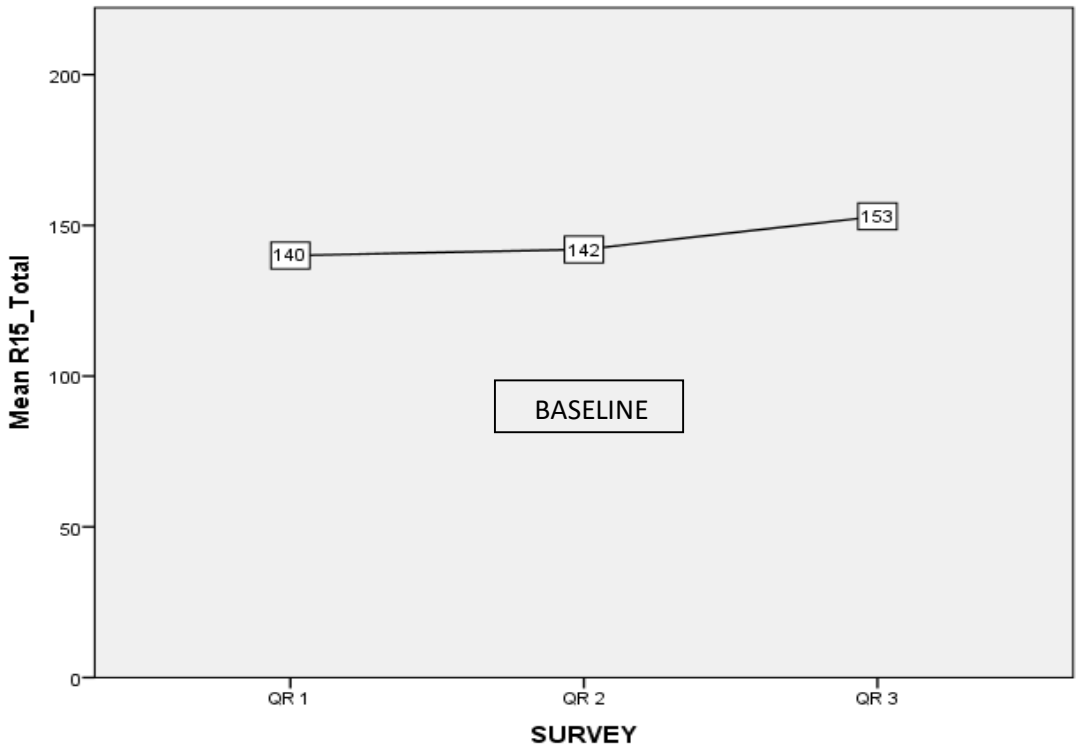
This woman was 30 years old and spoke in Marathi. She has completed secondary education and is a housewife in a nuclear family. There are three people living in the house and the family income is between rupees 3 to 6 Lacs. She doesn't know about the type of waste. She cleared that the Pune Municipal Corporation officials never come there to provide information about waste management. So she uses plastic bags to dispose of the waste and throws it under the building.

In baseline data collection, researcher used to visit MHADA Colony in the morning, afternoon, or evening depending on the availability of caseat the same place.

During baseline collection, it was found that the level of awareness was low. She was busy with household chores and was fresher to talk in the morning than at other times. The Pre Intervention measurement scores are presented in Graph No. 4.4.15.

Graph No. 4.4.15

Pre Intervention Measurement Scores of Case No. 15



Case No. 16:

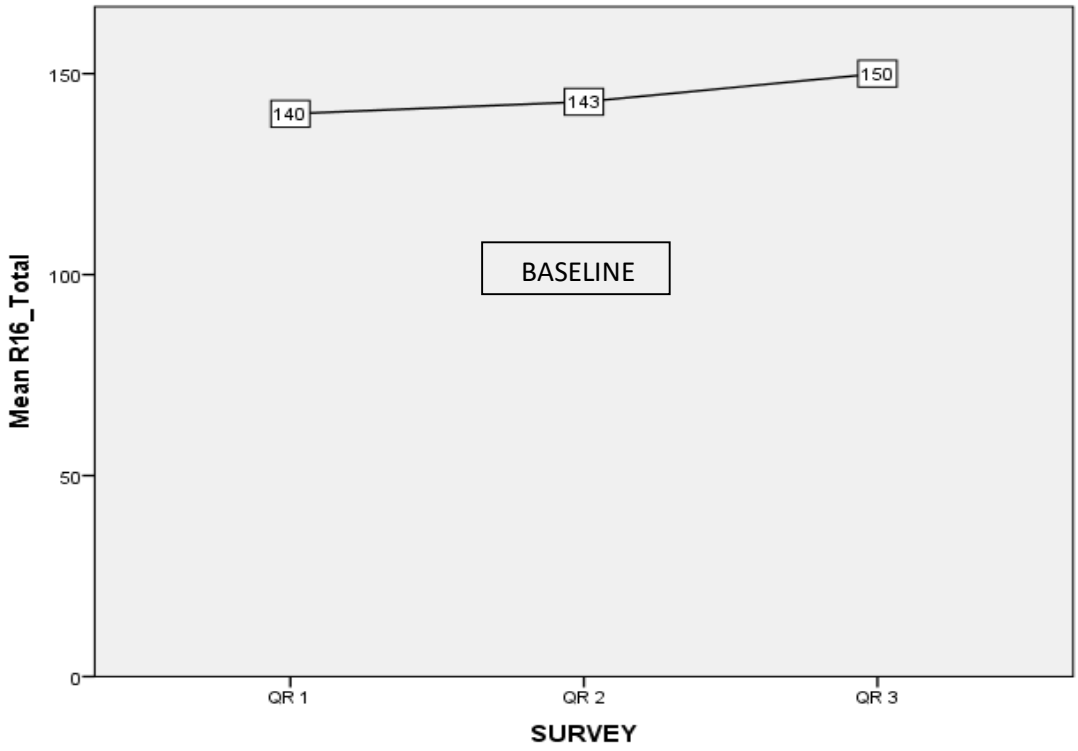
This woman was 35 years old and answered in Marathi. She has completed primary education and is a housewife in a joint extended family. There are six people living in the house and the family income is between rupees 3 to 6 Lacs. Rs. She doesn't know about waste sorting and doesn't have a dustbins to store waste, so she uses plastic bags. Instead of storing waste at home and getting sick, she throws it outside in the trash.

In baseline data collection, researcher used to visit MHADA Colony in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline, it was found that she had no knowledge of waste. She was busy with household chores, fresh to talk in the evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.16.

Graph No. 4.4.16

Pre Intervention Measurement Scores of Case No. 16



Case No. 17:

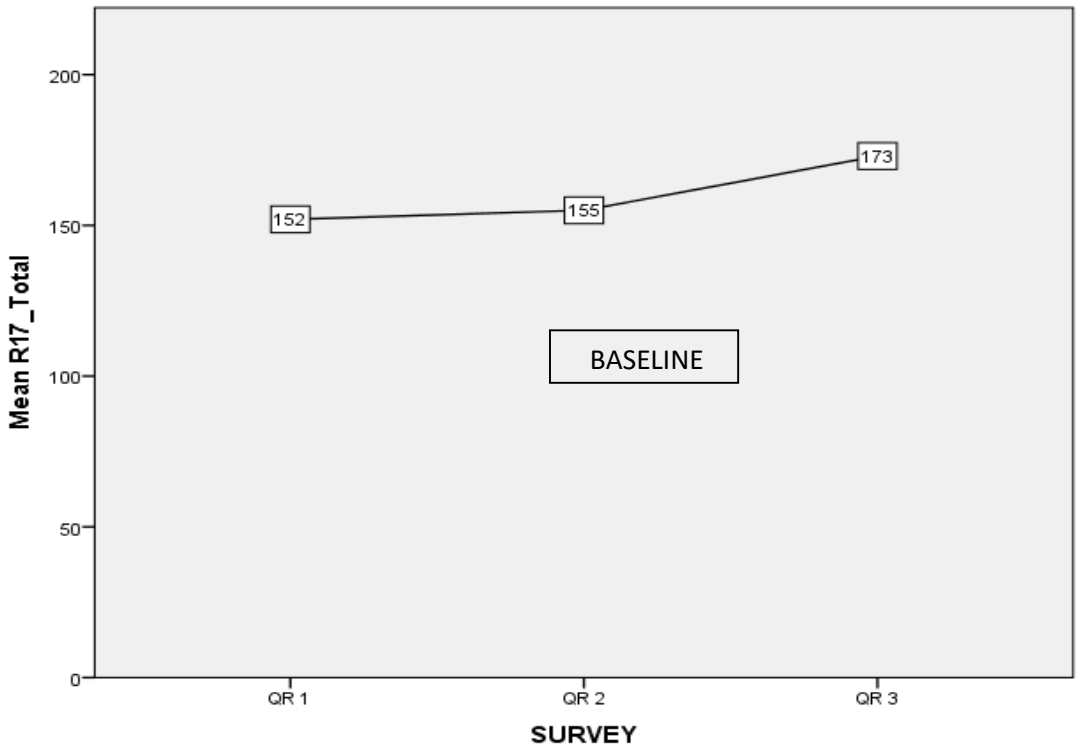
This woman was 31 years old and speaks Marathi. She has completed primary education and is a housewife in a nuclear family. There are three people living in the house and the family income is is between rupees 3 to 6 Lacs. She doesn't know how to sort her waste, so she uses one plastic bag for each type of waste. Instead of storing waste at home and getting sick, she throws it in the garbage dump outside.

In baseline data collection, researcher used to visit MHADA Colony in the morning, afternoon, or evening depending on the availability of caseat the same place.

During baseline collection, it was found that she had no idea of waste. She was busy with housework, fresh and cooperative to talk to in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.17.

Graph No. 4.4.17

Pre Intervention Measurement Scores of Case No. 17



Case No. 18:

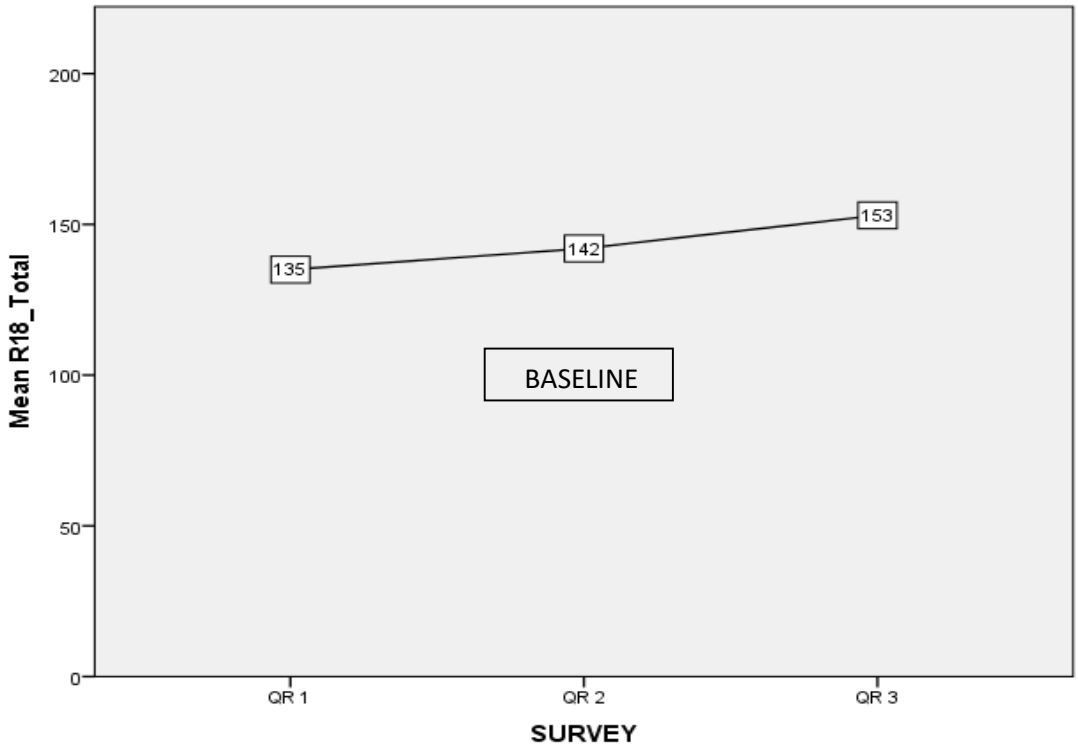
This woman was 29 years old and replied in Marathi. She has completed secondary education and is a housewife in a joint extended family. There are six people living in the house and the family income is between rupees 3 to 6 Lacs. She has no idea about the types of waste and its segregation. She puts all the waste in one bucket and throws it on the roadside. She told that it is necessary to educate the peoples of MHADA colonies about waste and arrange for a waste vehicle.

In baseline data collection, researcher used to visit MHADA Colony in the morning, afternoon, or evening depending on the availability of caseat the same place.

During collecting the baseline it was observed that she was busy in household work, filling fresh to talk in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.18.

Graph No. 4.4.18

Pre Intervention Measurement Scores of Case No. 18



Case No. 19:

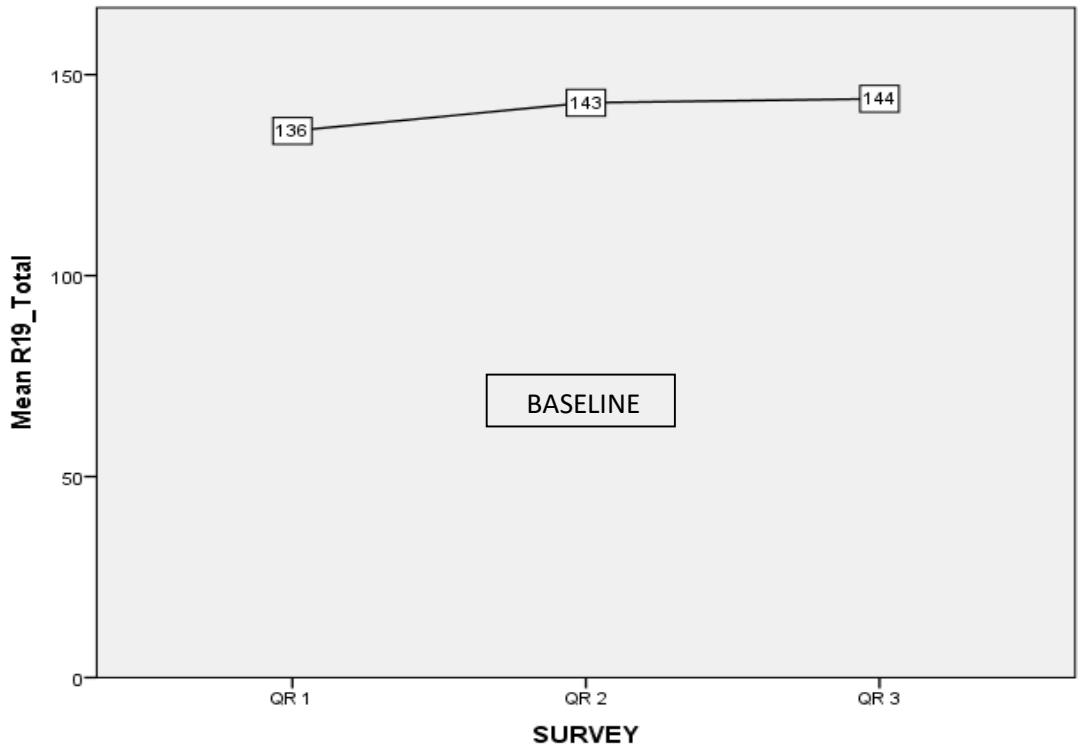
This woman was 26 years old and spoke in Marathi. She has completed higher secondary education and is a housewife in a nuclear family. There are three people living in the house and the family income is between rupees 3 to 6 Lacs. She is unaware of the health risks of waste and is not aware of waste segregation. She uses plastic bags to collect waste and throws it near the garbage dump. She complained that the Pune Municipal Corporation does not collect the waste piled up outside the MHADA colony despite repeated complaints.

In baseline data collection, researcher used to visit MHADA Colony in the morning, afternoon, or evening depending on the availability of caseat the same area.

While collecting the baseline it was observed that she was busy in household work, filling fresh to talk in the morning and afternoon. The Pre Intervention measurement scores are presented in Graph No. 4.4.19.

Graph No. 4.4.19

Pre Intervention Measurement Scores of Case No. 19



Case No. 20:

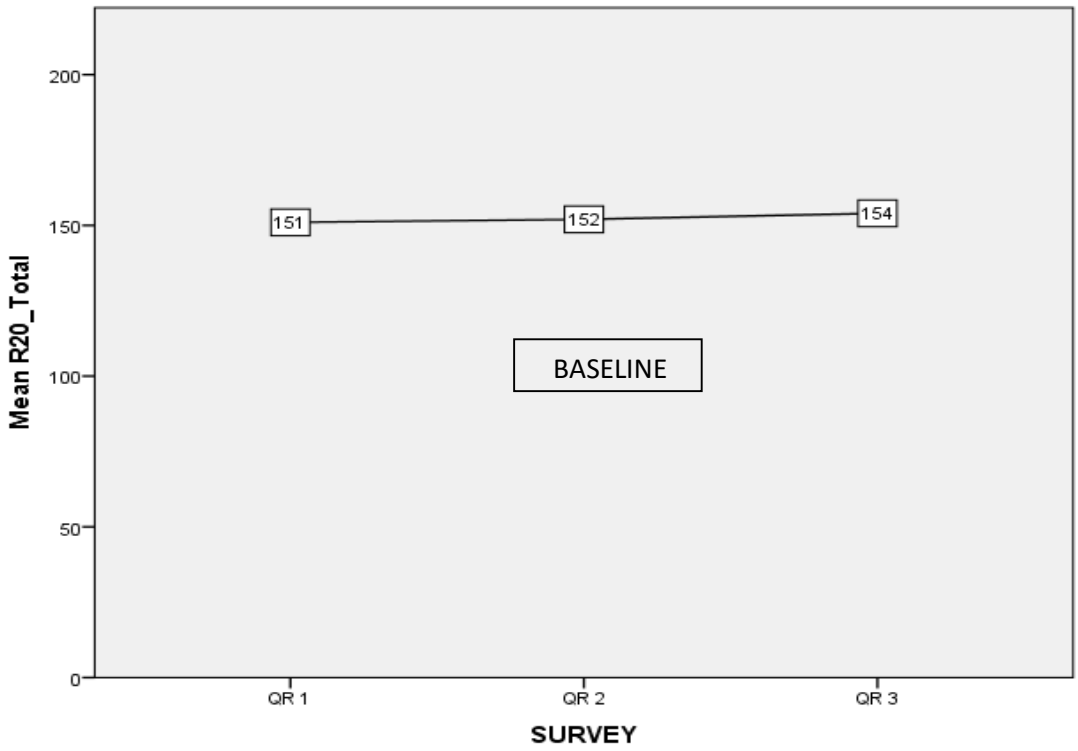
This woman was 37 years old and answered in Marathi. She has completed primary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. She doesn't know about the types of waste and collects mixed waste in a plastic bag. She doesn't know that wet and dry waste are separated, so she throws it under the building.

For baseline data collection, researcher used to visit MHADA Colony in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline, she was found to be busy with household chores, fresh to talk in the morning and evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.20.

Graph No. 4.4.20

Pre Intervention Measurement Scores of Case No. 20



Case No. 21:

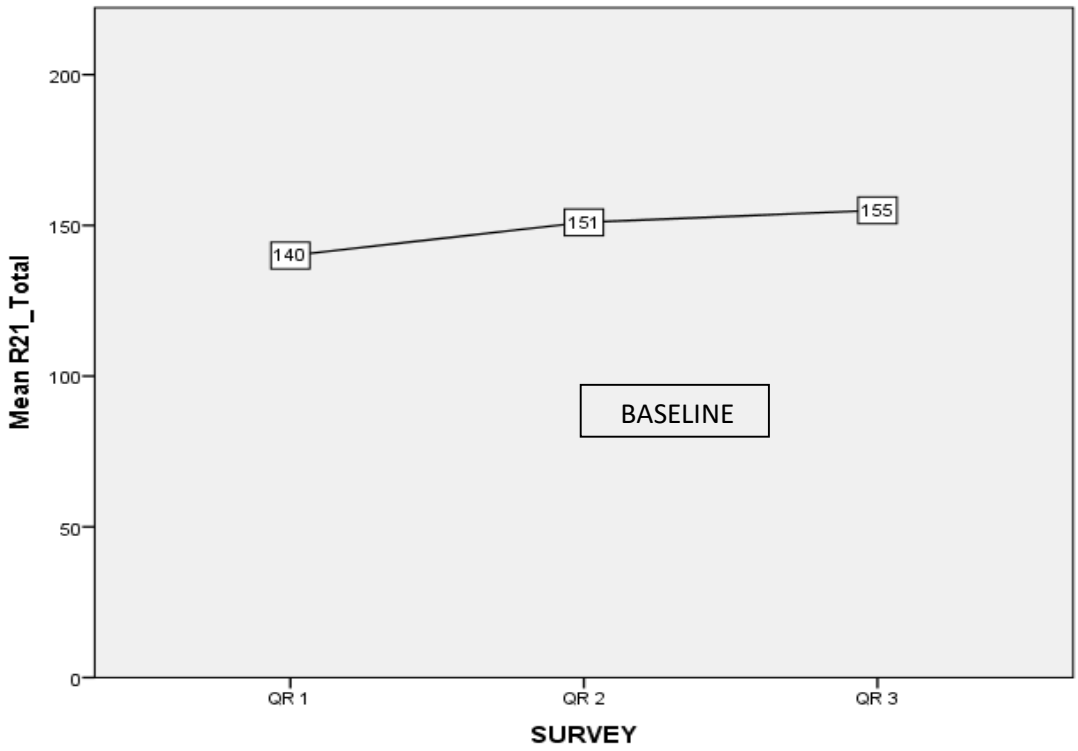
This woman is 45 years old and replied in Marathi. She is graduate, do a job and she is also a housewife in a joint extended family. There are eight people living in the house and the family income is between rupees 3 to 6 Lacs. She is a BSW graduate. She knows the ill effects of garbage. But since Gokulnagar Patharis a BDP zone, the administration has not made any arrangements for collecting and transporting garbage in this area. So she uses a plastic bucket to store the garbage and throws it near the garbage dump there.

In baseline data collection, researcher used to visit Gokulnagar Pathar in the morning, afternoon, or evening depending on the availability of case.

During collecting the baseline it was observed that she was aware about waste. She was busy with her work, filling fresh to talk in the evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.21.

Graph No. 4.4.21

Pre Intervention Measurement Scores of Case No. 21



Case No. 22:

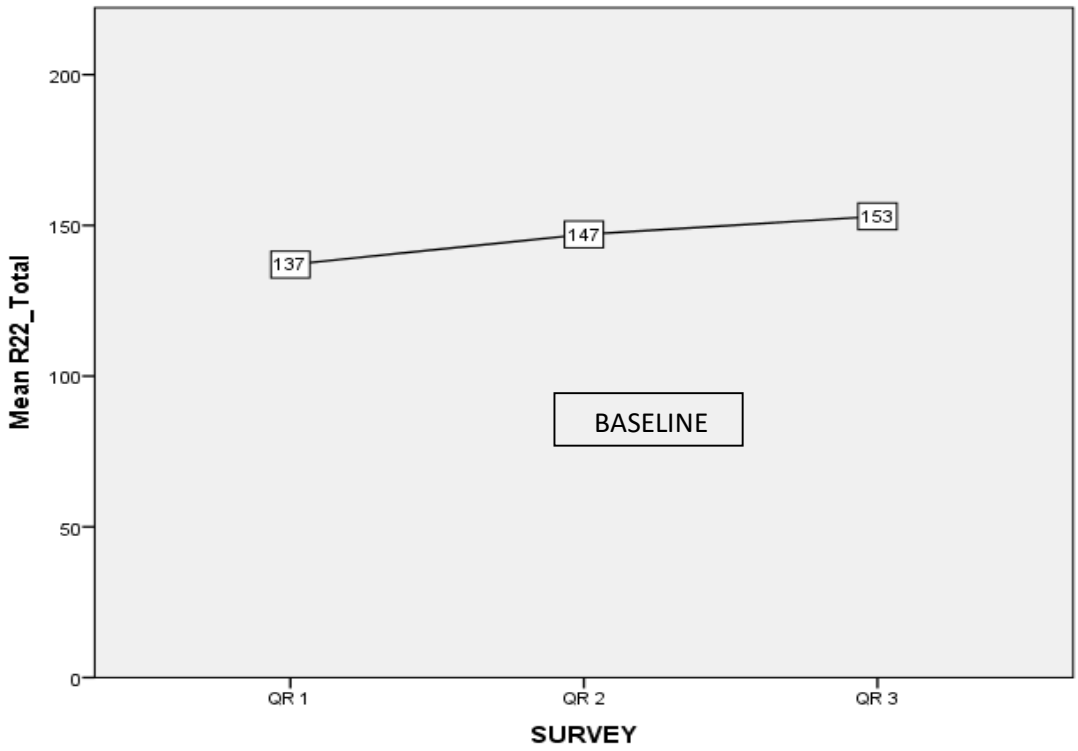
This man was 35 years old and spoke in Marathi. He has completed higher secondary education, works and living in a joint extended family. There are five people living in the house and the family income is between rupees 3 to 6 Lacs. This person, who lives in Gokul Nagar area, has not been given any information about waste classification and types of waste by the administration. Since he himself is not aware of this, he collects the waste in a mixed form in a plastic bag and throws it on the roadside.

In baseline data collection, researcher used to visit Gokulnagar Pathar in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline it was observed that the level of KAP was low. He was busy with his work, filling fresh to talk in the evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.22.

Graph No. 4.4.22

Pre Intervention Measurement Scores of Case No. 22



Case No. 23:

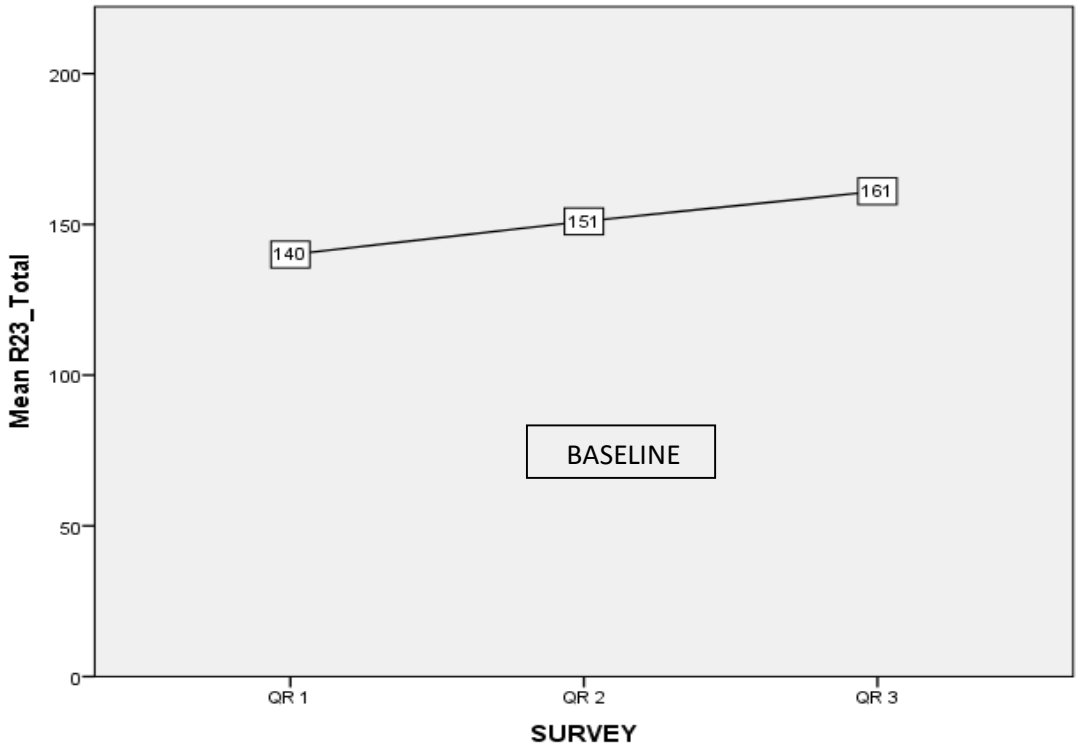
This woman was 24 years old and answered in Marathi. She has completed higher primary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. This woman, who lives in Gokul Nagar area, has no knowledge about waste segregation and the ill effects of waste. Since she is unaware of this, she collects the waste in a mixed form in a plastic bag and throws it wherever there is a pile of waste.

In baseline data collection, researcher used to visit Gokulnagar Pathar in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline it was observed that she was busy in household work, filling fresh to talk and cooperative in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.23.

Graph No. 4.4.23

Pre Intervention Measurement Scores of Case No. 23



Case No. 24:

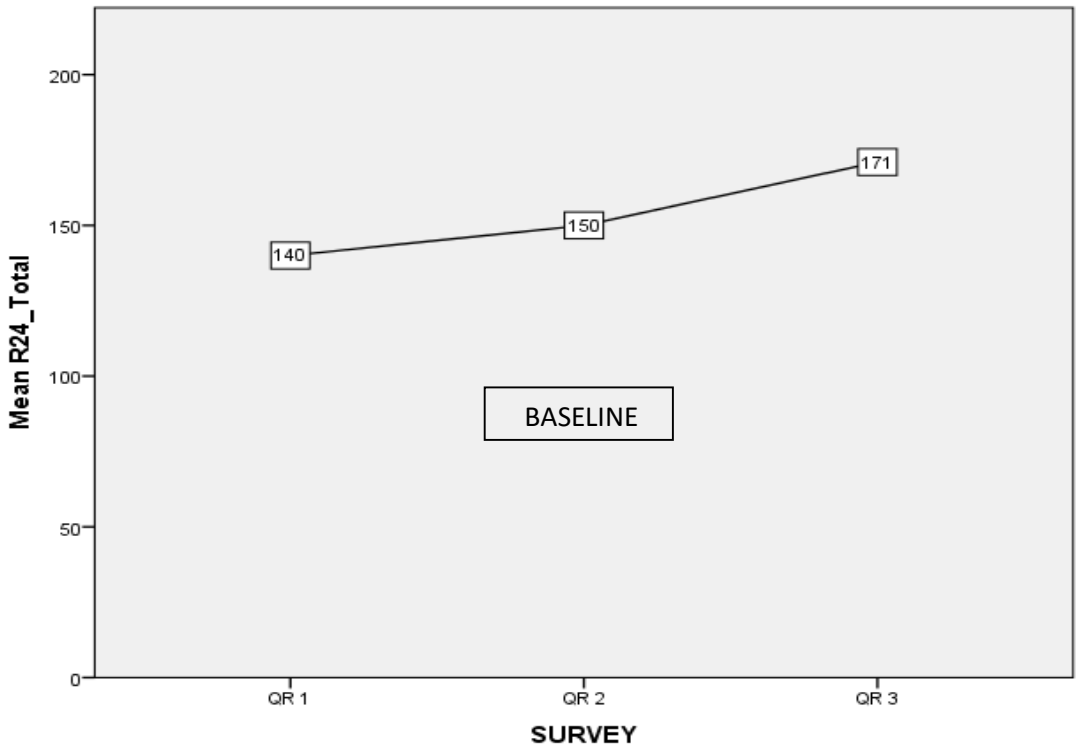
This woman was 35 years old and speaks Marathi. She has completed secondary education, works and lives in a joint extended family. There are five people living in the house and the family income is between rupees 3 to 6 Lacs. This family does not have a dustbin and they store waste in plastic bags. The private garbage truck comes irregularly. This causes garbage to accumulate in the house and creates a bad smell, as a result of which they throw the garbage on the roadside.

In baseline data collection, researcher used to visit Gokulnagar Pathar in the morning, afternoon and evening depending on the availability of caseat the same place.

During baseline collection, it was observed that she had not sorted the waste. She was busy with household chores, only available for conversation in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.24.

Graph No. 4.4.24

Pre Intervention Measurement Scores of Case No. 24



Case No. 25:

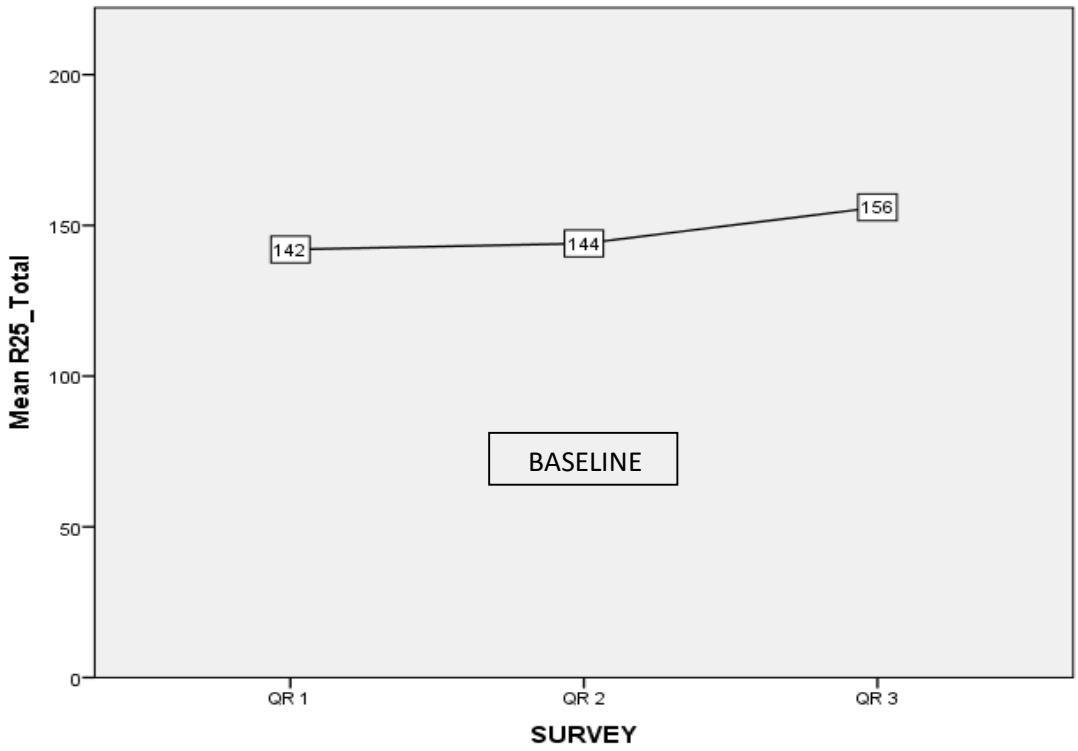
This woman is 65 years old and speaks Marathi. She has completed secondary education and is a housewife in a joint extended family. There are five people living in the house and the family income is between rupees 3 to 6 Lacs. Garbage and health issues are serious in the Gokul Nagar Pathar area. This woman has no knowledge about waste segregation, so throwing daily waste outside the house is her daily routine.

In baseline data collection, researcher used to visit Gokulnagar Pathar in the morning, afternoon, or evening depending on the availability of caseat the same place.

During baseline collection, it was observed that she had less awareness about waste. She was busy with housework and but available to talk in the morning, afternoon, and evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.25.

Graph No. 4.4.25

Pre Intervention Measurement Scores of Case No. 25



Case No. 26:

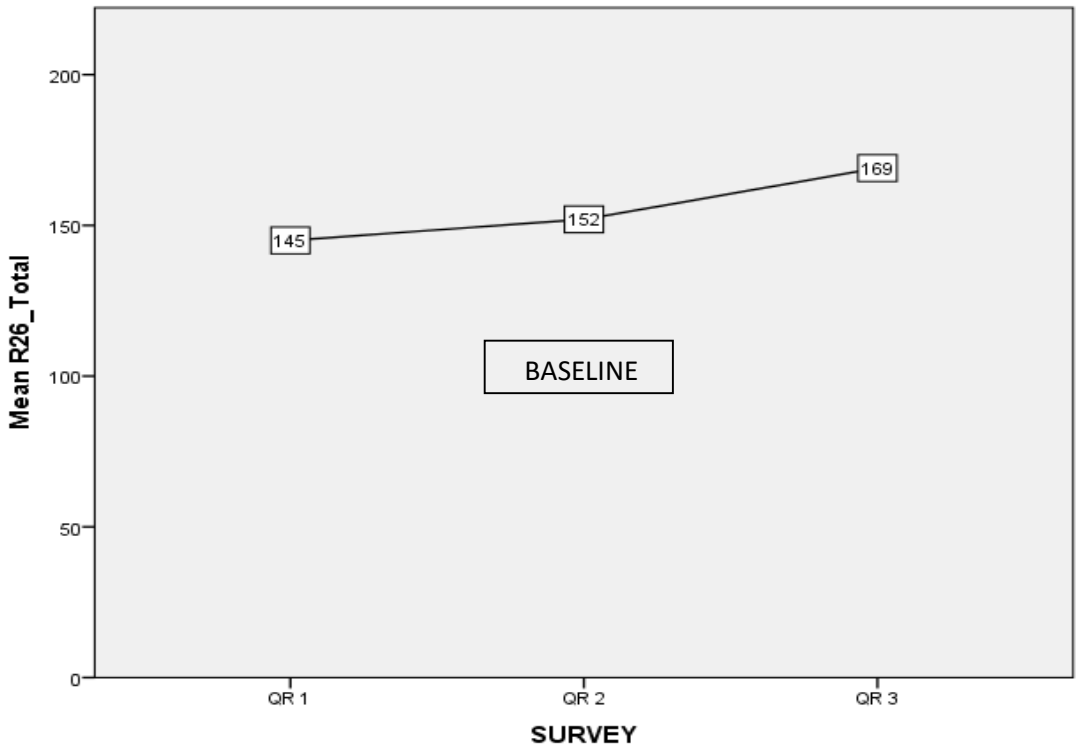
This woman was 42 years old and replied in Marathi. She has completed secondary education and doing a job and living in a joint extended family. There are five people living in the house and the family income is between rupees 3 to 6 Lacs. Gokul Nagar Pathar is neglected by the government as it is a BDP zone, so there is no seriousness regarding waste management. Since the government has not made any arrangements regarding waste management, this woman fills all the waste together in a plastic bag and throws it on the roadside.

In baseline data collection, researcher used to visit Gokulnagar Pathar in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline it was observed that her KAP level was low. She was busy with her work, filling fresh to talk only in the evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.26.

Graph No. 4.4.26

Pre Intervention Measurement Scores of Case No. 26



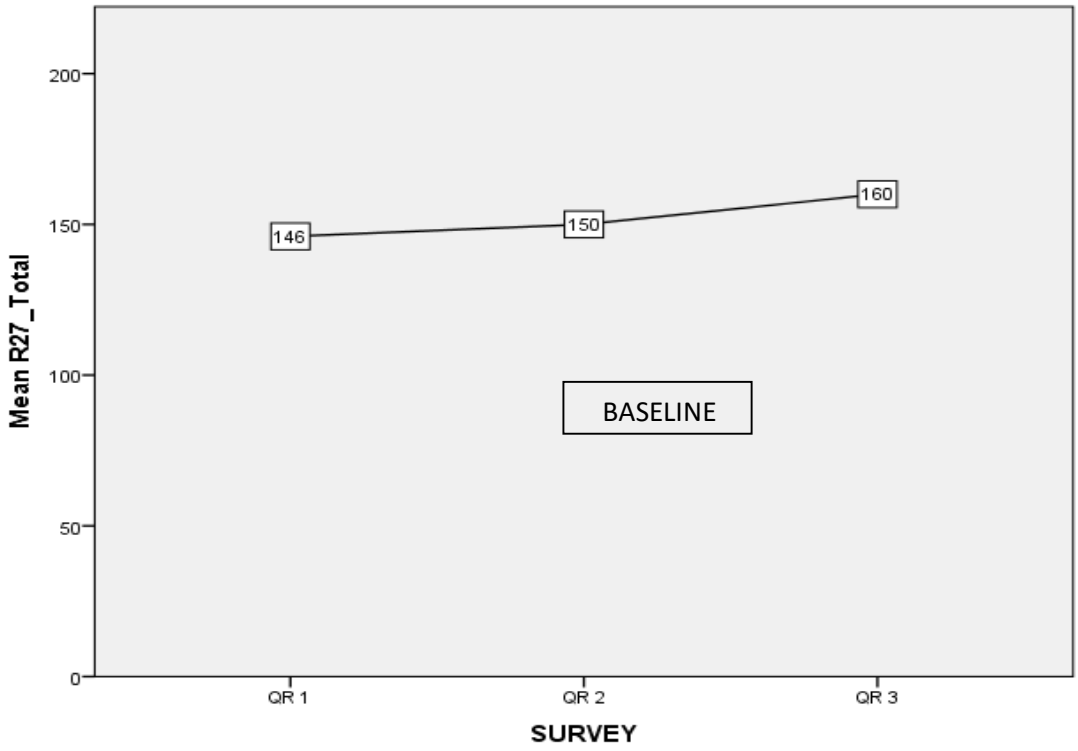
Case No. 27:

This man was 28 years old and spoke in Marathi. He has completed secondary education and doing a job and living in a nuclear family. There are three people living in the house and the family income is between rupees 3 to 6 Lacs. He does not have a dustbins. In the Gokul Nagar Pathar area, the government has not placed large garbage bins anywhere to dispose of garbage, so this person fills the garbage in a plastic bag and throws it in a garbage heap.

In baseline data collection, researcher used to visit Gokulnagar Pathar in the morning, afternoon, or evening depending on the availability of caseat the same area. During collecting the baseline it was observed that his KAP level was low. He was busy in his work, filling fresh to talk in the evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.27.

Graph No. 4.4.27

Pre Intervention Measurement Scores of Case No. 27



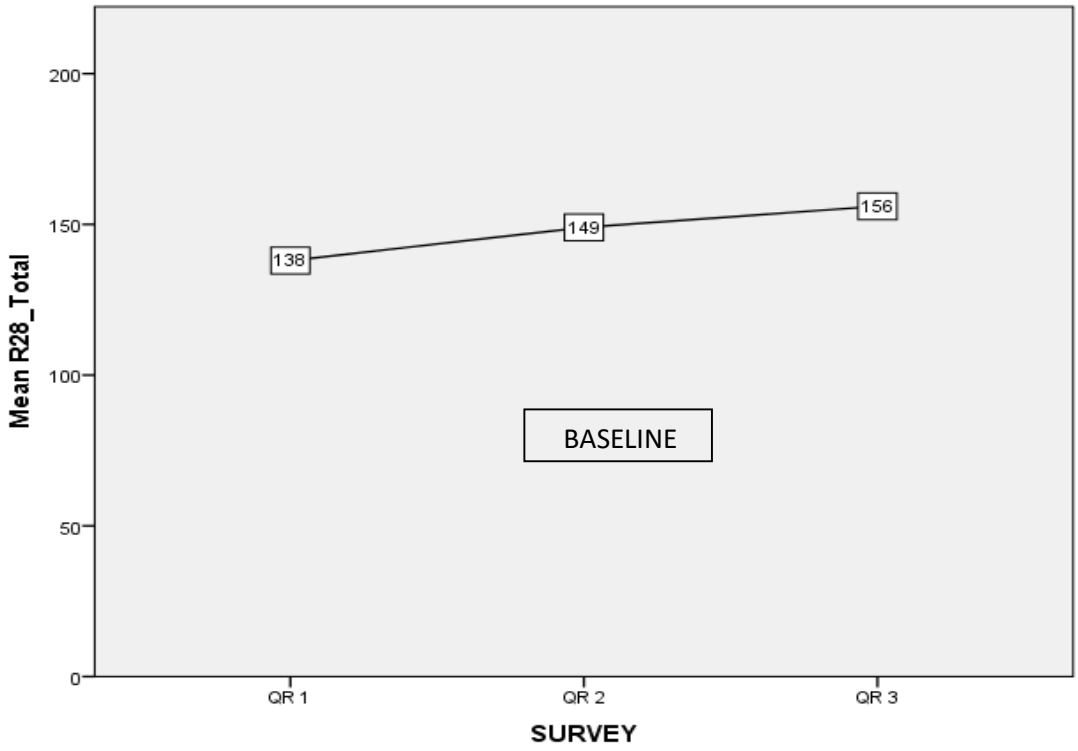
Case No. 28:

This woman was 30 years old and speaks Marathi. She has completed secondary education and doing job and living in a joint extended family. There are five people living in the house and the family income is between rupees 3 to 6 Lacs. This woman is always busy with family responsibilities. She has no knowledge about waste segregation and there is no waste collection system in this area. So she puts all the waste in plastic bags and throws it somewhere else.

In baseline data collection, researcher used to visit Gokulnagar Pathar in the morning, afternoon, or evening depending on the availability of caseat the same place. While collecting the baseline, it was found that she was not aware of the ill effects of waste. She was busy with household chores and was fresh to talk in the evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.28.

Graph No. 4.4.28

Pre Intervention Measurement Scores of Case No. 28



Case No. 29:

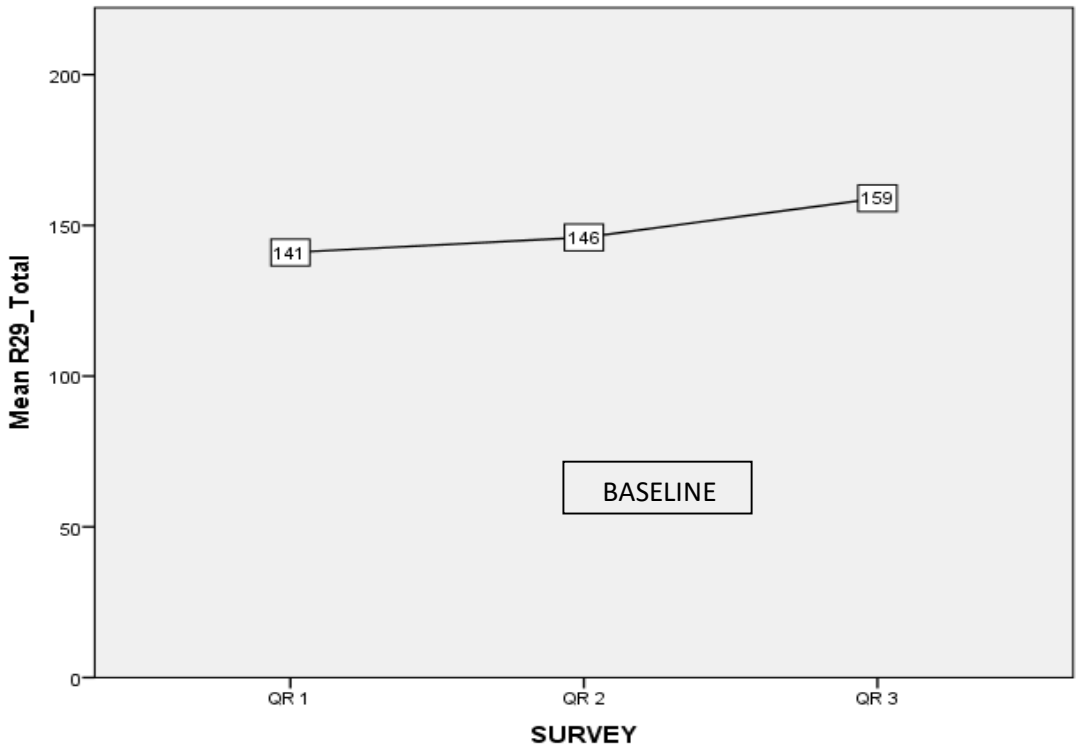
This woman was 26 years old and spoke in Marathi. She has a graduate and doing a job and living in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. She said that Pune Municipal Corporation officials have not created awareness about waste in this area, so she is also not aware of it.This woman collects all the waste together in a plastic bag and throws it outside after a few days.

In baseline data collection, researcher visited to Gokulnagar Pathar in the morning, afternoon and evening depending on the availability of caseat the same locality.

During collecting the baseline it was observed that she was unaware about waste and busy with her work, and available to talk in the evening and also on Sunday. The Pre Intervention measurement scores are presented in Graph No. 4.4.29.

Graph No. 4.4.29

Pre Intervention Measurement Scores of Case No. 29



Case No. 30:

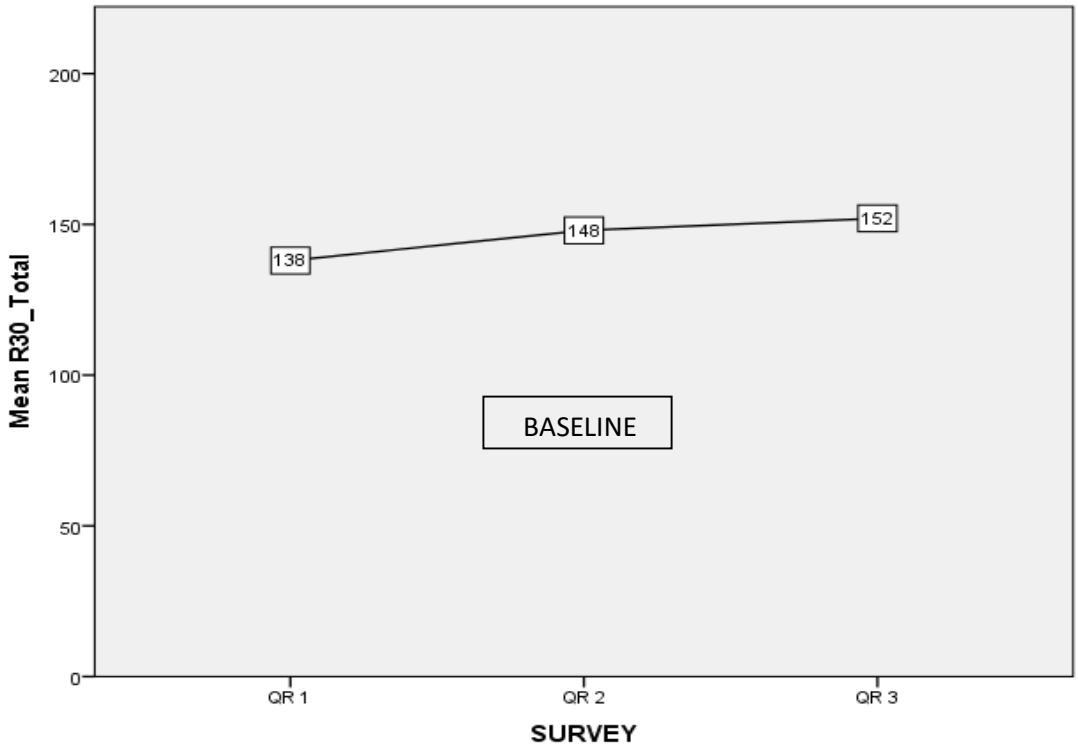
This woman is 23 years old and speaks Marathi. She has completed secondary education and doing a job and living in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. There is no awareness from the administration about the types of waste and its classification. The woman is busy with her work and collects all the waste and throws it in a garbage dump near the road.

In baseline data collection, researcher used to visit Gokulnagar Pathar in the morning, afternoon, or evening depending on the availability of case.

During baseline collection, it was found that her KAP level was low. She was busy with household chores, fresh to talk in the evenings and on holidays. The Pre Intervention measurement scores are presented in Graph No. 4.4.30.

Graph No. 4.4.30

Pre Intervention Measurement Scores of Case No. 30



Case No. 31:

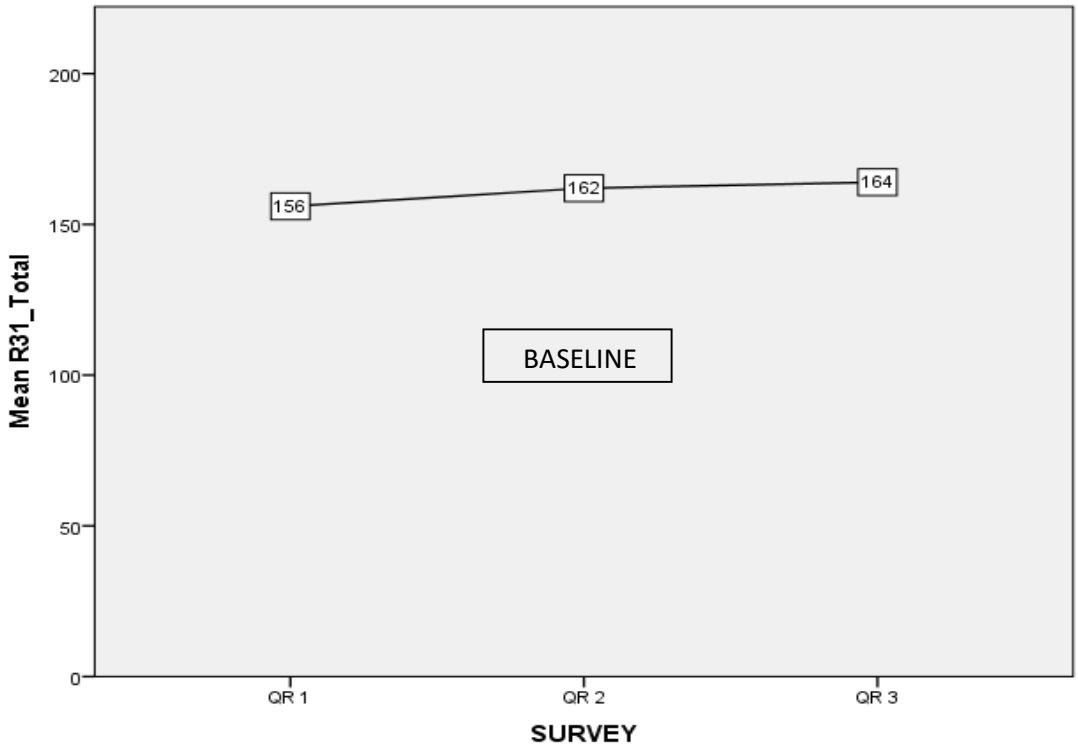
This man was 27 years old and spoke Marathi. He is a graduate, works and lives in a nuclear family.There are two people living in the house and the family income is between rupees 3 to 6 Lacs. No garbage trucks come to Sahyog Nagar because it is a BDP zone, so wet and dry waste is dumped along the sides of the houses. He is unaware of waste segregation. He uses plastic bags to collect waste and also throws it near Vitthalnagar Chowk.

In baseline data collection, researcher visited Sahyog Nagar in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline, it was found that he knew nothing about waste segregation, he was busy with his work, fresh to talk in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.31.

Graph No. 4.4.31

Pre Intervention Measurement Scores of Case No. 31



Case No. 32:

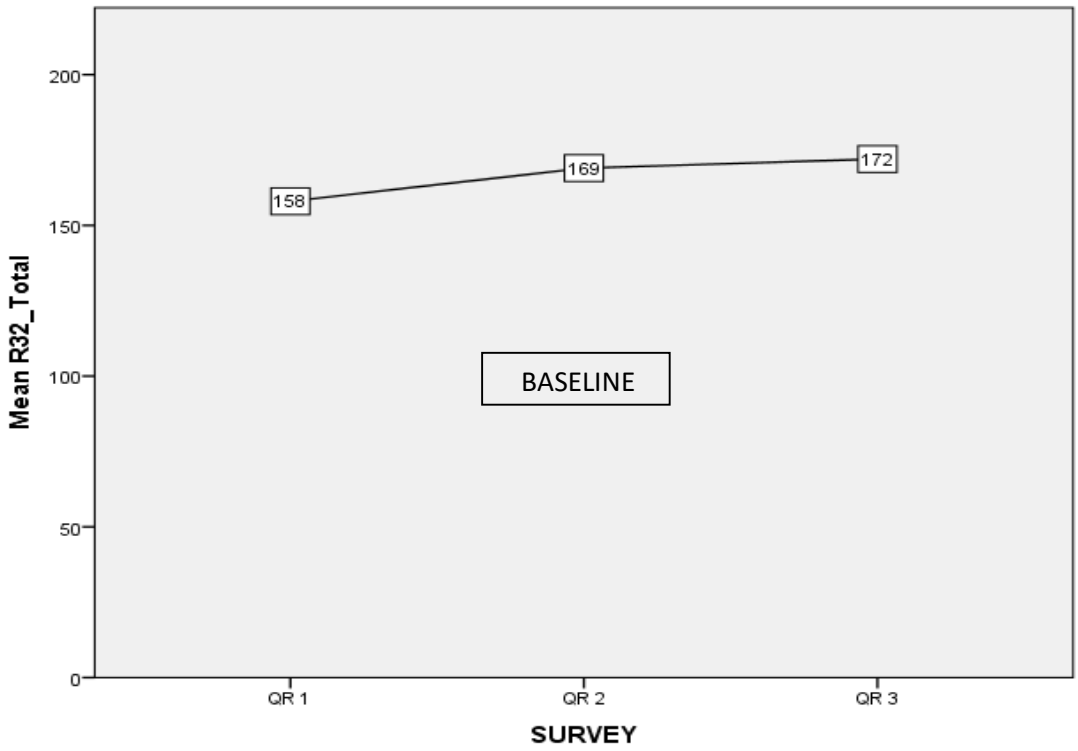
This woman is 28 years old and speaks Marathi. She has completed secondary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. There are no large garbage bins in the Sahyog Nagar area, nor does she have any knowledge about the harmful effects of waste and its segregation. So she collects all the waste together in a bucket and throws it in the garbage dumps around her house or in Vitthalnagar Chowk.

In baseline data collection, researcher used to visit Sahyog Nagar in the morning, afternoon, or evening depending on the availability of caseat the same area.

While collecting the baseline, it was revealed that she was busy with housework, always available to talk in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.32.

Graph No. 4.4.32

Pre Intervention Measurement Scores of Case No. 32



Case No. 33:

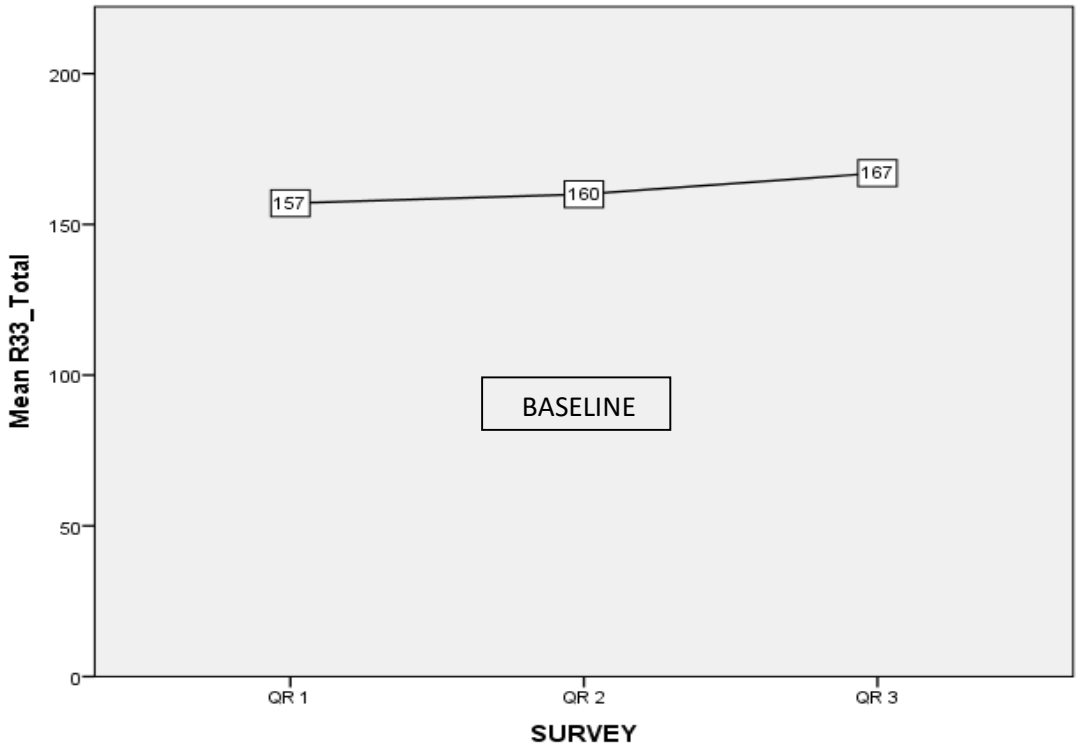
This woman was 35 years old and speaks Marathi and Hindi. She has completed secondary education and is a housewife in a nuclear family. There are five people living in the house and the family income is between rupees 3 to 6 Lacs. She has no dustbins and knows nothing about the harmful effects of waste and its classification. So she collects all the waste in plastic bags and throws it in the garbage dumps around her house or in Vitthalnagar Chowk.

In baseline data collection, researcher visited Sahyog Nagar in the morning, afternoon, or evening, depending on case availability.

While collecting the baseline it was observed that she was busy in her household work and availableto talk in the afternoon and evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.33.

Graph No. 4.4.33

Pre Intervention Measurement Scores of Case No. 33



Case No. 34:

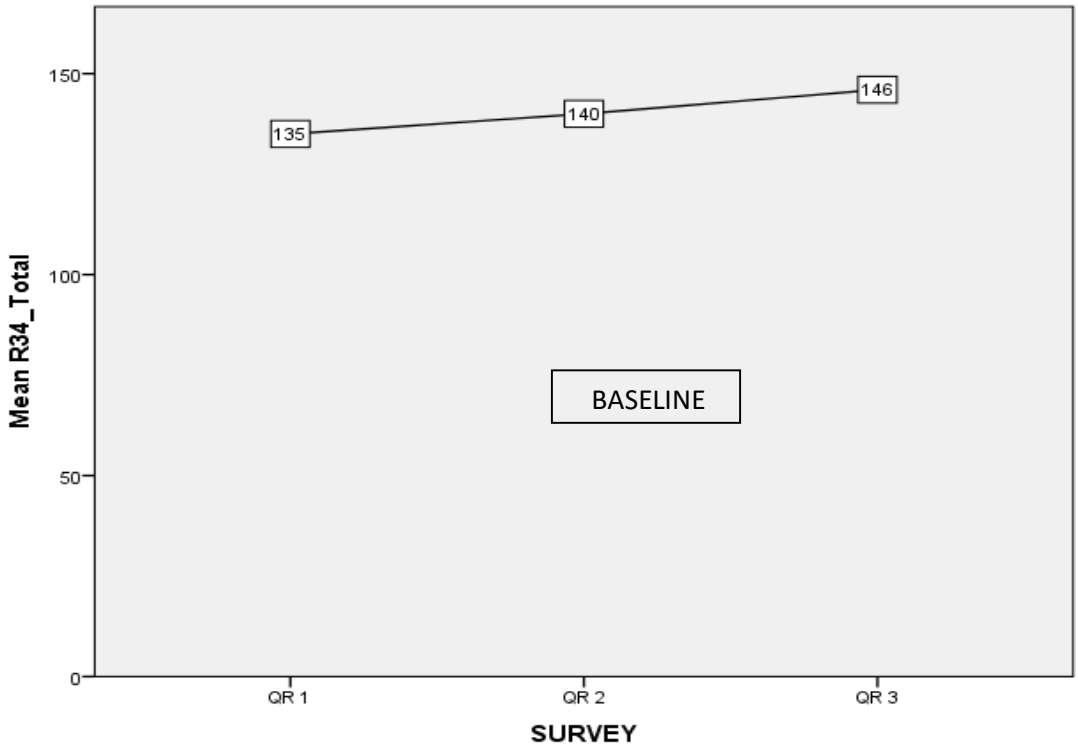
This woman was 28 years old and speaks Marathi and Hindi. She has completedsecondary primary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. She has no dustbins and unaware about the harmful effects of waste and its segregation. So she collects all the waste in plastic bags and throws it in the garbage dumps around her house.

In baseline data collection, researcher visited to Sahyog Nagar in the morning, afternoon, or evening depending on the availability of case.

During baseline collection, it was found that her KAP level was low and she was busy with her household chores, fresh to talk in the morning and afternoon. The Pre Intervention measurement scores are presented in Graph No. 4.4.34.

Graph No. 4.4.34

Pre Intervention Measurement Scores of Case No. 34



Case No. 35:

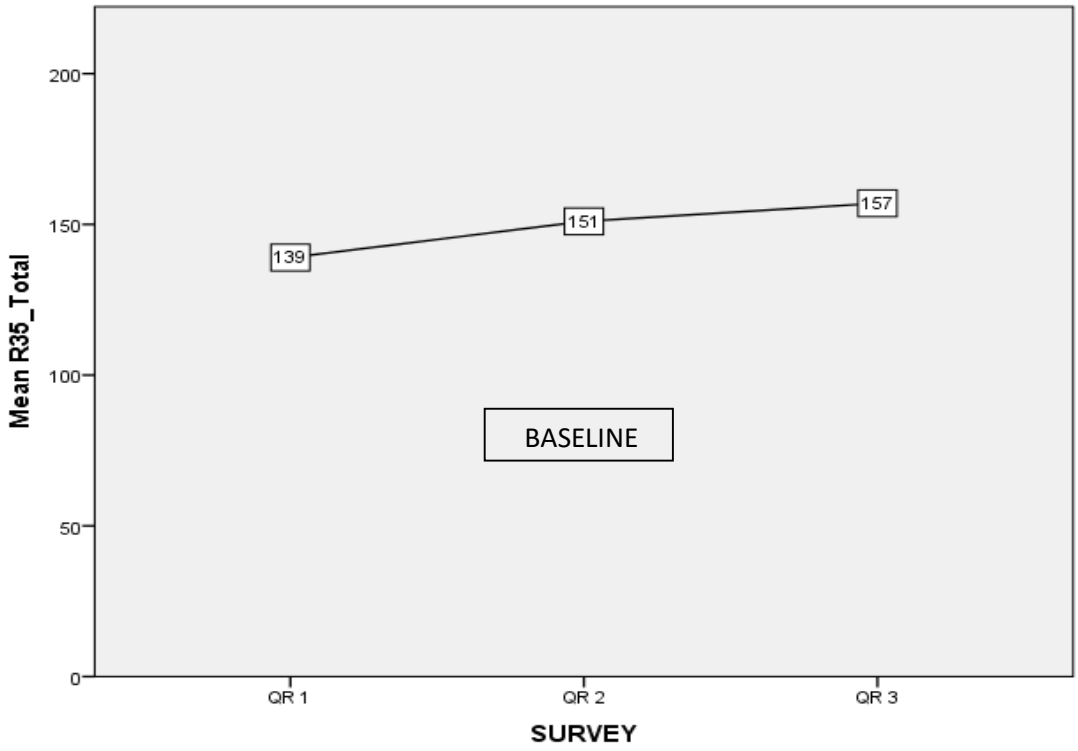
This woman was 30 years old and speaks Marathi and Hindi. She has completed secondary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. She doesn't have any dustbins and doesn't know anything about waste segregation. So she collects all the waste in plastic bags and throws it in the garbage dump on the side of the road or at Vitthalnagar Chowk.

In baseline data collection, the researcher visited Sahyog Nagar in the morning, afternoon, or evening depending on the availability of case in the same area.

While collecting the baseline it was observed that she was unaware for waste types, busy in household work, filling fresh to talk in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.35.

Graph No. 4.4.35

Pre Intervention Measurement Scores of Case No. 35



Case No. 36:

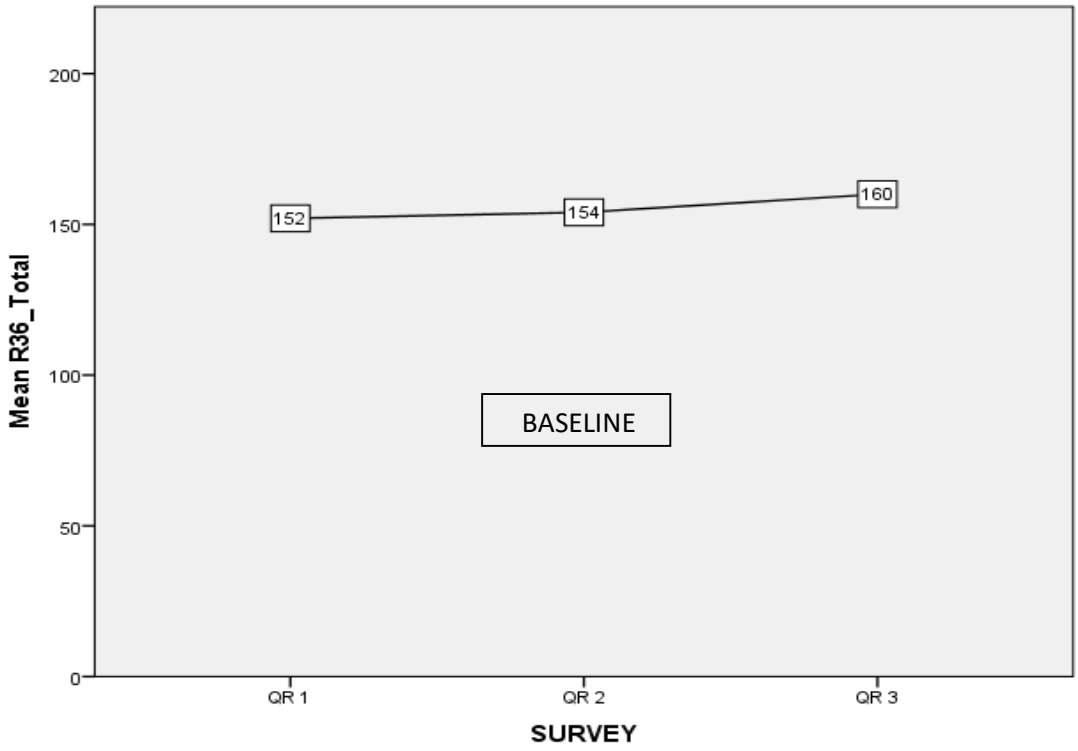
This woman was 22 years old and speaks Marathi. She has completed secondary education and is a housewife in a nuclear family. There are two people living in the house and the family income is between rupees 3 to 6 Lacs. She doesn't knowledge about waste segregation. Since the PMC administration has not provided any information or plan to the citizens of Sahyog Nagar regarding waste, so she throws her daily waste near her house.

In baseline data collection, researcher used to visit Sahyog Nagar in the morning, afternoon, or evening depending on the availability of caseat the same place.

During collecting the baseline it was observed that she was busy in household work, filling fresh to talk in the morning and evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.36.

Graph No. 4.4.36

Pre Intervention Measurement Scores of Case No. 36



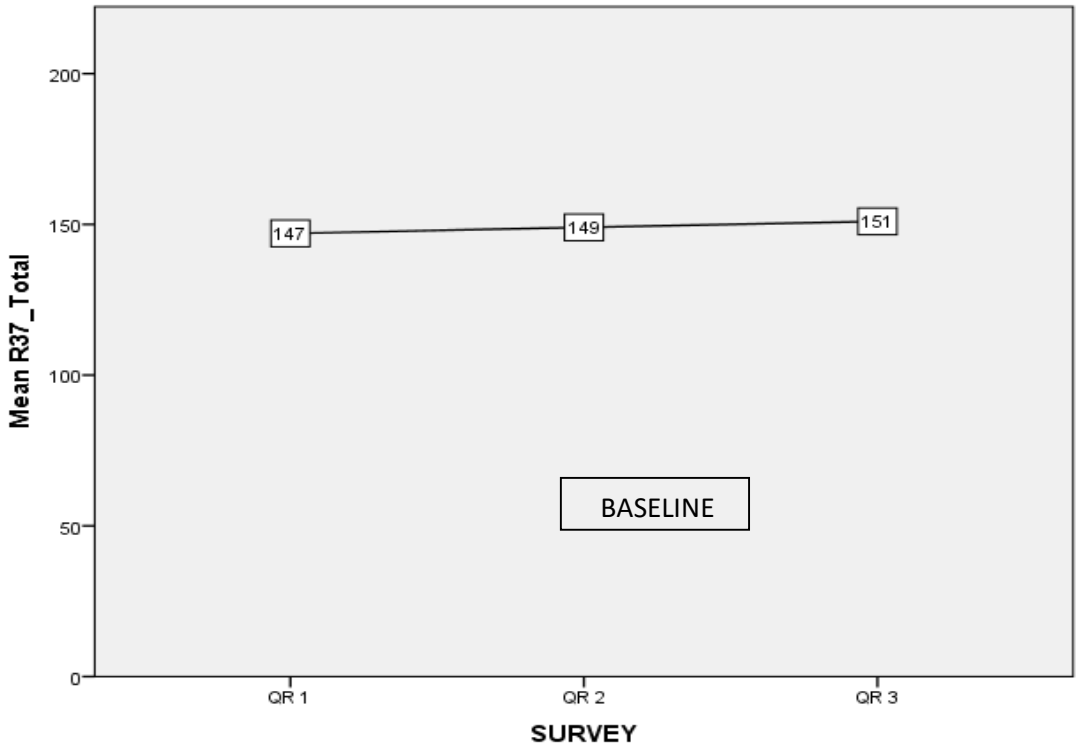
Case No. 37:

This woman was 28 years old and speaks Marathi. She has completed higher secondary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. She said that the PMC administration has not provided any information to the citizens of Sahyog Nagar regarding garbage, so she collects all the garbage in plastic bags and throws the garbage near her house.

For baseline data collection, researcher used to visit Sahyog Nagar in the morning, afternoon, or evening depending on the availability of caseat the same place. While collecting the baseline it was observed that she was busy in household work, filling fresh to talk in the morning and afternoon. The Pre Intervention measurement scores are presented in Graph No. 4.4.37.

Graph No. 4.4.37

Pre Intervention Measurement Scores of Case No. 37



Case No. 38:

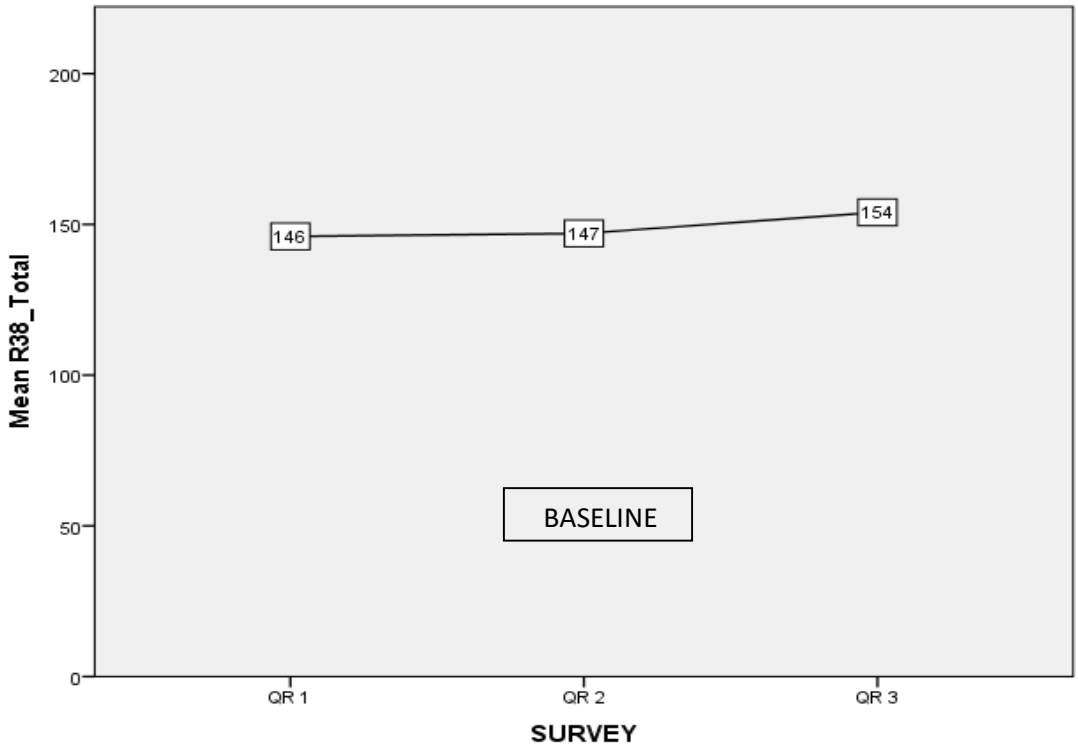
This man was 55 years old and speaks Marathi. He has completed secondary education and doing a job and living in a joint extended family. There are five people living in the house and the family income is between rupees 3 to 6 Lacs. He stated that the PMC administration has not provided any waste disposal facility at Sahyog Nagar. So, he collects all the waste in plastic bags and throws it in the garbage dump near the road.

For baseline data collection, researcher visited to Sahyog Nagar in the morning, afternoon, or evening depending on the availability of case.

While collecting the baseline, it appeared that he was busy with his work and refreshingly available to talk in the evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.38.

Graph No. 4.4.38

Pre Intervention Measurement Scores of Case No. 38



Case No. 39:

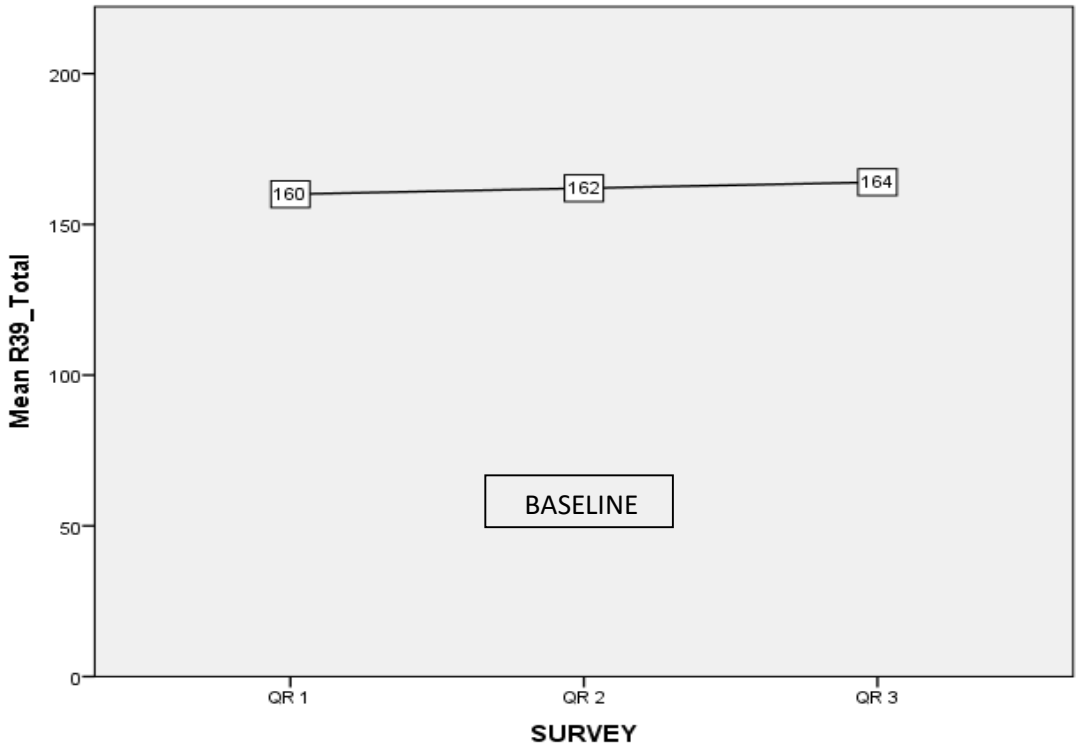
This woman was 40 years old and speaks Marathi. She has completed secondary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. She said that the PMC administration has not provided any waste disposal facility to the citizens of Sahyog Nagar. Since she does not have a dustbins to store the waste, she collects all the waste in plastic bags and throws it near her house.

In baseline data collection, researcher used to visit Sahyog Nagar in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline, it was found that her knowledge about waste was low, she was busy with housework, fresh to talk in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.39.

Graph No. 4.4.39

Pre Intervention Measurement Scores of Case No. 39



Case No. 40:

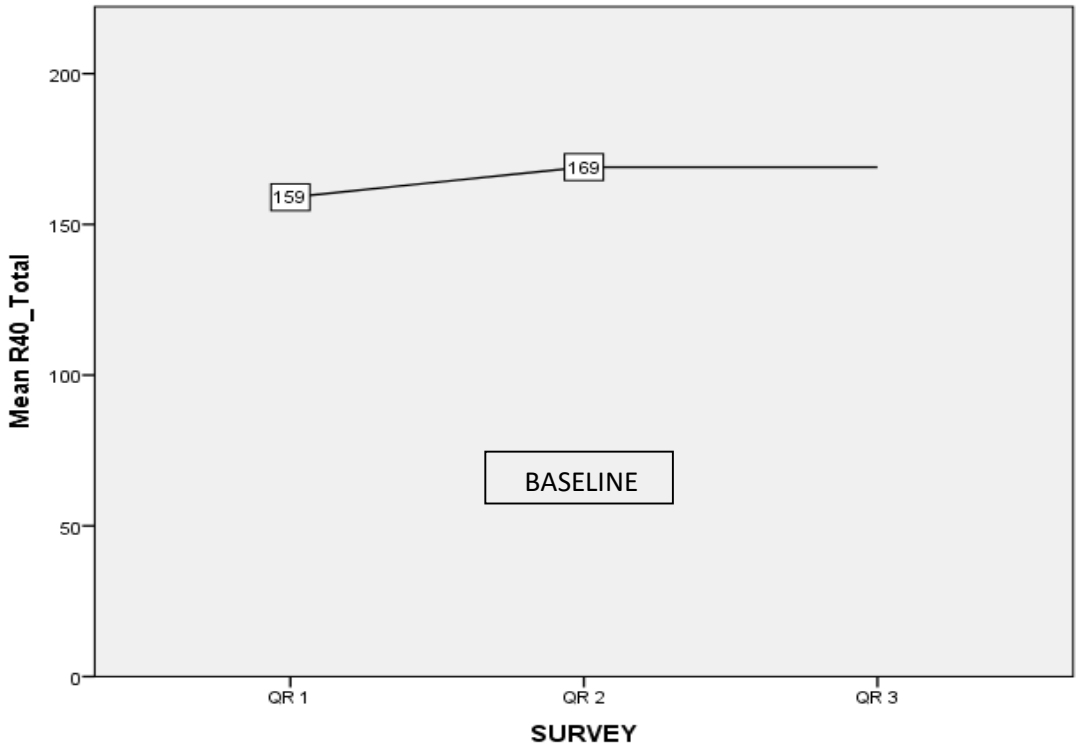
This woman was 30 years old and speaks Marathi. She has completed her higher secondary education, works and lives in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. She is unaware of the types and classification of waste. Since the PMC administration has not provided any information or plan to the citizens of Sahyog Nagar regarding waste, so she is unaware of this, so she throws her daily waste near her house.

For baseline data collection, researcher used to visit Sahyog Nagar in the morning, afternoon, or evening depending on the availability of caseat the same area.

During baseline collection, it was found that she was not aware of the types of waste. She was busy with household chores, fresh to talk in the evenings and on holidays. The Pre Intervention measurement scores are presented in Graph No. 4.4.40.

Graph No. 4.4.40

Pre Intervention Measurement Scores of Case No. 40



Case No. 41:

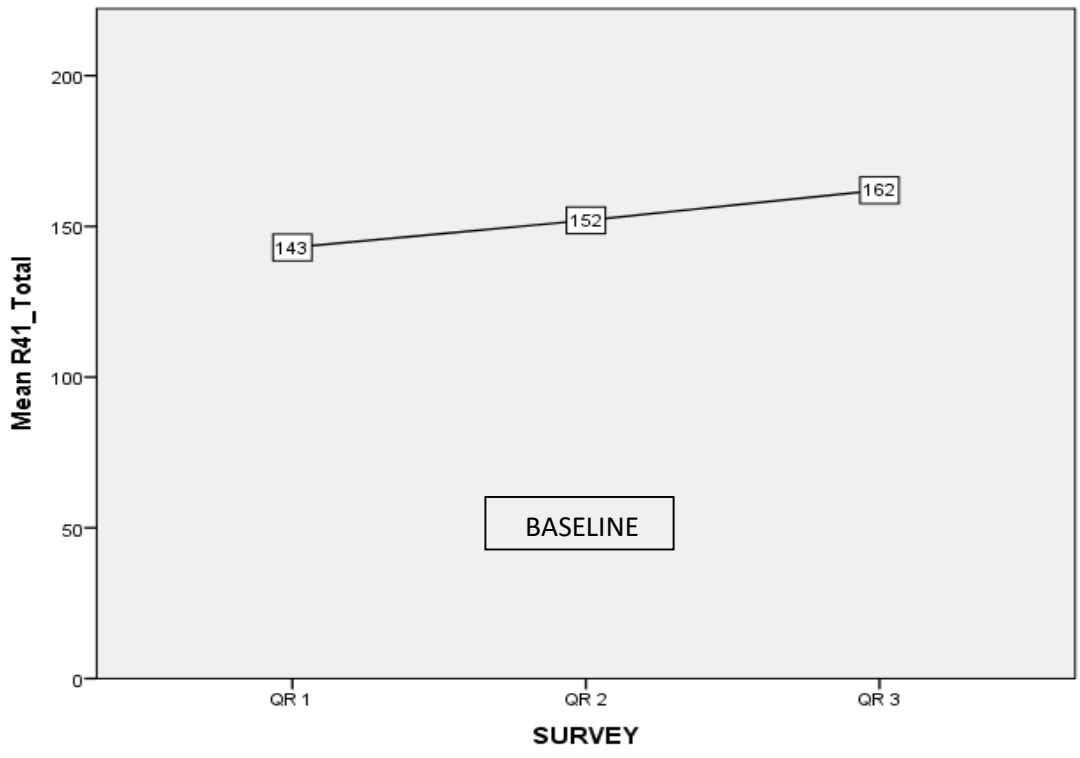
This woman was 55 years old and speaks Marathi. She has completed secondary education and is a housewife in a joint extended family. There are six people living in the house and the family income is between rupees 3 to 6 Lacs. Gosavi Vasti is a slum located under the Pune Municipal Corporation's slum clearance program (Ga.Va.Ni.). However, due to dense population, there has been no improvement here.Since the administration has not given her any information about separating wet and dry waste, she collects the accumulated waste mixed in plastic bags and throws it in the open space in front of the settlement.

In baseline data collection, researcher used to visit Gosavi Vasti in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline, it was found that she was unaware of the health effects of garbage, was busy with housework, and was available for conversation in the morning and afternoon. The Pre Intervention measurement scores are presented in Graph No. 4.4.41.

Graph No. 4.4.41

Pre Intervention Measurement Scores of Case No. 41



Case No. 42:

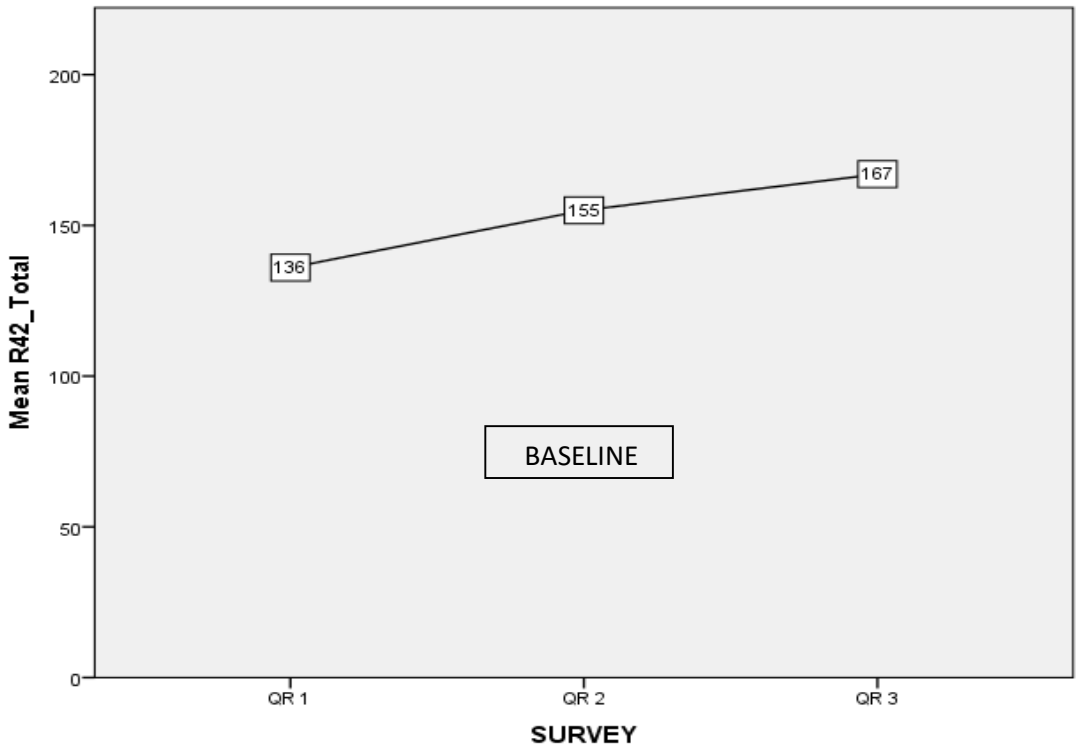
This woman was 40 years old and speaks Marathi. She has completed secondary education and is a housewife in a joint extended family. There are six people living in the house and the family income is between rupees 3 to 6 Lacs. Gosavi Vasti is a slum under the Slum Eradication Program (SEP) of the Pune Municipal Corporation. There has been no improvement in the waste management here. She has no knowledge about segregation of wet and dry waste. She collects all the accumulated waste in plastic bags and throws it in the open space in front of the slum.

In baseline data collection, researcher used to visit Gosavi Vasti in the morning, afternoon, or evening depending on the availability of caseat the same place.

During baseline collection, it was found that KAP level was low. She was busy with household chores, fresh to talk in the morning and evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.42.

Graph No. 4.4.42

Pre Intervention Measurement Scores of Case No. 42



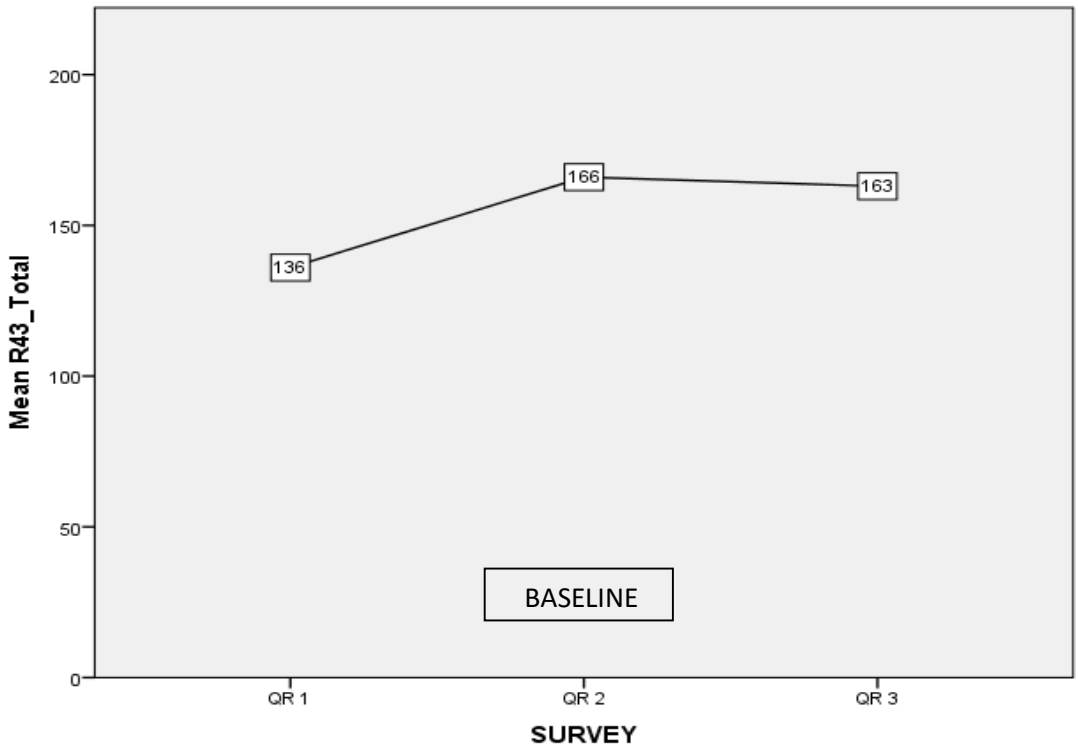
Case No. 43:

This woman was 30 years old and speaks Marathi. She has completed secondary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. Gosavi Vasti is a slum under the Slum Eradication Program (SEP) of the PMC. There are no large garbage bins here. Since she has no knowledge about separating wet and dry waste, she collects all the wet and dry waste in plastic bags and throws it in the open space in front of the slum.

In baseline data collection, researcher used to visit Gosavi Vasti in the morning, afternoon, or evening depending on the availability of caseat the same place. While collecting the baseline it was observed that the KAP level is low. She was busy in household work and cooperativeto talk in the morning and evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.43.

Graph No. 4.4.43

Pre Intervention Measurement Scores of Case No. 43



Case No. 44:

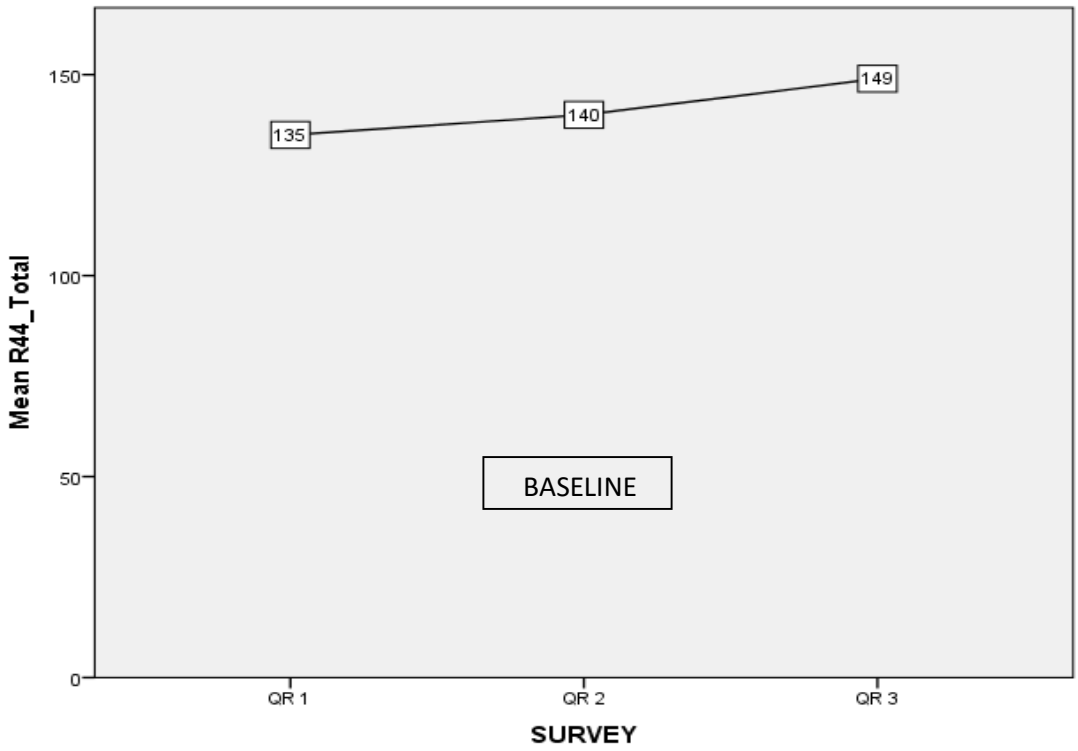
This man was 25 years old and speaks Marathi. He has completed secondary education, works and lives in a nuclear family. There are three people living in the house and the family income is between rupees 3 to 6 Lacs. He has no knowledge about waste segregation and its health effects. He collects the waste accumulated at home while going to work and throws it in the open.

In baseline data collection, researcher visited toGosavi Vasti in the morning, afternoon, or evening depending on the availability of caseat the same place.

While collecting the baseline it was observed that level of awareness was low. He was busy in his work and fills fresh to talk in the evening and on holiday. The Pre Intervention measurement scores are presented in Graph No. 4.4.44.

Graph No. 4.4.44

Pre Intervention Measurement Scores of Case No. 44



Case No. 45:

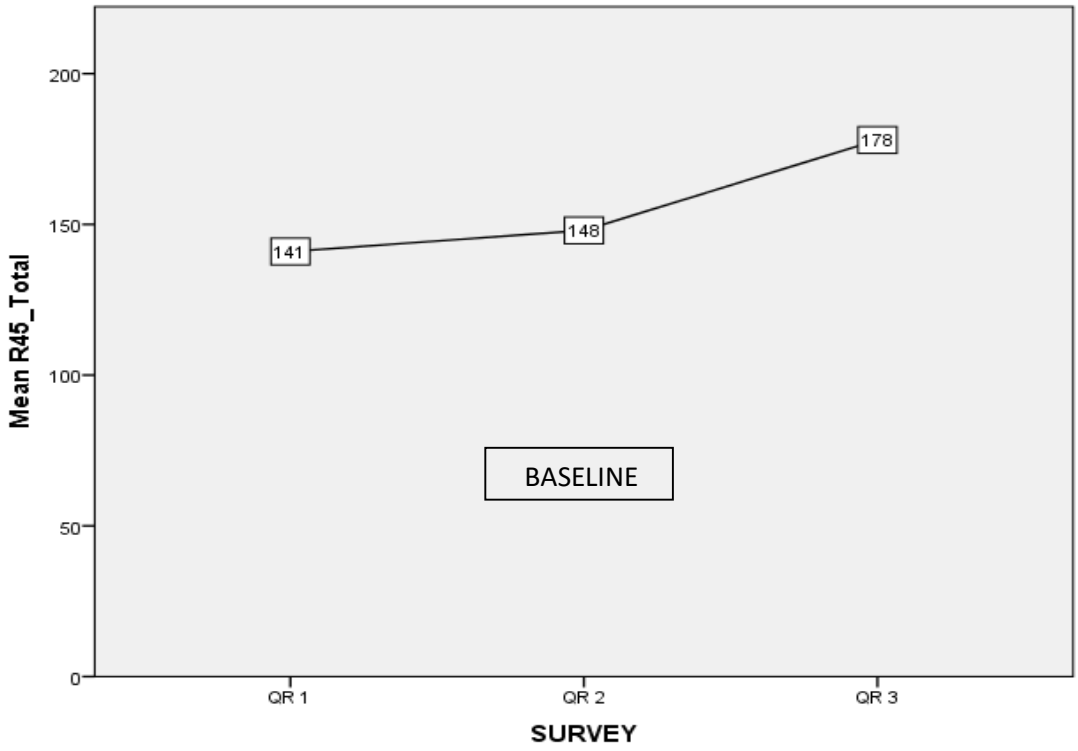
This woman is 22 years old and speaks Marathi. She has completed secondary education and is a housewife in a nuclear family. There are two people living in the house and the family income is between rupees 3 to 6 Lacs. PMC has not arranged a large garbage bin at Gosavi Vasti. Since PMC has not given her any information about segregation of wet and dry waste, she collects all the wet and dry waste in plastic bags and throws it in the available open space.

For baseline data collection, researcher used to visit Gosavi Vasti in the morning, afternoon, or evening depending on the availability of case at slum area.

While collecting the baseline it was observed that level of KAP was low. She was busy in household work, filling fresh to talk in the evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.45.

Graph No. 4.4.45

Pre Intervention Measurement Scores of Case No. 45



Case No. 46:

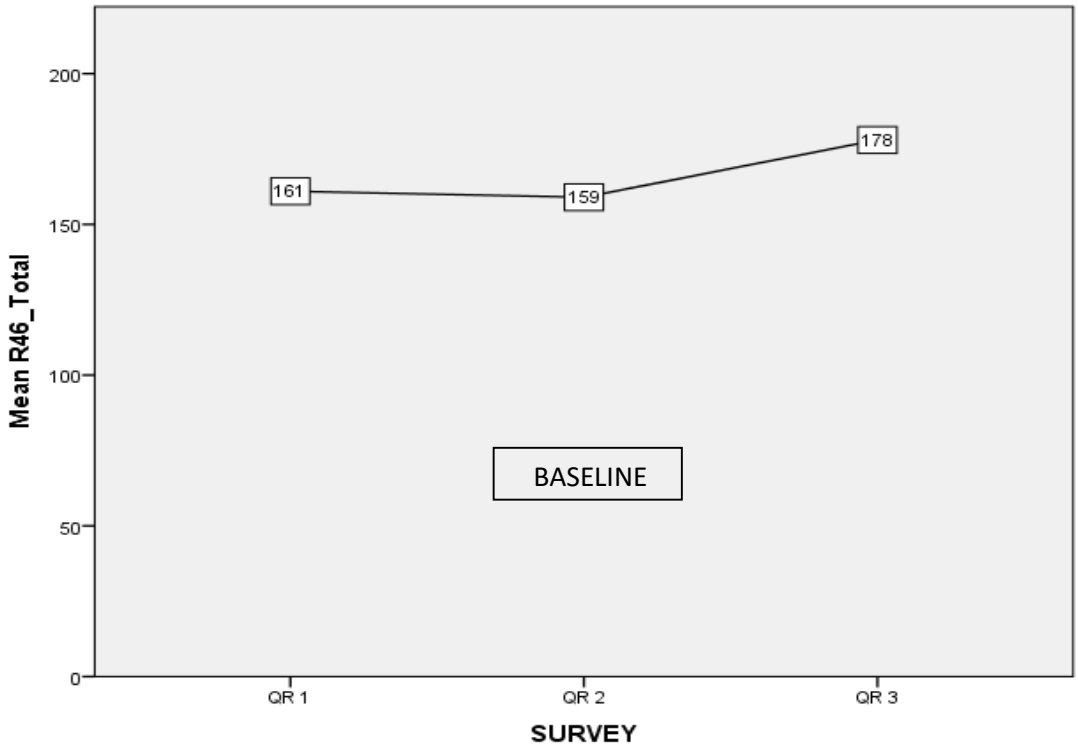
This woman is 23 years old and speaks Marathi. She has completed secondary education and is a housewife in a nuclear family. There are three people living in the house and the family income is is between rupees 3 to 6 Lacs. She does not have a dustbins and keeps her waste in plastic bags. Garbage trucks do not come here. This causes the waste to accumulate in the house and creates a bad smell, as a result of which she throws the waste wherever it is available.

For baseline data collection, researcher used to visit Gosavi Vasti in the morning, afternoon, or evening depending on the availability of case.

While collecting the baseline it was observed that level of KAP was less. She was busy in household work, filling fresh to talk in the afternoon. The Pre Intervention measurement scores are presented in Graph No. 4.4.46.

Graph No. 4.4.46

Pre Intervention Measurement Scores of Case No. 46



Case No. 47:

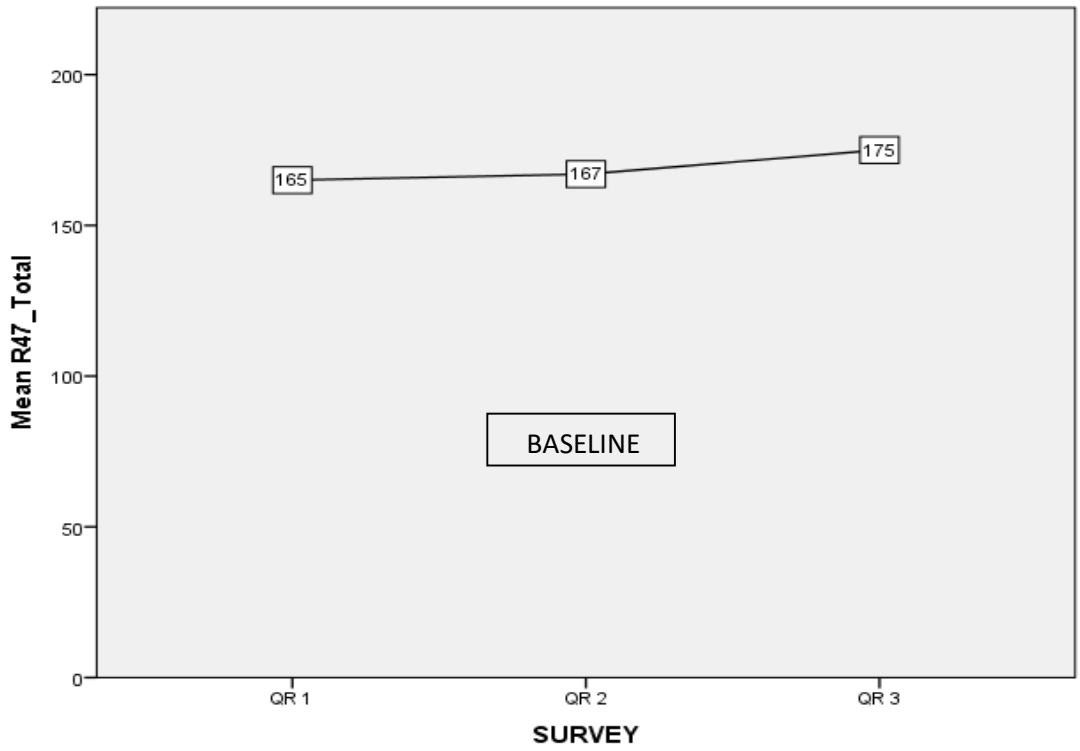
This woman was 35 years old and speaks Marathi. She has completed secondary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. She has no idea about waste segregation and its health effects. She collects the garbage accumulated in the house and throws it on the roadside.

In baseline data collection, researcher used to visit Gosavi Vasti in the morning, afternoon, or evening depending on the availability of case at the same slum area.

While collecting the baseline, it was observed that awareness about waste was very low. She was busy with household chores, available to talk in the morning rather than in the afternoon and evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.47.

Graph No. 4.4.47

Pre Intervention Measurement Scores of Case No. 47



Case No. 48:

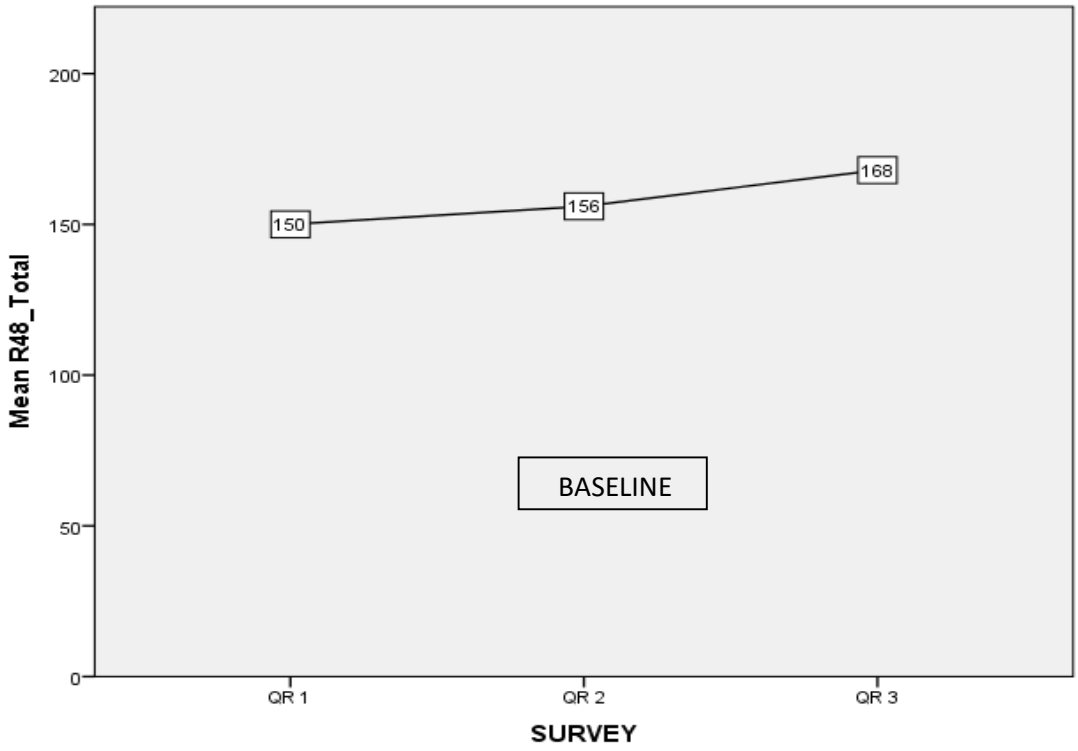
This woman is 40 years old and speaks Marathi and Hindi. She has completed secondary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. She does not have a dustbin and she stores mixed waste in plastic bucket. She cleared that the garbage truck not comes here. This causes garbage to accumulate in the house and creates a bad smell, as a result of which they throw the garbage on the roadside.

In baseline data collection, researcher used to visit Gosavi Vasti in the morning, afternoon, or evening depending on the availability of case at Gosavi Vasti.

While collecting the baseline it was observed that she was unaware about waste, busy in housework, filling fresh to talk in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.48.

Graph No. 4.4.48

Pre Intervention Measurement Scores of Case No. 48



Case No. 49:

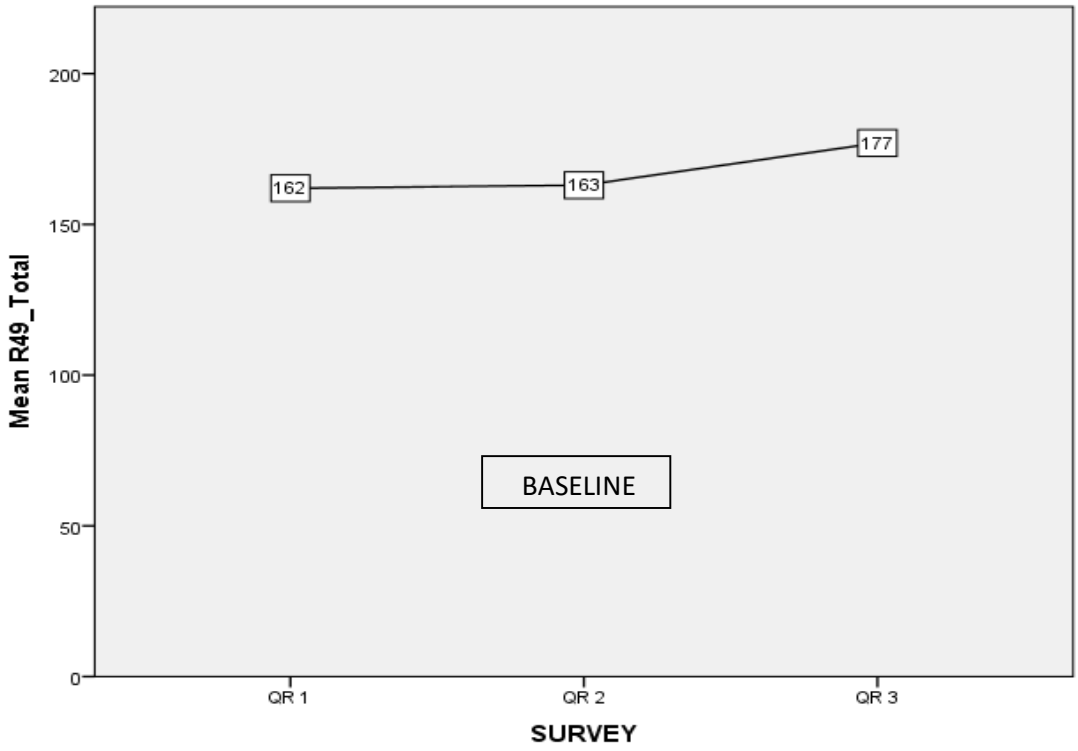
This woman was 25 years old and speaks Marathi. She has completed primary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. This family does not have a dustbin and they store waste in plastic bags. She said that the private garbage truck comes once in the week. This causes garbage to accumulate in the house and creates a bad smell, as a result of which they throw the garbage on the roadside.

In baseline data collection, researcher used to visit Gosavi Vasti in the morning, afternoon, or evening depending on the availability of case at her home.

While collecting the baseline it was observed that she was no knowledge about waste, busy in household work, available to talk in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.49.

Graph No. 4.4.49

Pre Intervention Measurement Scores of Case No. 49



Case No. 50:

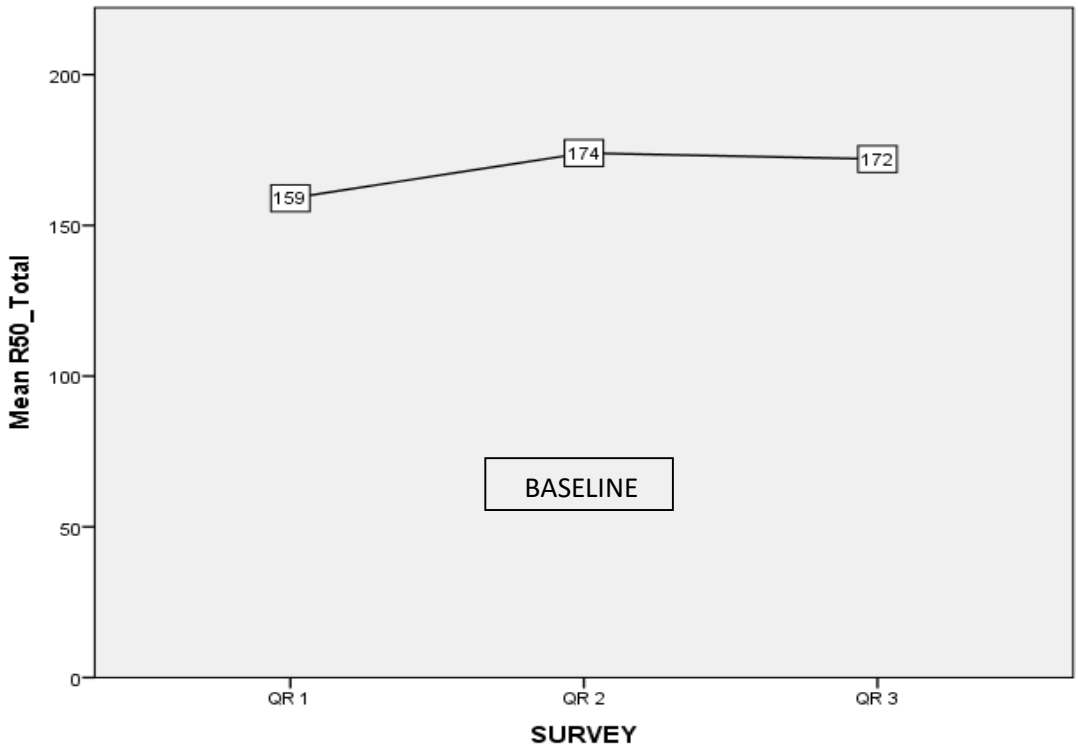
This woman was 28 years old and speaks Marathi. She has completed secondary education, works and lives in nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. This family does not have a dustbin and they store waste in plastic bags. She told that the private garbage truck comes irregularly. This causes garbage to accumulate in the house and creates a bad smell, as a result of which they throw the garbage on the roadside.

In baseline data collection, researcher used to visit Gosavi Vasti in the morning, afternoon, or evening depending on the availability of case at the same place.

While collecting the baseline it was observed that her KAP level was low, busy in household work, filling fresh to talk in the morning as compared to afternoon and evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.50.

Graph No. 4.4.50

Pre Intervention Measurement Scores of Case No. 50



Case No. 51:

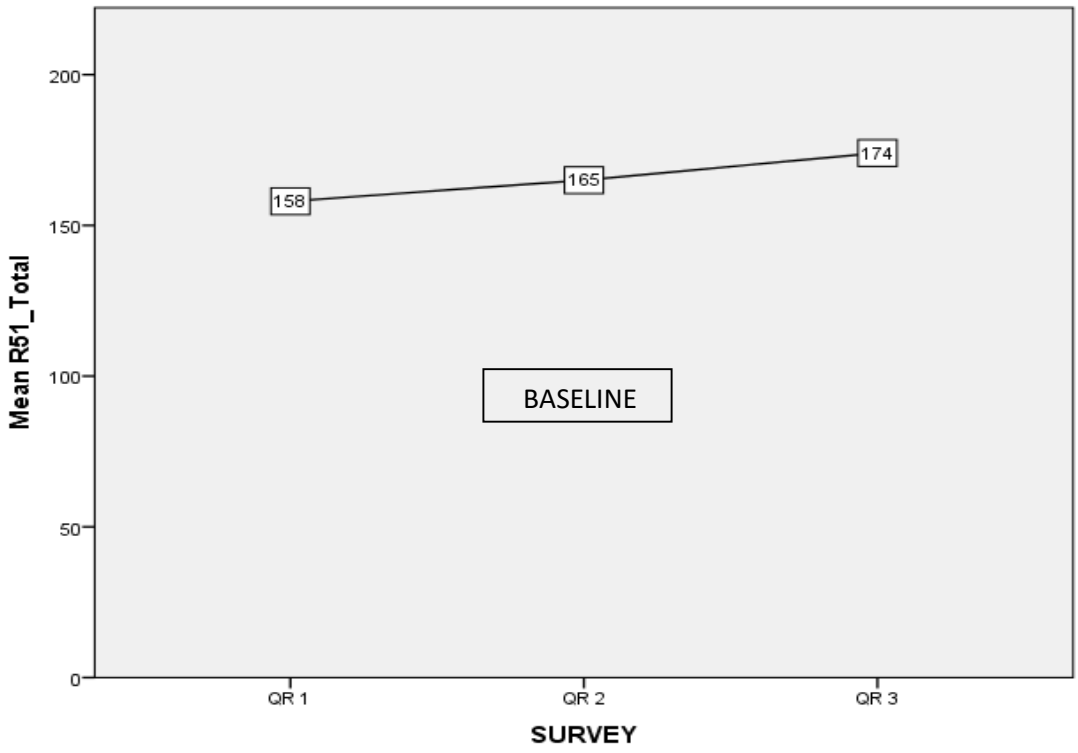
She was a Marathi speaking widowed woman of 45 years. She has completed her secondary education and works as a housemaid and lives in a nuclear family. There are 4 people living in the house and the family income is between rupees 3 to 6 Lacs. Dongarwadi in Ramnagar is a hilly settlement and due to the very small roads here, even trolleys are not available for garbage transportation.This causes garbage to accumulate in the house and creates a foul odor, causing her to throw the garbage into a pit near the hill.

In baseline data collection, researcher used to visit Dongarwadi in the morning, afternoon, or evening depending on the availability of case at the same place.

While collecting the baseline it was observed that the level of KAP is less. She was busy in household work, filling fresh to talk in the morning and evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.51.

Graph No. 4.4.51

Pre Intervention Measurement Scores of Case No. 51



Case No. 52:

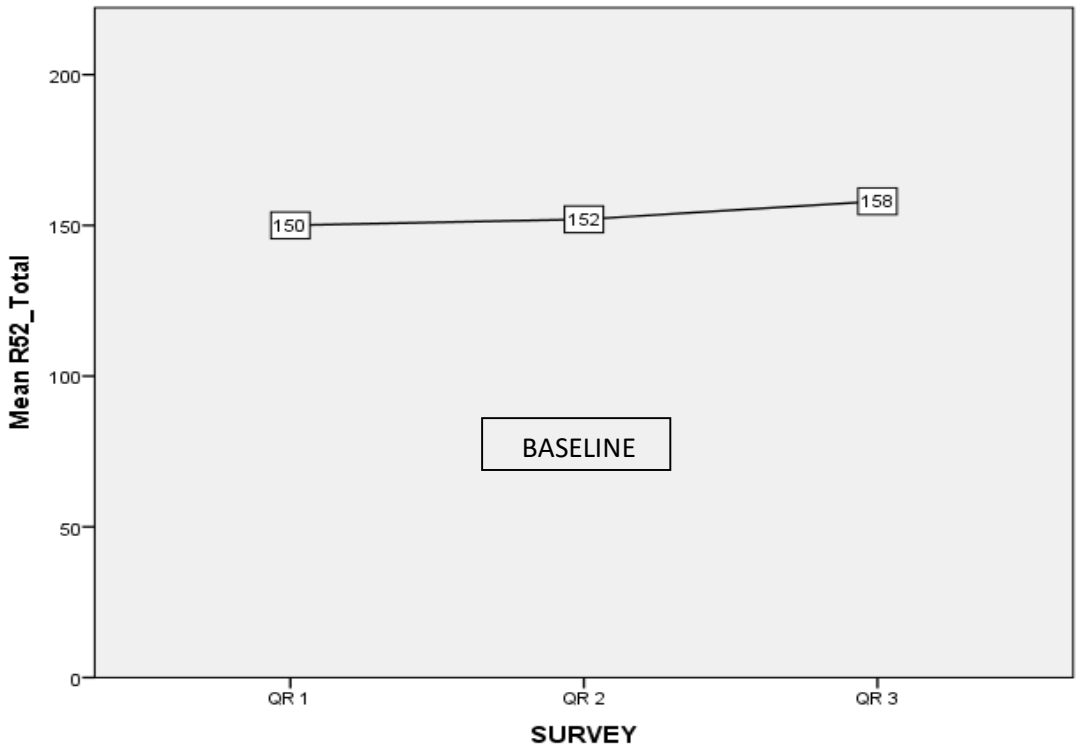
This woman was 35 years old and speaks Marathi. She has completed secondary education and is a housewife in a nuclear family. There are five people living in the house and the family income is between rupees 3 to 6 Lacs. Dongarwadi in Ramnagar is a hilly area and there are no trolleys available to carry garbage. So she fills the garbage stored in her house in a plastic bag and throws it in a pit near the hill.

In baseline data collection, researcher used to visit Dongarwadi in the morning, afternoon, or evening depending on the availability of case at the same place.

During baseline collection, it was found that KAP level was very low. She was busy with household chores and was available for conversation in the morning compared to the afternoon and evening. The Pre Intervention measurement scores are presented in Graph No. 4.4.52.

Graph No. 4.4.52

Pre Intervention Measurement Scores of Case No. 52



Case No. 53:

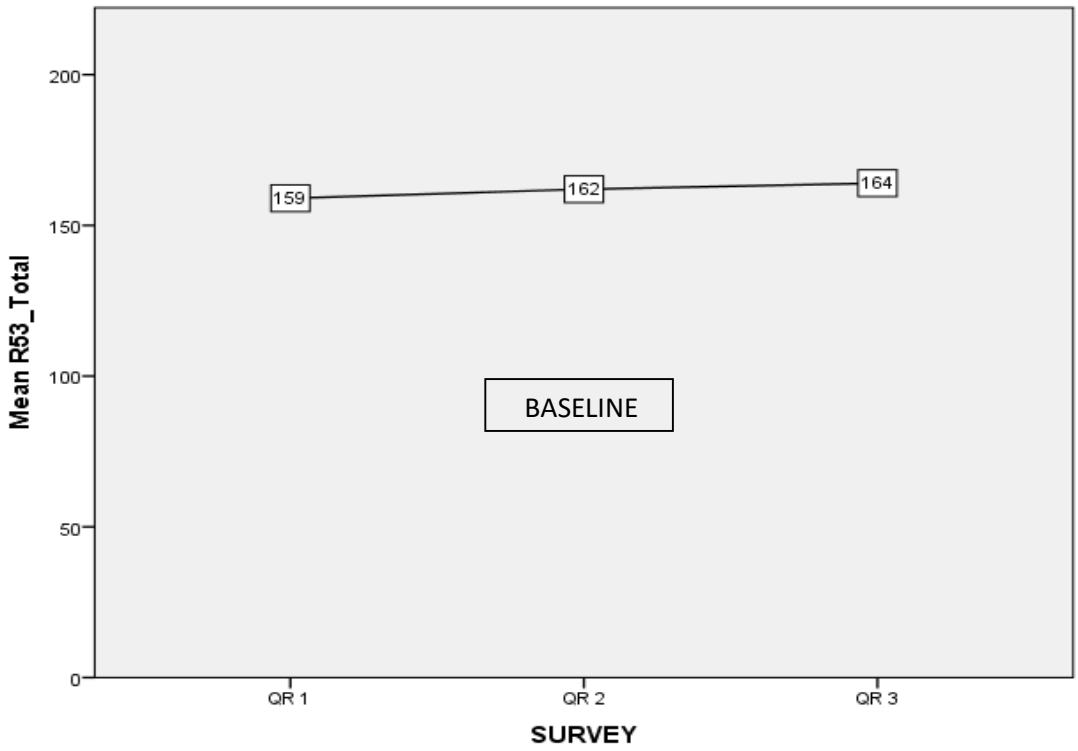
This woman was 28 years old and speaks Marathi. She is a graduate, works, and lives in a joint extended family.There are five people living in the house and the family income is between rupees 3 to 6 Lacs. She does not have garbage bins to store wet and dry waste. Dongarwadi in Ramnagar is a hilly area and there are no trolleys available to carry waste. So she fills the mixed waste in a plastic bag and throws it in a pit near the hill.

In baseline data collection, researcher used to visit Dongarwadi in the morning, afternoon, or evening depending on the availability of case at the same place.

While collecting the baseline it was observed that KAP level was low. She was busy with her work andavailable to talk in the morning. The Pre Intervention measurement scores are presented in Graph No. 4.4.53.

Graph No. 4.4.53

Pre Intervention Measurement Scores of Case No. 53



Case No. 54:

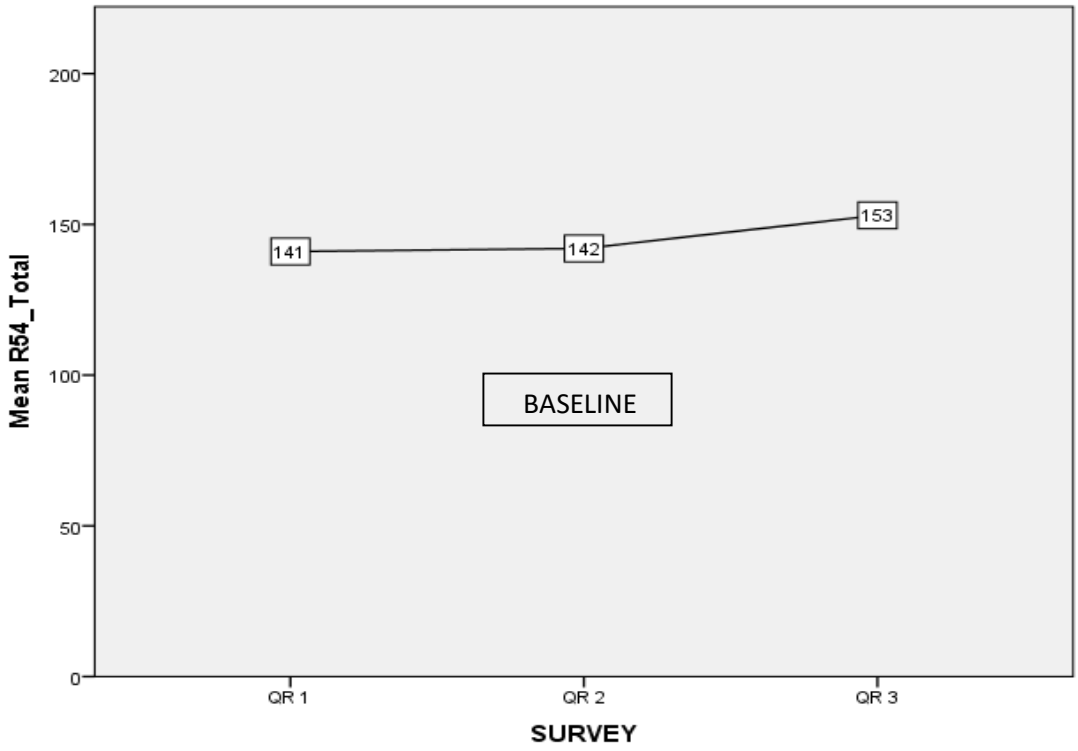
This woman was 30 years old and speaks Marathi. She has completed primary education and is a housewife in a nuclear family. There are four people living in the house and the family income is between rupees 3 to 6 Lacs. She has no knowledge about the types and classification of waste. She told that the administration has not conducted any awareness campaign in Dongarwadi area, so she collects the waste in a plastic bag and throws it on the roadside.

In baseline data collection, researcher used to visit Dongarwadi in the morning, afternoon, or evening depending on the availability of case at the same slum.

While collecting the baseline, it was found that the level of awareness was low. She was busy with household chores, fresh to talk in the afternoon. The Pre Intervention measurement scores are presented in Graph No. 4.4.54.

Graph No. 4.4.54

Pre Intervention Measurement Scores of Case No. 54



Case No. 55:

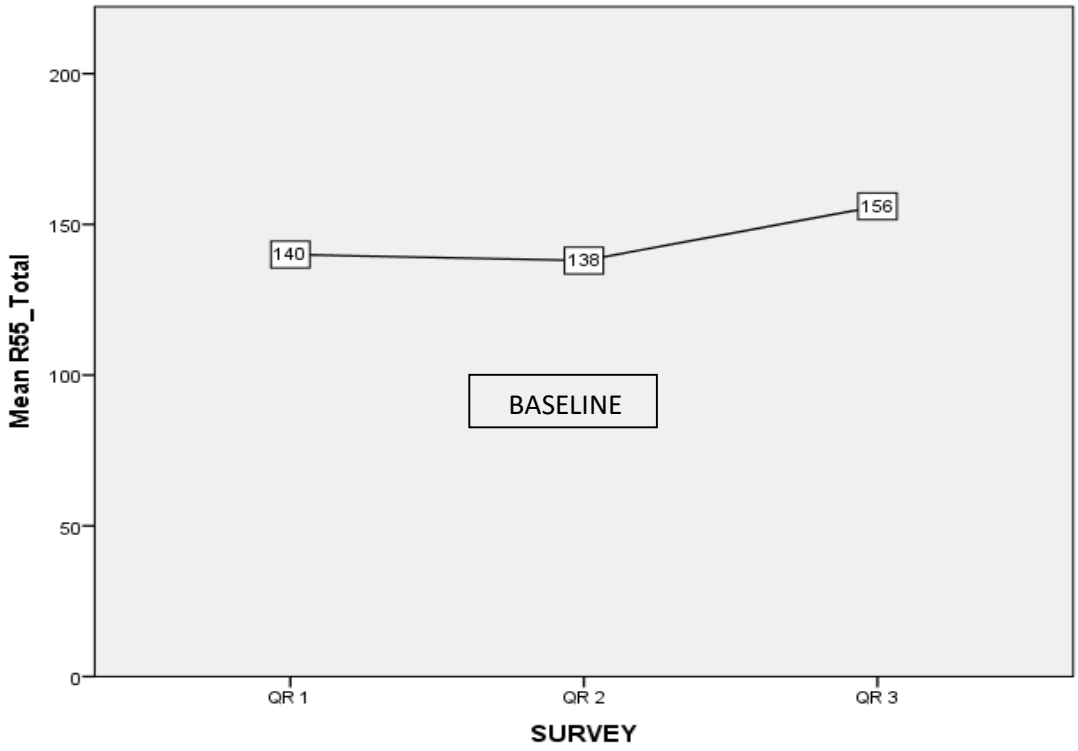
This man was 30 years old and speaks Marathi. He has completed secondary education and is employed and lives in a joint extended family. There are three people living in the house and the family income is between rupees 3 to 6 Lacs. He doesn't know about waste segregation. He doesn't have separate waste bins to separate wet and dry waste. He collects the waste in plastic bags and throws it on the river bank while going to work.

In baseline data collection, researcher visited to Dongarwadi in the morning, afternoon, or evening depending on the availability of case at the place.

During baseline collection, it was found that KAP level was low. He was busy with his work, available to talk in the evenings and on holidays. The Pre Intervention measurement scores are presented in Graph No. 4.4.55.

Graph No. 4.4.55

Pre Intervention Measurement Scores of Case No. 55



PART - D

4.5 Social Work Intervention

4.5.1 Description of Intervention

It was observed that a huge problem of garbage had arisen in the areas of Siddhivinayak Colony, MHADA Colony, Gokulnagarpathar, Sanyognagar, Gosavi Vasti and Dongarwadi in the Warje area of Pune City. Theses 6 communities are selected for research study in study area. Many problems had arisen due to garbage in these areas, leading to health issues. The citizens of these areas were unaware of garbage segregation, due to which mixed garbage was being thrown on the road and large piles of garbage were piled up in many places. The citizens of these 6 areas needed to get proper guidance from the administration regarding garbage segregation. Social Work Intervention was conducted in six sections of Warje area. Ten respondents were selected from each section and a group leader was selected. Five respondents were taken from the last section, a total of 55 respondents participated in this.

Various sessions were conducted in this areas by officials of the SWaCH Sanstha and the Pune Municipal Corporation's Health Department, on the basis of which citizens were guided about waste segregation, health hazards of waste and the adverse effects of waste on the environment.

4.5.2 Details of sessions conducted during Research Period

Pre and Post Intervention sessions

For Siddhivinayak Colony, Mhada Colony, Gokulnagar Pathar, Sahyog Nagar Gosavi vasti, Dongarwadi at Warje area

Table No. 4.5.1

Details of sessions conducted during Research Period

No	Month	Session Topic	Resource Person Details	Name of the Area
1	3 June 2023	Types of Waste Group Leader- **Vasundhara Suryawanshi**	Bharti Adagale of SWaCH Sanstha& R. Pujari DSI-PMC	Siddhivinayak Colony
	8 June	Waste & Its Effects	Punam Sarate of SWaCH	

	2023	on Health and Environment	Sanstha	
	14 June 2023	Need of Waste Segregation	Bharti Adagale of SWaCH Sanstha	
	18 June 2023	Types of Waste & demonstration of with 3 colour Dustbins	Bharti Adagale of SWaCH Sanstha& RakeshPujari DSI- PMC, Patole-Mukadam	
	22 June 2023	Selfie With Kachara Rally Garbage Awareness Rally KAP Sessions and Demos	RWA, SWaCH Santha & PMC Officials	
	26 June 2023	Practical demonstration of Waste with 3 colour Dustbins	By Bharti Adagale of SWaCH Sanstha& DSI-PMC R. Pujari.	
	July 2023	Waste Segregation Demonstration at Source	By Punam Sarate, Bharti Adagale of SWaCH Sanstha and D. Dalvi - SI-PMC, S. Savant- Si- Pmc, Mukadam S. Barate	
2	9 June 2023	Types of Waste Group Leader-**Sunita Adagale**	By Bharti Adagale of SWaCH Sanstha&RakeshPujariDsi-Pmc	Mhada Colony
	6 & 13 June 2023	Effects of Waste on Health and Environment	Bharti Adagale of SWaCH Sanstha	
	15 JUNE 2023	Need of Waste Segregation	Bharti Adagale of SWaCH Sanstha	

	18 June 2023	Types of Waste & demonstration of with 3 colour Dustbins	Bharti Adagale of SWaCH Sanstha&Rakesh PujariDsi-Pmc	
	22 June 2023	Selfie With Kachara Rally Awareness Rally KAP Sessions and Demo	By RWA, SWaCH Santha& PMC Officials	
	26 June 2023	Practical demonstration of Waste with 3 colour Dustbins	By Bharti Adagale of SWaCH Sanstha& DSI R. Pujari, Patole Mukadam	
	2 July 2023	Waste Segregation Demonstration at Source	By Punam Sarate, Bharti Adagale of SWaCH Sanstha and By D. Dalvi - SI- PMC, S. Savant- SI- PMC S. Barate	
3	1 June 2023	Information- Types of Waste Group Leader- **Sunita Gharte, Madhuri Bhanavase, Asha Kayte**	By Punam Sarate& Swati Patil of SWaCH Santha	Gokulnagar Pathar
	7 June 2023	Waste & Its Effects on Health and Environment	Swati Patil of SWaCH Santha	
	15 June 2023	Need of Waste Segregation	Punam Sarate of SWaCH Santha	
	18 June 2023	Demonstration Waste segregating with 3 colour Dustbins	Punam Sarate, Bharti Adagale of SWaCH Sanstha And S. Savant- SI- PMC	
	22 June	Selfie With Kachara	By RWA, SWaCH Santha	

	2023	Rally Awareness sessions KAP Sessions and Demonstration at 6 places	& Pmc Officials and Staff	
	28 June 2023	Practical demonstration of Garbage segregation with 3 colour coded Dustbins	By Bharti Adagale of SWaCH Sanstha& DSI- R. Pujari.	
	2 July 2023	Waste Segregation Demonstration at Households	By Punam Sarate, Bharti Adagale of SWaCH Sanstha And Session By D. Dalvi - SI- PMC, S. Savant- SI- PMC	
4	25 May 2023	Types of Waste-information session Group Leader-**Popat Hemgude**	By Punam Sarate& Swati Patil of SWaCH Santha	Sahyog Nagar
	5 June 2023	Effects of Garbage on Health and Environment	By Bharti Adagale & Swati Patil of SWaCH Santha	
	15 June 2023	Importance and Need of Waste Segregation	Punam Sarate and Bharti Adagale of SWaCH Santha	
	18 June 2023	Practical demonstrations of Waste Segregation with 3 colour Dustbins	PMC Officials	
	22 June 2023	Selfie With Kachara Rally KAP Sessions Segregation Demos	By SWaCH Santha &PMC Officials	
	26 June	Practical	By Bharti Adagale of	

	2023	demonstration of Garbage segregation at the houses of problematic area	SWaCH Sanstha & DSI R. Pujari, Patole- Mukadam	
	2 July 2023	Waste Segregation Demonstration at source	By Punam Sarate, Bharti Adagale of SWaCH Sanstha And Session By D. Dalvi - SI- PMC, S. Savant- SI- PMC	
5	25 May 2023	Types of Waste and Awareness Group Leader- **SindhuMurkute**	By Punam Sarate& Swati Patil of SWaCH Santha	Gosavi Vasti
	2 June 2023	Effects of Waste on Health and Environment	Punam Sarate of SWaCH Sanstha	
	13 June 2023	Need of Waste Segregation	Bharti Adagale of SWaCH Sanstha	
	18 June 2023	Types of Waste & demonstration of with 3 colour Dustbins	Bharti Adagale of SWaCH Sanstha& Rakesh Pujari DSI- PMC, Patole-Mukadam	
	22 June 2023	Selfie With Kachara Rally Waste Awareness Rally, Demos, Sessions	By SWaCH Santha &PMC Officials	
	26 June 2023	Practical Demos of Type of Waste &segregation	By Swati Patil of SWaCH Sanstha& S. Savant – SI-PMC	
	2 July 2023	Practical Waste Segregation Demonstration at the	By Punam Sarate, Bharti Adagale of SWaCH Sanstha And Session By	

		area	D. Dalvi - SI- PMC, S. Savant- SI- PMC	
6	3 June 2023	Types of Waste Information session Group Leader- **Pushpavati Kadam**	By Punam Sarate& Swati Patil of SWaCH Santha	Dongarwadi
	10 June 2023	Waste & Its Effects on Health and Environment	Punam Sarate of SWaCH Sanstha	
	15 June 2023	Need of Waste Segregation	Bharti Adagale of SWaCH Sanstha	
	18 June 2023	Types of Waste & demonstration of with 3 colour Dustbins	Bharti Adagale of SWaCH Sanstha&Rakesh Pujari DSI- PMC Patole- Mukadam	
	22 June 2023	Selfie With Kachara Rally Garbage Awareness Rally KAP Sessions and Demos	By SWaCH Santha & PMC Officials	
	26 June 2023	Practical Demonstration of Waste Segregation	By Swati Patil of SWaCH Sanstha & S. Savant – SI- PMC	
	2 July 2023	Waste Segregation Demonstration at Source in that area	By Punam Sarate, Bharti Adagale of SWaCH Sanstha And Session By D. Dalvi - SI- PMC S. Savant- SI- PMC	

4.5.3 Description about Sessions

INTERVENTION SESSION - I

18 JUNE 2023

Types of Waste & Its Effects on Human and Environment

By Bharti Adagale of SWaCH Sanstha & Rakesh Pujari DSI-PMC.

Introduction to waste types and their classification

Types of Household waste explained

- **Wet waste - Biodegradable waste**
  Cooking ingredients, food leftovers, garden waste
- **Dry waste and recyclable waste explained**
  Plastic, paper, glass and metal
- **Hazardous waste explained**
  Medicines, batteries, paints, chemicals
- **E-waste explained**
  Outdated and defective mobiles, chargers, broken and defective electronic and electrical equipment
- **Sanitary waste explained**
  Different diapers, sanitary pads and medical cotton
- **Visual aids were used**
  Posters, videos, live demos with colour Bins, pamphlets

Health hazards of improper segregation explained

- **Wet waste**
  It causes foul smell, breeding of mosquitoes and flies
  Food and water borne diseases like dengue, cholera, diarrhoea
- **Dry waste hazards like plastic and wrappers**
  Block drains, air pollution due to burn and micro plastics enter the food chain
- **Sanitary waste**
  Mixing with other waste creates a risk of infection
- **Hazardous waste**
  Poisoning, respiratory diseases and skin allergies
- **E-waste**
  Heavy metals such as lead and mercury, which affect brain development and cause kidney and liver damage.

Risk of improper segregation on Environment explained

- **Impact of climate change**

  Landfills emit methane which is a potent greenhouse gas.
- **Air pollution**

  Burning plastic and mixed waste produces toxic gases.
- **Water pollution**

  Liquids from mixed waste dumps contaminate groundwater.
- **Soil pollution**

  Chemicals, plastics and metals pollute the soil and reduce soil fertility.
- **Threat to wildlife**

  Animals ingesting plastic, causes illness and death.

INTERVENTION SESSION II

Selfie with Kachara: Waste Awareness Rally Report

22 JUNE 2023

Selfie With Kachara Rally Sessions & Demonstration By SWaCH Santha, Group Leaders &PMC Officials

Programme Overview:

- A community awareness rally on waste segregation was organized in collaboration with Vitthalnagar- Gokulnagar -Sahyog Nagar -Malwadi Resident Welfare Association (RWA) members, SWaCH Sanstha and corporator as well as social workers.
- Participation: 1200 students and around 300 citizens, including group leaders, RWA members, women, school teachers and community members.

Key Points:

1. **Rally and Participation**

- Students, RWA members, citizens and press Reporters also actively participated in the rally promoting waste segregation.
- Selfies, videos and group photographs were taken to capture the enthusiasm and collective spirit.

2. **Awareness Sessions**

- Knowledge-Attitude-Practice (KAP) based awareness sessions were organized at 6 major waste problem locations during the rally.

  Focus Areas

- Importance of waste segregation at source
- Health benefits for all
- Environmental protection and benefits
- Individual and community responsibility.

3. **Demonstration**

- Group leaders, PMC and SWaCH Sanstha staff presented a demonstration of waste segregation at 6 problem areas.
- Examples of biodegradable, recyclable and hazardous waste were displayed by showing bins with colour codes of green, blue and red.

4. **Community Participation**

- Inclusivity was ensured through the active participation of school teachers, students, women and local citizens.
- During the rally, students acted as agents of change by spreading messages through slogans, information boards and posters in the affected areas.

5. **Slogans and Motivation**

- Leaders of groups promoting cleanliness and waste segregation, SWaCH office bearers and participating citizens gave various slogans like 'SWaCHWarje Sundar Warje'.
- Community participation created an enthusiastic and inspiring atmosphere.

6. **Result of the rally**

- Awareness about waste segregation increased among families and citizens.
- Positive attitude of citizens in problem areas increased.
- Citizens were motivated to adopt segregation practically at the household level.
- Community-organizational ties of citizens in problem areas with PMC and SWaCH Sanstha were strengthened.

7. **FEEDBACK OF MEMBERS:**

- The impact of this rally was to successfully mobilize students and citizens, impart practical knowledge through KAP sessions and demonstrations, and created a sense of community responsibility towards sustainable waste management.

INTERVENTION SESSION III

PI 3 -26 JUNE 2023

By Bharti Adagale of SWaCH Sanstha& R. Pujari DSI of PMC.

Attitude based intervention sessions for waste segregation.

Sense of shared responsibility

- It was explained that waste management is not only the duty of PMCs, social organizations and private institutions but it is the responsibility of every household.
- Awareness of shared responsibility of the community was conveyed.
- Guidance and discussion were given on how collective efforts reduce health hazards and keep the surroundings clean.
- Emphasis was placed on the approach of 'My waste, my responsibility'.

Environment and Family health

- Family welfare means clean homes - fewer hospital visits - healthier life and more savings was shown through pictures.
- The ill effects of mixed waste - clogged drains and channels, the accumulation of garbage leading to the activities of rats, pigs, and dogs, it were shown in the video.
- Information was given on the close relationship between the surrounding environment and family health.
- How improper segregation affects children's health and causes diseases due to flies and mosquitoes, it was shown through pictures.

The benefits of motivation and positive thinking

These slogans were given by group leaders and citizens during the discussion session.

- *'SWaCHPune Sundar Pune'*
- *'SWaCHWarje Sundar Warje'*
- *'MaziVasundharaMajhiJababdari'*
- *'Kara Ola SukaKacharaVegala - SundarJivanAnubhava'*
- *'Ola Kachara Compost Kara- SundarBagaFulva'*
- *'SWaCH Vatavaran- NirogiJivan'*

Positive reinforcement, recognition and acceptance

- 'Star (Clean) Family Award' announced for homes that segregate.
- The segregated family was publicly praised in the session and inspired others.

- Families were encouraged to inspire their neighbours.
- It was decided to hold monthly meetings to share experiences, successes and challenges.
- It was decided to involve schools and RWAs - Resident Welfare Associations to ensure long-term attitude change.
- It was announced to share models and stories of waste segregation from wards and colonies to keep the momentum going.

Misunderstandings and resistance.

The following misconceptions are clarified.

- Segregation is time-consuming. In reality, it only takes 1 or 2 minutes.
- All waste is mixed by collectors.

Provided guidance for

- Collection of segregated waste is mandatory in many cities as per municipal bylaws.
- Open dialogue sessions are needed for the community to share challenges and find solutions together.

Expected results regarding attitude change due to the session

- They think that waste segregation is the responsibility and duty of the family individually.
- They see segregation as a positive, beneficial, and feasible practice.
- They feel proud of contributing to a clean environment and a healthy community.

INTERVENTION SESSION IV

2 JULY 2023

Session & Waste Segregation Demonstration

By PoonamSarate, Bharti Adagale of SWaCH Sanstha and Session by D. Dalvi -SI-PMC, S. Savant- SI- PMC

Expected outcomes of the practice

- Family members should consistently segregate waste at the source.
- Reduce the amount of mixed waste going to landfill.
- Family members should start recycling and composting regularly.
- Make segregation a continuous daily habit, not a one-time.

Practical demonstration of waste segregation was shown.

Live demonstration of 3 Dustbin system

- **Green Dustbin** - Wet and biodegradable waste
  Food waste and stale food, vegetable peels and unusable parts
- **Blue Dustbin** - Dry and recyclable waste
  Plastic, glass, paper
- **Red Dustbin** - Hazardous and hygiene waste
  Diapers, sanitary pads, medicines

Allocation and consumption of segregation kits (Bins)

- The households were given 3 colour bins.
- Stickers were given with wet, dry and hazardous written on them.
- Each household was asked to make a photo and video of themselves separating the waste into the correct bins.
- They were asked to upload such videos on their group heads, SWaCH Sanstha, PMC officers and the 'Garbage Segregation' group.
- They were encouraged to show 'Garbage Segregation' to their neighbours and encourage them.

Training at household level

- Volunteers, Group leaders, SWaCH Sanstha officers and PMC health workers started visiting the houses in the problem areas and guiding the family members on daily waste disposal.
- Families were encouraged to use wet waste bins while cooking.
- Family members were trained to segregate the daily waste immediately.

Composting Practice with Optional Modules

- Simple composting techniques for wet waste were demonstrated.
- Pot composting, pit composting and compost bags
- Families were demonstrated how to use compost for gardening or community gardens.
- Simple and low-cost models were taught
- A bucket with holes and a clay pot

Practice Monitoring and Feedback Campaign

- Weekly inspections are conducted by the Group Leaders and Vitthalnagar-Gokulnagar -Sahyog Nagar -Malwadi Resident Welfare Association (RWA) members to monitor segregation at source from their groups.

- Inspection and feedback visits are conducted - segregation errors are gently corrected such as plastic and paper in wet bins
- Household segregation challenges like 'Weekly Clean Segregation Campaign' are organized.

Recycling and safe disposal methods practice

- Families were guided on how to sell dry waste such as plastic, paper and empty bottles to recyclers.
- A demonstration was given on how to safely store e-waste and hazardous waste until official collection.
- A demonstration was given on how to wrap sanitary waste in newspapers with red colour for safe handling.

To maintain consistency in the segregation routine

- Families were encouraged to make isolation a daily habit, linked to a routine of wet bin after meals and dry bin after shopping.
- Monthly follow-up meetings were held to share experiences, problems and solutions.
- What's App groups and noticeboard were created for reminders and tips.

Rewards, Prize and Honour

- The homes of families that segregated properly were given 'Star Segregator and Green House of Warje' stickers.
- The best performing families were publicly recognized during the weekly community meetings.
- Such families were given the opportunity to share their experiences with others.

4.5.4. Principles of Community Organization followed by Researcher during Research Process

Applying the principles of community organization of H. Y. Siddique in the research process.

Community organization is an essential approach in social research, such as when the study is related to the real-life situations of people, such as waste management, health, and social welfare. The researcher's application of the principles of community organization ensures that the research process is not only scientific but also ethical, participatory and socially relevant.

1. **The Principle of Specific Objectives:** A community organization should focus on achieving specific, clearly defined objectives to meet the needs of specific clients.
2. **The Principle of Planning:** Effective planning is critical for anticipating problems and developing programs that are consistent with community goals.
3. **The principle of people participation** Active and broad participation of community members is absolutely necessary to identify needs, formulate strategies, and ensure ownership of the development process
4. **Principle of working democratically:** Decisions should be made democratically, the voices of community members should be heard, and community members should be involved in the decision-making process.
5. **Principle of Inter group approach:** This principle emphasizes and places special importance on building relationships and cooperation between different groups in the community to create a united front.
6. **Principle of Cultural orientation:** The approach should be sensitive to the culture of the community, respecting and gaining acceptance for cultural values and norms, while also working to challenge harmful practices.
7. **Principle of Flexible organisation:** The organizational structure should be adaptable and equitable to the diverse capabilities and needs of community members.
8. **Principle of Optimum utilization of Resources:** Community organizers should identify and work to make the best use of resources that already exist in the community, rather than relying solely on external help.

Finally, applying community organizing principles to research transforms the process into a participatory and empowering one. This ensures that research not only generates academic knowledge but also contributes to social change and community development in all areas.

4.5.5 Evaluation of Community Organisation according KAP

KAP MODEL : Waste segregation for Community Organisation

This table links the KAP elements directly to the principles of community organizing and specifies measurable indicators, practical tools also expected outcomes. It is detailed enough for a methodology and evaluation framework.

Table No. 4.5.2

KAP MODEL : Waste segregation for Community Organisation

KAP Measurements or Dimensions	KEY INDICATORS	METHOD OR TOOLS	OUT COMES
Knowledge	Awareness and Recognition of Wet, Dry and Hazardous Garbage	Structured Questionnaire	Community members can properly and correctly identify waste classes.
	Risk of Poor Segregation for Health and Environment	Home to Home Survey	High awareness about risks and benefits
	Introduction to municipal regulations such as the PMC 2 Dustbin system and fines.	Discussions at awareness sessions of PMC officials and SWaCH Sanstha.	Good knowledge of official rules and systems
	Understanding the benefits of composting, recycling, and a clean environment		
	Information sources such as PMCs, NGOs, Education system and media		

Attitude	Perception or Understanding about waste Segregation imp or load-burden, optional	Focus group discussions FGDs	Positive about Waste Segregation
	Sense of Individual vs. collective responsibility	Attitude Rating Scale, Questionnaire and FGDs	Increased willingness to join campaign for waste
	Faith in the PMC Waste Management	Questionnaire and key informant Interviews Community leaders, group leaders, PMC officers and employees, NGO members	Trust Increased
	Social Norms or Rules related to Segregation connected to civic pride, culture and cleanliness or Hygiene	Discussions during session	Increased sense of civic responsibility
	Willingness and readiness to change behavior (use of	Discussions during sessions	There was a change in the behaviour

	separate dustbins and composting		
Practice	Segregation of Wet and Dry Waste in separate Dustbins at Home Consistency in Wet and Dry Segregation Community based (level) initiatives (collective composting and waste audits)	Observation while collecting waste at Garbage vehicle (Tempo) Waste Audit- Observation of citizens giving Waste in Garbage vehicle (tempo) Session effect	Improvement in segregation rates at household and community levels A decrease in mixed waste was recorded. Started at 3 Societies
Community Organisation aspects (blended) integrated to KAP	Mobilisation- Organising people- Awareness Sessions by PMC Authorities and SWaCH Sanstha Participation- Community participation in decision-making processes and campaigns Leadership- Social	6 Group leaders and citizens of affected area was present. Session Photos and Record Community involvement in the sessions and Selfie with Kachara Rally Interviews of	Strong community ownership of waste segregation Positive change in behaviour Empowered and

	activist, Role of RWA (Resident Welfare Association), NGOs, Community chief, Group leaders, Waste pickers	Stakeholders	Capable local leadership
	Capacity building-training workshops and volunteer involvement	Community involvement and Scorecard	Dependence on external agencies decreased
	Sustainability-Continuity of Segregation practices even after intervention	Follow up	Improved Wet, Dry and Hazardous Segregation

4.5.6. Evaluation and Closing of Community organisation Process:

- **Introduction**

A community-based organizational intervention was initiated to improve waste segregation practices among urban households. The research followed the K-Knowledge, A-Attitude and P-Practice (KAP) model as the intervention and evaluation framework. The intervention sessions in this process included awareness sessions, demonstrations, capacity-building workshops, Selfie with Garbage rallies and monitoring visits.

4.5.6.1 Evaluation of the Knowledge

Pre-intervention and post-intervention surveys were conducted to assess the household's current knowledge and understanding of waste segregation.

- Types of waste Wet waste, dry waste, hazardous waste and e-waste.

- Health and environmental impacts and risks of improper waste disposal.
- Municipal regulations and penalties related to waste segregation.

Out come

- Awareness of households regarding waste segregation was found to have increased significantly after the interventions.
- More than 95% of households could correctly identify wet waste, dry waste, hazardous waste and e-waste.
- Families' knowledge about the harmful effects of plastic increased significantly.

4.5.6.2 Evaluation of the Attitude

The perception of households and their willingness to accept segregation was assessed using an attitude scale questionnaire and focus group discussions.

The following indicators were assessed for this:

- Motivation for cleanliness.
- Sense of community responsibility.
- Willingness to cooperate with SWaCH Sanstha workers and waste collectors of PMC.

Outcome

- Positive attitude change was observed in women, children and resident welfare groups.
- Families showed readiness for waste segregation and actively participated in rallies.
- Resistance levels such as apathy and neglect were reduced by 70%.

4.5.6.3 Evaluation of the Practice

- Waste collection became regular and smooth after SWaCH launched 6 waste collection tempos in the affected areas.
- Household level observations by Group Leaders, SWaCH Sanstha staff as well as analysis of Pune Municipal Corporation records were analysed.

The following indicators assessed

- The actual adoption of three-dustbin systems by the families.
- The consistency of the families in separation practices.

- The participation of the families in recycling.

Outcome

- About 90-95% of the households started segregating waste consistently.
- There was a significant reduction in the mixed waste given to the SWaCH Sanstha garbage truck.
- 12 households started composting on a small scale.
- There was a gap between slums and low income groups, which required continuous efforts.

4.5.7 Closing of Community organisation: The final phase

4.5.7.1 Review of objectives

- The objectives of awareness, knowledge, attitude change and adoption of practices were reconsidered.
- Most of the objectives were achieved, but long-term sustainability remains a challenge.

4.5.7.2 Community Feedback

- Feedback was collected from families, school teachers, group leaders, women's groups, social workers, SWaCH Sanstha as well as PMC waste collectors and officials.
- Families expressed the need for continuous follow-up and support from the SWaCH Sanstha and Pune Municipal Corporation for waste segregation and regular waste collection.
- Residents demanded better infrastructure such as waste segregation posters, instructions-guidance and penal action from the authorities, more dustbins, more waste vehicles and door-to-door waste collection system.

4.5.7.3 Transfer and sustainability of the Initiative

- The responsibility of monitoring was entrusted to Vitthalnagar- Gokulnagar - Sahyog Nagar -Malwadi Resident Welfare Association (RWA), 6 Group Leaders, SWaCH Institute, Social Workers and Local NGOs.
- 6 Group Leaders, 5 women and 1 man, were selected from the community as Garbage Volunteers to work as "Green Ambassadors".

- This initiative was linked to ongoing initiatives of the Pune Municipal Corporation like SWaCH Bharat Mission, Adar Poonawalla Clean City Initiative (APCCI) and SWaCH survey.

4.5.7.4 Documentation and Reporting

- A comprehensive evaluation report was prepared, covering Changes in knowledge- attitudes and practices (KAP), information and examples of successful initiatives as well as challenges and recommendations for policy support.

4.5.7.5 Formal Closing Ceremony

- A community meeting was organized by the group leaders and SWaCH Sanstha to officially conclude the intervention. In this, Pune Municipal Corporation Employees and Officials of Health Department interacted with the citizens.
- The families that successfully segregated waste were given the 'SWaCH Kutumb Sundar Kutumb' award by the Resident's Welfare Association (RWA). Stickers like 'Star Segregator' and 'Green House of Warje' were put up on their houses.
- At the event, the Pune Municipal Officials of Health Department assured of continued collaboration with the local groups.
- The event focused on shifting from research-centric initiatives to community-owned initiatives.

4.5.7.6 Evaluation and Conclusion Outcomes

- Knowledge: Families became more aware of waste segregation, PMC rules and waste side effects.
- Attitude: A strong positive mind set of the family and citizens towards waste management was developed.
- Practice: Majority of the families in the problem areas adopted waste segregation
- Sustainability: Local representation and Pune Municipal Corporation relationship ensure continuity.

- Conclusion: The community organization process was formally closed by transferring the capacity to the community stakeholders.

4.5.8 Conclusions

- The evaluation confirmed significant improvements in the relevant KAPs (Knowledge, Attitude and Practice) regarding waste segregation among urban households.
- The final phase ensured sustainability by empowering the urban communities and connecting them with Group Leaders, NGOs as well as Local Pune Municipal Officials of Health Department.
- This process highlights that, when combined with planned consistent follow-up and support from the local municipal government, such effective community organization can transform waste management practices.

PART - E

4.6 Post Intervention Measurement

Subsequent to the completion of the intervention, the instrument of Knowledge, Attitude and Practice was administered again to the subjects and the scores of the post intervention measurement were recorded. To ensure the reliability of the information collected during post intervention measurement, same instrument was administered and it was repeated immediate after intervention to identify changes in the segregation of waste. This was purposefully done to ensure that the change should be near permanent. Subject wise and group wise pre and post intervention scores, graphs and test results are presented below. The result shows that the gap of knowledge, attitude and practice reduced in post intervention.

Siddhivinayak Colony : Case No. 1

Table 4.6.1

Pre and Post Intervention Scores of Case 1

Case Summaries

		R1PRE INTERVENTION QR1, QR2, QR3 SCORE	R1 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	135	100
	2	142	84
	3	149	77
	Mean	142.00	87.00
	Std. Deviation	7.000	11.790

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R1 POST INTERVENTION PI1, PI2, PI3 SCORE - R1PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R1 POST INTERVENTION PI1, PI2, PI3 SCORE < R1PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R1 POST INTERVENTION PI1, PI2, PI3 SCORE > R1PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R1 POST INTERVENTION PI1, PI2, PI3 SCORE = R1PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R1 POST INTERVENTION PI1, PI2, PI3 SCORE - R1PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

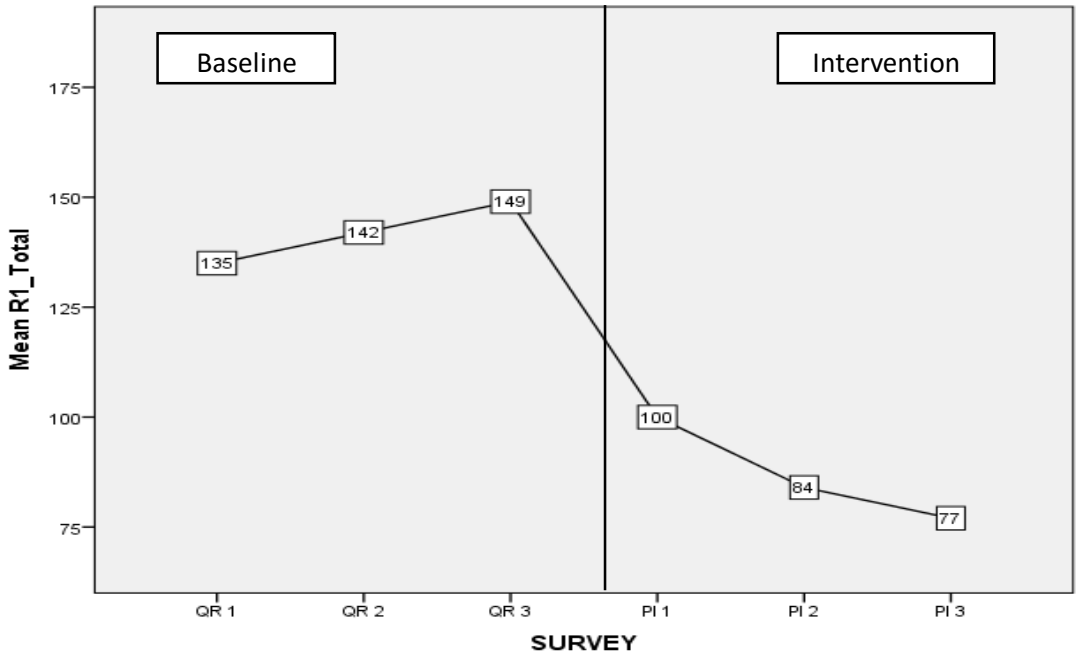
b. Based on positive ranks.

The result of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Graph No. 4.6.1

Pre and Post Intervention Graph Case 1



Repeated Measures

The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase.This indicates that the social work intervention was effective.

To know if the decreasing trend is statically significant, Two Standard Deviation method was used. The results of the tests are shown below

Mean Score = 142

σ(Standard Deviation) = 7

2σ =14

Range = Mean Pre Interventions Score ± 2σ

= 142 ± 14

= 156 to 128

In the case of group of subjects as a single subject all the post interventions scores (Table 4.6.1) are below the lowest value of the range (128). Hence, we can infer that the intervention with the group was effective. In other words we can say that the intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table No. 4.6.1) are below the lowest value of the range (128). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 2

Table No. 4.6.2

Pre and Post Intervention Scores of Case 2

Case Summaries[a]

		R2 PRE INTERVENTION QR1, QR2, QR3 SCORE	R2 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	136	98
	2	150	74
	3	158	77
	Mean	148.00	83.00
	Std. Deviation	11.136	13.077

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R2 POST INTERVENTION PI1, PI2, PI3 SCORE - R2 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R2 POST INTERVENTION PI1, PI2, PI3 SCORE < R2 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R2 POST INTERVENTION PI1, PI2, PI3 SCORE > R2 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R2 POST INTERVENTION PI1, PI2, PI3 SCORE = R2 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R2 POST INTERVENTION PI1, PI2, PI3 SCORE - R2 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

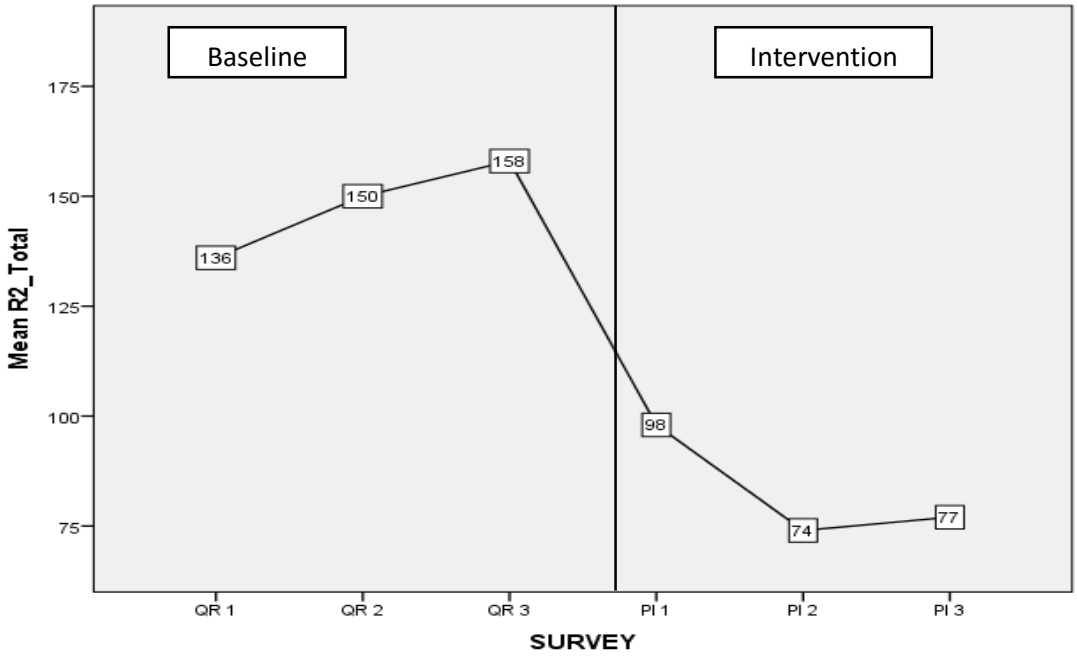
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Graph No. 4.6.2

Pre and Post Intervention Graph Case 2



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 148

σ(Standard Deviation) = 11.136

2σ = 22.272

Range = Mean Pre Interventions Score ± 2σ

= 148 ± 22.272

= 170.272 to 125.728

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.2) are below the lowest value of the range (125.728). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 3

Table No. 4.6.3

Pre and Post Intervention Scores of Case 3

Case Summaries[a]

		R3 PRE INTERVENTION QR1, QR2, QR3 SCORE	R3POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	139	102
	2	143	82
	3	158	80
	Mean	146.67	88.00
	Std. Deviation	10.017	12.166

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R3POST INTERVENTION PI1, PI2, PI3 SCORE - R3 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R3POST INTERVENTION PI1, PI2, PI3 SCORE < R3 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R3POST INTERVENTION PI1, PI2, PI3 SCORE > R3 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R3POST INTERVENTION PI1, PI2, PI3 SCORE = R3 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R3POST INTERVENTION PI1, PI2, PI3 SCORE - R3 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

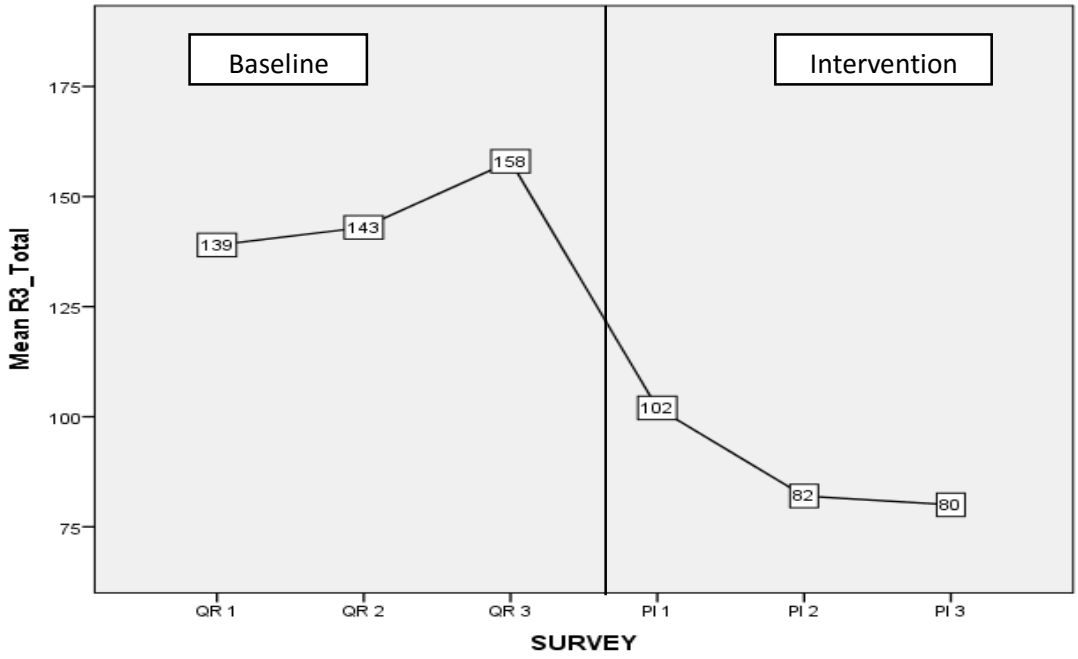
a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.3

Pre and Post Intervention Graph Case 3



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 146.67

σ(Standard Deviation) = 10.017

2σ = 20.034

Range = Mean Pre Interventions Score ± 2σ

= 146.67 ± 20.034

= 166.704 to126.636

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.3) are below the lowest value of the range (126.636). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 4

Table No. 4.6.4

Pre and Post Intervention Scores of Case 4

Case Summaries[a]

		R4 PRE INTERVENTION QR1, QR2, QR3 SCORE	R4 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	144	82
	2	143	84
	3	146	74
	Mean	144.33	80.00
	Std. Deviation	1.528	5.292

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R4 POST INTERVENTION PI1, PI2, PI3 SCORE - R4 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R4 POST INTERVENTION PI1, PI2, PI3 SCORE < R4 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R4 POST INTERVENTION PI1, PI2, PI3 SCORE > R4 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R4 POST INTERVENTION PI1, PI2, PI3 SCORE = R4 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R4 POST INTERVENTION PI1, PI2, PI3 SCORE - R4 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

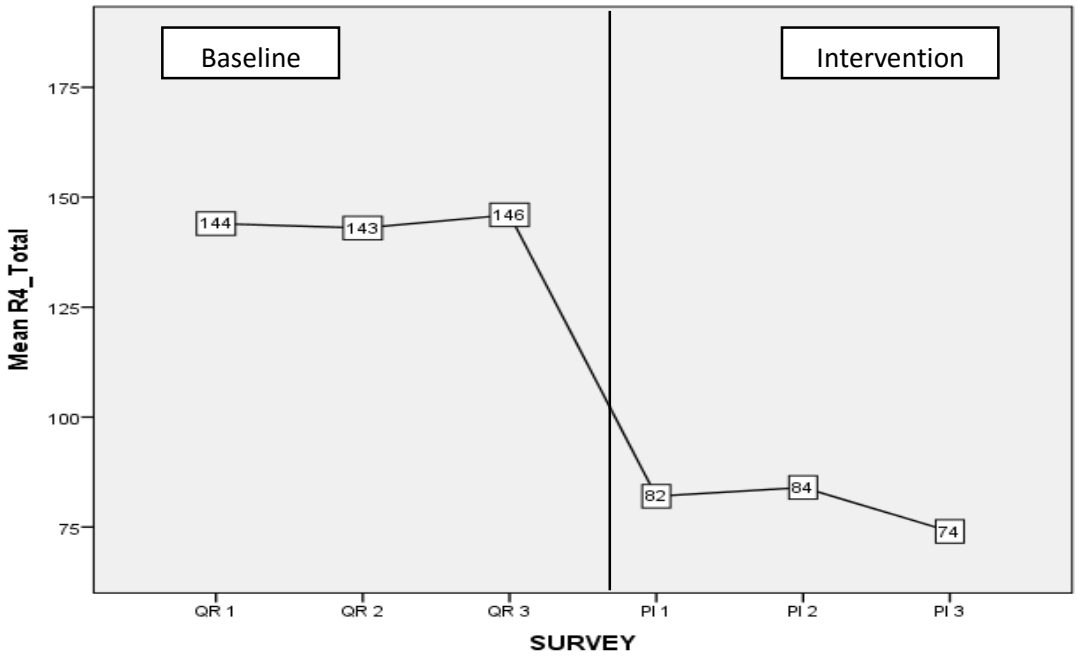
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.4

Pre and Post Intervention Graph Case 4



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 144.33

σ(Standard Deviation) = 1.528

2σ = 3.056

Range = Mean Pre Interventions Score ± 2σ

= 144.33 ± 3.056

= 147.386 to 141.274

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.4) are below the lowest value of the range (141.274). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 5

Table 4.6.5

Pre and Post Intervention Scores of Case 5

Case Summaries[a]

		R5 PRE INTERVENTION QR1, QR2, QR3 SCORE	R5 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	135	87
	2	151	79
	3	149	76
	Mean	145.00	80.67
	Std. Deviation	8.718	5.686

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R5 POST INTERVENTION PI1, PI2, PI3 SCORE - R5 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R5 POST INTERVENTION PI1, PI2, PI3 SCORE < R5 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R5 POST INTERVENTION PI1, PI2, PI3 SCORE > R5 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R5 POST INTERVENTION PI1, PI2, PI3 SCORE = R5 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R5 POST INTERVENTION PI1, PI2, PI3 SCORE - R5 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

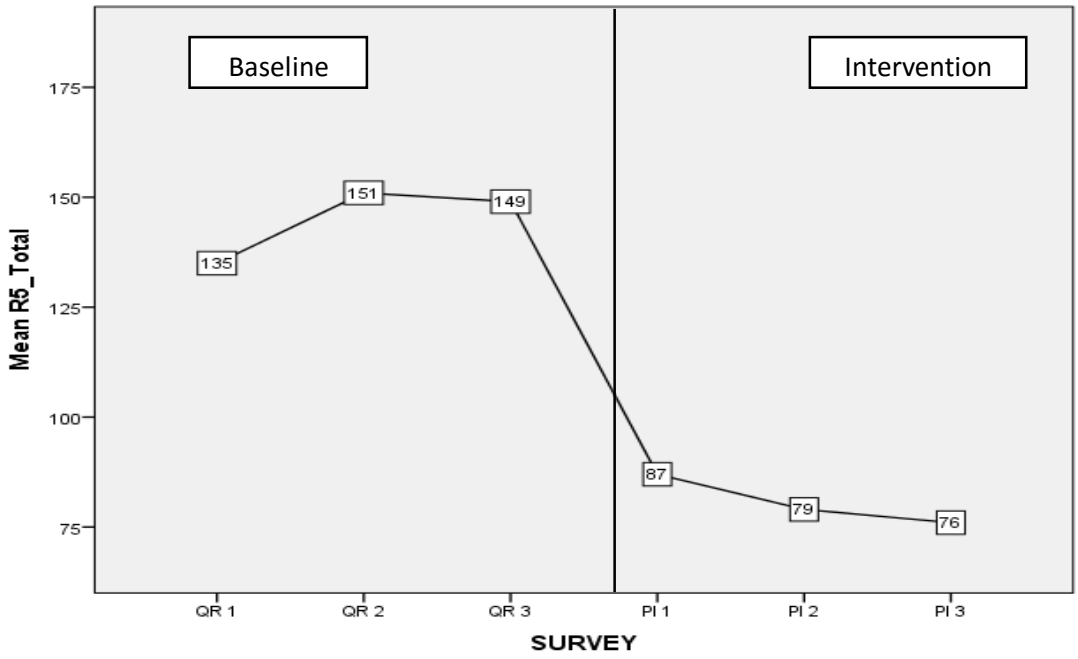
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.5

Pre and Post Intervention Graph Case 5



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 145

σ(Standard Deviation) = 8.718

2σ = 17.436

Range = Mean Pre Interventions Score ± 2σ

= 145 ± 17.436

= 162.436 to 127.564

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.5) are below the lowest value of the range (127.564). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 6

Table No. 4.6.6

Pre and Post Intervention Scores of Case 6

Case Summaries[a]

		R6 PRE INTERVENTION QR1, QR2, QR3 SCORE	R6 POST INTERVENTION PI1, PI2, PI3 SCORE
	1	141	102
	2	143	79
	3	147	74
Total	Mean	143.67	85.00
	Std. Deviation	3.055	14.933

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R6 POST INTERVENTION PI1, PI2, PI3 SCORE - R6 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R6 POST INTERVENTION PI1, PI2, PI3 SCORE < R6 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R6 POST INTERVENTION PI1, PI2, PI3 SCORE > R6 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R6 POST INTERVENTION PI1, PI2, PI3 SCORE = R6 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R6 POST INTERVENTION PI1, PI2, PI3 SCORE - R6 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

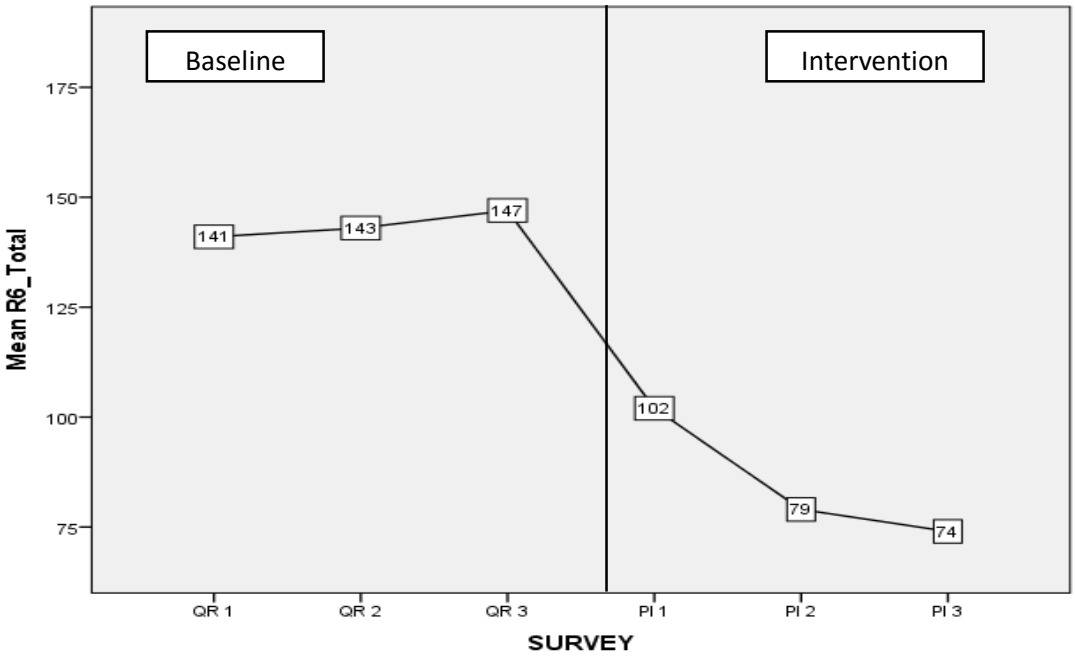
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.6

Pre and Post Intervention Graph Case 6



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 143.67

σ(Standard Deviation) = 3.055

$2\sigma = 6.11$

Range = Mean Pre Interventions Score $\pm 2\sigma$

$= 143.67 \pm 6.11$

= 149.78 to 137.56

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.6) are below the lowest value of the range (137.56). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 7

Table 4.6.7

Pre and Post Intervention Scores of Case 7

Case Summaries[a]

		R7 PRE INTERVENTION QR1, QR2, QR3 SCORE	R7 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	143	102
	2	146	82
	3	148	76
	Mean	145.67	86.67
	Std. Deviation	2.517	13.614

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R7 POST INTERVENTION PI1, PI2, PI3 SCORE - R7 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R7 POST INTERVENTION PI1, PI2, PI3 SCORE < R7 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R7 POST INTERVENTION PI1, PI2, PI3 SCORE > R7 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R7 POST INTERVENTION PI1, PI2, PI3 SCORE = R7 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R7 POST INTERVENTION PI1, PI2, PI3 SCORE - R7 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

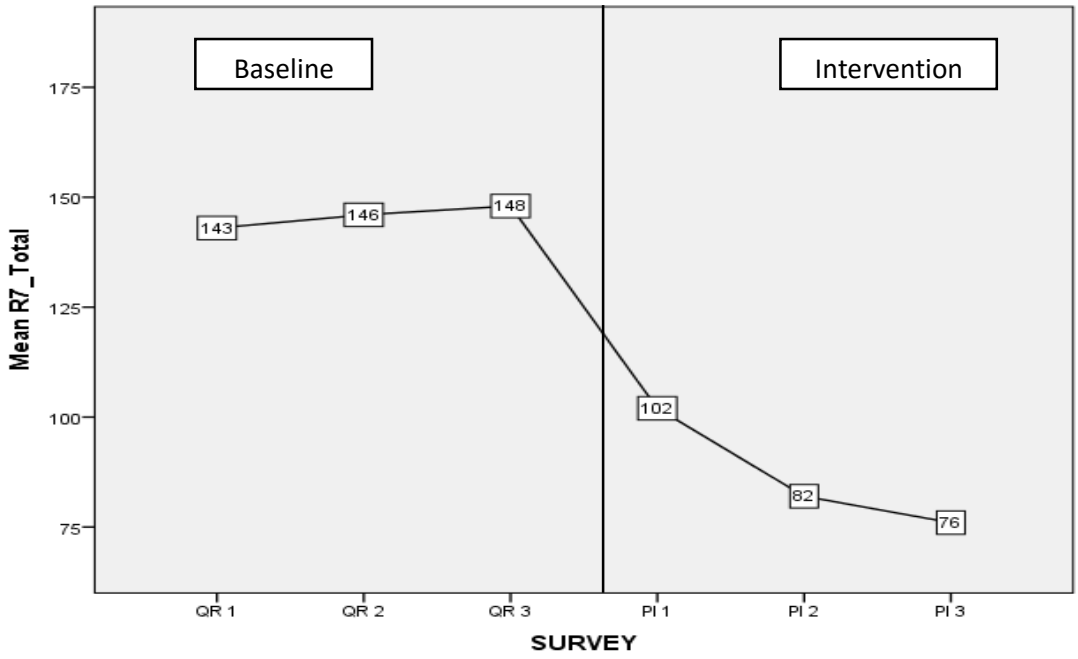
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.7

Pre and Post Intervention Graph Case 7



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 145.67

σ(Standard Deviation) = 2.517

$2\sigma = 5.034$

Range = Mean Pre Interventions Score $\pm 2\sigma$

= 145.67 ± 5.034

= 150.704 to 140.636

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.7) are below the lowest value of the range (140.636). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 8

Table 4.6.8

Pre and Post Intervention Scores of Case 8

Case Summaries[a]

		R8 PRE INTERVENTION QR1, QR2, QR3 SCORE	R8 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	135	100
	2	140	85
	3	150	78
	Mean	141.67	87.67
	Std. Deviation	7.638	11.240

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R8 POST INTERVENTION PI1, PI2, PI3 SCORE - R8 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R8 POST INTERVENTION PI1, PI2, PI3 SCORE < R8 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R8 POST INTERVENTION PI1, PI2, PI3 SCORE > R8 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R8 POST INTERVENTION PI1, PI2, PI3 SCORE = R8 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R8 POST INTERVENTION PI1, PI2, PI3 SCORE - R8 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

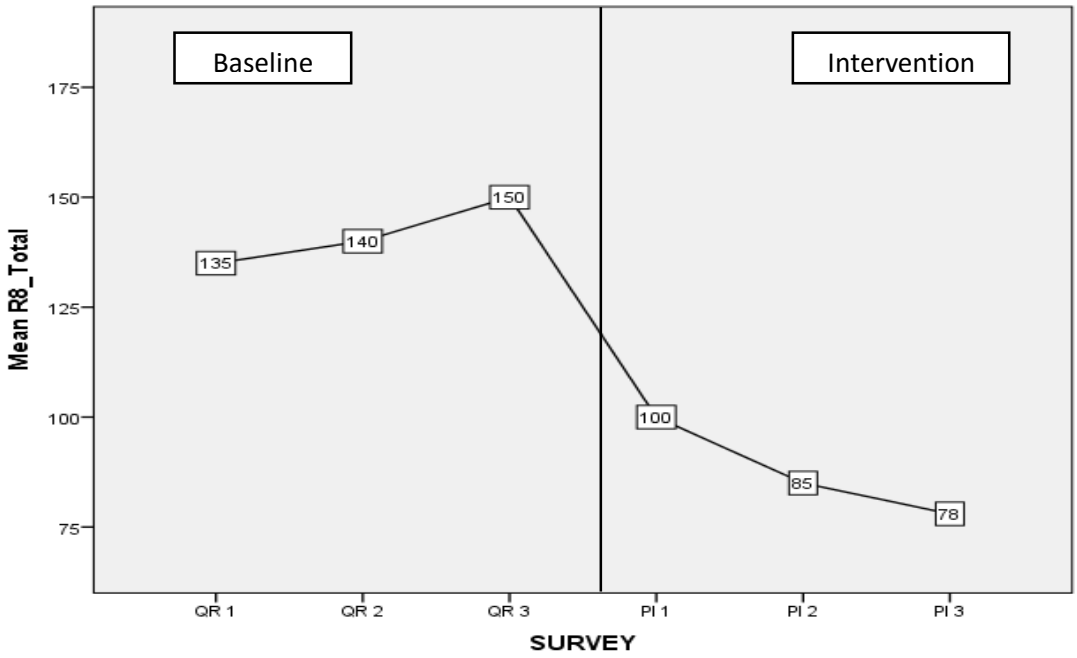
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.8

Pre and Post Intervention Graph Case 8



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 141.67

σ(Standard Deviation) = 7.638

2σ = 15.276

Range = Mean Pre Interventions Score ± 2σ

= 141.67 ± 15.276

= 156.946 to 126.394

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.8) are below the lowest value of the range (126.394). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 9

Table No. 4.6.9

Pre and Post Intervention Scores of Case 9

Case Summaries[a]

		R9 PRE INTERVENTION QR1, QR2, QR3 SCORE	R9 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	141	99
	2	141	86
	3	145	77
	Mean	142.33	87.33
	Std. Deviation	2.309	11.060

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R9 POST INTERVENTION PI1, PI2, PI3 SCORE - R9 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R9 POST INTERVENTION PI1, PI2, PI3 SCORE < R9 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R9 POST INTERVENTION PI1, PI2, PI3 SCORE > R9 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R9 POST INTERVENTION PI1, PI2, PI3 SCORE = R9 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R9 POST INTERVENTION PI1, PI2, PI3 SCORE - R9 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

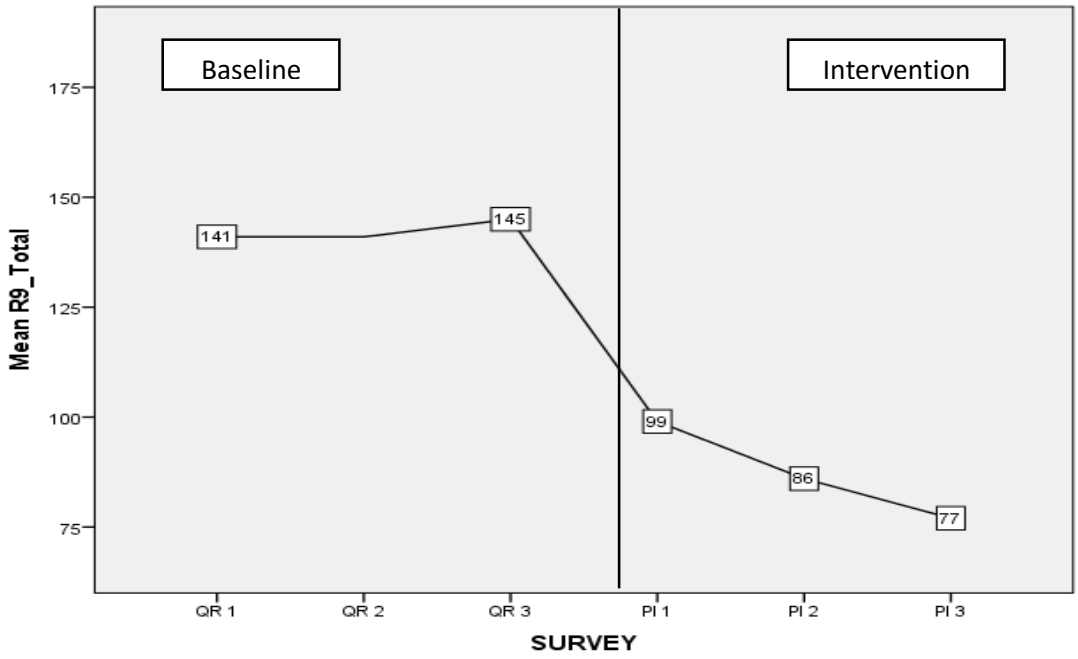
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.9

Pre and Post Intervention Graph Case 9



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 142.33

σ(Standard Deviation) = 2.309

2σ = 4.078

Range = Mean Pre Interventions Score ± 2σ

= 142.33 ± 4.078

= 146.408 to 138.252

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.9) are below the lowest value of the range (138.252). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 10

Table No. 4.6.10

Pre and Post Intervention Scores of Case 10

Case Summaries[a]

		R10 PRE INTERVENTION QR1, QR2, QR3 SCORE	R10 POST INTERVENTION PI1, PI2, PI3 SCORE
	1	137	87
	2	138	86
	3	155	76
Total	Mean	143.33	83.00
	Std. Deviation	10.116	6.083

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R10 POST INTERVENTION PI1, PI2, PI3 SCORE - R10 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R10 POST INTERVENTION PI1, PI2, PI3 SCORE < R10 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R10 POST INTERVENTION PI1, PI2, PI3 SCORE > R10 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R10 POST INTERVENTION PI1, PI2, PI3 SCORE = R10 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R10 POST INTERVENTION PI1, PI2, PI3 SCORE - R10 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

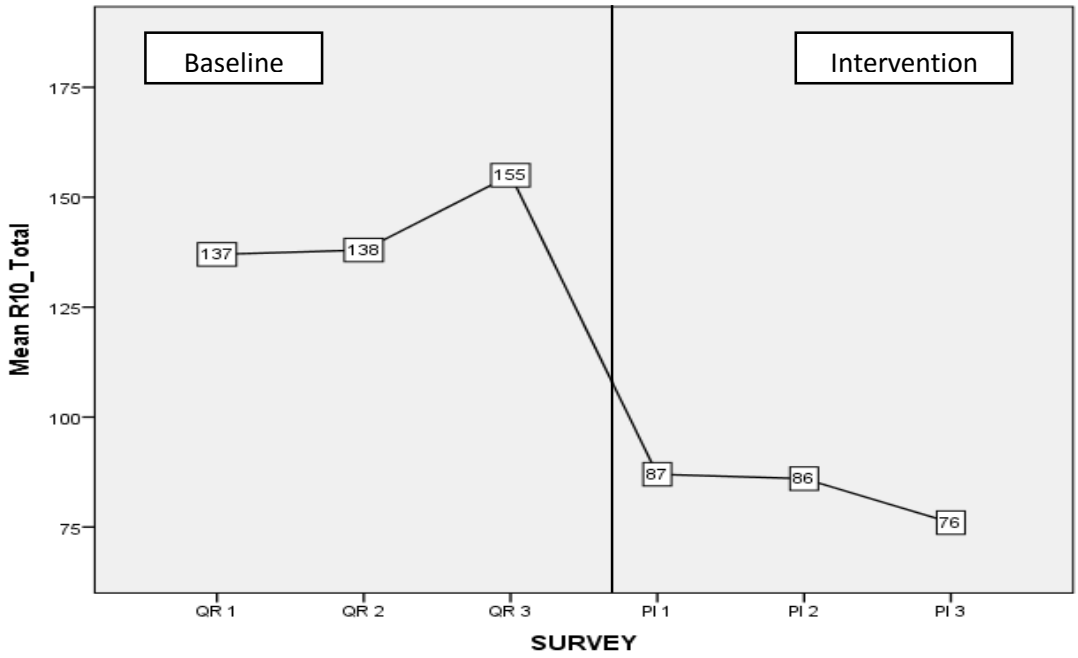
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.10

Pre and Post Intervention Graph Case 10



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 143.33

σ(Standard Deviation) = 10.116

2σ = 20.232

Range = Mean Pre Interventions Score ± 2σ

= 143.33 ± 20.232

= 163.562 to 123.098

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.10) are below the lowest value of the range (123.098). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

MAHADA COLONY

Case No. 11

Table No. 4.6.11

Pre and Post Intervention Scores of Case 11

Case Summaries[a]

		R11PRE INTERVENTION QR1, QR2, QR3 SCORE	R11 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	143	86
	2	146	86
	3	154	73
	Mean	147.67	81.67
	Std. Deviation	5.686	7.506

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R11 POST INTERVENTION PI1, PI2, PI3 SCORE - R11PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R11 POST INTERVENTION PI1, PI2, PI3 SCORE < R11PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R11 POST INTERVENTION PI1, PI2, PI3 SCORE > R11PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R11 POST INTERVENTION PI1, PI2, PI3 SCORE = R11PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R11 POST INTERVENTION PI1, PI2, PI3 SCORE - R11PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

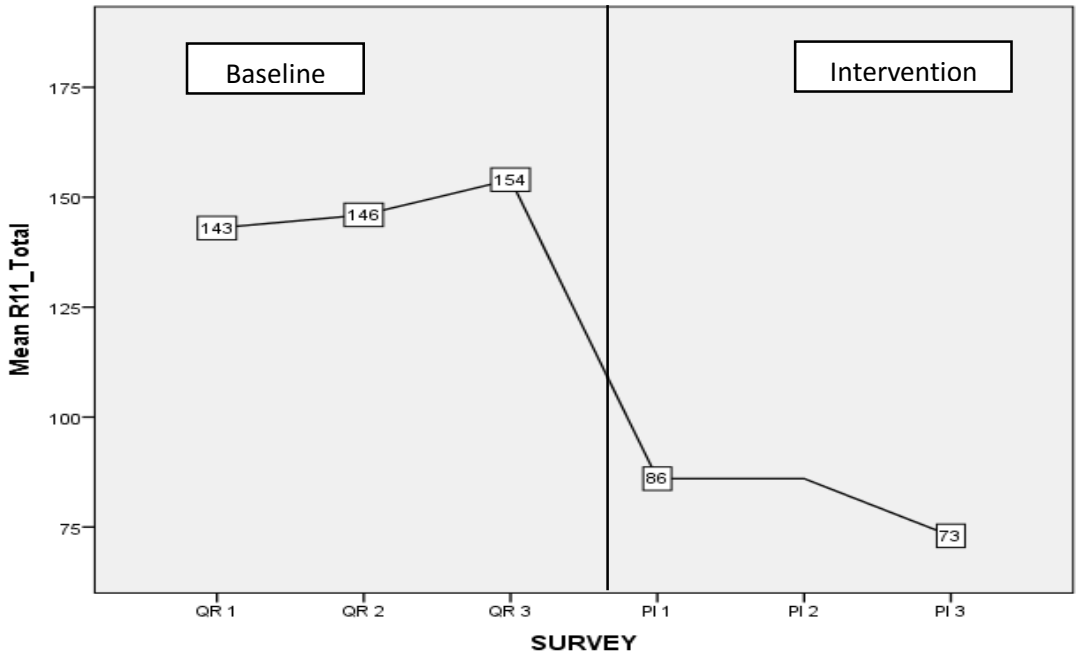
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.11

Pre and Post Intervention Graph Case 11



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 147.67

σ(Standard Deviation) = 5.686

$2\sigma = 11.372$

Range = Mean Pre Interventions Score $\pm 2\sigma$

= 147.67 ± 11.372

= 159.042 to 136.298

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.11) are below the lowest value of the range (136.298). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 12

Table No. 4.6.12

Pre and Post Intervention Scores of Case 12

Case Summaries[a]

		R12 PRE INTERVENTION QR1, QR2, QR3 SCORE	R12 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	146	90
	2	150	83
	3	159	75
	Mean	151.67	82.67
	Std. Deviation	6.658	7.506

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R12 POST INTERVENTION PI1, PI2, PI3 SCORE - R12 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R12 POST INTERVENTION PI1, PI2, PI3 SCORE < R12 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R12 POST INTERVENTION PI1, PI2, PI3 SCORE > R12 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R12 POST INTERVENTION PI1, PI2, PI3 SCORE = R12 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R12 POST INTERVENTION PI1, PI2, PI3 SCORE - R12 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

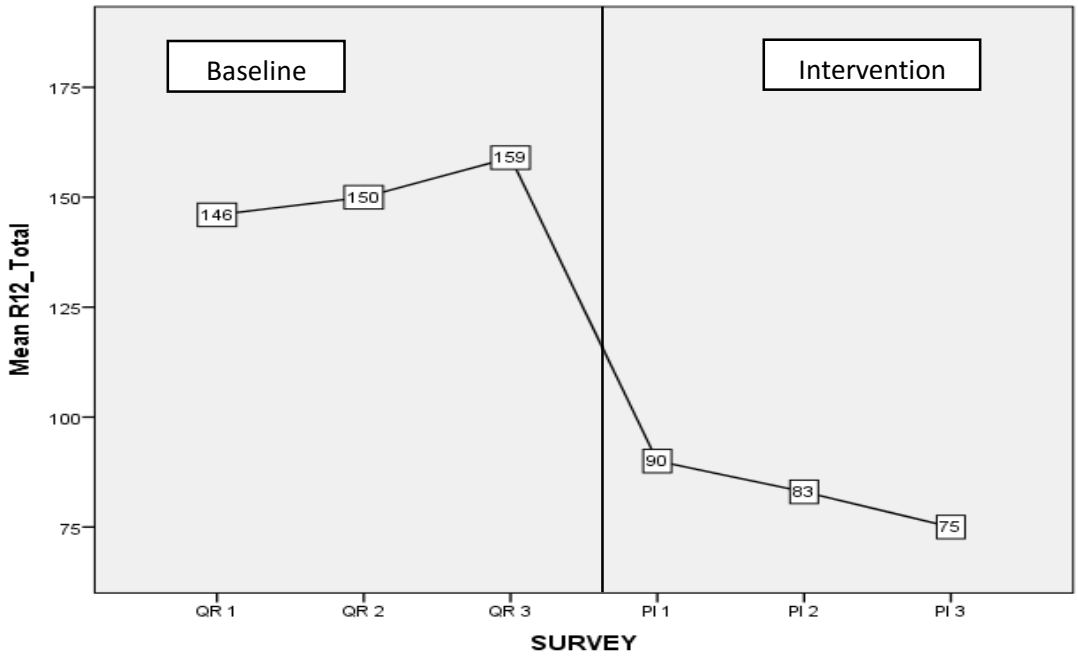
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.12

Pre and Post Intervention Graph Case 12



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 151.67

σ(Standard Deviation) = 6.658

2σ = 13.316

Range = Mean Pre Interventions Score ± 2σ

= 151.67 ± 13.316

= 164.986 to 138.354

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.12) are below the lowest value of the range (138.354). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 13

Table No. 4.6.13

Pre and Post Intervention Scores of Case 13

Case Summaries[a]

		R13 PRE INTERVENTION QR1, QR2, QR3 SCORE	R13POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	140	87
	2	141	82
	3	149	77
	Mean	143.33	82.00
	Std. Deviation	4.933	5.000

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R13POST INTERVENTION PI1, PI2, PI3 SCORE - R13 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R13POST INTERVENTION PI1, PI2, PI3 SCORE < R13 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R13POST INTERVENTION PI1, PI2, PI3 SCORE > R13 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R13POST INTERVENTION PI1, PI2, PI3 SCORE = R13 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R13POST INTERVENTION PI1, PI2, PI3 SCORE - R13 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

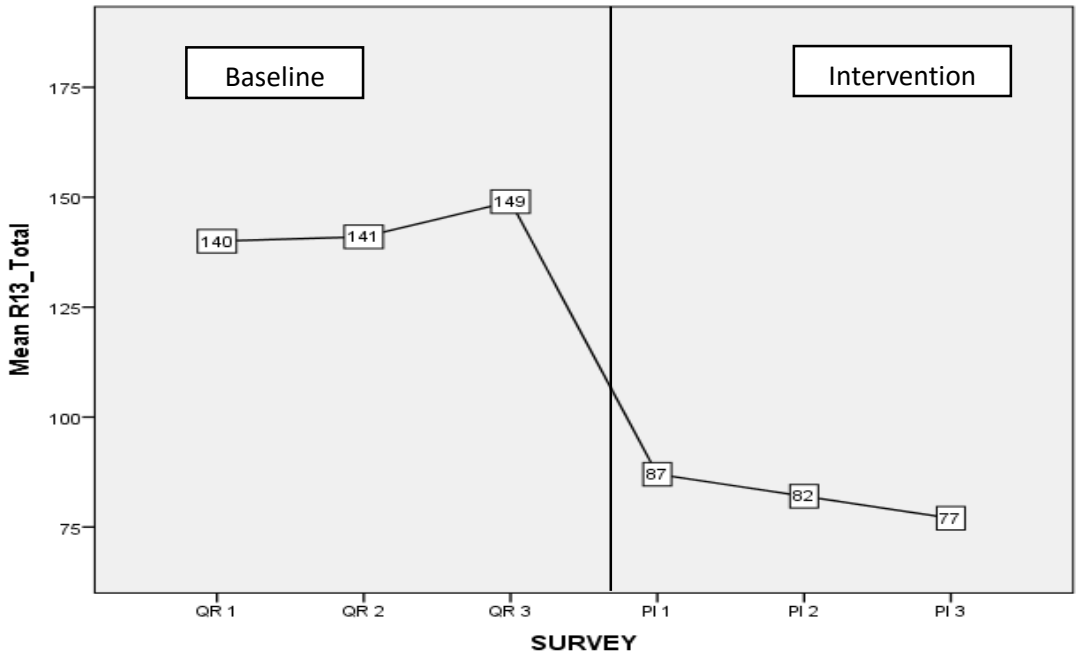
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.13

Pre and Post Intervention Graph Case 13



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 143.33

σ(Standard Deviation) = 4.933

$2\sigma = 9.866$

Range = Mean Pre Interventions Score ± 2σ

= 143.33 ± 9.866

= 153.196 to 133.464

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.13) are below the lowest value of the range (133.464). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 14

Table No. 4.6.14

Pre and Post Intervention Scores of Case 14

Case Summaries[a]

		R14 PRE INTERVENTION QR1, QR2, QR3 SCORE	R14 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	145	108
	2	156	88
	3	169	72
	Mean	156.67	89.33
	Std. Deviation	12.014	18.037

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R14 POST INTERVENTION PI1, PI2, PI3 SCORE - R14 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R14 POST INTERVENTION PI1, PI2, PI3 SCORE < R14 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R14 POST INTERVENTION PI1, PI2, PI3 SCORE > R14 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R14 POST INTERVENTION PI1, PI2, PI3 SCORE = R14 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R14 POST INTERVENTION PI1, PI2, PI3 SCORE - R14 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

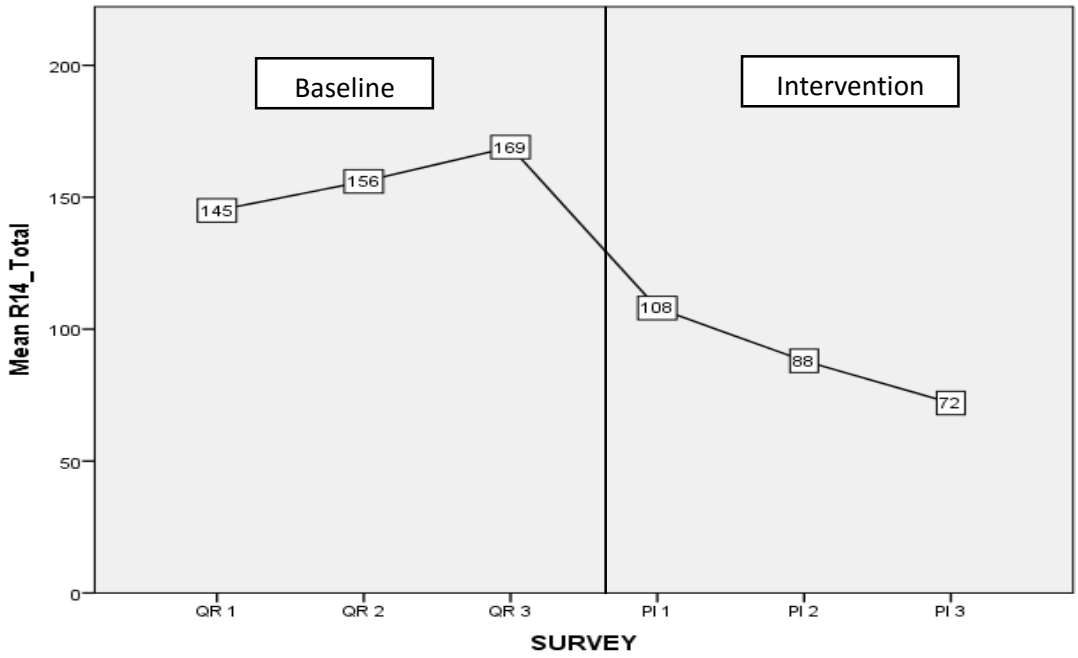
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.14

Pre and Post Intervention Graph Case 14



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 156.67

σ(Standard Deviation) = 12.014

2σ = 24.028

Range = Mean Pre Interventions Score ± 2σ

= 156.67 ± 24.028

= 180.698 to 132.642

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.14) are below the lowest value of the range (132.642). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 15

Table No. 4.6.15

Pre and Post Intervention Scores of Case 1

Case Summaries[a]

		R15 PRE INTERVENTION QR1, QR2, QR3 SCORE	R15 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	140	84
	2	142	82
	3	153	76
	Mean	145.00	80.67
	Std. Deviation	7.000	4.163

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R15 POST INTERVENTION PI1, PI2, PI3 SCORE - R15 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R15 POST INTERVENTION PI1, PI2, PI3 SCORE < R15 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R15 POST INTERVENTION PI1, PI2, PI3 SCORE > R15 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R15 POST INTERVENTION PI1, PI2, PI3 SCORE = R15 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R15 POST INTERVENTION PI1, PI2, PI3 SCORE - R15 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

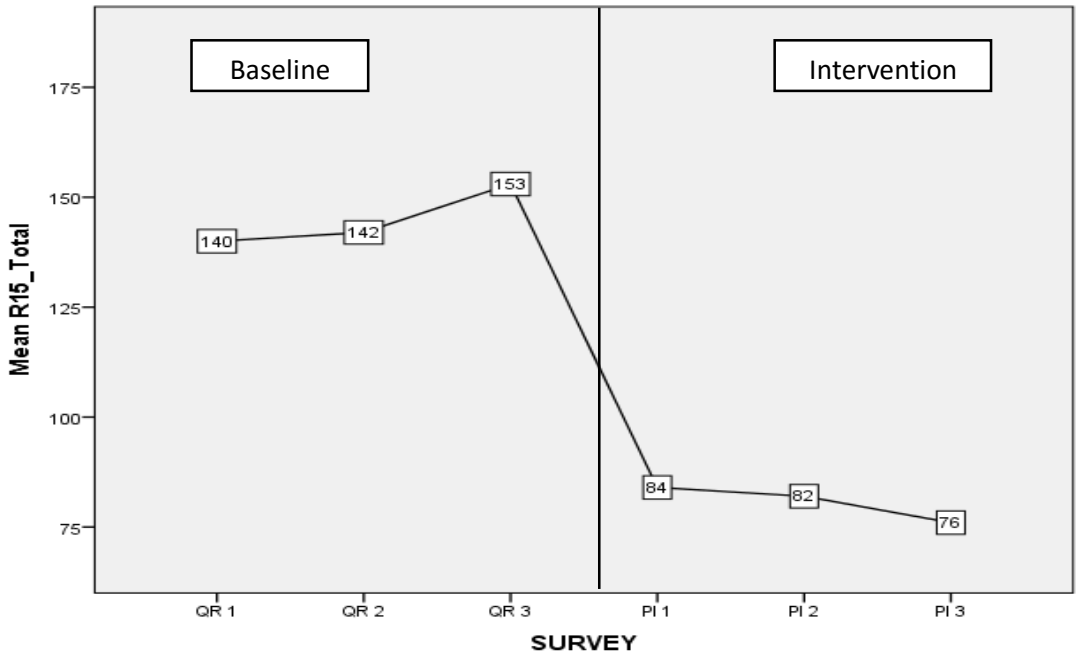
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.15

Pre and Post Intervention Graph Case 15



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 145.00

σ(Standard Deviation) = 7.000

$2\sigma = 14.000$

Range = Mean Pre Interventions Score $\pm 2\sigma$

$= 145.00 \pm 14.000$

= 159 to 131

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.15) are below the lowest value of the range (131). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 4.16

Table No. 4.6.16

Pre and Post Intervention Scores of Case 16

Case Summaries[a]

		R16 PRE INTERVENTION QR1, QR2, QR3 SCORE	R16 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	140	91
	2	143	85
	3	150	72
	Mean	144.33	82.67
	Std. Deviation	5.132	9.713

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R16 POST INTERVENTION PI1, PI2, PI3 SCORE - R16 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R16 POST INTERVENTION PI1, PI2, PI3 SCORE < R16 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R16 POST INTERVENTION PI1, PI2, PI3 SCORE > R16 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R16 POST INTERVENTION PI1, PI2, PI3 SCORE = R16 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R16 POST INTERVENTION PI1, PI2, PI3 SCORE - R16 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

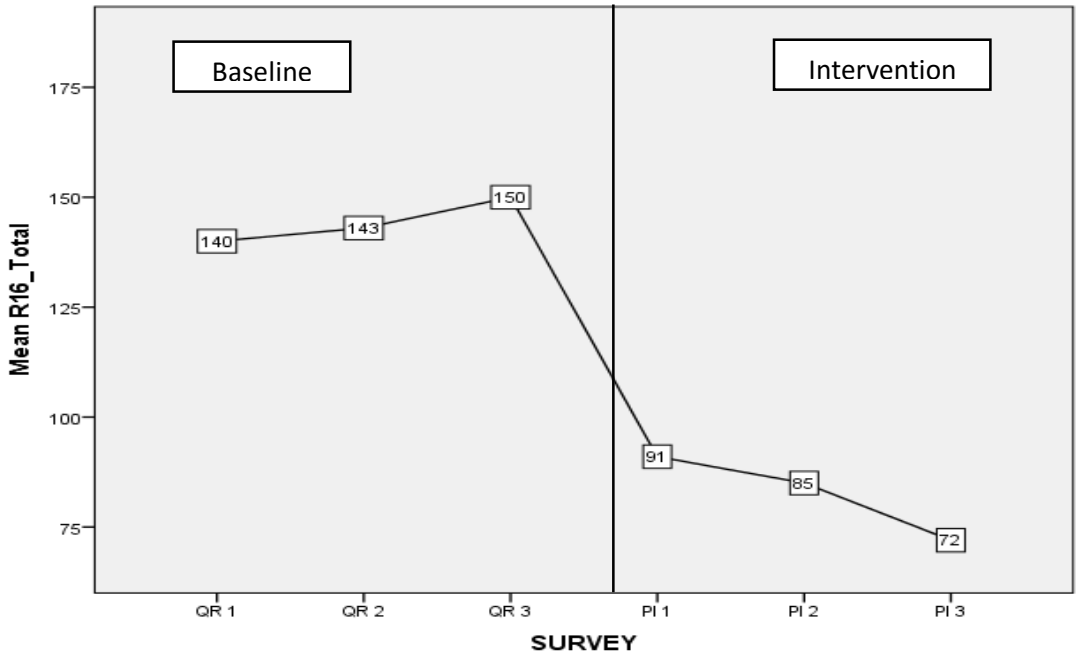
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.16

Pre and Post Intervention Graph Case 16



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 144.33

σ(Standard Deviation) = 5.132

$2\sigma = 10.264$

Range = MeanPre Interventions Score $\pm 2\sigma$

$= 144.33 \pm 10.264$

= 154.594 to 134.066

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.16) are below the lowest value of the range (134.066). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 17

Table No. 4.6.17

Pre and Post Intervention Scores of Case 17

Case Summaries[a]

		R17 PRE INTERVENTION QR1, QR2, QR3 SCORE	R17 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	152	95
	2	155	81
	3	173	72
	Mean	160.00	82.67
	Std. Deviation	11.358	11.590

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R17 POST INTERVENTION PI1, PI2, PI3 SCORE - R17 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R17 POST INTERVENTION PI1, PI2, PI3 SCORE < R17 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R17 POST INTERVENTION PI1, PI2, PI3 SCORE > R17 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R17 POST INTERVENTION PI1, PI2, PI3 SCORE = R17 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R17 POST INTERVENTION PI1, PI2, PI3 SCORE - R17 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

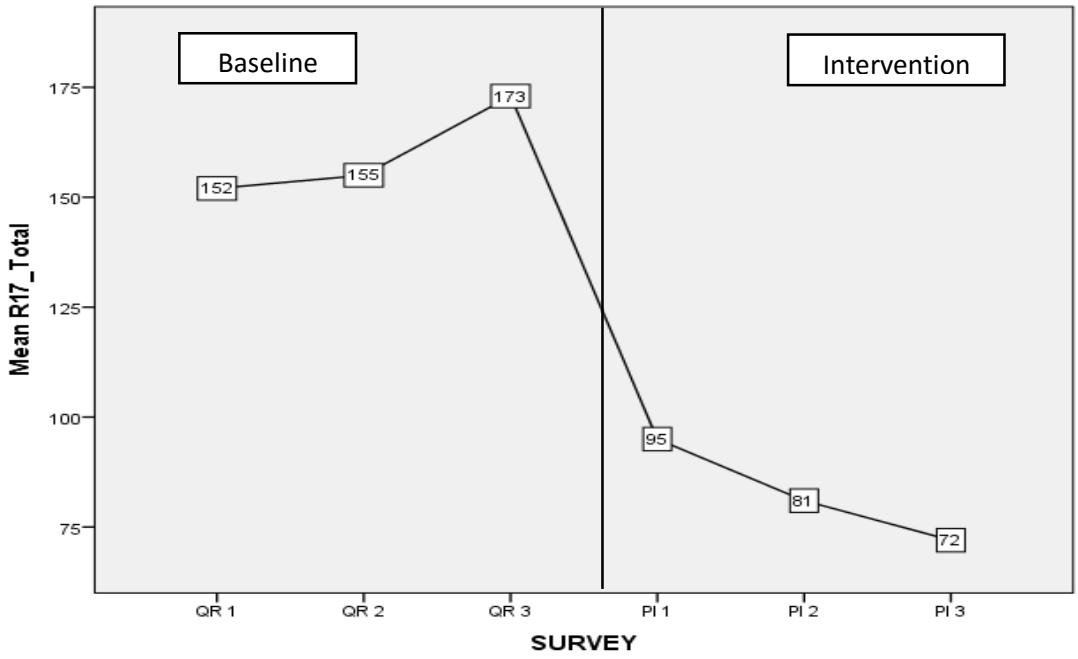
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.17

Pre and Post Intervention Graph Case 17



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 160.00

σ(Standard Deviation) = 11.358

$2\sigma = 22.716$

Range = Mean Pre Interventions Score $\pm 2\sigma$

= 160.00 ± 22.716

= 182.716 to 137.284

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.17) are below the lowest value of the range (137.284). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 18

Table No. 4.6.18

Pre and Post Intervention Scores of Case 18

Case Summaries[a]

		R18 PRE INTERVENTION QR1, QR2, QR3 SCORE	R18 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	135	83
	2	142	84
	3	153	73
	Mean	143.33	80.00
	Std. Deviation	9.074	6.083

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R18 POST INTERVENTION PI1, PI2, PI3 SCORE - R18 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R18 POST INTERVENTION PI1, PI2, PI3 SCORE < R18 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R18 POST INTERVENTION PI1, PI2, PI3 SCORE > R18 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R18 POST INTERVENTION PI1, PI2, PI3 SCORE = R18 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R18 POST INTERVENTION PI1, PI2, PI3 SCORE - R18 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

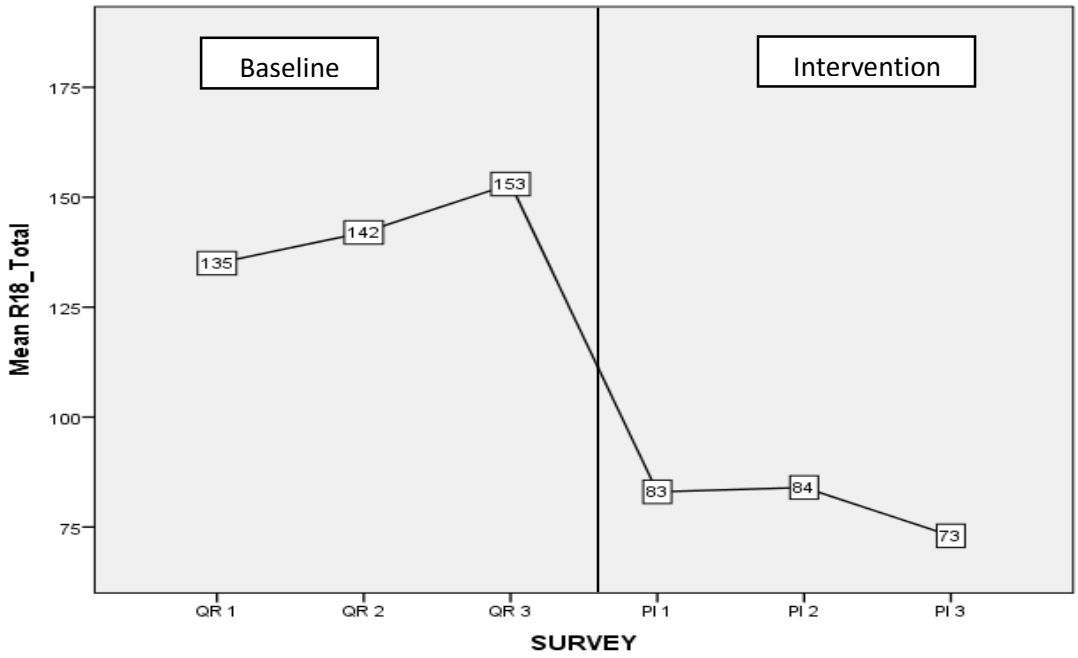
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.18

Pre and Post Intervention Graph Case 18



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 143.33

σ(Standard Deviation) = 9.074

2σ = 18.184

Range = Mean Pre Interventions Score ± 2σ

= 143.33 ± 18.184

= 161.478 to 125.146

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.18) are below the lowest value of the range (125.146). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 19

Table No. 4.6.19

Pre and Post Intervention Scores of Case 19

Case Summaries[a]

		R19 PRE INTERVENTION QR1, QR2, QR3 SCORE	R19 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	136	94
	2	143	85
	3	144	70
	Mean	141.00	83.00
	Std. Deviation	4.359	12.124

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R19 POST INTERVENTION PI1, PI2, PI3 SCORE - R19 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R19 POST INTERVENTION PI1, PI2, PI3 SCORE < R19 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R19 POST INTERVENTION PI1, PI2, PI3 SCORE > R19 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R19 POST INTERVENTION PI1, PI2, PI3 SCORE = R19 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R19 POST INTERVENTION PI1, PI2, PI3 SCORE - R19 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

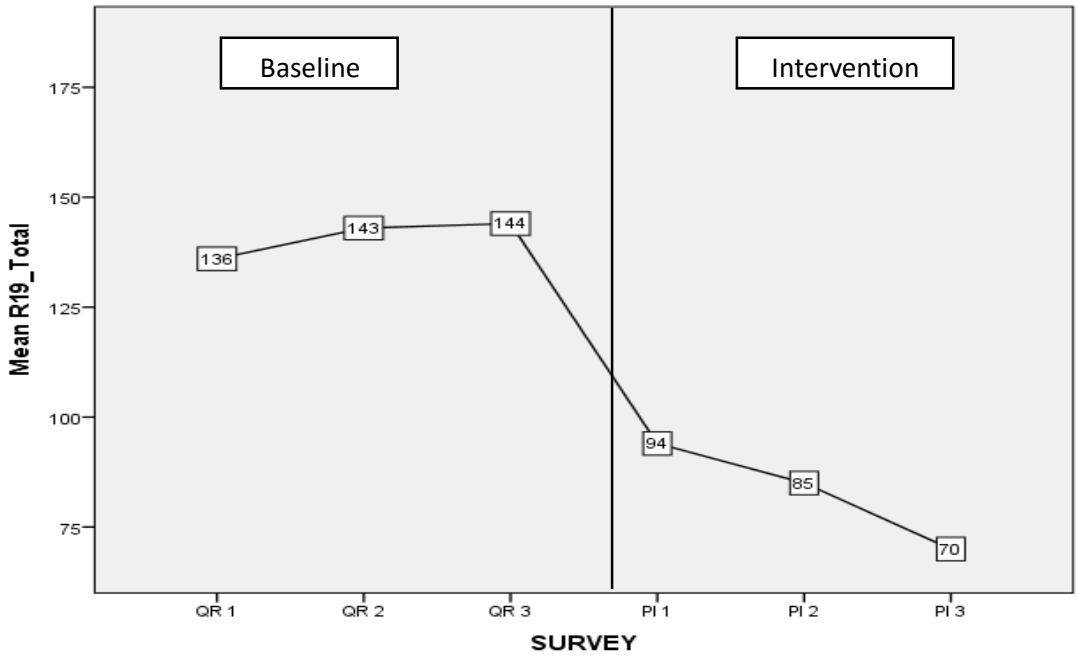
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.19

Pre and Post Intervention Graph Case 19



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 141.00

σ(Standard Deviation) = 4.359

$2\sigma = 8.718$

Range = Mean Pre Interventions Score $\pm 2\sigma$

$= 141.00 \pm 8.718$

$= 149.718$ to 132.282

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.19) are below the lowest value of the range (132.282). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 20

Table No. 4.6.20

Pre and Post Intervention Scores of Case 20

Case Summaries[a]

		R20 PRE INTERVENTION QR1, QR2, QR3 SCORE	R20 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	151	92
	2	152	82
	3	154	71
	Mean	152.33	81.67
	Std. Deviation	1.528	10.504

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R20 POST INTERVENTION PI1, PI2, PI3 SCORE - R20 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R20 POST INTERVENTION PI1, PI2, PI3 SCORE < R20 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R20 POST INTERVENTION PI1, PI2, PI3 SCORE > R20 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R20 POST INTERVENTION PI1, PI2, PI3 SCORE = R20 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R20 POST INTERVENTION PI1, PI2, PI3 SCORE - R20 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

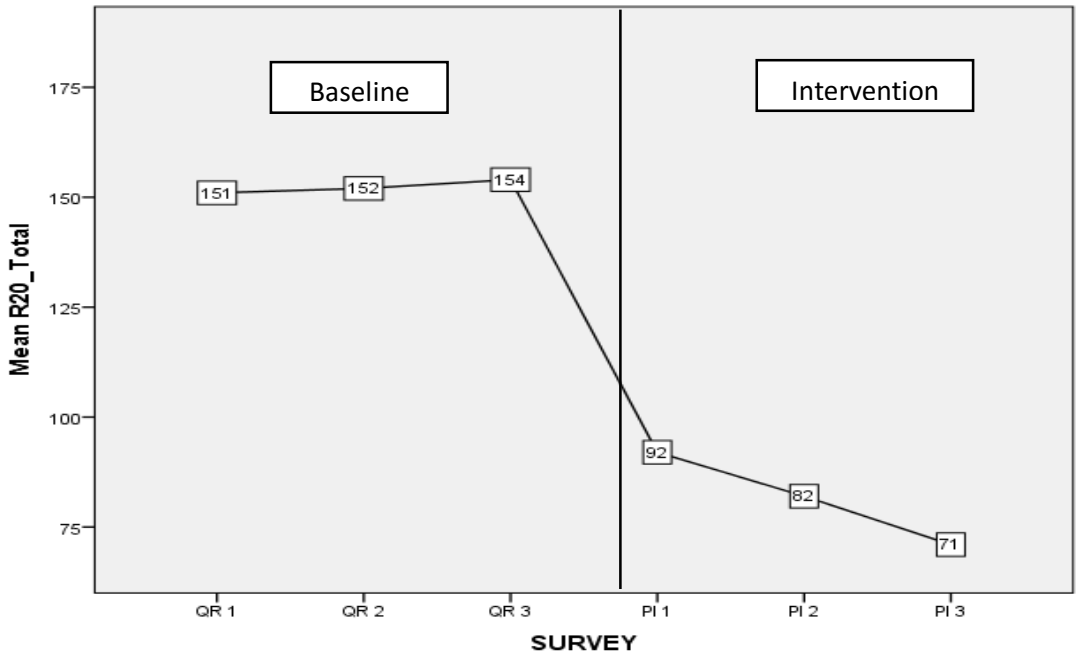
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.20

Pre and Post Intervention Graph Case 20



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 152.33

σ(Standard Deviation) = 1.528

2σ = 3.056

Range = Mean Pre Interventions Score ± 2σ

= 152.33 ± 3.056

= 155.056 to 149.274

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.20) are below the lowest value of the range (149.274). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

GOKULNAGAR PATHAR

Case No. 21

Table No. 4.6.21

Pre and Post Intervention Scores of Case 21

Case Summaries[a]

		R21PRE INTERVENTION QR1, QR2, QR3 SCORE	R21 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	140	114
	2	151	97
	3	155	72
	Mean	148.67	94.33
	Std. Deviation	7.767	21.127

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R21 POST INTERVENTION PI1, PI2, PI3 SCORE - R21PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R21 POST INTERVENTION PI1, PI2, PI3 SCORE < R21PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R21 POST INTERVENTION PI1, PI2, PI3 SCORE > R21PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R21 POST INTERVENTION PI1, PI2, PI3 SCORE = R21PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R21 POST INTERVENTION PI1, PI2, PI3 SCORE - R21PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

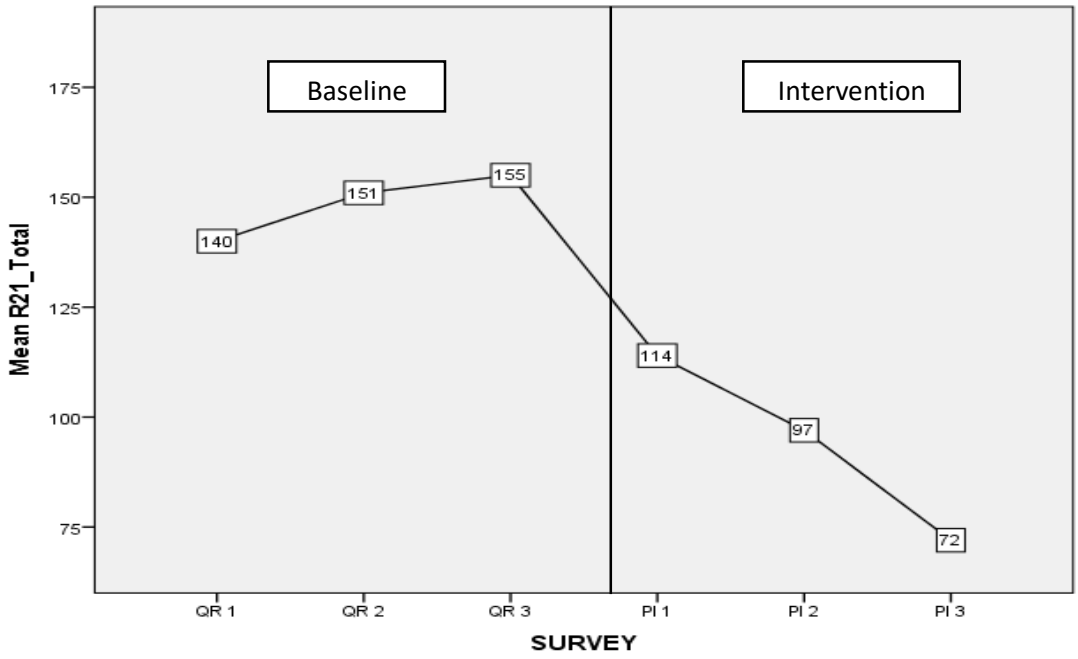
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.21

Pre and Post Intervention Graph Case 21



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 148.67

σ(Standard Deviation) = 7.767

$2\sigma = 15.534$

Range = Mean Pre Interventions Score ± 2σ

= 148.67 ± 15.534

= 164.204 to 133.136

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.21) are below the lowest value of the range (133.136). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 22

Table No. 4.6.22

Pre and Post Intervention Scores of Case 22

Case Summaries[a]

		R22 PRE INTERVENTION QR1, QR2, QR3 SCORE	R22 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	137	110
	2	147	106
	3	153	72
	Mean	145.67	96.00
	Std. Deviation	8.083	20.881

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R22 POST INTERVENTION PI1, PI2, PI3 SCORE - R22 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R22 POST INTERVENTION PI1, PI2, PI3 SCORE < R22 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R22 POST INTERVENTION PI1, PI2, PI3 SCORE > R22 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R22 POST INTERVENTION PI1, PI2, PI3 SCORE = R22 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R22 POST INTERVENTION PI1, PI2, PI3 SCORE - R22 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

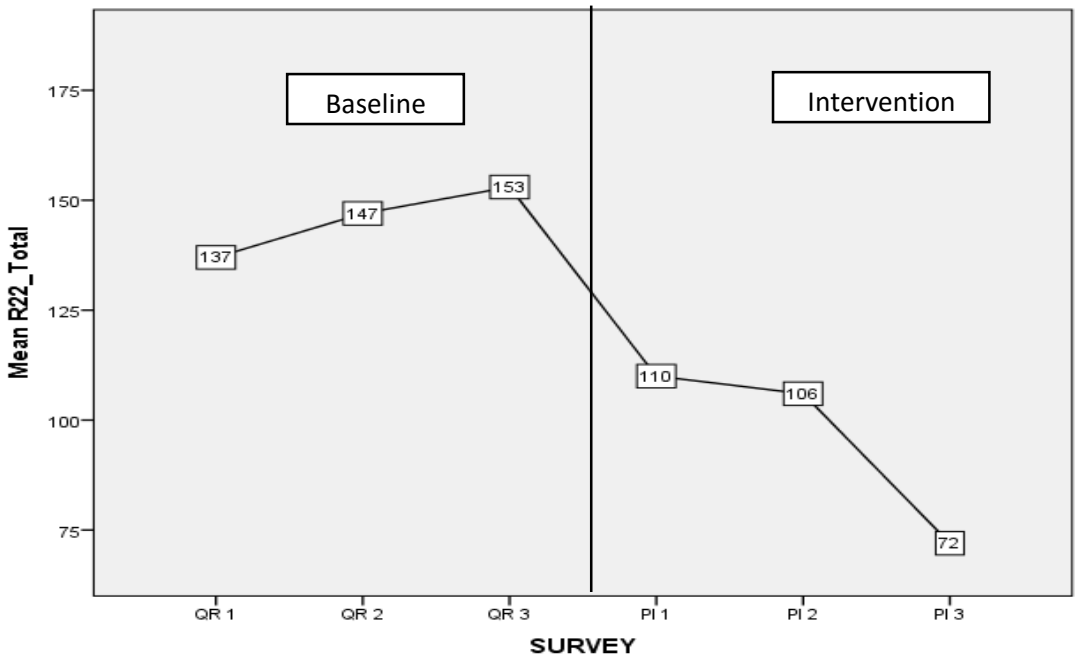
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.22

Pre and Post Intervention Graph Case 22



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 145.67

σ(Standard Deviation) = 8.083

2σ =16.166

Range = Mean Pre Interventions Score ± 2σ

= 145.67 ± 16.166

= 161.836 to 129.504

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.22) are below the lowest value of the range (129.504). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 23

Table No. 4.23

Pre and Post Intervention Scores of Case 23

Case Summaries[a]

		R23 PRE INTERVENTION QR1, QR2, QR3 SCORE	R23POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	140	118
	2	151	108
	3	161	79
	Mean	150.67	101.67
	Std. Deviation	10.504	20.257

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R23POST INTERVENTION PI1, PI2, PI3 SCORE - R23 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R23POST INTERVENTION PI1, PI2, PI3 SCORE < R23 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R23POST INTERVENTION PI1, PI2, PI3 SCORE > R23 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R23POST INTERVENTION PI1, PI2, PI3 SCORE = R23 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R23POST INTERVENTION PI1, PI2, PI3 SCORE - R23 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

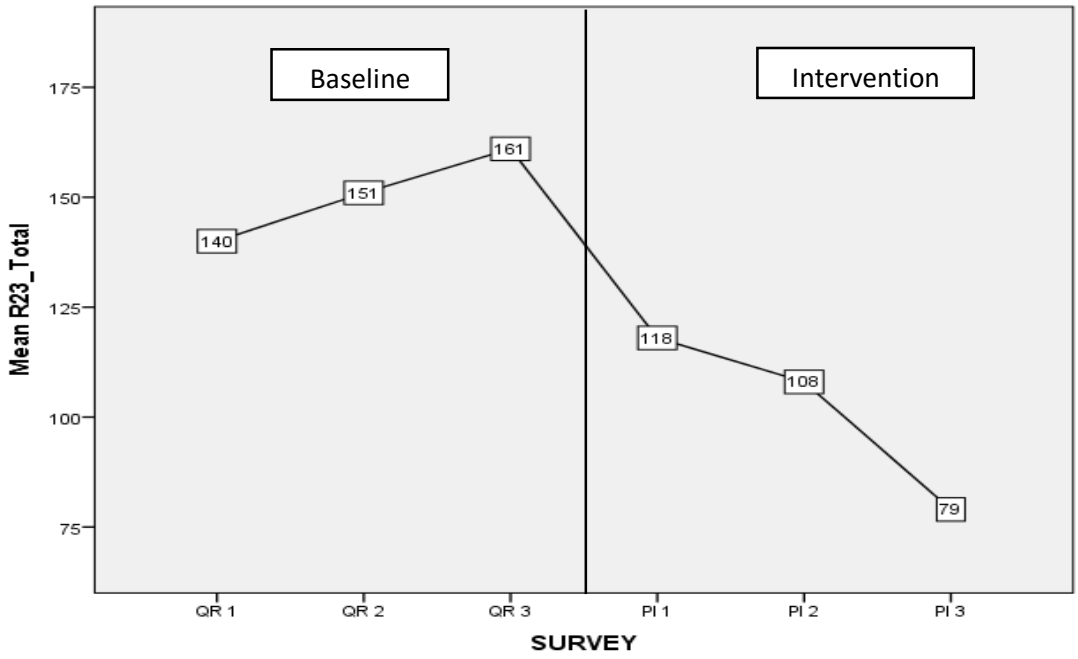
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.23

Pre and Post Intervention Graph Case 23



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 150.67

σ(Standard Deviation) = 10.504

$2\sigma = 21.008$

Range = Mean Pre Interventions Score ± 2σ

= 150.67 ± 21.008

= 171.678 to 129.662

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.23) are below the lowest value of the range (129.662). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 24

Table No. 4.6.24

Pre and Post Intervention Scores of Case 24

Case Summaries[a]

		R24 PRE INTERVENTION QR1, QR2, QR3 SCORE	R24 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	140	111
	2	150	107
	3	171	87
	Mean	153.67	101.67
	Std. Deviation	15.822	12.858

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R24 POST INTERVENTION PI1, PI2, PI3 SCORE - R24 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R24 POST INTERVENTION PI1, PI2, PI3 SCORE < R24 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R24 POST INTERVENTION PI1, PI2, PI3 SCORE > R24 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R24 POST INTERVENTION PI1, PI2, PI3 SCORE = R24 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R24 POST INTERVENTION PI1, PI2, PI3 SCORE - R24 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

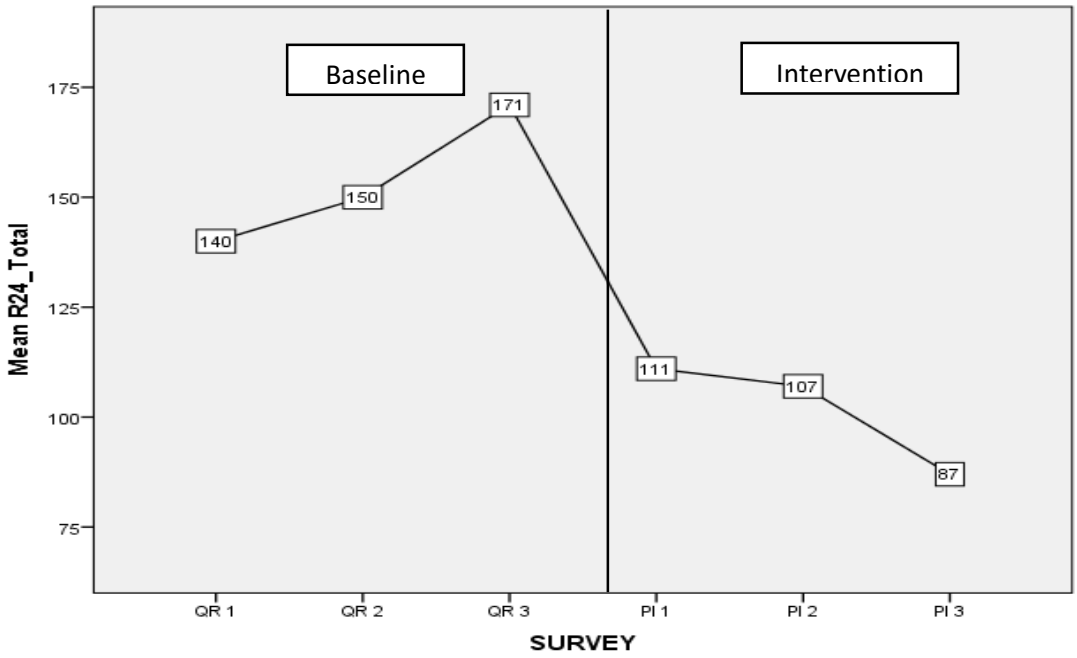
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.24

Pre and Post Intervention Graph Case 24



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 153.67

σ(Standard Deviation) = 15.822

$2\sigma = 31.644$

Range = Mean Pre Interventions Score $\pm 2\sigma$

$= 153.67 \pm 31.644$

= 185.314 to 122.026

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.24) are below the lowest value of the range (122.026). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No.25

Table No. 4.6.25

Pre and Post Intervention Scores of Case 25

Case Summaries[a]

		R25 PRE INTERVENTION QR1, QR2, QR3 SCORE	R25 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	142	116
	2	144	109
	3	156	90
	Mean	147.33	105.00
	Std. Deviation	7.572	13.454

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R25 POST INTERVENTION PI1, PI2, PI3 SCORE - R25 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R25 POST INTERVENTION PI1, PI2, PI3 SCORE < R25 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R25 POST INTERVENTION PI1, PI2, PI3 SCORE > R25 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R25 POST INTERVENTION PI1, PI2, PI3 SCORE = R25 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R25 POST INTERVENTION PI1, PI2, PI3 SCORE - R25 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

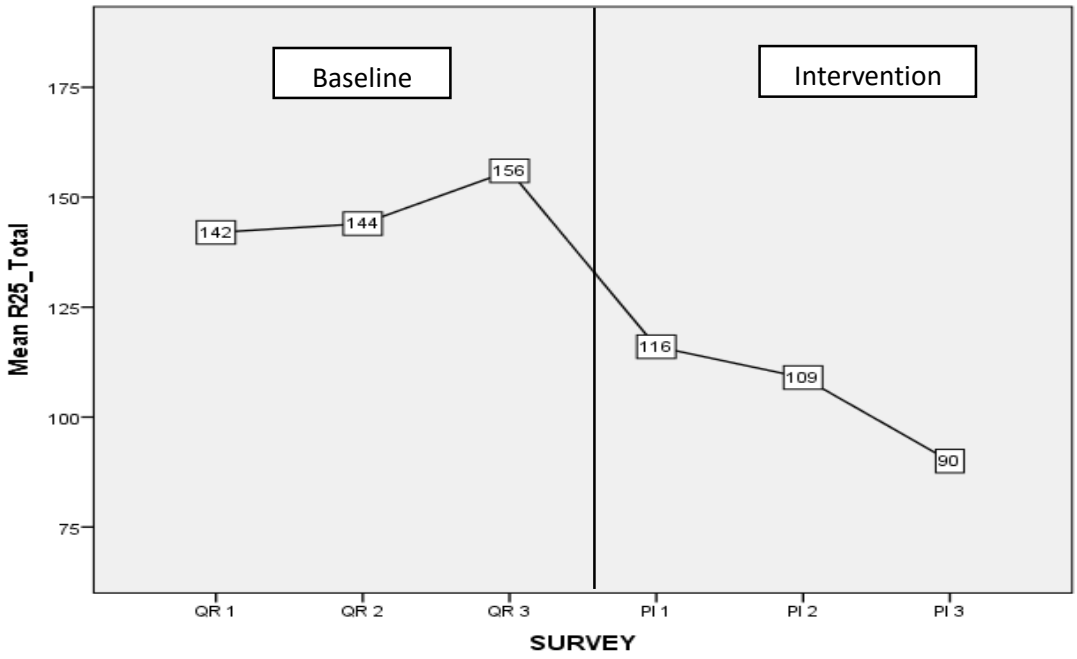
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.25

Pre and Post Intervention Graph Case 25



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 147.33

σ(Standard Deviation) = 7.572

$2\sigma = 15.144$

Range = Mean Pre Interventions Score $\pm 2\sigma$

$= 147.33 \pm 15.144$

$= 162.474$ to 132.186

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.25) are below the lowest value of the range (132.186). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 26

Table No. 4.6.26

Pre and Post Intervention Scores of Case 26

Case Summaries[a]

		R26 PRE INTERVENTION QR1, QR2, QR3 SCORE	R26 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	145	101
	2	152	98
	3	169	81
	Mean	155.33	93.33
	Std. Deviation	12.342	10.786

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R26 POST INTERVENTION PI1, PI2, PI3 SCORE - R26 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R26 POST INTERVENTION PI1, PI2, PI3 SCORE < R26 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R26 POST INTERVENTION PI1, PI2, PI3 SCORE > R26 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R26 POST INTERVENTION PI1, PI2, PI3 SCORE = R26 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R26 POST INTERVENTION PI1, PI2, PI3 SCORE - R26 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

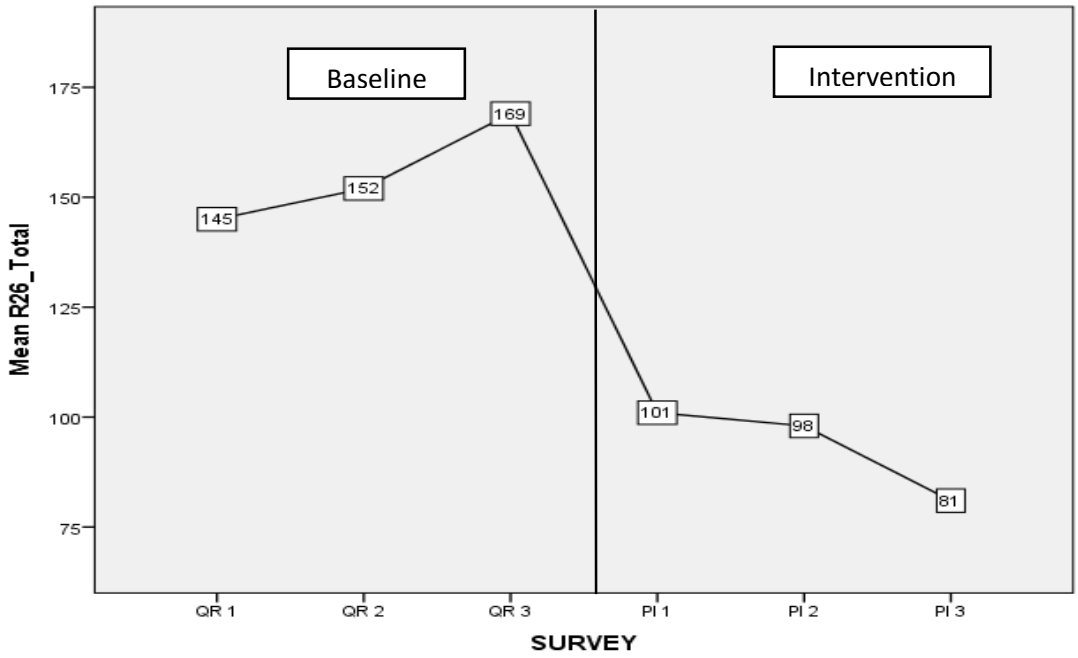
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.26

Pre and Post Intervention Graph Case 26



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 155.33

σ(Standard Deviation) = 12.324

2σ = 24.684

Range = Mean Pre Interventions Score ± 2σ

= 155.33 ± 24.684

= 180.014 to 130.646

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.26) are below the lowest value of the range (130.646). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 27

Table No. 4.6.27

Pre and Post Intervention Scores of Case 27

Case Summaries[a]

		R27 PRE INTERVENTION QR1, QR2, QR3 SCORE	R27 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	146	102
	2	150	104
	3	160	77
	Mean	152.00	94.33
	Std. Deviation	7.211	15.044

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R27 POST INTERVENTION PI1, PI2, PI3 SCORE - R27 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R27 POST INTERVENTION PI1, PI2, PI3 SCORE < R27 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R27 POST INTERVENTION PI1, PI2, PI3 SCORE > R27 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R27 POST INTERVENTION PI1, PI2, PI3 SCORE = R27 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R27 POST INTERVENTION PI1, PI2, PI3 SCORE - R27 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

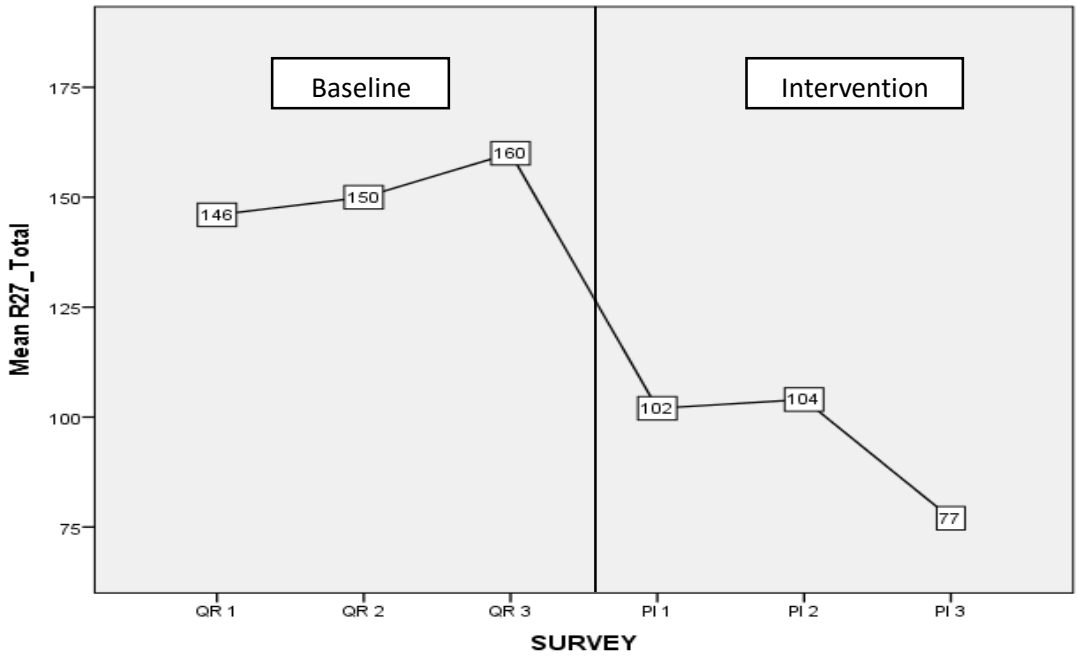
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.27

Pre and Post Intervention Graph Case 27



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 152.00

σ(Standard Deviation) = 7.211

$2\sigma = 14.422$

Range = Mean Pre Interventions Score $\pm 2\sigma$

$= 152.00 \pm 14.422$

$= 166.422$ to 137.578

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.27) are below the lowest value of the range (137.578). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 28

Table No. 4.6.28

Pre and Post Intervention Scores of Case 28

Case Summaries[a]

		R28 PRE INTERVENTION QR1, QR2, QR3 SCORE	R28 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	138	119
	2	149	106
	3	156	75
	Mean	147.67	100.00
	Std. Deviation	9.074	22.605

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R28 POST INTERVENTION PI1, PI2, PI3 SCORE - R28 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R28 POST INTERVENTION PI1, PI2, PI3 SCORE < R28 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R28 POST INTERVENTION PI1, PI2, PI3 SCORE > R28 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R28 POST INTERVENTION PI1, PI2, PI3 SCORE = R28 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R28 POST INTERVENTION PI1, PI2, PI3 SCORE - R28 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

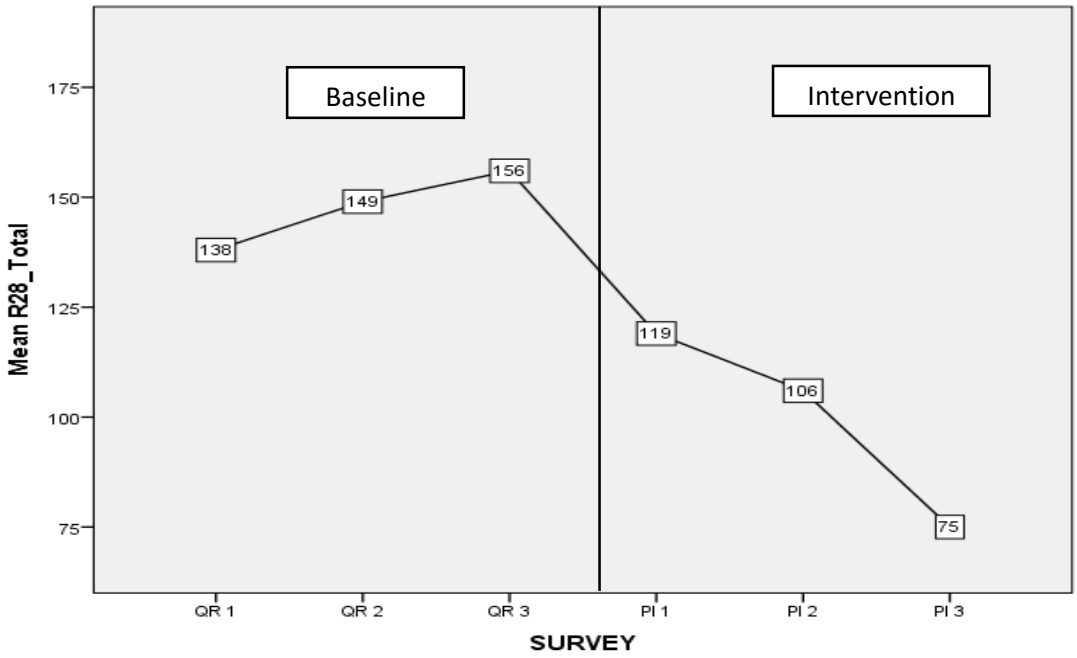
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.28

Pre and Post Intervention Graph Case 28



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 147.67

σ(Standard Deviation) =9.074

2σ = 18.148

Range = Mean Pre Interventions Score ± 2σ

= 147.67 ± 18.148

= 165.818 to 129.522

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.28) are below the lowest value of the range (129.522). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 29

Table No. 4.6.29

Pre and Post Intervention Scores of Case 29

Case Summaries[a]

		R29 PRE INTERVENTION QR1, QR2, QR3 SCORE	R29 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	141	109
	2	146	110
	3	159	74
	Mean	148.67	97.67
	Std. Deviation	9.292	20.502

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R29 POST INTERVENTION PI1, PI2, PI3 SCORE - R29 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R29 POST INTERVENTION PI1, PI2, PI3 SCORE < R29 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R29 POST INTERVENTION PI1, PI2, PI3 SCORE > R29 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R29 POST INTERVENTION PI1, PI2, PI3 SCORE = R29 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R29 POST INTERVENTION PI1, PI2, PI3 SCORE - R29 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

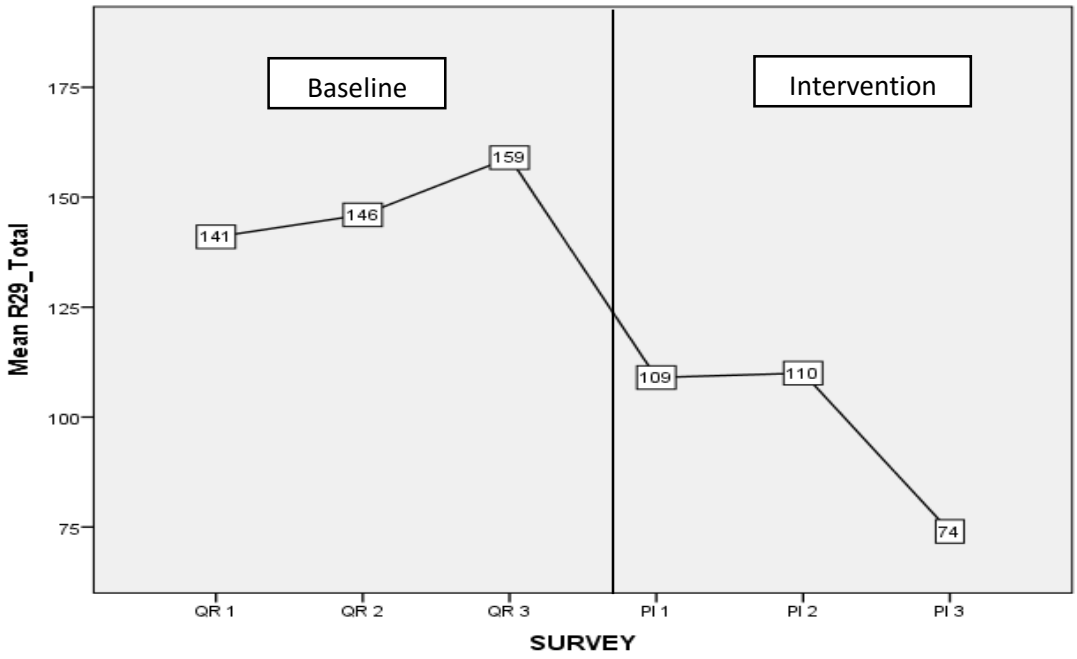
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.29

Pre and Post Intervention Graph Case 29



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 148.67

σ(Standard Deviation) = 9.292

$2\sigma = 18.584$

Range = Mean Pre Interventions Score ± 2σ

= 148.67 ± 18.584

= 167.254 to 130.086

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.29) are below the lowest value of the range (130.086). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 30

Table No. 4.6.30

Pre and Post Intervention Scores of Case 30

Case Summaries[a]

		R30 PRE INTERVENTION QR1, QR2, QR3 SCORE	R30 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	138	116
	2	148	107
	3	152	71
	Mean	146.00	98.00
	Std. Deviation	7.211	23.812

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R30 POST INTERVENTION PI1, PI2, PI3 SCORE - R30 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R30 POST INTERVENTION PI1, PI2, PI3 SCORE < R30 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R30 POST INTERVENTION PI1, PI2, PI3 SCORE > R30 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R30 POST INTERVENTION PI1, PI2, PI3 SCORE = R30 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R30 POST INTERVENTION PI1, PI2, PI3 SCORE - R30 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

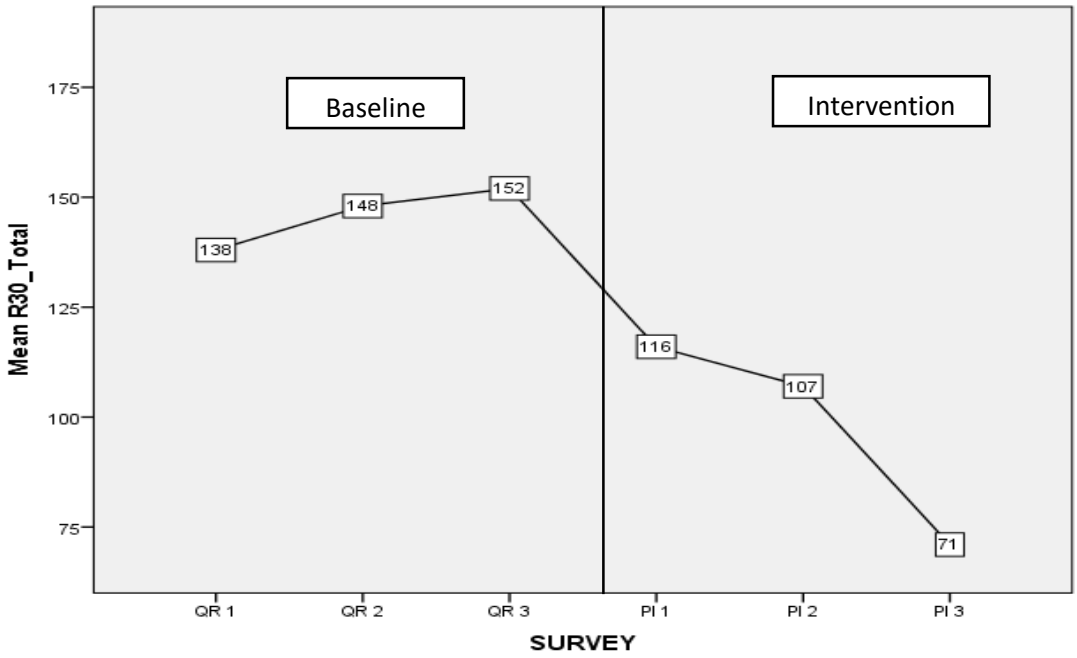
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.30

Pre and Post Intervention Graph Case 30



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 146

σ(Standard Deviation) = 7.211

2σ = 14.422

Range = Mean Pre Interventions Score ± 2σ

= 146 ± 14.422

= 160.422 to 131.578

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.30) are below the lowest value of the range (131.578). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

SAHAYOG NAGAR

Case No. 31

Table No. 4.6.31

Pre and Post Intervention Scores of Case 31

Case Summaries[a]

		R31PRE INTERVENTION QR1, QR2, QR3 SCORE	R31 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	156	117
	2	162	89
	3	164	74
	Mean	160.67	93.33
	Std. Deviation	4.163	21.825

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R31 POST INTERVENTION PI1, PI2, PI3 SCORE - R31PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R31 POST INTERVENTION PI1, PI2, PI3 SCORE < R31PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R31 POST INTERVENTION PI1, PI2, PI3 SCORE > R31PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R31 POST INTERVENTION PI1, PI2, PI3 SCORE = R31PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R31 POST INTERVENTION PI1, PI2, PI3 SCORE - R31PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

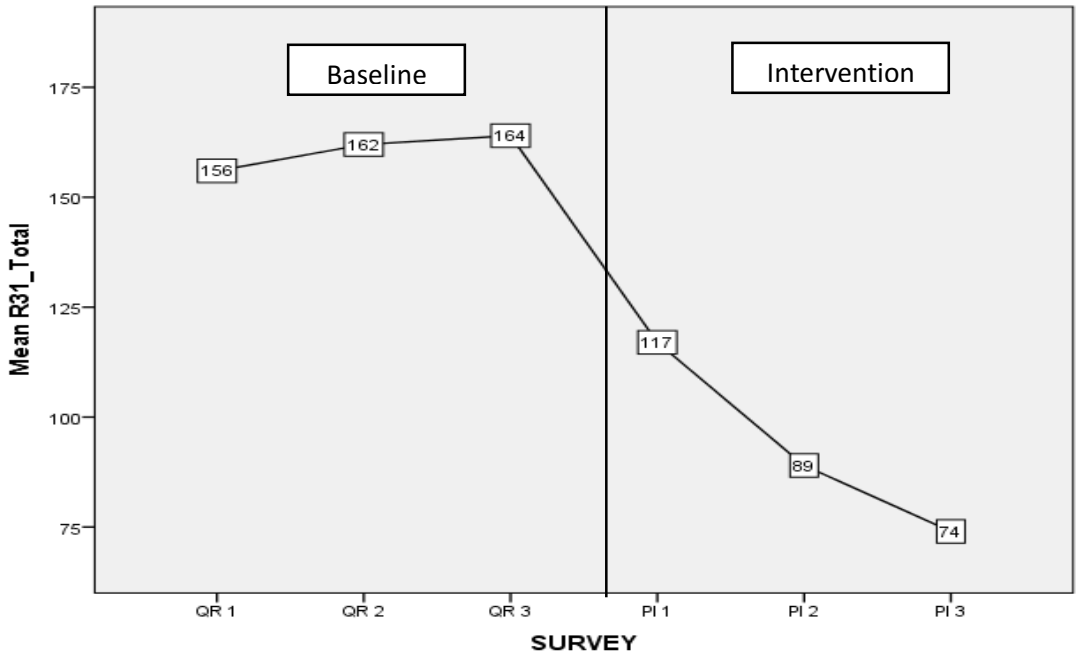
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.31

Pre and Post Intervention Graph Case 31



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 160.67

σ(Standard Deviation) = 4.163

$2\sigma = 8.326$

Range = Mean Pre Interventions Score ± 2σ

= 160.67 ± 8.326

= 168.996 to 160.67

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.31) are below the lowest value of the range (160.67). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 32

Table No. 4.6.32

Pre and Post Intervention Scores of Case 32

Case Summaries[a]

		R32 PRE INTERVENTION QR1, QR2, QR3 SCORE	R32 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	158	119
	2	169	84
	3	172	76
	Mean	166.33	93.00
	Std. Deviation	7.371	22.869

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R32 POST INTERVENTION PI1, PI2, PI3 SCORE - R32 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R32 POST INTERVENTION PI1, PI2, PI3 SCORE < R32 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R32 POST INTERVENTION PI1, PI2, PI3 SCORE > R32 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R32 POST INTERVENTION PI1, PI2, PI3 SCORE = R32 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R32 POST INTERVENTION PI1, PI2, PI3 SCORE - R32 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

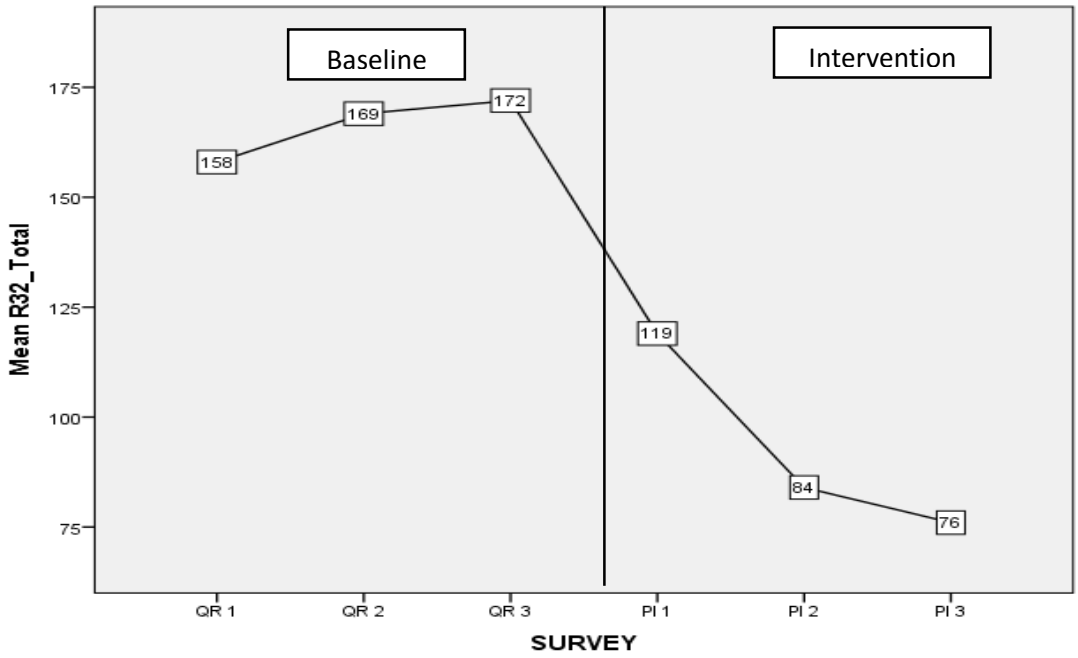
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.32

Pre and Post Intervention Graph Case 32



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 166.33

σ(Standard Deviation) = 7.371

2σ = 14.742

Range = Mean Pre Interventions Score ± 2σ

= 166.33 ± 14.742

= 181.072 to 151.588

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.32) are below the lowest value of the range (151.588). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 33

Table No. 4.6.33

Pre and Post Intervention Scores of Case 33

Case Summaries[a]

		R33 PRE INTERVENTION QR1, QR2, QR3 SCORE	R33POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	157	108
	2	160	94
	3	167	72
	Mean	161.33	91.33
	Std. Deviation	5.132	18.148

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R33POST INTERVENTION PI1, PI2, PI3 SCORE - R33 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R33POST INTERVENTION PI1, PI2, PI3 SCORE < R33 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R33POST INTERVENTION PI1, PI2, PI3 SCORE > R33 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R33POST INTERVENTION PI1, PI2, PI3 SCORE = R33 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R33POST INTERVENTION PI1, PI2, PI3 SCORE - R33 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

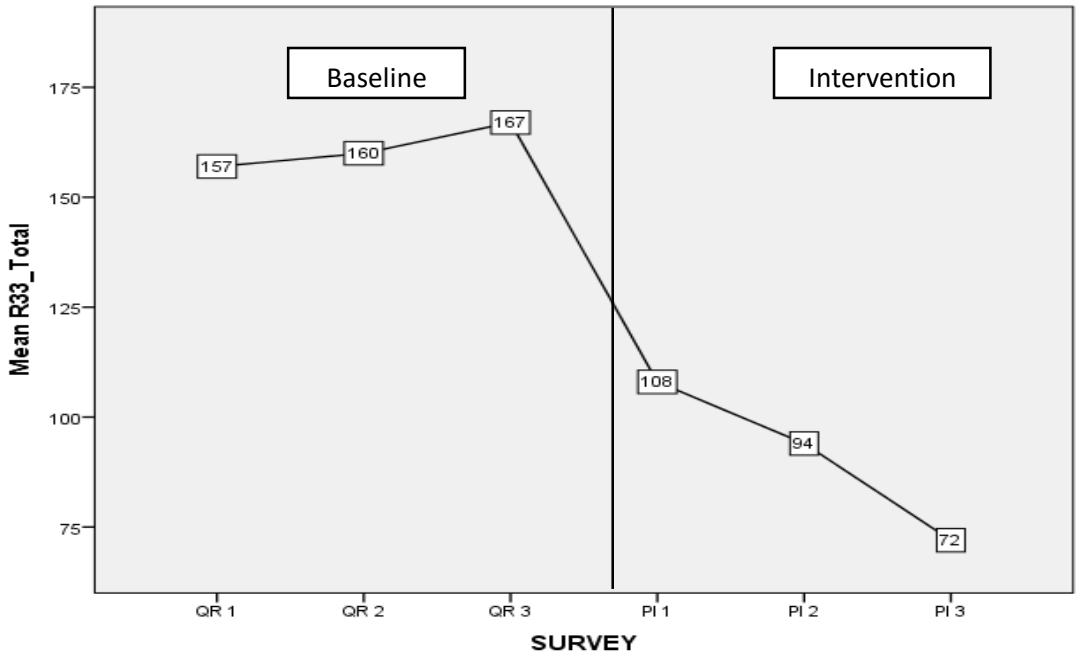
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.33

Pre and Post Intervention Graph Case 33



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 161.33

σ(Standard Deviation) = 5.132

$2\sigma = 10.264$

Range = Mean Pre Interventions Score $\pm 2\sigma$

$= 161.33 \pm 10.264$

$= 171.594$ to 151.066

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.33) are below the lowest value of the range (151.066). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 34

Table No. 4.6.34

Pre and Post Intervention Scores of Case 34

Case Summaries[a]

		R34 PRE INTERVENTION QR1, QR2, QR3 SCORE	R34 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	135	112
	2	140	88
	3	146	71
	Mean	140.33	90.33
	Std. Deviation	5.508	20.599

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R34 POST INTERVENTION PI1, PI2, PI3 SCORE - R34 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R34 POST INTERVENTION PI1, PI2, PI3 SCORE < R34 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R34 POST INTERVENTION PI1, PI2, PI3 SCORE > R34 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R34 POST INTERVENTION PI1, PI2, PI3 SCORE = R34 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R34 POST INTERVENTION PI1, PI2, PI3 SCORE - R34 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

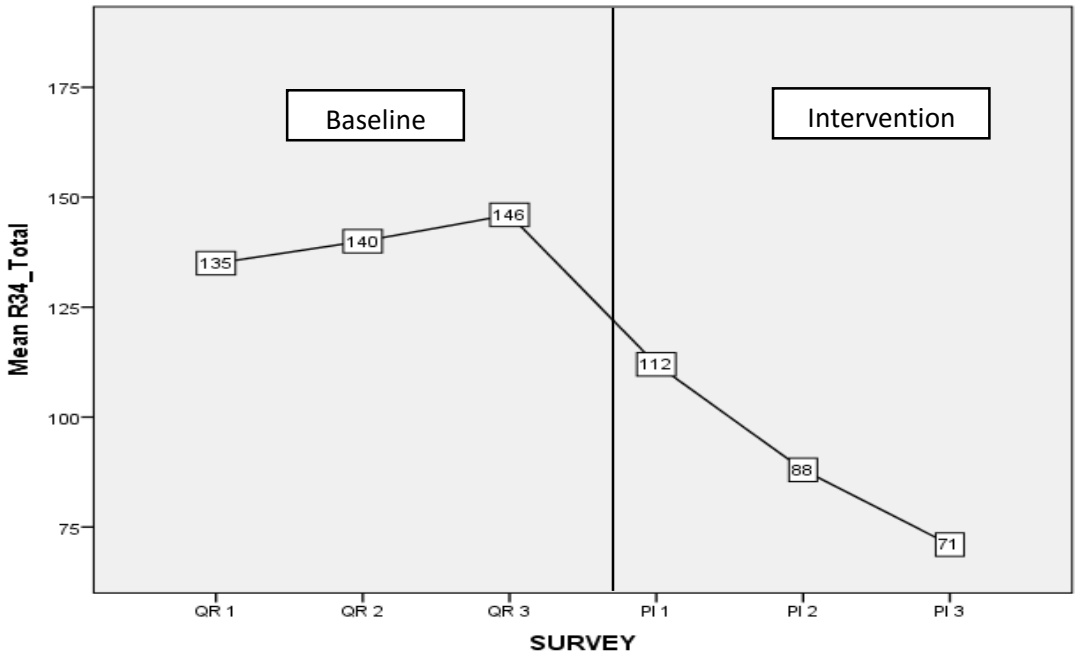
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.34

Pre and Post Intervention Graph Case 34



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 140.33

σ(Standard Deviation) = 5.508

2σ = 11.016

Range = Mean Pre Interventions Score ± 2σ

= 140.33 ± 11.016

= 151.346 to 129.314

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.34) are below the lowest value of the range (129.314). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 35

Table No. 4.6.35

Pre and Post Intervention Scores of Case 35

Case Summaries[a]

		R35 PRE INTERVENTION QR1, QR2, QR3 SCORE	R35 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	139	126
	2	151	83
	3	157	73
	Mean	149.00	94.00
	Std. Deviation	9.165	28.160

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R35 POST INTERVENTION PI1, PI2, PI3 SCORE - R35 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R35 POST INTERVENTION PI1, PI2, PI3 SCORE < R35 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R35 POST INTERVENTION PI1, PI2, PI3 SCORE > R35 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R35 POST INTERVENTION PI1, PI2, PI3 SCORE = R35 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R35 POST INTERVENTION PI1, PI2, PI3 SCORE - R35 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

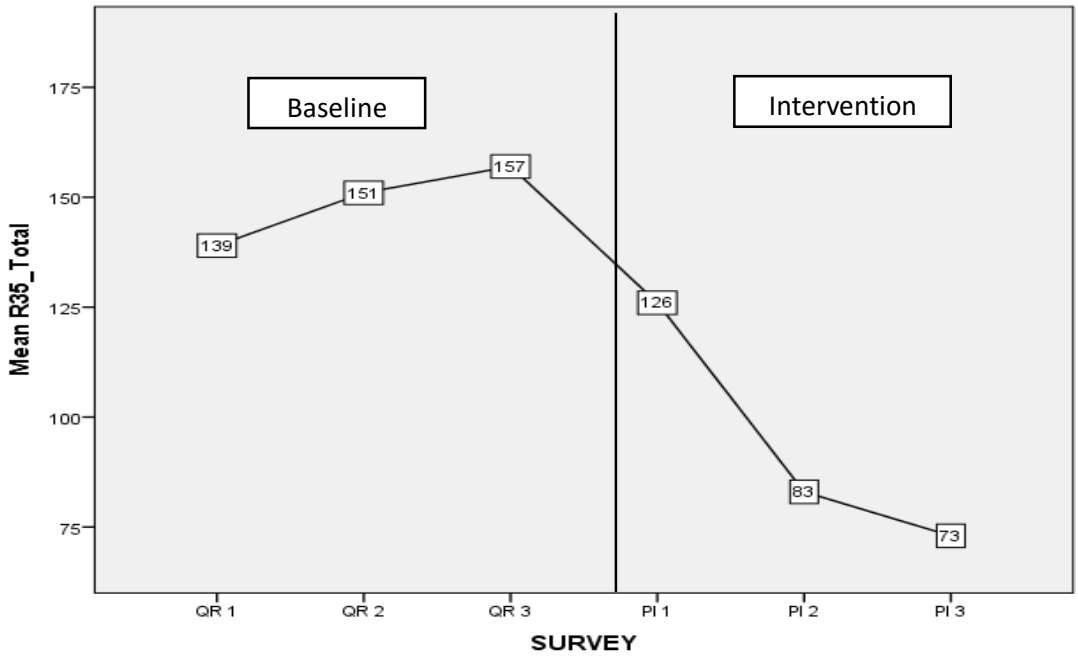
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.35

Pre and Post Intervention Graph Case 35



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 149.00

σ(Standard Deviation) = 9.165

$2\sigma = 18.33$

Range = Mean Pre Interventions Score $\pm 2\sigma$

$= 149.00 \pm 18.33$

$= 167.33$ to 130.67

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.35) are below the lowest value of the range (130.67). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 36

Table No. 4.6.36

Pre and Post Intervention Scores of Case 36

Case Summaries[a]

		R36 PRE INTERVENTION QR1, QR2, QR3 SCORE	R36 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	152	129
	2	154	90
	3	160	72
	Mean	155.33	97.00
	Std. Deviation	4.163	29.138

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R36 POST INTERVENTION PI1, PI2, PI3 SCORE - R36 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R36 POST INTERVENTION PI1, PI2, PI3 SCORE < R36 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R36 POST INTERVENTION PI1, PI2, PI3 SCORE > R36 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R36 POST INTERVENTION PI1, PI2, PI3 SCORE = R36 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R36 POST INTERVENTION PI1, PI2, PI3 SCORE - R36 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

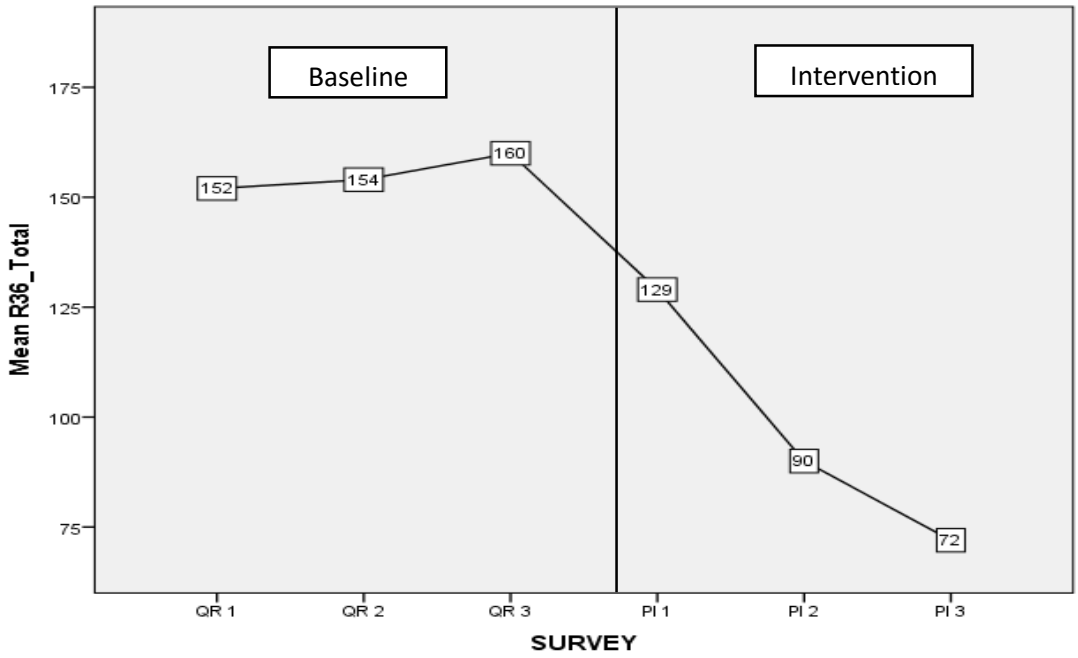
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.36

Pre and Post Intervention Graph Case 36



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 155.33

σ(Standard Deviation) = 4.163

$2\sigma = 8.326$

Range = Mean Pre Interventions Score $\pm 2\sigma$

$= 155.33 \pm 8.326$

= 163.656 to 147.004

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.36) are below the lowest value of the range (147.004). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 37

Table No. 4.6.37

Pre and Post Intervention Scores of Case 37

Case Summaries[a]

		R37 PRE INTERVENTION QR1, QR2, QR3 SCORE	R37 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	147	124
	2	149	102
	3	151	70
	Mean	149.00	98.67
	Std. Deviation	2.000	27.154

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R37 POST INTERVENTION PI1, PI2, PI3 SCORE - R37 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R37 POST INTERVENTION PI1, PI2, PI3 SCORE < R37 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R37 POST INTERVENTION PI1, PI2, PI3 SCORE > R37 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R37 POST INTERVENTION PI1, PI2, PI3 SCORE = R37 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R37 POST INTERVENTION PI1, PI2, PI3 SCORE - R37 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

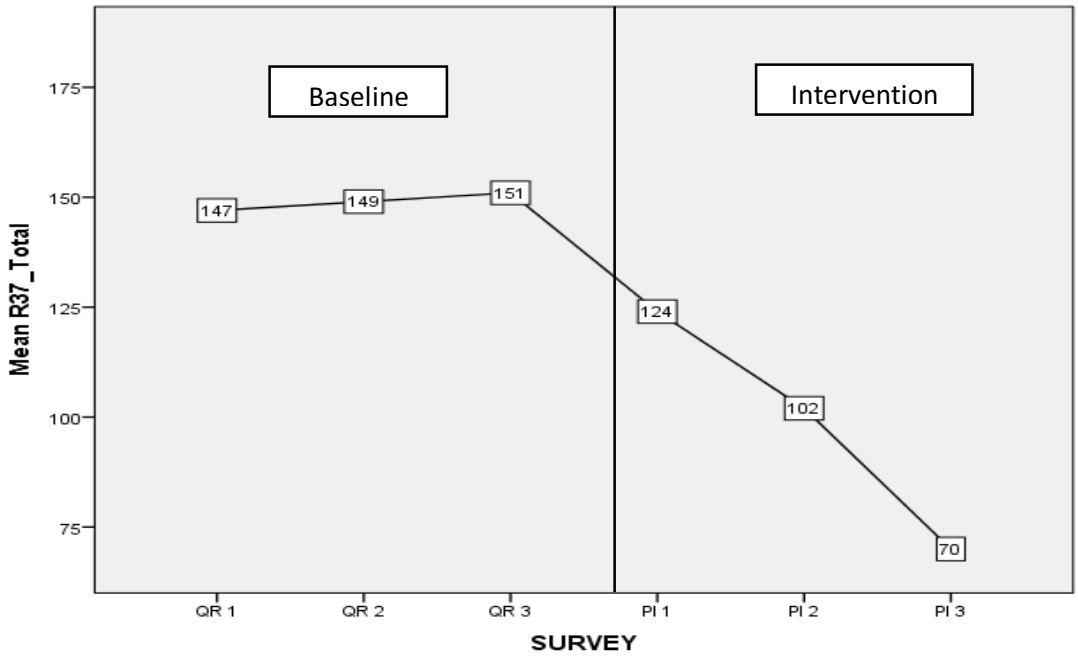
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.37

Pre and Post Intervention Graph Case 37



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 149.00

σ(Standard Deviation) = 2.000

$2\sigma = 4$

Range = Mean Pre Interventions Score $\pm 2\sigma$

= 149.00 ± 4

= 153 to 145

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.37) are below the lowest value of the range (145). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 38

Table No. 4.6.38

Pre and Post Intervention Scores of Case 38

Case Summaries[a]

		R38 PRE INTERVENTION QR1, QR2, QR3 SCORE	R38 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	146	123
	2	147	97
	3	154	77
	Mean	149.00	99.00
	Std. Deviation	4.359	23.065

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R38 POST INTERVENTION PI1, PI2, PI3 SCORE - R38 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R38 POST INTERVENTION PI1, PI2, PI3 SCORE < R38 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R38 POST INTERVENTION PI1, PI2, PI3 SCORE > R38 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R38 POST INTERVENTION PI1, PI2, PI3 SCORE = R38 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R38 POST INTERVENTION PI1, PI2, PI3 SCORE - R38 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

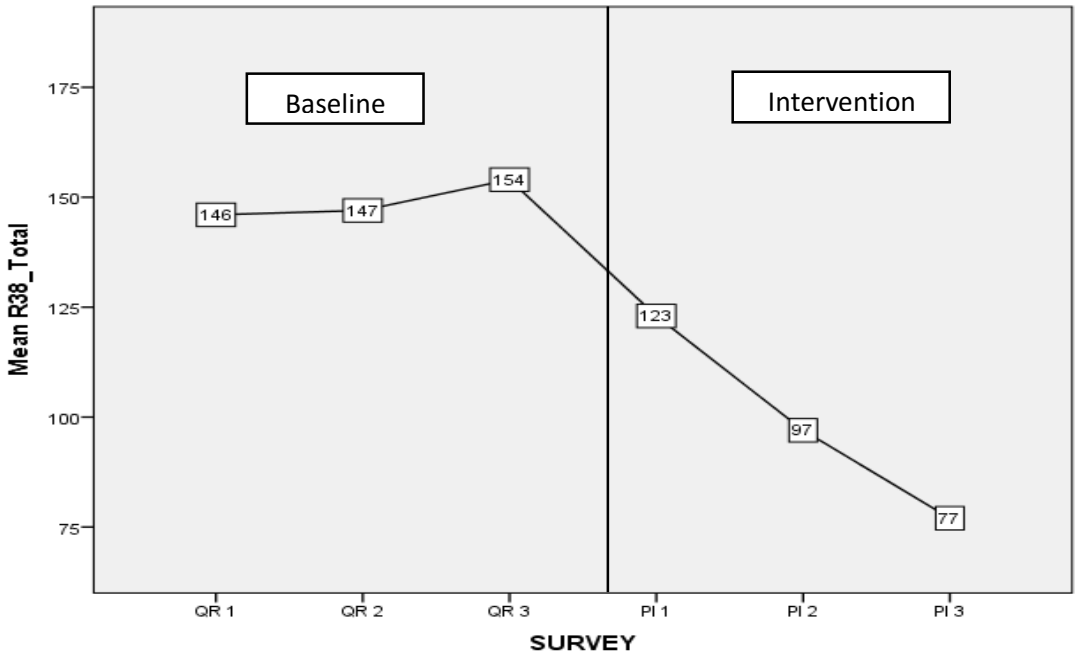
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.38

Pre and Post Intervention Graph Case 38



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 149.00

σ(Standard Deviation) = 4.359

$2\sigma = 8.718$

Range = Mean Pre Interventions Score $\pm 2\sigma$

$= 149.00 \pm 8.718$

= 157.718 to 149

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.38) are below the lowest value of the range (149). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 39

Table No. 4.6.39

Pre and Post Intervention Scores of Case 39

Case Summaries[a]

		R39 PRE INTERVENTION QR1, QR2, QR3 SCORE	R39 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	160	115
	2	162	94
	3	164	72
	Mean	162.00	93.67
	Std. Deviation	2.000	21.502

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R39 POST INTERVENTION PI1, PI2, PI3 SCORE - R39 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R39 POST INTERVENTION PI1, PI2, PI3 SCORE < R39 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R39 POST INTERVENTION PI1, PI2, PI3 SCORE > R39 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R39 POST INTERVENTION PI1, PI2, PI3 SCORE = R39 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R39 POST INTERVENTION PI1, PI2, PI3 SCORE - R39 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

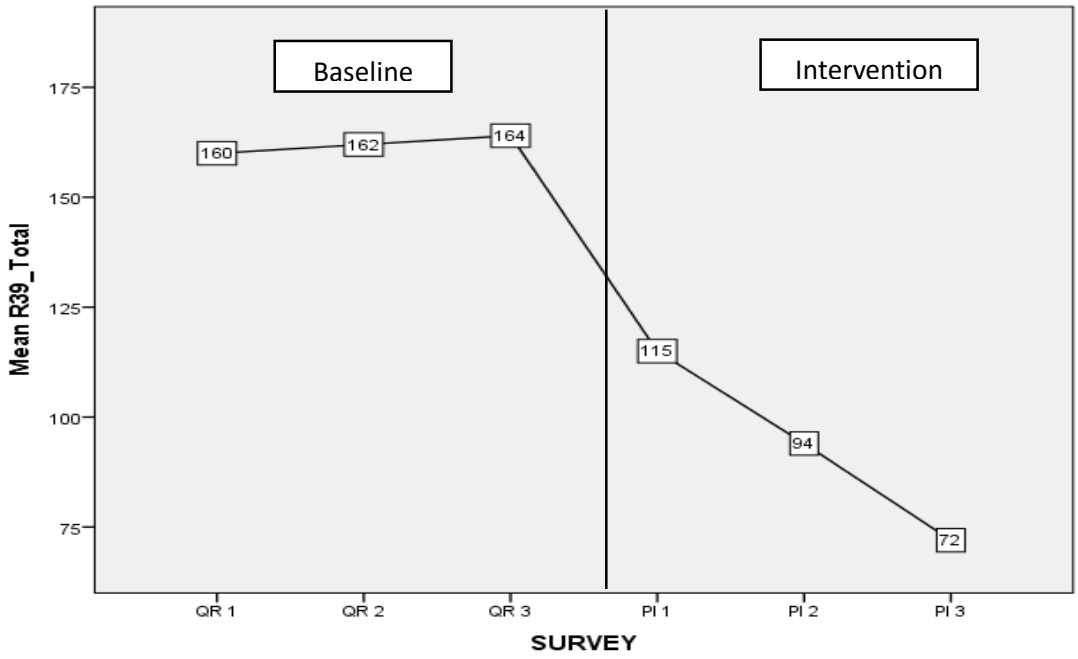
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.39

Pre and Post Intervention Graph Case 39



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 162.00

σ(Standard Deviation) = 2.000

$2\sigma = 4$

Range = Mean Pre Interventions Score $\pm 2\sigma$

= 162.00 ± 4

= 166 to 158

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.39) are below the lowest value of the range (158). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 40

Table No. 4.6.40

Pre and Post Intervention Scores of Case 40

Case Summaries[a]

		R40 PRE INTERVENTION QR1, QR2, QR3 SCORE	R40 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	159	111
	2	169	104
	3	169	72
	Mean	165.67	95.67
	Std. Deviation	5.774	20.793

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R40 POST INTERVENTION PI1, PI2, PI3 SCORE - R40 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R40 POST INTERVENTION PI1, PI2, PI3 SCORE < R40 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R40 POST INTERVENTION PI1, PI2, PI3 SCORE > R40 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R40 POST INTERVENTION PI1, PI2, PI3 SCORE = R40 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R40 POST INTERVENTION PI1, PI2, PI3 SCORE - R40 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

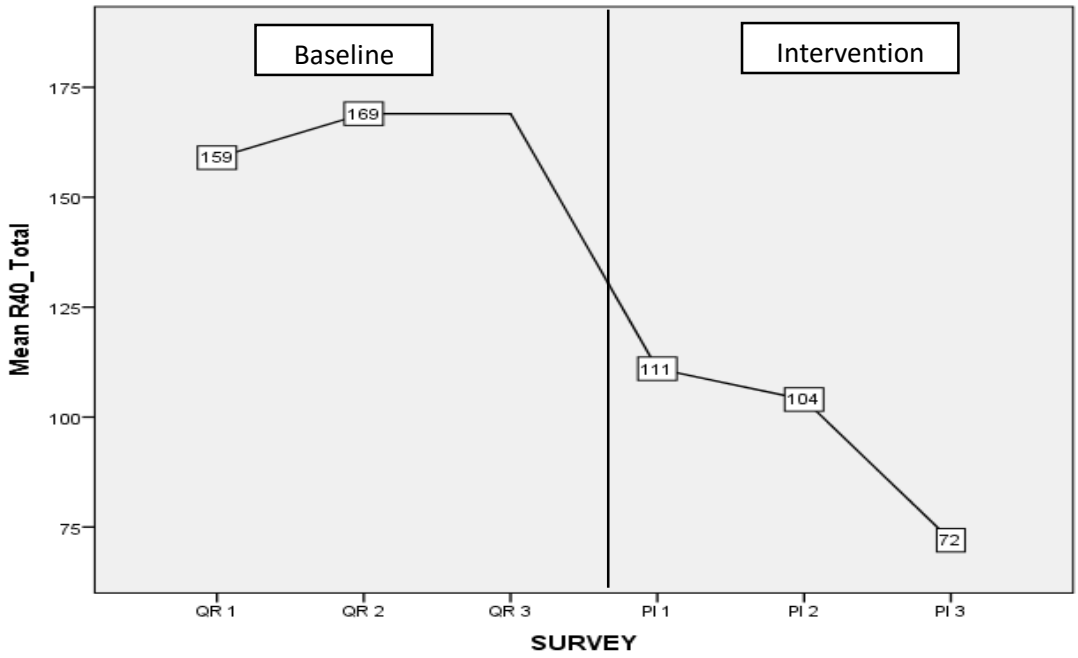
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.40

Pre and Post Intervention Graph Case 40



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 165.67

σ(Standard Deviation) = 5.774

2σ = 11.548

Range = Mean Pre Interventions Score ± 2σ

= 165.67 ± 11.548

= 177.218 to 154.122

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.40) are below the lowest value of the range (154.122). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

GOSAVI VASTI

Case No. 41

Table No. 4.6.41

Pre and Post Intervention Scores of Case 41

Case Summaries[a]

		R41PRE INTERVENTION QR1, QR2, QR3 SCORE	R41 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	143	92
	2	152	85
	3	162	75
	Mean	152.33	84.00
	Std. Deviation	9.504	8.544

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R41 POST INTERVENTION PI1, PI2, PI3 SCORE - R41PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R41 POST INTERVENTION PI1, PI2, PI3 SCORE < R41PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R41 POST INTERVENTION PI1, PI2, PI3 SCORE > R41PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R41 POST INTERVENTION PI1, PI2, PI3 SCORE = R41PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R41 POST INTERVENTION PI1, PI2, PI3 SCORE - R41PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

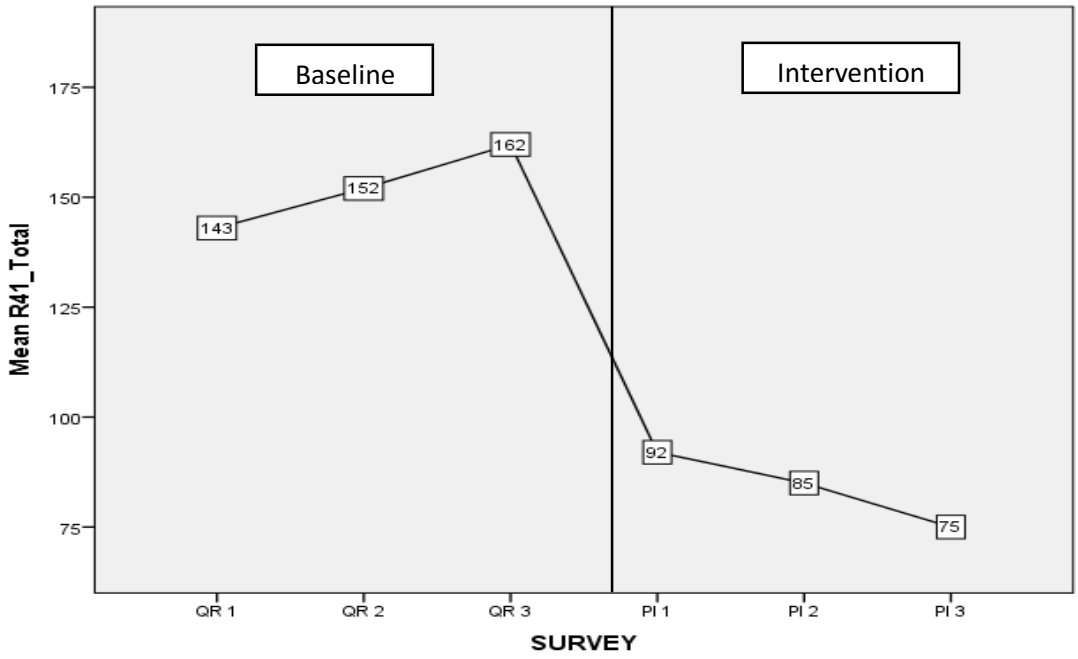
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.41

Pre and Post Intervention Graph Case 41



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 152.33

σ(Standard Deviation) = 9.504

$2\sigma = 19.008$

Range = Mean Pre Interventions Score ± 2σ

= 152.33 ± 19.008

= 171.338 to 133.322

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.41) are below the lowest value of the range (133.322). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 42

Table No. 4.6.42

Pre and Post Intervention Scores of Case 42

Case Summaries[a]

		R42 PRE INTERVENTION QR1, QR2, QR3 SCORE	R42 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	136	89
	2	155	85
	3	167	73
	Mean	152.67	82.33
	Std. Deviation	15.631	8.327

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R42 POST INTERVENTION PI1, PI2, PI3 SCORE - R42 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R42 POST INTERVENTION PI1, PI2, PI3 SCORE < R42 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R42 POST INTERVENTION PI1, PI2, PI3 SCORE > R42 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R42 POST INTERVENTION PI1, PI2, PI3 SCORE = R42 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R42 POST INTERVENTION PI1, PI2, PI3 SCORE - R42 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

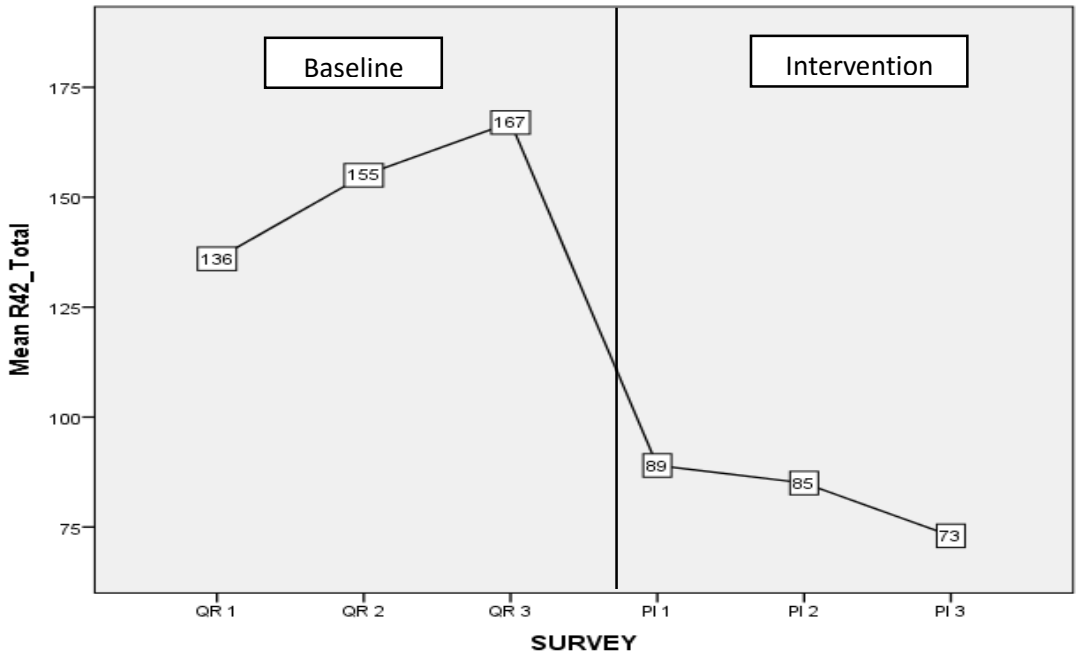
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.42

Pre and Post Intervention Graph Case 42



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 152.67

σ(Standard Deviation) = 15.631

2σ = 31.262

Range = Mean Pre Interventions Score ± 2σ

= 152.67 ± 31.262

= 183.932 to 121.408

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.42) are below the lowest value of the range (121.408). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 43

Table No. 4.6.43

Pre and Post Intervention Scores of Case 43

Case Summaries[a]

		R43 PRE INTERVENTION QR1, QR2, QR3 SCORE	R43POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	136	96
	2	166	85
	3	163	70
	Mean	155.00	83.67
	Std. Deviation	16.523	13.051

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R43POST INTERVENTION PI1, PI2, PI3 SCORE - R43 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R43POST INTERVENTION PI1, PI2, PI3 SCORE < R43 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R43POST INTERVENTION PI1, PI2, PI3 SCORE > R43 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R43POST INTERVENTION PI1, PI2, PI3 SCORE = R43 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R43POST INTERVENTION PI1, PI2, PI3 SCORE - R43 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

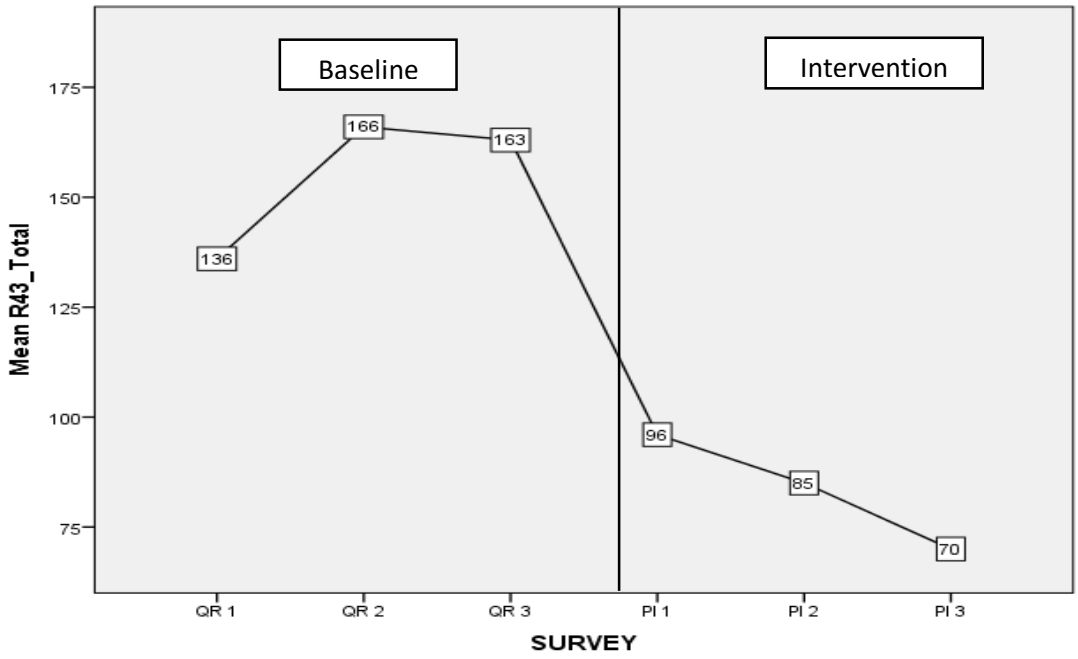
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.43

Pre and Post Intervention Graph Case 43



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 155.00

σ(Standard Deviation) = 16.523

$2\sigma = 33.046$

Range = Mean Pre Interventions Score $\pm 2\sigma$

$= 155.00 \pm 33.046$

$= 188.046$ to 121.954

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.43) are below the lowest value of the range (121.954). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 44

Table No. 4.6.44

Pre and Post Intervention Scores of Case 44

Case Summaries[a]

		R44 PRE INTERVENTION QR1, QR2, QR3 SCORE	R44 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	135	95
	2	140	87
	3	149	75
	Mean	141.33	85.67
	Std. Deviation	7.095	10.066

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R44 POST INTERVENTION PI1, PI2, PI3 SCORE - R44 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R44 POST INTERVENTION PI1, PI2, PI3 SCORE < R44 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R44 POST INTERVENTION PI1, PI2, PI3 SCORE > R44 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R44 POST INTERVENTION PI1, PI2, PI3 SCORE = R44 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R44 POST INTERVENTION PI1, PI2, PI3 SCORE - R44 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

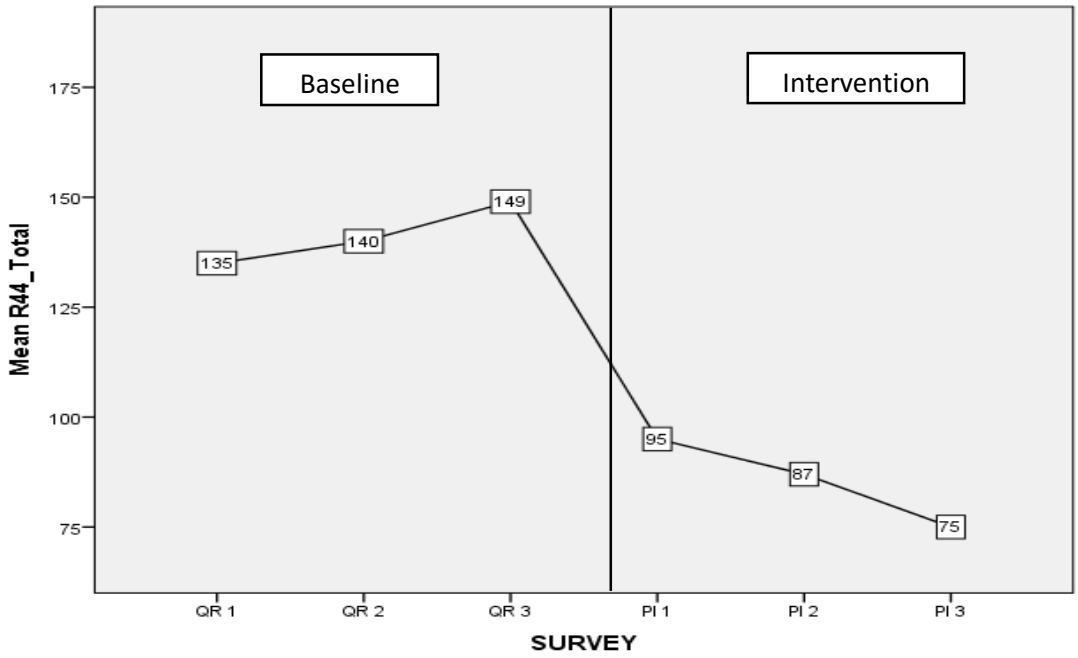
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.44

Pre and Post Intervention Graph Case 44



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 141.33

σ(Standard Deviation) = 7.095

2σ = 14.19

Range = Mean Pre Interventions Score ± 2σ

= 141.33 ± 14.19

= 155.52 to 127.14

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.44) are below the lowest value of the range (127.14). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 45

Table No. 4.6.45

Pre and Post Intervention Scores of Case 45

Case Summaries[a]

		R45 PRE INTERVENTION QR1, QR2, QR3 SCORE	R45 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	141	90
	2	148	87
	3	178	68
	Mean	155.67	81.67
	Std. Deviation	19.655	11.930

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R45 POST INTERVENTION PI1, PI2, PI3 SCORE - R45 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R45 POST INTERVENTION PI1, PI2, PI3 SCORE < R45 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R45 POST INTERVENTION PI1, PI2, PI3 SCORE > R45 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R45 POST INTERVENTION PI1, PI2, PI3 SCORE = R45 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R45 POST INTERVENTION PI1, PI2, PI3 SCORE - R45 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

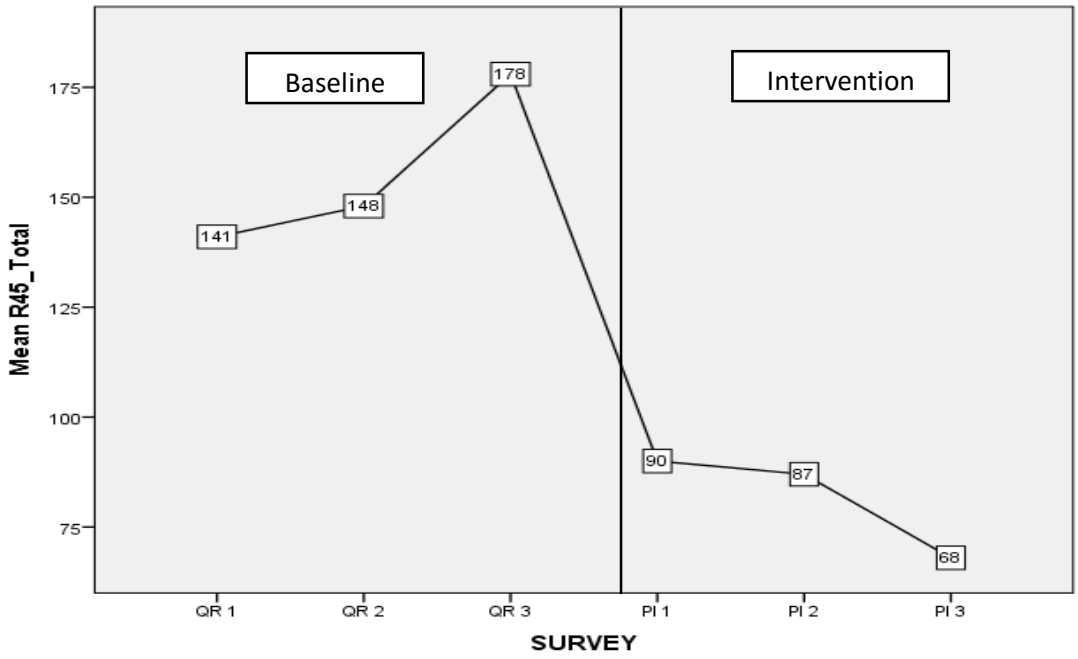
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.45

Pre and Post Intervention Graph Case 45



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 155.67

σ(Standard Deviation) = 19.655

$2\sigma = 39.31$

Range = Mean Pre Interventions Score ± 2σ

= 155.67 ± 39.31

= 194.98 to 116.39

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.45) are below the lowest value of the range (116.39). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 46

Table No. 4.6.46

Pre and Post Intervention Scores of Case 46

Case Summaries[a]

		R46 PRE INTERVENTION QR1, QR2, QR3 SCORE	R46 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	161	91
	2	159	90
	3	178	73
	Mean	166.00	84.67
	Std. Deviation	10.440	10.116

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R46 POST INTERVENTION PI1, PI2, PI3 SCORE - R46 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R46 POST INTERVENTION PI1, PI2, PI3 SCORE < R46 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R46 POST INTERVENTION PI1, PI2, PI3 SCORE > R46 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R46 POST INTERVENTION PI1, PI2, PI3 SCORE = R46 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R46 POST INTERVENTION PI1, PI2, PI3 SCORE - R46 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

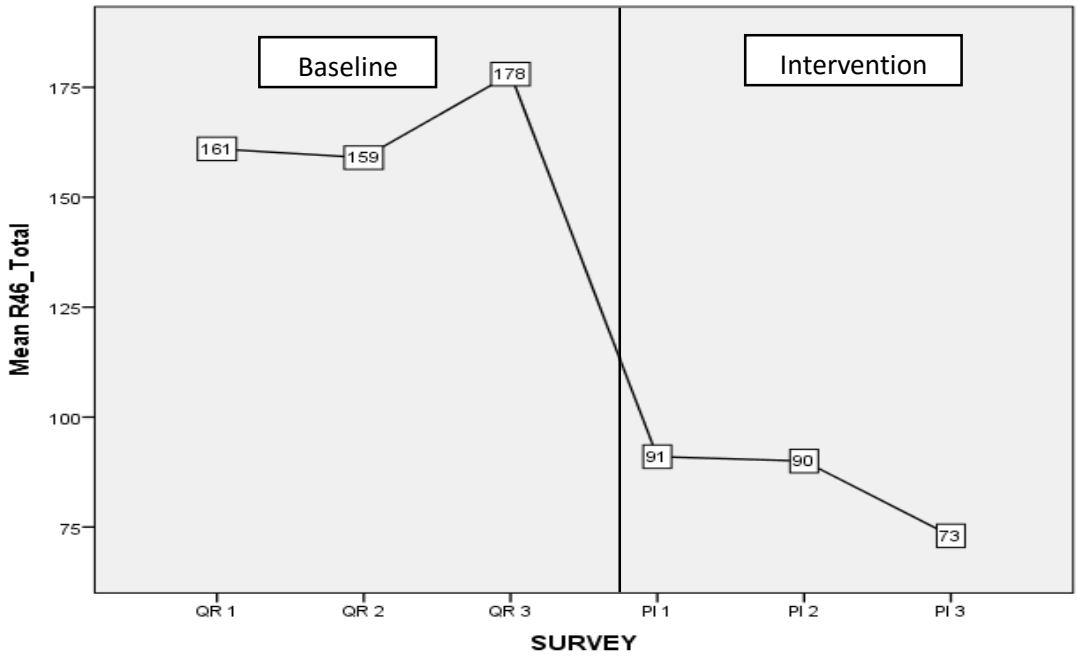
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.46

Pre and Post Intervention Graph Case 46



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 166.00

σ(Standard Deviation) = 10.440

$2\sigma = 20.88$

Range = Mean Pre Interventions Score $\pm 2\sigma$

$= 166.00 \pm 20.88$

= 186.88 to 145.12

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.46) are below the lowest value of the range (145.12). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 47

Table No. 4.6.47

Pre and Post Intervention Scores of Case 47

Case Summaries[a]

		R47 PRE INTERVENTION QR1, QR2, QR3 SCORE	R47 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	165	92
	2	167	87
	3	175	72
	Mean	169.00	83.67
	Std. Deviation	5.292	10.408

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R47 POST INTERVENTION PI1, PI2, PI3 SCORE - R47 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R47 POST INTERVENTION PI1, PI2, PI3 SCORE < R47 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R47 POST INTERVENTION PI1, PI2, PI3 SCORE > R47 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R47 POST INTERVENTION PI1, PI2, PI3 SCORE = R47 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R47 POST INTERVENTION PI1, PI2, PI3 SCORE - R47 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

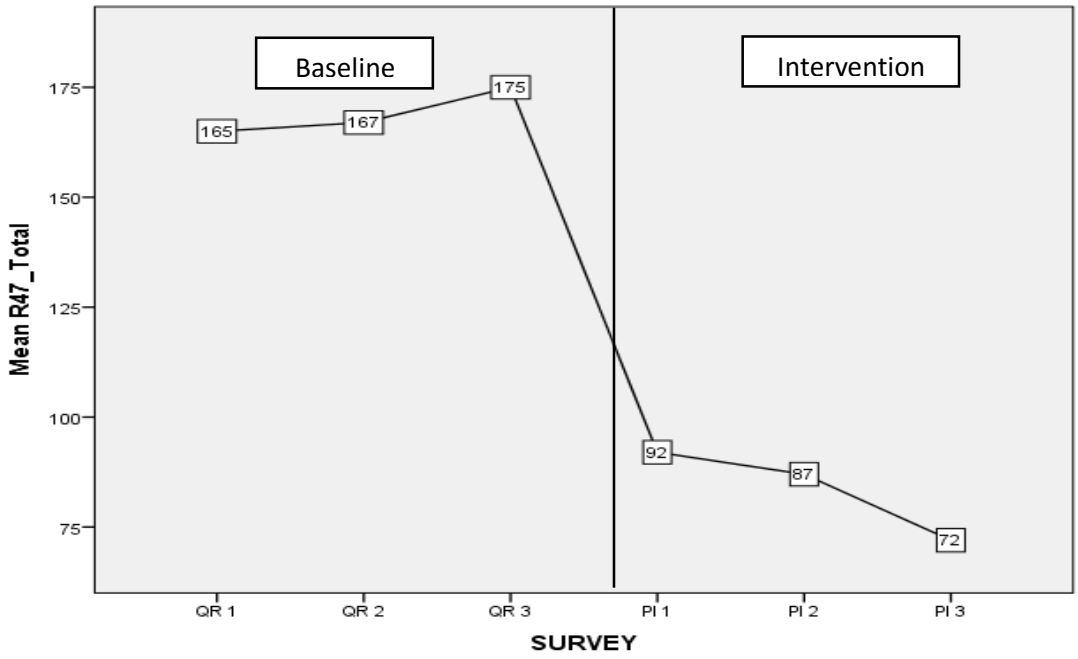
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.47

Pre and Post Intervention Graph Case 47



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 169.00

σ(Standard Deviation) = 5.292

2σ =10.584

Range = Mean Pre Interventions Score ± 2σ

= 169.00 ± 10.584

= 158.416 to 153.416

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.47) are below the lowest value of the range (153.416). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 48

Table 4.6.48

Pre and Post Intervention Scores of Case 48

Case Summaries[a]

		R48 PRE INTERVENTION QR1, QR2, QR3 SCORE	R48 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	150	93
	2	156	86
	3	168	73
	Mean	158.00	84.00
	Std. Deviation	9.165	10.149

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R48 POST INTERVENTION PI1, PI2, PI3 SCORE - R48 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R48 POST INTERVENTION PI1, PI2, PI3 SCORE < R48 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R48 POST INTERVENTION PI1, PI2, PI3 SCORE > R48 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R48 POST INTERVENTION PI1, PI2, PI3 SCORE = R48 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R48 POST INTERVENTION PI1, PI2, PI3 SCORE - R48 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

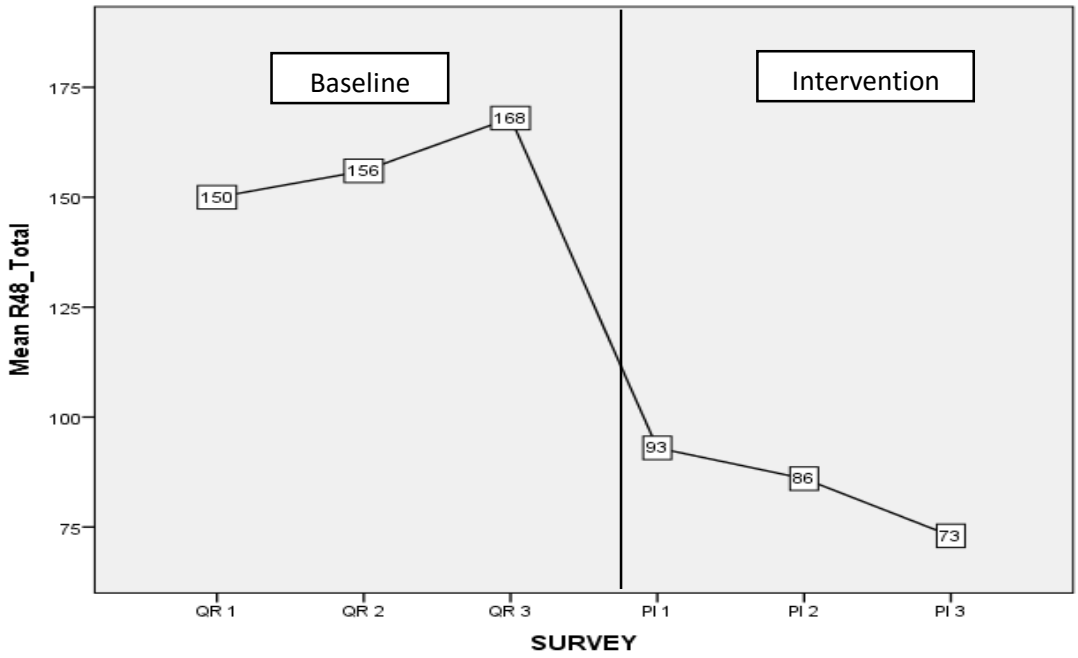
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.48

Pre and Post Intervention Graph Case 48



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 158.00

σ(Standard Deviation) = 9.165

2σ = 18.33

Range = Mean Pre Interventions Score ± 2σ

= 159.00 ± 18.33

= 177.33 to 140.67

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.48) are below the lowest value of the range (140.67). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 49

Table No. 4.6.49

Pre and Post Intervention Scores of Case 49

Case Summaries[a]

		R49 PRE INTERVENTION QR1, QR2, QR3 SCORE	R49 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	162	94
	2	163	87
	3	177	74
	Mean	167.33	85.00
	Std. Deviation	8.386	10.149

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R49 POST INTERVENTION PI1, PI2, PI3 SCORE - R49 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R49 POST INTERVENTION PI1, PI2, PI3 SCORE < R49 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R49 POST INTERVENTION PI1, PI2, PI3 SCORE > R49 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R49 POST INTERVENTION PI1, PI2, PI3 SCORE = R49 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R49 POST INTERVENTION PI1, PI2, PI3 SCORE - R49 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

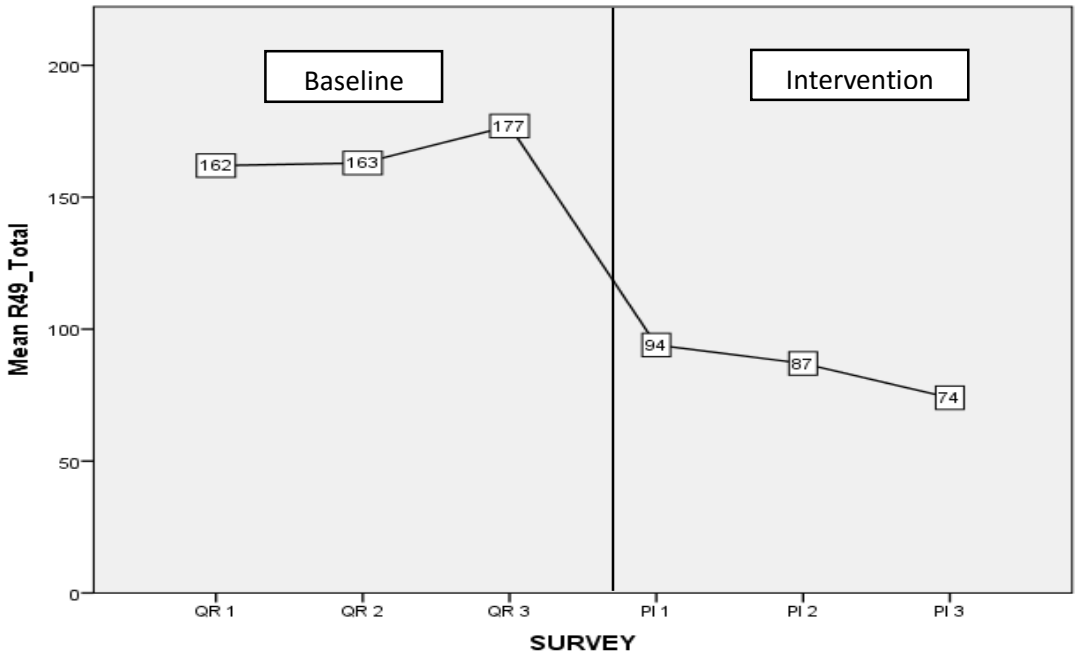
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.49

Pre and Post Intervention Graph Case 49



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 167.33

σ(Standard Deviation) = 8.386

$2\sigma = 16.772$

Range = Mean Pre Interventions Score ± 2σ

= 167.33 ± 16.772

= 184.102 to 150.558

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.49) are below the lowest value of the range (150.558). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 50

Table No. 4.6.50

Pre and Post Intervention Scores of Case 50

Case Summaries[a]

		R50 PRE INTERVENTION QR1, QR2, QR3 SCORE	R49 PRE INTERVENTION QR1, QR2, QR3 SCORE
Total	1	159	162
	2	174	163
	3	172	177
	Mean	168.33	167.33
	Std. Deviation	8.145	8.386

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R50 POST INTERVENTION PI1, PI2, PI3 SCORE - R50 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R50 POST INTERVENTION PI1, PI2, PI3 SCORE < R50 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R50 POST INTERVENTION PI1, PI2, PI3 SCORE > R50 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R50 POST INTERVENTION PI1, PI2, PI3 SCORE = R50 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R50 POST INTERVENTION PI1, PI2, PI3 SCORE - R50 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

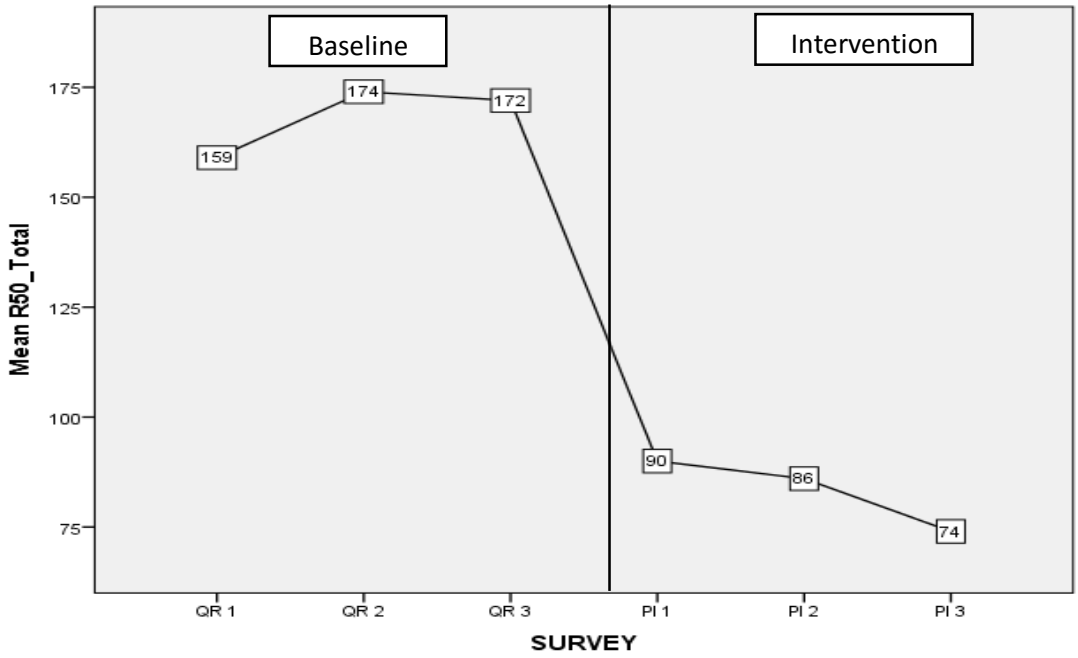
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.50

Pre and Post Intervention Graph Case 50



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 168.33

σ(Standard Deviation) = 8.145

2σ = 16.29

Range = Mean Pre Interventions Score ± 2σ

= 168.33 ± 16.29

= 184.62 to 152.04

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.50) are below the lowest value of the range (152.04). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

DONGAR WADI

Case No. 51

Table No. 4.6.51

Pre and Post Intervention Scores of Case 51

Case Summaries[a]

		R51PRE INTERVENTION QR1, QR2, QR3 SCORE	R51 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	158	93
	2	165	76
	3	174	66
	Mean	165.67	78.33
	Std. Deviation	8.021	13.650

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R51 POST INTERVENTION PI1, PI2, PI3 SCORE - R51PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R51 POST INTERVENTION PI1, PI2, PI3 SCORE < R51PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R51 POST INTERVENTION PI1, PI2, PI3 SCORE > R51PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R51 POST INTERVENTION PI1, PI2, PI3 SCORE = R51PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R51 POST INTERVENTION PI1, PI2, PI3 SCORE - R51PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

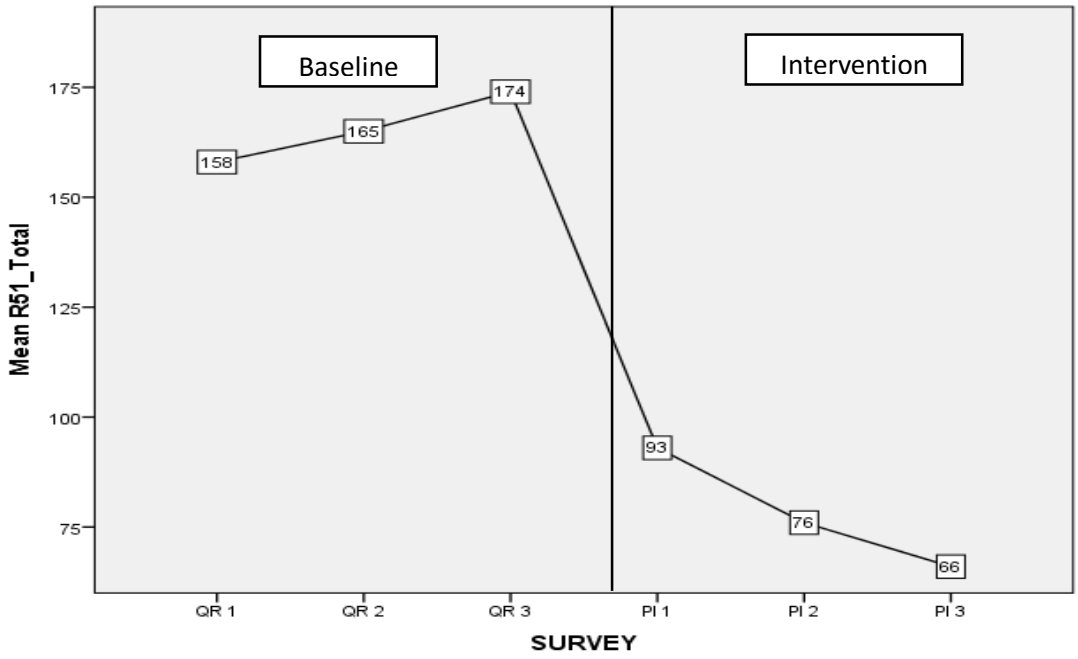
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.51

Pre and Post Intervention Graph Case 51



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 165.67

σ(Standard Deviation) = 8.021

$2\sigma = 16.042$

Range = Mean Pre Interventions Score ± 2σ

= 165.67 ± 16.042

= 181.712 to 149.628

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.51) are below the lowest value of the range (149.628). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 52

Table No. 4.6.52

Pre and Post Intervention Scores of Case 52

Case Summaries[a]

		R52 PRE INTERVENTION QR1, QR2, QR3 SCORE	R52 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	150	98
	2	152	89
	3	158	66
	Mean	153.33	84.33
	Std. Deviation	4.163	16.503

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R52 POST INTERVENTION PI1, PI2, PI3 SCORE - R52 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R52 POST INTERVENTION PI1, PI2, PI3 SCORE < R52 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R52 POST INTERVENTION PI1, PI2, PI3 SCORE > R52 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R52 POST INTERVENTION PI1, PI2, PI3 SCORE = R52 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R52 POST INTERVENTION PI1, PI2, PI3 SCORE - R52 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

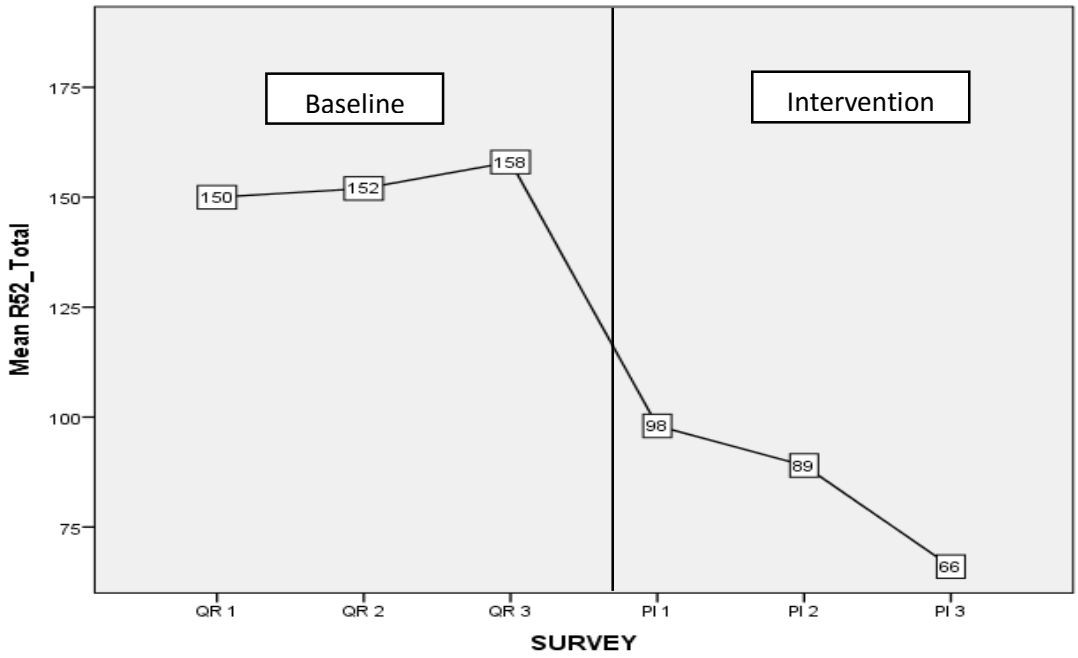
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.52

Pre and Post Intervention Graph Case 52



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 153.33

σ(Standard Deviation) = 4.163

2σ = 8.326

Range = Mean Pre Interventions Score ± 2σ

= 153.33 ± 8.326

= 161.656 to 145.004

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.52) are below the lowest value of the range (145.004). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 53

Table No. 4.6.53

Pre and Post Intervention Scores of Case 53

Case Summaries[a]

		R53 PRE INTERVENTION QR1, QR2, QR3 SCORE	R53POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	159	88
	2	162	84
	3	164	67
	Mean	161.67	79.67
	Std. Deviation	2.517	11.150

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R53POST INTERVENTION PI1, PI2, PI3 SCORE - R53 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R53POST INTERVENTION PI1, PI2, PI3 SCORE < R53 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R53POST INTERVENTION PI1, PI2, PI3 SCORE > R53 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R53POST INTERVENTION PI1, PI2, PI3 SCORE = R53 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R53POST INTERVENTION PI1, PI2, PI3 SCORE - R53 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

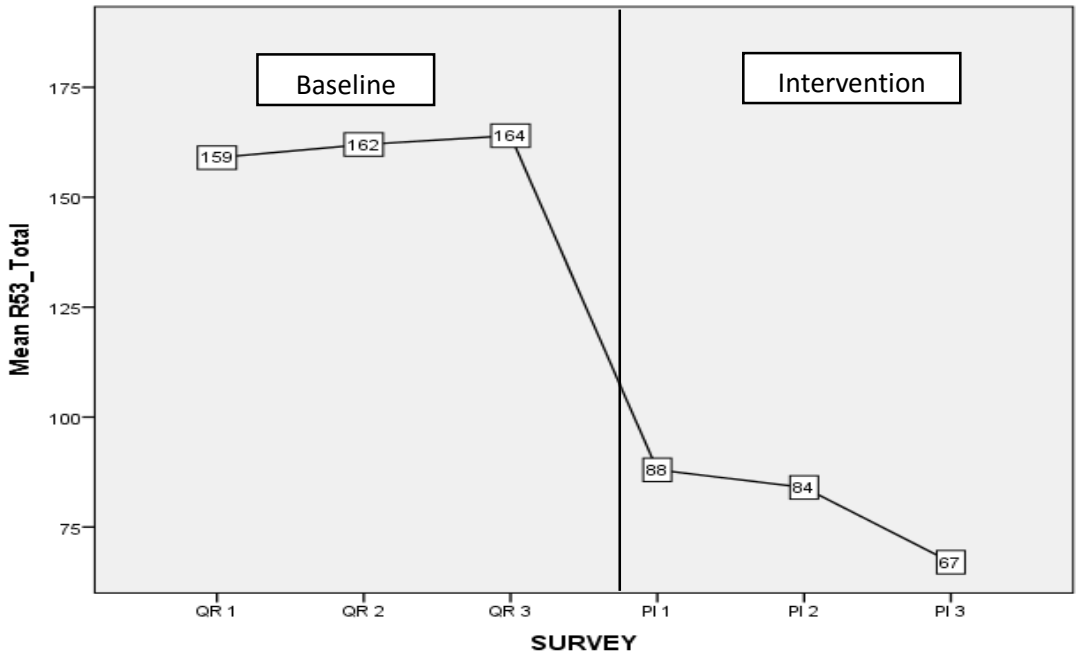
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.53

Pre and Post Intervention Graph Case 53



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 161.67

σ(Standard Deviation) = 2.517

$2\sigma = 5.034$

Range = Mean Pre Interventions Score ± 2σ

= 161.67 ± 5.034

= 166.704 to 156.636

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.53) are below the lowest value of the range (156.636). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 54

Table No. 4.6.54

Pre and Post Intervention Scores of Case 54

Case Summaries[a]

		R54 PRE INTERVENTION QR1, QR2, QR3 SCORE	R54 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	141	97
	2	142	87
	3	153	67
	Mean	145.33	83.67
	Std. Deviation	6.658	15.275

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R54 POST INTERVENTION PI1, PI2, PI3 SCORE - R54 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R54 POST INTERVENTION PI1, PI2, PI3 SCORE < R54 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R54 POST INTERVENTION PI1, PI2, PI3 SCORE > R54 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R54 POST INTERVENTION PI1, PI2, PI3 SCORE = R54 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R54 POST INTERVENTION PI1, PI2, PI3 SCORE - R54 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

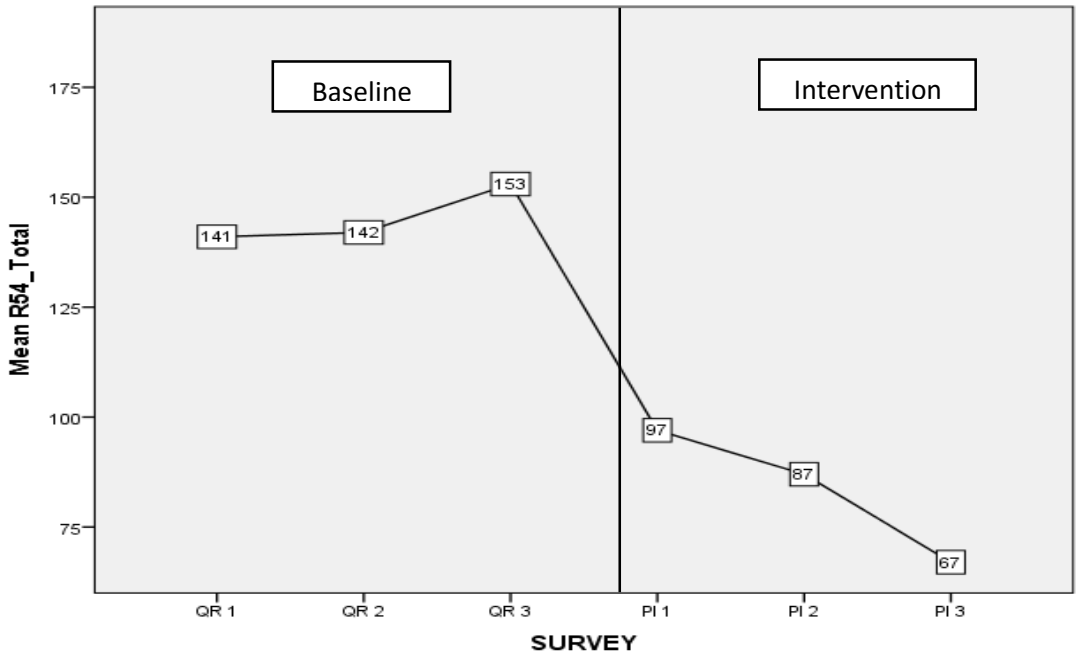
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.54

Pre and Post Intervention Graph Case 54



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 145.33

σ(Standard Deviation) = 6.658

2σ = 13.316

Range = Mean Pre Interventions Score ± 2σ

= 145.33 ± 13.316

= 158.646 to 132.014

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.54) are below the lowest value of the range (132.014). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 55

Table No. 4.6.55

Pre and Post Intervention Scores of Case 55

Case Summaries[a]

		R55 PRE INTERVENTION QR1, QR2, QR3 SCORE	R55 POST INTERVENTION PI1, PI2, PI3 SCORE
Total	1	140	93
	2	138	87
	3	156	69
	Mean	144.67	83.00
	Std. Deviation	9.866	12.490

a. Limited to first 3 cases.

To know if there is significant different in Pre and Post intervention scores 'Wilcoxon Signed Ranked Test' was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
R55 POST INTERVENTION PI1, PI2, PI3 SCORE - R55 PRE INTERVENTION QR1, QR2, QR3 SCORE	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. R55 POST INTERVENTION PI1, PI2, PI3 SCORE < R55 PRE INTERVENTION QR1, QR2, QR3 SCORE

b. R55 POST INTERVENTION PI1, PI2, PI3 SCORE > R55 PRE INTERVENTION QR1, QR2, QR3 SCORE

c. R55 POST INTERVENTION PI1, PI2, PI3 SCORE = R55 PRE INTERVENTION QR1, QR2, QR3 SCORE

Test Statistics[a]

	R55 POST INTERVENTION PI1, PI2, PI3 SCORE - R55 PRE INTERVENTION QR1, QR2, QR3 SCORE
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

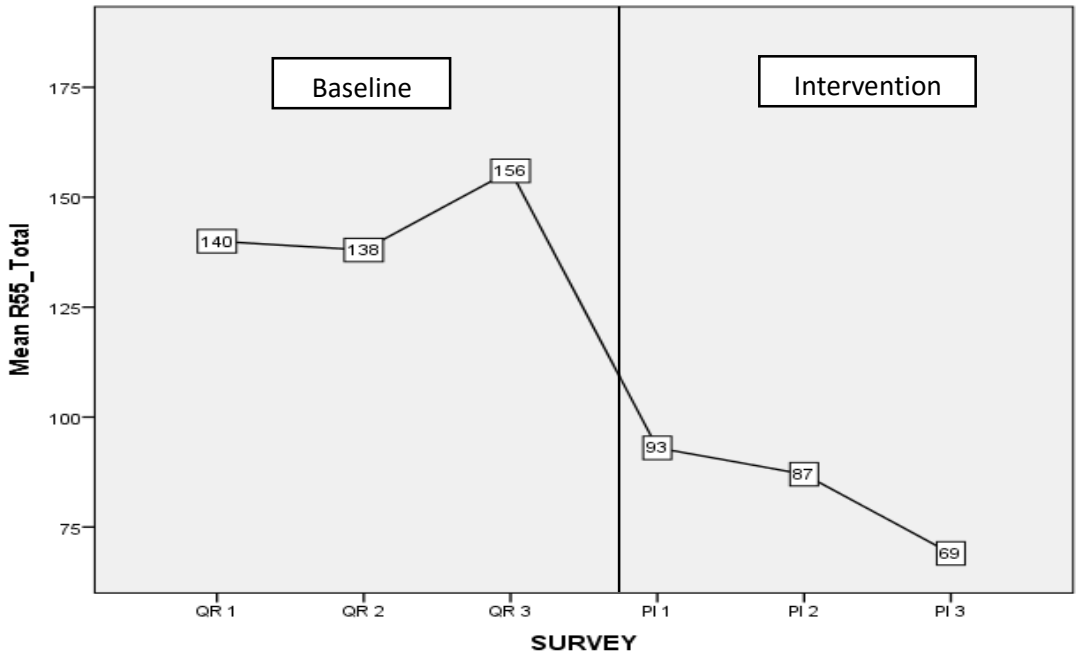
b. Based on positive ranks.

The results of the test shows that the difference in pre and post intervention scores was not statically significant (p=0.109)

Pre and Post scores obtained by case one are presented in the graphical form below.

Figure No. 4.6.55

Pre and Post Intervention Graph Case 55



The graphical representation of the pre and post intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work intervention was effective.

To know if the decreasing trend is statistically significant, Two Standard Deviation method was used. The results of the tests are shown below.

Mean Score = 144.67

σ(Standard Deviation) = 9.866

$2\sigma = 19.732$

Range = Mean Pre Interventions Score $\pm 2\sigma$

= 144.67 ± 19.732

= 164.402 to 124.938

As a rule, if two consecutive scores out of three post interventions scores are beyond the range (either above the highest value or below the lowest value of the range) we can infer that the change is statistically significant at 0.05 (Rubin and Babbie,1993, p.518). In this case, three intervention scores (Table 4.6.55) are below the lowest value of the range (124.938). Hence, we can infer that the intervention was not effective. In other words, we can say that the Intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

PART - F

4.7 Group Pre and Post Intervention Scores (Average)

4.7.1 Pre-Intervention and Post-Intervention

- **Introduction :**

  Research can be either observational or interventional. Garbage collection and distribution studies involve making a change or intervening in order to study the outcome of what has been changed. An intervention is introduced immediately after the baseline period with the aim of affecting an outcome the intervention. This study has been done keeping in view the families of certain areas. This intervention study is divided into two sections, the first section being pre-intervention and second one is post-intervention. The intervention itself is the aspect that is being manipulated in this research. In the garbage collection and segregation total research is not only depending on the intervention but also some observational study is involve for monitoring a data that is being collected from the various area of the Pune city. The Wilcoxon rank test is preferred here for measurement of intervention as pre/post intervention measurements were taken on the same groups and changes were reported by the group leaders.

- **Wilcoxon Signed Rank Test:**

  It compares two distributions to assess whether one has systematically larger values than the other. The Wilcoxon test is based on which is the sum of the ranks of one of the samples.

- **Definition**:

  "The Wilcoxon signed rank test, also known as the Wilcoxon matched pairs test, is a non-parametric test used to test the median difference in paired data."

  "The Wilcoxon test, which can refer to either the rank sum test or the signed rank test version, is a nonparametric statistical test that compares two paired groups. The tests essentially calculate the difference between sets of pairs and analyse these differences to establish if they are statistically significantly different from one another."

  - A non-parametric test does not require any particular form for the population distribution from which our sample comes.
  - Nonparametric inference is mostly limited to simple settings (Place or environment where people live).

The Wilcoxon rank-sum test is a nonparametric alternative to the two sample t-test which is based solely on the order in which the observations from the two samples fall. We will use the following as a running example.

- The goal of the test is to determine if two or more sets of pairs are different from one another in a statistically significant manner. Here pre intervention and post intervention sets of pairs were taken into the consideration for checking their statistical values.
- Both versions of the model assume that the pairs in the data come from dependent populations, i.e., following the same groups from 6 areas from Pune urban and suburban area with same families were taken into the consideration, with different time and same place for hypothetical checking.
- As per of the title thesis "The knowledge, attitude and practice about garbage segregation among urban families: A social work intervention study in Pune city". Here groups from the 6 areas with different family background were surveyed for output.

Case No. 1

Pre and Post Intervention Scores of Siddhivinayak Colony

Table: 4.7.1

Pre and Post Intervention Scores of Siddhivinayak Colony

Case Summaries (a)

No of the Interventions		PRE INTERVENTION QR1, QR2, QR3 SCORE 1	POST INTERVENTION PI1, PI2, PI3 SCORE 1
Total	1	1386	959
	2	1437	821
	3	1505	765
	N	3	3
	Mean	1442.67	848.33
	Std. Deviation	59.702	99.847

Source: Primary data with pre and post (a. Limited to first 3 cases.)

To know if there is significant difference in pre and post intervention scores Wilcoxon Signed Rank Test was administered

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
POST INTERVENTION PI1, PI2, PI3 SCORE 1 - PRE INTERVENTION QR1, QR2, QR3 SCORE 1	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. POST INTERVENTION PI1, PI2, PI3 SCORE 1 < PRE INTERVENTION QR1, QR2, QR3 SCORE 1

b. POST INTERVENTION PI1, PI2, PI3 SCORE 1 > PRE INTERVENTION QR1, QR2, QR3 SCORE 1

c. POST INTERVENTION PI1, PI2, PI3 SCORE 1 = PRE INTERVENTION QR1, QR2, QR3 SCORE 1

Test Statistics

	POST INTERVENTION PI1, PI2, PI3 SCORE 1 - PRE INTERVENTION QR1, QR2, QR3 SCORE 1
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

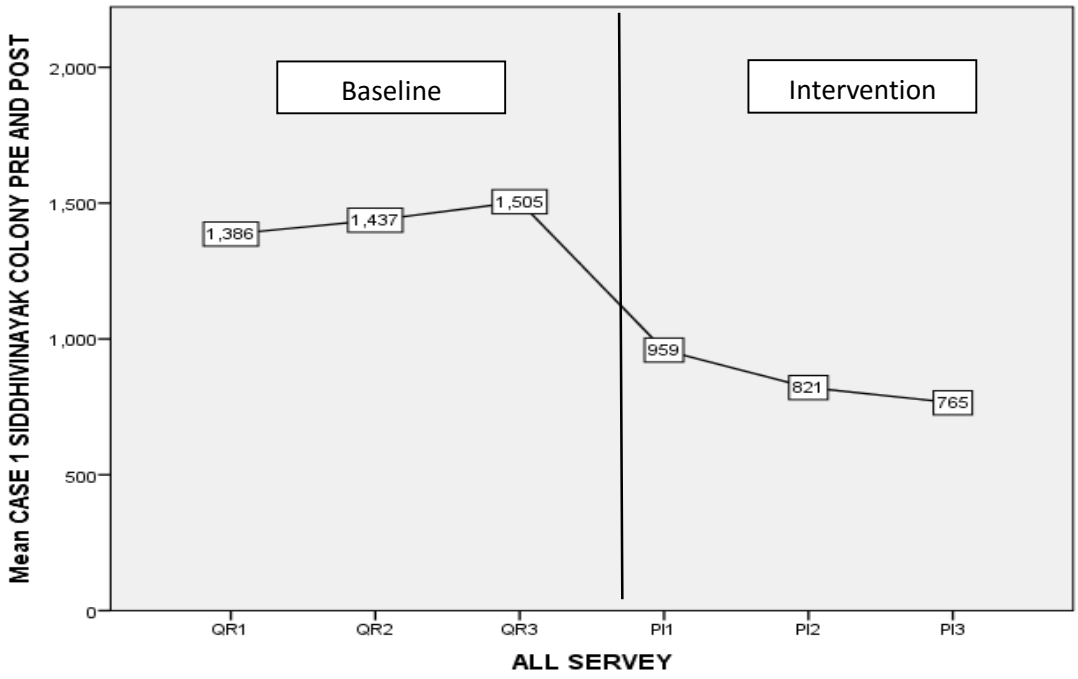
b. Based on positive ranks.

The results of the test show that the difference in Pre and Post intervention scores was not significant statically significant (p = .109)

Pre and Post course obtained by Case No. 1 are presented in the graphical form below:

Graph No. 4.7.1

Pre and Post course obtained by Case No. 1



Source: Primary Survey

Interpretation: The graphical representation of the Pre and Post Intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work Intervention was effective.

To know if the decreasing trend is statically significant, two standard deviation method was used. The result of the test are presented below.

Mean Pre interventions score = 1442.67

σ (Standard Deviation) = 59.702

2σ = 119.404

Range = Mean Pre Interventions score ± 2σ

= 1442.67 ± 119.404

= 1562.074 to 1323.266

As a rule, if two consecutive scores out of three post intervention score are beyond the range (either above the highest value or below the lowest value of range) we can infer that the change is statically significant at .05 (Rubin and Babbie, 1993, p.518). In this case, two post interventions scores (Table 4.7.1) are below the lowest value of the range (1323.266). Hence, we can infer that the intervention was effective. In other words, we can say that the intervention (treatment) has not made significant change in the KAP (knowledge- attitude and Practice) of subjects to normal functioning.

Case No. 2

Pre and Post Intervention Scores of MAHDA- Colony

Table No. 4.7.2

Pre and Post Intervention Scores of MAHDA- Colony

Case Summaries

		PRE INTERVENTION QR1, QR2, QR3 SCORE 2	POST INTERVENTION PI1, PI2, PI3 SCORE 2
Total	1	1428	910
	2	1470	838
	3	1558	731
	N	3	3
	Mean	1485.33	826.33
	Std. Deviation	66.343	90.068

Source: Primary data with pre and post (a. Limited to first 3 cases.)a. Limited to first 3 cases.

To know if there is significant difference in pre and post intervention scores Wilcoxon Signed Rank Test was administered

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
POST INTERVENTION PI1, PI2, PI3 SCORE 2 - PRE INTERVENTION QR1, QR2, QR3 SCORE 2	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

Source: Primary Survey of selected 10 families from 55 families with assigned group.

a. POST INTERVENTION PI1, PI2, PI3 SCORE 2 < PRE INTERVENTION QR1, QR2, QR3 SCORE 2

b. POST INTERVENTION PI1, PI2, PI3 SCORE 2 > PRE INTERVENTION QR1, QR2, QR3 SCORE 2

c. POST INTERVENTION PI1, PI2, PI3 SCORE 2 = PRE INTERVENTION QR1, QR2, QR3 SCORE 2

Test Statistics

Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

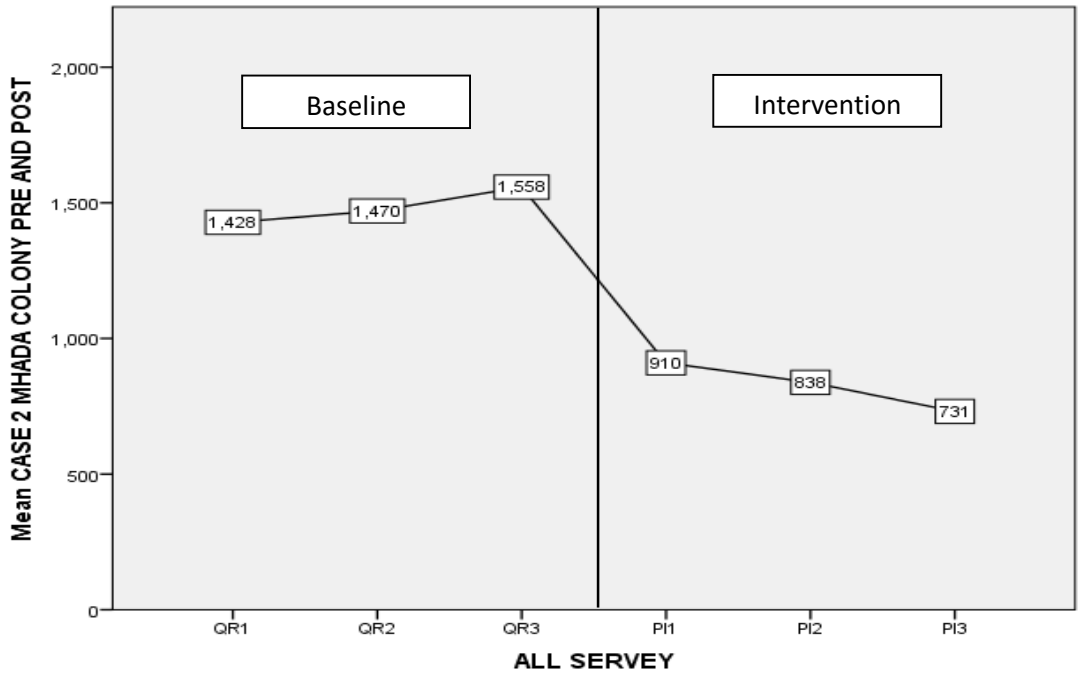
b. Based on positive ranks.

The results of the test show that the difference in Pre and Post intervention scores was not significant statically significant (p = .109).

Pre and Post course obtained by Case No. 2 are presented in the graphical form below

Graph No.: 4.7.2

Pre and Post course obtained by Case No. 2



Source: Primary survey of Group2 in Case 2.

Interpretation: The graphical representation of the Pre and Post Intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work Intervention was effective.

To know if the decreasing trend is statically significant, two standard deviation method was used. The result of the test are presented below.

Mean Pre interventions score = 1485.33

σ (Standard Deviation) = 66.343

2σ = 132.686

Range = Mean Pre Interventions score ± 2σ

= 1485.33 ± 132.686

= 1618.016 to 1352.644

As a rule, if two consecutive scores out of three post intervention score are beyond the range (either above the highest value or below the lowest value of range) we can infer that the change is statically significant at .05 (Rubin and Babbie, 1993, p.518). In this case, two post interventions scores (Table 4.7.2) are below the lowest value of the range (1352.644). Hence, we can infer that the intervention was effective. In other words, we can say that the intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 3

Pre and Post Intervention Scores of Gokulnagar Pathar

Table No. 4.7.3

Pre and Post Intervention Scores of Gokulnagar Pathar

Case Summaries

		PRE INTERVENTION QR1, QR2, QR3 SCORE 3	POST INTERVENTION PI1, PI2, PI3 SCORE 3
Total	1	1407	1116
	2	1488	1052
	3	1592	778
	N	3	3
	Mean	1495.67	982.00
	Std. Deviation	92.738	179.544

a. Limited to first 3 cases.

To know if there is significant difference in pre and post intervention scores Wilcoxon Signed Rank Test was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
POST INTERVENTION PI1, PI2, PI3 SCORE 3 - PRE INTERVENTION QR1, QR2, QR3 SCORE 3	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. POST INTERVENTION PI1, PI2, PI3 SCORE 3 < PRE INTERVENTION QR1, QR2, QR3 SCORE 3

b. POST INTERVENTION PI1, PI2, PI3 SCORE 3 > PRE INTERVENTION QR1, QR2, QR3 SCORE 3

c. POST INTERVENTION PI1, PI2, PI3 SCORE 3 = PRE INTERVENTION QR1, QR2, QR3 SCORE 3

Test Statistics

	POST INTERVENTION PI1, PI2, PI3 SCORE 3 - PRE INTERVENTION QR1, QR2, QR3 SCORE 3
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

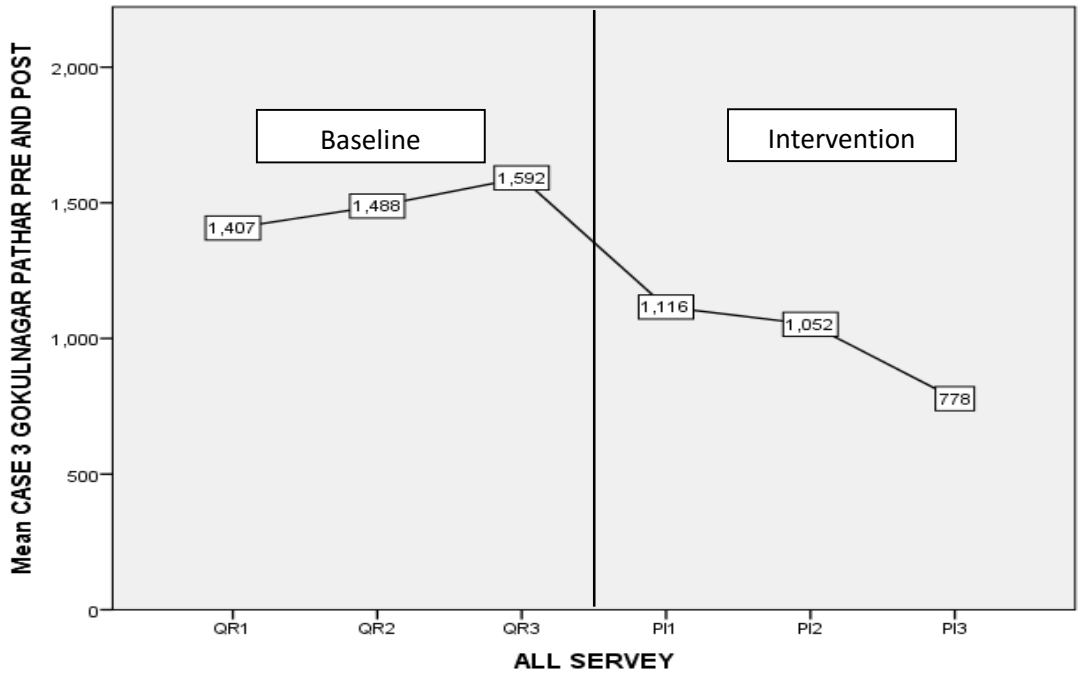
b. Based on positive ranks.

The results of the test show that the difference in Pre and Post intervention scores was not significant statically significant (p = .109).

Pre and Post course obtained by Case No. 3 are presented in the graphical form below

Graph No. 4.7.3

Pre and Post course obtained by Case No. 3



The graphical representation of the Pre and Post Intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work Intervention was effective.

To know if the decreasing trend is statically significant, two standard deviation method was used. The result of the test are presented below.

Mean Pre interventions score = 1495.67

σ (Standard Deviation) = 92.738

2σ = 185.476

Range = Mean Pre Interventions score ± 2σ

= 1495.67 ± 185.476

= 1681.146 to 1310.194

As a rule, if two consecutive scores out of three post intervention score are beyond the range (either above the highest value or below the lowest value of range) we can infer that the change is statically significant at .05 (Rubin and Babbie, 1993, p.518). In this case, two post interventions scores (Table 4.7.3) are below the lowest value of the range (1310.194). Hence, we can infer that the intervention was effective. In other words, we can say that the intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

Case No. 4

Pre and Post Intervention Scores of Sahyog Nagar

Table No. 4.7.4

Pre and Post Intervention Scores of Sahyog Nagar

Case Summaries

		PRE INTERVENTION QR1, QR2, QR3 SCORE 4	POST INTERVENTION PI1, PI2, PI3 SCORE 4
Total	1	1509	1184
	2	1563	925
	3	1604	729
	N	3	3
	Mean	1558.67	946.00
	Std. Deviation	47.648	228.226

a. Limited to first 3 cases.

To know if there is significant difference in pre and post intervention scores Wilcoxon Signed Rank Test was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
POST INTERVENTION PI1, PI2, PI3 SCORE 4 - PRE INTERVENTION QR1, QR2, QR3 SCORE 4	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. POST INTERVENTION PI1, PI2, PI3 SCORE 4 < PRE INTERVENTION QR1, QR2, QR3 SCORE 4

b. POST INTERVENTION PI1, PI2, PI3 SCORE 4 > PRE INTERVENTION QR1, QR2, QR3 SCORE 4

c. POST INTERVENTION PI1, PI2, PI3 SCORE 4 = PRE INTERVENTION QR1, QR2, QR3 SCORE 4

Test Statistics

	POST INTERVENTION PI1, PI2, PI3 SCORE 4 - PRE INTERVENTION QR1, QR2, QR3 SCORE 4
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

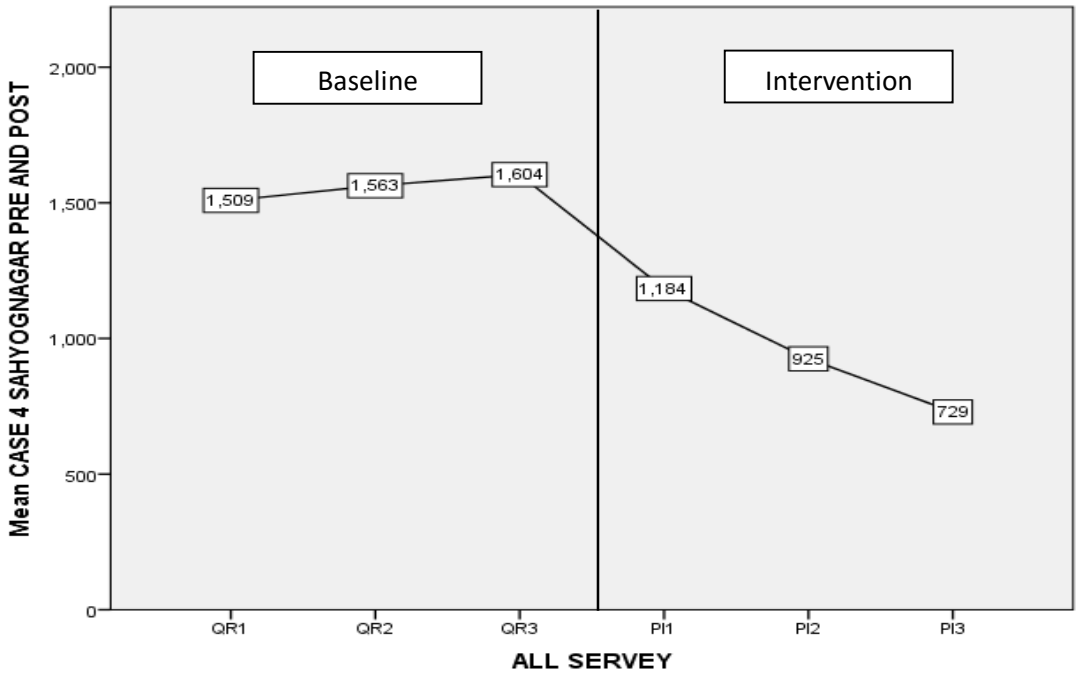
b. Based on positive ranks.

The results of the test show that the difference in Pre and Post intervention scores was not significant statically significant (p =.109).

Pre and Post course obtained by Case No. 4 are presented in the graphical form below

Graph No. 4.7.4

Pre and Post course obtained by Case No. 4



The graphical representation of the Pre and Post Intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work Intervention was effective.

To know if the decreasing trend is statically significant, two standard deviation method was used. The result of the test are presented below.

Mean Pre interventions score = 1558.67

σ (Standard Deviation) = 47.648

2σ = 95.296

Range = Mean Pre Interventions score ± 2σ

= 1558.67 ± 95.296

= 1653.966 to 1463.374

As a rule, if two consecutive scores out of three post intervention score are beyond the range (either above the highest value or below the lowest value of range) we can infer that the change is statically significant at .05 (Rubin and Babbie, 1993, p.518). In this case, two post interventions scores (Table 4.7.4) are below the lowest value of the range (1463. 374). Hence, we can infer that the intervention was effective. In other words, we can say that the intervention (treatment) has not made significant change in the KAP of subjects to normal functioning (in regular practice).

Case No. 5

Pre and Post Intervention Scores of Gosavi Vasti:

Table No. 4.7.5

Pre and Post Intervention Scores of Gosavi Vasti

Case Summaries

		PRE INTERVENTION QR1, QR2, QR3 SCORE 5	POST INTERVENTION PI1, PI2, PI3 SCORE 5
Total	1	1488	922
	2	1580	865
	3	1689	727
	N	3	3
	Mean	1585.67	838.00
	Std. Deviation	100.620	100.265

a. Limited to first 3 cases.

To know if there is significant difference in pre and post intervention scores Wilcoxon Signed Rank Test was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
POST INTERVENTION PI1, PI2, PI3 SCORE 5 - PRE INTERVENTION QR1, QR2, QR3 SCORE 5	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. POST INTERVENTION PI1, PI2, PI3 SCORE 5 < PRE INTERVENTION QR1, QR2, QR3 SCORE 5

b. POST INTERVENTION PI1, PI2, PI3 SCORE 5 > PRE INTERVENTION QR1, QR2, QR3 SCORE 5

c. POST INTERVENTION PI1, PI2, PI3 SCORE 5 = PRE INTERVENTION QR1, QR2, QR3 SCORE 5

Test Statistics

	POST INTERVENTION PI1, PI2, PI3 SCORE 5 - PRE INTERVENTION QR1, QR2, QR3 SCORE 5
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

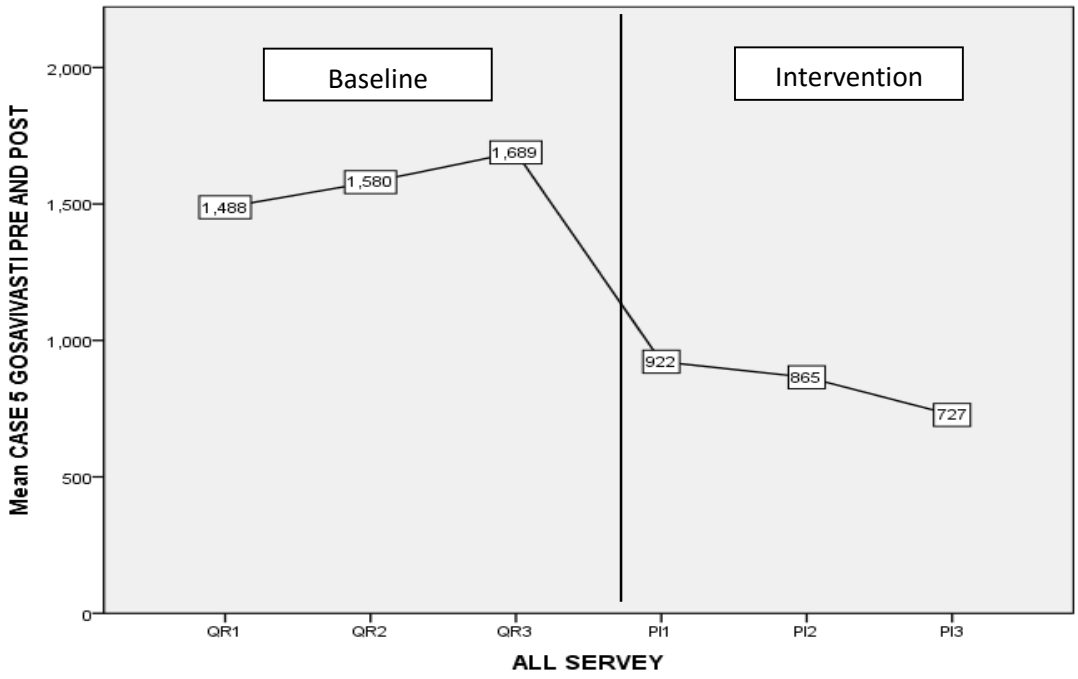
b. Based on positive ranks.

The results of the test show that the difference in Pre and Post intervention scores was not significant statically significant (p = .109).

Pre and Post course obtained by Case No. 5 are presented in the graphical form below

Graph No. 4.7.5

Pre and Post course obtained by Case No. 5



The graphical representation of the Pre and Post Intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work Intervention was effective.

To know if the decreasing trend is statically significant, two standard deviation method was used. The result of the test are presented below.

Mean Pre interventions score = 1585.67

σ (Standard Deviation) = 100.620

2σ = 201.24

Range = Mean Pre Interventions score ± 2σ

= 1585.67 ± 201.24

= 1786.91 to 1384.43

As a rule, if two consecutive scores out of three post intervention score are beyond the range (either above the highest value or below the lowest value of range) we can infer that the change is statically significant at .05 (Rubin and Babbie, 1993, p.518). In this case, two post interventions scores (Table 4.7.5) are below the lowest value of the range (1384.43). Hence, we can infer that the intervention was effective. In other words, we can say that the intervention (treatment) has not made significant change in the KAP of subjects to normal functioning (in regular practice before intervention).

Case No. 6

Pre and Post Intervention Scores of Dongar Wadi

Table: 4.7.6

Pre and Post Intervention Scores of Dongar Wadi

Case Summaries

		PRE INTERVENTION QR1, QR2, QR3 SCORE 6	POST INTERVENTION PI1, PI2, PI3 SCORE 6
Total	1	748	469
	2	759	423
	3	805	335
	N	3	3
	Mean	770.67	409.00
	Std. Deviation	30.238	68.088

a. Limited to first 3 cases.

To know if there is significant difference in pre and post intervention scores Wilcoxon Signed Rank Test was administered.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
POST INTERVENTION PI1, PI2, PI3 SCORE 6 - PRE INTERVENTION QR1, QR2, QR3 SCORE 6	Negative Ranks	3[a]	2.00	6.00
	Positive Ranks	0[b]	.00	.00
	Ties	0[c]		
	Total	3		

a. POST INTERVENTION PI1, PI2, PI3 SCORE 6 < PRE INTERVENTION QR1, QR2, QR3 SCORE 6

b. POST INTERVENTION PI1, PI2, PI3 SCORE 6 > PRE INTERVENTION QR1, QR2, QR3 SCORE 6

c. POST INTERVENTION PI1, PI2, PI3 SCORE 6 = PRE INTERVENTION QR1, QR2, QR3 SCORE 6

Test Statistics

	POST INTERVENTION PI1, PI2, PI3 SCORE 6 - PRE INTERVENTION QR1, QR2, QR3 SCORE 6
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

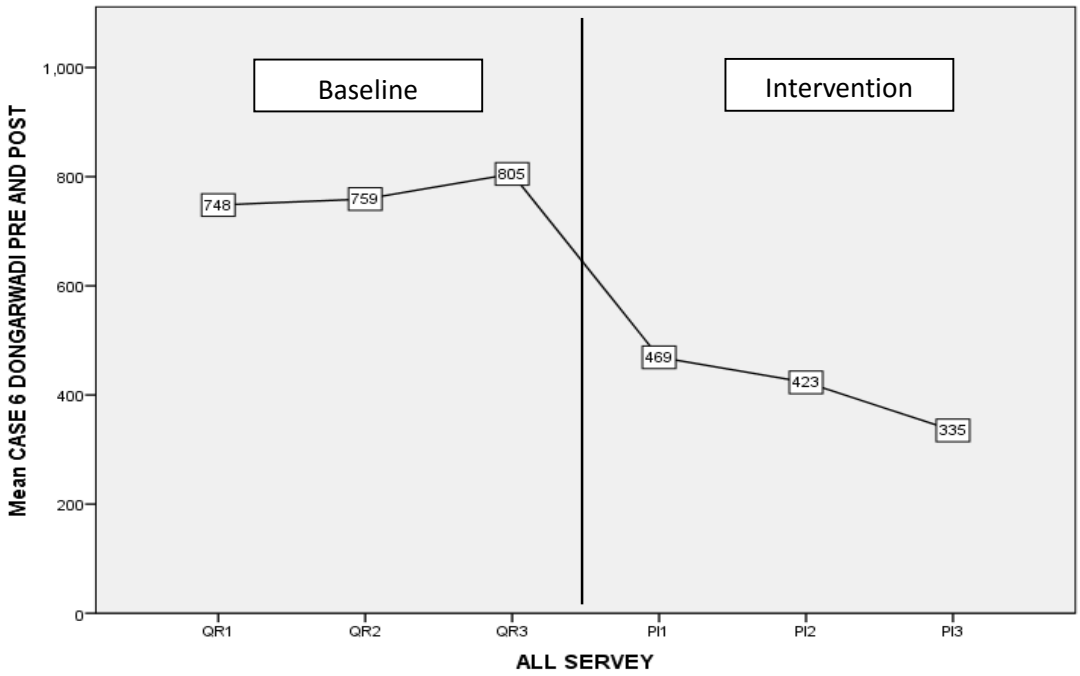
b. Based on positive ranks.

The results of the test show that the difference in Pre and Post intervention scores was not significant statically significant (p = .109).

Pre and Post course obtained by Case No. 6 are presented in the graphical form below

Graph No. 4.7.6

Pre and Post course obtained by Case No. 6



The graphical representation of the Pre and Post Intervention scores clearly shows a steep decreasing trend in the post intervention phase. This indicates that the social work Intervention was effective.

To know if the decreasing trend is statically significant, two standard deviation method was used. The result of the test are presented below.

Mean Pre interventions score = 770.67

σ (Standard Deviation) = 30.238

$2\sigma = 60.476$

Range = Mean Pre Interventions score $\pm 2\sigma$

$= 770.67 \pm 60.476$

= 831.146 to 710.194

As a rule, if two consecutive scores out of three post intervention score are beyond the range (either above the highest value or below the lowest value of range) we can infer that the change is statically significant at .05 (Rubin and Babbie, 1993, p.518). In this case, two post interventions scores (Table 4.7.6) are below the lowest value of the range (710.194). Hence, we can infer that the intervention was effective. In other words, we can say that the intervention (treatment) has not made significant change in the KAP of subjects to normal functioning.

- **Pre and Post Intervention Scores of Dongarwadi**

Interpretation:

The **Wilcoxon Signed Ranks Test** was conducted to determine if there was a statistically significant difference between the pre- and post-intervention scores for the Dongarwadi case. The analysis of the test results revealed a **p-value** of **0.109**, which indicates that the difference between the pre- and post-intervention scores is **not statistically significant** at the 0.05 level.

Data Analysis:

- **Mean Scores:**
  - Pre-Intervention Mean Score: **770.67**
  - Post-Intervention Mean Score: **409.00**
- **Standard Deviations:**
  - Pre-Intervention: **30.238**
  - Post-Intervention: **68.088**

The **graphical representation** of the data shows a clear and significant decrease in the post-intervention scores compared to the pre-intervention scores. This visual decrease suggests that the intervention may have been effective in improving the participants' practices and awareness related to waste management.

To further validate these findings, the **two-standard deviation method** was employed:

- **Mean Pre-Intervention Score:770.67**
- **Standard Deviation:30.238**
- **Two Standard Deviations (2σ):60.476**
- **Range Calculation:**
  - Upper Limit: **770.67 + 60.476 = 831.146**
  - Lower Limit: **770.67 - 60.476 = 710.194**

According to the rule (Rubin and Babbie, 1993), if two consecutive post-intervention scores fall outside this range, the change can be considered **statistically significant**. In the case of Dongarwadi:

- The post-intervention scores (PI1, PI2, PI3) are all below the lower limit of **710.194**.

This result supports the inference that the intervention was effective. The **declining trend** in the post-intervention scores indicates that the intervention led to substantial

improvements in the participants' Knowledge, Attitude and Practices concerning waste management.

Additional Context:

The study highlights that the intervention was conducted among a diverse sample of households in Dongarwadi.

Key observations include:

- **Educational Background:** The majority of participants had low to moderate education levels, with significant numbers unaware of waste management practices.
- **Family Structure:** The predominant family type was joint families (94%).
- **Income Levels:** The study included families with varying income levels, and those with existing waste management practices were excluded from the study.

The findings underscore that despite the Wilcoxon test's result indicating a lack of statistical significance, the overall evidence from the two-standard deviation method and graphical data strongly suggests that the intervention had a meaningful impact on the participants' waste management practices.

4.8 Summary :

The analysis of pre- and post-intervention scores across the cases in Siddhivinayak Colony, MHADA Colony, Gokulnagar Pathar, Sahyog Nagar, Gosavi Vasti, and Dongarwadi reveals a general trend of improvement in awareness and practices related to waste management following the interventions. While the Wilcoxon Signed Ranks Test indicated that the differences between pre- and post-intervention scores were not statistically significant ($p = 0.109$) for all cases, the graphical representations and the two-standard deviation method consistently show a significant decrease in post-intervention scores. Specifically in Siddhivinayak Colony, MHADA Colony, Gokulnagar Pathar, Sahyog Nagar, Gosavi Vasti, and Dongarwadi, the decline in scores fell below the calculated range of pre-intervention scores, suggesting effective intervention. The observed improvements in each area highlight the positive impact of the interventions on waste management practices, despite the statistical test's inability to confirm significance.

❑❑❑

CHAPTER - V

MAJOR FINDINGS, CONCLUSIONS & SUGGESTIONS

5.1 Summery of the Research Study :

Introduction is the first chapter of the research study, divided into eleven subtopics.In this section, the researcher focused on community development in rapid urbanizationin the world. The researcher majorly focused on Pune has led to a sharp rise in municipal solid waste. Improper garbage segregation at the household level is a major barrier to effective waste management, causing environmental pollution, health hazards, and overburdened landfills. Many urban families lack knowledge, motivation, or consistent segregation practice. This failure at the source disrupts the entire chain of recycling and composting. Consequences include environmental pollution of soil, air, and groundwater. Health hazards affect waste pickers and communities near overburdened landfills. The KAP gap highlights the need for community-based behavioral interventions. Hence, this study assesses KAP and tests social work intervention for sustainable segregation in Pune.

In the second chapter Review of Literature, the researcher reviewed 64 research papers (policy documents) and 18 books related to solid waste management, garbage segregation, KAP studies, and social work interventions. The literature was critically analyzed and differentiated under various thematic aspects to identify trends, findings, and gaps.Most studies focus on technical or municipal-level waste management, not household-level KAP. Limited empirical data exists on the segregation behavior of urban families in Pune specifically. While social work's role is acknowledged, no structured intervention study has measured its effectiveness on KAP in Pune's urban wards. Six studies linked segregation practices to broader community development outcomes.The review establishes that household segregation is a critical yet understudied area. This study addresses the gap by assessing KAP among Pune's urban families and testing a social work intervention model to create sustainable change.

Research Methodology is the third chapter, which begins with a Problem Statement: 'Despite PMC awareness campaigns, many urban families lack adequate knowledge, hold negative attitudes, or fail to practice source segregation consistently. This gap between policy and household behavior limits the success of "Swachh

Bharat" and "Zero Waste" initiatives. The researcher set eight objectives to gain goal of the tile. To assess the existing knowledge, attitude, and practice (KAP) levels regarding garbage segregation among urban families in Pune. To identify socio-economic and cultural factors influencing segregation behavior. To design and implement a social work intervention model for improving KAP. To evaluate the effectiveness of the intervention on changing household waste practices.Descriptive cum intervention study was conducted for Urban families from selected suburban areas of Pune City. Multi-stage sampling was used to select 350 households. Tools: Structured interview schedule for KAP assessment; Focus Group Discussions; Observation checklist. Intervention: Social work methods including awareness drives, street plays, home visits, IEC material distribution, and formation of resident groups. Duration: 9 months. Data Analysis: Pre-test and post-test design. SPSS was used for statistical analysis, including Wilcoxon Signed Rank Test & Two Standard Deviation method.

In chapter four, Data Analysis and Interpretation, all collected data was analyzed by the researcher. The output of the work is as follows:

- **Knowledge-related** improvement: Pre-intervention, only 42% families knew the correct wet vs dry segregation rules. Post-intervention, this rose to 78%.
- **Attitude:** 60% initially felt segregation was "PMC's job". After the intervention, 81% agreed it was a household responsibility.
- **Practice:** Actual segregation compliance improved from 28% to 67% based on observation. Main barriers were a lack of time, space, and motivation.
- **Social Work Impact:** Group work and community mobilization were more effective than pamphlets alone. Women and children emerged as key change agents.

Chapter no five deals with Major Findings, Conclusion and Suggestions which shows: There is a significant gap between knowledge and practice of garbage segregation among Pune's urban families. Targeted social work interventions using participatory methods can positively change attitudes and practices. Sustained behavior change requires continuous community engagement, local leadership, and municipal support. Social Work Implications: The study recommends integrating professional social workers in municipal waste management programs, using SHGs and schools as entry points, and a policy focus on incentive-based segregation models.

5.2 Major Findings:

The findings from Siddhivinayak Colony, MHADA Colony, Gokul Nagar Pathar, Sahyog Nagar, Gosavi Vasti, and Dongarwadi demonstrate the positive impact of targeted interventions on waste management practices in these areas. By focusing on education, behavior change, and infrastructure development, the interventions successfully improved waste segregation, reduced improper waste disposal, and fostered greater community participation.

While challenges remain, particularly in ensuring consistent waste collection services and further reducing the amount of waste sent to landfills, the progress made through these interventions highlights the potential for scalable waste management solutions in similar urban and semi-urban contexts. The findings also underscore the importance of community involvement and the need for continuous engagement and education to sustain long-term changes in waste management behavior.The interventions carried out in Siddhivinayak Colony, MHADA Colony, Gokulnagar Pathar, Sahyog Nagar, Gosavi Vasti, and Dongarwadi have yielded significant improvements in waste management practices, reflecting a positive impact on the communities involved. This conclusion synthesizes the results and insights gained from the research, offering an overview of the successes achieved, the challenges encountered, and the broader implications for waste management in similar urban and semi-urban settings.

5.2.1 Summary of Key Findings

The targeted interventions aimed to address critical issues in waste management by implementing a multifaceted approach encompassing education, behavior change, and infrastructure development. The findings demonstrate that these strategies were effective in improving waste management practices across the four areas:

- **Improved Waste Segregation:** One of the most notable outcomes was the significant increase in waste segregation practices. In Gokulnagar Pathar, for instance, the proportion of households practicing proper waste segregation rose from 15% to 65%. Similar improvements were observed in the other areas, indicating that the educational campaigns effectively conveyed the importance of separating wet and dry waste. The increase in proper waste segregation not only signifies a shift in resident behavior but also highlights

the success of the educational efforts in raising awareness about sustainable waste practices.

- **Increased Recycling:** The interventions also led to a marked increase in community participation in recycling activities. Prior to the interventions, recycling practices were minimal or non-existent. However, post-intervention data revealed a substantial rise in the use of designated recycling centers for plastic, metal, and paper waste. This improvement underscores the effectiveness of the recycling awareness campaigns and the infrastructure developed to support recycling efforts.
- **Reduction in Improper Waste Disposal:** The interventions significantly reduced improper waste disposal practices, such as dumping and burning waste. Data indicated a 40-50% decrease in such practices, particularly in Sahyog Nagar and Gosavi Vasti. This reduction can be attributed to the increased awareness generated through the interventions and the improved waste collection infrastructure. By addressing the issues associated with improper waste disposal, the interventions contributed to a cleaner environment and reduced health risks related to waste management.
- **Enhanced Community Engagement:** A key component of the interventions was the emphasis on community engagement. In Dongarwadi, residents formed a waste management committee that played a crucial role in monitoring and improving local waste collection services. This model of community-led waste management proved effective in fostering a sense of ownership and responsibility among residents, contributing to sustained behavioral changes and improved waste management practices.
- **Health and Environmental Awareness:** The targeted health and environmental awareness campaigns successfully highlighted the links between improper waste disposal and health issues. As a result, there was a 30% reduction in complaints related to health problems caused by waste mismanagement. This outcome underscores the effectiveness of the awareness campaigns in informing residents about the health implications of waste practices and encouraging proactive measures to mitigate associated risks.

- **Areas for Improvement :** Despite the successes achieved, several challenges remain in ensuring the continued effectiveness of waste management practices:
- **Consistency in Waste Collection Services:** One of the primary challenges faced was ensuring consistent and reliable waste collection services. In some areas, sporadic waste collection remained an issue, which could undermine the effectiveness of the waste segregation and recycling practices. Addressing this challenge requires ongoing coordination between municipal authorities, waste collectors, and residents to ensure regular and efficient waste collection services.
- **Infrastructure Limitations:** While the interventions included the development of infrastructure such as color-coded bins and recycling centers, some areas still faced limitations in infrastructure, particularly in Dongarwadi. The lack of adequate infrastructure for proper waste disposal and recycling can hinder the effectiveness of waste management practices. Continued investment in infrastructure development is essential to support and sustain improved waste management practices.
- **Sustaining Behavioral Changes:** Maintaining the behavioural changes achieved through the interventions requires continuous engagement and education. As communities evolve and new residents move in, ongoing efforts are needed to reinforce the importance of waste segregation and recycling. Regular community outreach, refresher training sessions, and updated educational materials can help sustain the positive changes and address any emerging challenges.
- **Expansion to other Areas:** The success observed in Siddhivinayak Colony, MHADA Colony, Gokulnagar Pathar, Sahyog Nagar, Gosavi Vasti and Dongarwadi highlights the potential for scaling waste management solutions to other urban and semi-urban areas facing similar challenges. However, scaling these solutions requires careful consideration of local contexts, including socio-economic conditions, cultural factors, and existing infrastructure. Customizing interventions to meet the specific needs of different communities will be crucial for achieving similar successes in other areas.

5.2.2 Significance of study findings

The findings of this study hold substantial significance in the context of urban waste management, especially in rapidly urbanizing regions like Pune, India. The interventions conducted in Siddhivinayak Colony, MHADA Colony, Gokulnagar Pathar, Sahyog Nagar, Gosavi Vasti and Dongarwadi reveal critical insights into how targeted waste management strategies can create positive and sustainable changes. Below are the key areas where the study's findings are most significant:

1. **Improved Waste Management Practices in Urbanizing Areas**

   The study demonstrates that community-based interventions, when tailored to the specific socio-economic conditions of an area, can significantly improve waste segregation, recycling, and overall waste management practices. In Gokulnagar Pathar, for instance, the increase in households practicing waste segregation from 15% to 65% illustrates how awareness and education can lead to tangible behavioral changes. These findings highlight the potential of targeted interventions to address urban waste challenges, particularly in rapidly expanding regions.

2. **Importance of Community Engagement and Organization**

   The study underscores the vital role of community involvement in achieving sustainable waste management outcomes. By actively engaging local leaders, residents, and businesses, the interventions fostered a sense of ownership and responsibility within the community. The establishment of waste management committees in Dongarwadi and the active participation of community leaders in Gosavi Vasti demonstrate the success of community-driven approaches. This finding suggests that sustainable waste management solutions are more effective when communities are actively engaged and invested in the process.

3. **Addressing Socio-Economic Barriers**

   The study reveals that socio-economic conditions play a significant role in the success of waste management interventions. In areas like Sahyog Nagar, where there is a transient population and diverse income levels, waste management practices were inconsistent. The study highlights the importance of addressing socio-economic barriers through tailored interventions that account for population mobility, limited resources, and varying levels of

awareness. This insight is critical for designing interventions that are adaptable to different urban contexts.

4. **Infrastructure as a Key Factor**

   The findings emphasize that infrastructure development is crucial to supporting sustainable waste management practices. While awareness and behavior change are essential, the lack of infrastructure, as seen in Dongarwadi, limits the ability to fully implement best practices. The study demonstrates that providing adequate waste segregation systems, such as color-coded bins and centralized waste collection points, is necessary for long-term success. This finding points to the need for continued investment in waste management infrastructure in urbanizing regions.

5. **Enhancing Public Health and Environmental Outcomes**

   By improving waste management practices, the study contributes to enhanced public health and environmental outcomes. Reductions in improper waste disposal, such as open dumping and burning, not only decrease environmental pollution but also reduce the incidence of health issues, such as mosquito-borne diseases and respiratory problems. The link between proper waste management and improved public health underscores the broader societal benefits of implementing effective waste management interventions.

6. **Insights for Policy and Governance**

   The study's findings offer valuable insights for policy-makers and local governments. The research highlights the importance of policy alignment and governmental support for ensuring consistent waste collection services and enforcing regulations. The collaboration between local authorities and community members was key to the success of the interventions, pointing to the need for strong governance structures to support waste management efforts. These insights can guide the development of policies that promote community-led waste management initiatives and ensure long-term sustainability.

7. **Replicability and Scalability of Interventions**

   The study demonstrates that the interventions are replicable and scalable in other urban areas facing similar waste management challenges. The success of the multi-phase approach, combining education, infrastructure development, and community participation, provides a model that can be applied to other regions. The study also emphasizes the importance of customizing interventions based on the specific socio-economic and cultural conditions of each area, which is key to scaling these solutions effectively.

8. **Contribution to Sustainable Development Goals (SDGs)**

   The findings contribute to the broader global agenda of achieving the United Nations Sustainable Development Goals (SDGs), particularly SDG 11 (Sustainable Cities and Communities) and SDG 12 (Responsible Consumption and Production). By promoting sustainable waste management practices, the study advances efforts to make cities cleaner and more resilient, reduce the environmental impact of waste, and foster responsible consumption patterns.

5.3 Conclusion:

The findings derived from six selected areas within the Warje locality indicate that 'targeted interventions' have had a positive impact on waste management practices in these regions. By focusing on education, behavioral change, and infrastructure development, these interventions successfully achieved improved waste segregation, reduced improper waste disposal, and enhanced community participation.

The progress achieved through these Interventions underscores the potential for scalable waste management solutions in similar urban and semi-urban contexts.
These findings underscore the necessity of community participation, consistent communication and awareness-raising, to sustain long-term changes in waste management.

5.4 Suggestions:

5.4.1 For Respondents

- **Accept and Adopt Daily Segregation Practices:** Families must consistently segregate wet, dry, and hazardous waste at the source using color-coded bins.

- **Actively Participate in Awareness Programs**: To stay informed and updated, participants should actively take part in community meetings, workshops, and cleanliness drives organized by the administration and NGOs.
- **Ensure the proper disposal of waste:**Families should hand over segregated waste to collection workers and ensure that it is not subsequently mixed together again.

5.4.2 NGOs (Non Government Organisations)

- **Conduct Public Awareness Campaigns Regularly:** NGOs should organize workshops, door-to-door campaigns and demonstrations regarding proper waste segregation techniques.
- **Adopt Innovative Methods of Communication:** Skillfully and effectively utilization of social media, street plays, and audio-visual materials to bring about lasting behavioral change.
- **Collaboration with Local Authorities:** To implement and monitor waste management programs, NGOs should work in collaboration with local municipalities and municipal corporations.

5.4.3. Government- Pune Municipal Corporation (PMC), State & Central Government :

- **Improve Waste-related Infrastructure and Services:** Authorities such as the Pune Municipal Corporation should ensure an adequate supply of waste bins and an efficient collection system based on waste segregation.
- **Strengthen Public Awareness Initiatives:** Implement consistent and comprehensive campaigns through media, schools, and community programs.
- **Strict Enforcement of Rules and Regulations:** To ensure compliance with regulations, laws related to waste segregation should be enforced through a combination of proper oversight, punitive measures, and incentives.
- **Providing support for Training and Capacity Building:** Implementing effective waste management measures through the utilization of innovative technologies. Providing up-to-date training to officials and sanitation workers, as well as extending assistance to NGOs and social workers.

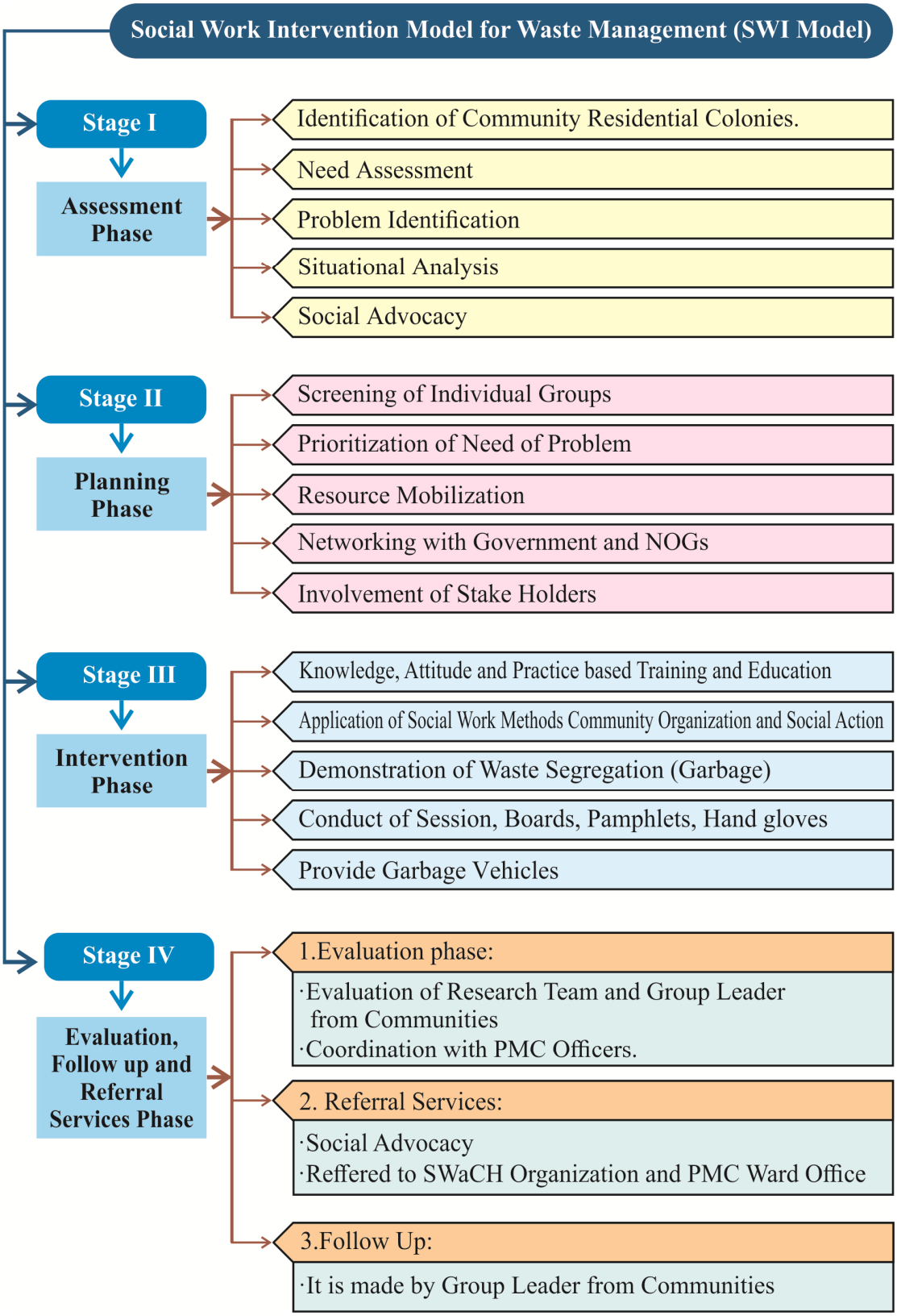
5.5 Recommendations :

- **Enhance the Effectiveness of Awareness Programs:** To reinforce proper knowledge regarding waste segregation, regular and well-planned awareness campaigns should be conducted at the community level, focusing primarily on practical implementation.
- **Provision of Infrastructure:** Municipal authorities must ensure the availability of color-coded waste bins in all urban areas, as well as a reliable service for door-to-door waste collection and segregation.
- **Incentives and Penalties:** With the aim of fostering a sense of responsibility, implement a reward system for families that properly segregate waste, and provisions for penalties for those who fail to comply with the regulations.
- **Regular Monitoring and Evaluation:** To assess the effectiveness of the measures implemented and to make necessary improvements, regular follow-ups and surveys should be conducted.
- **Regular Training for Waste Workers:** Sanitation workers should receive appropriate training and support to efficiently handle segregated waste, as well as to emphasize the importance of segregating waste at the source.
- **Collaboration with NGOs and Social Workers:** To implement community-based initiatives, sustain behavioral changes, and ensure the success of intervention programs, it is essential to strengthen partnerships with non-governmental organizations (NGOs) and social work professionals.
- **Consistent Use of Media and Technology:** Effectively utilize social media, mobile apps, and local communication channels to raise awareness, send reminders, and track waste segregation practices.

5.6 Proposed Social Work Intervention Model for Waste Management

Figure No. 5.6

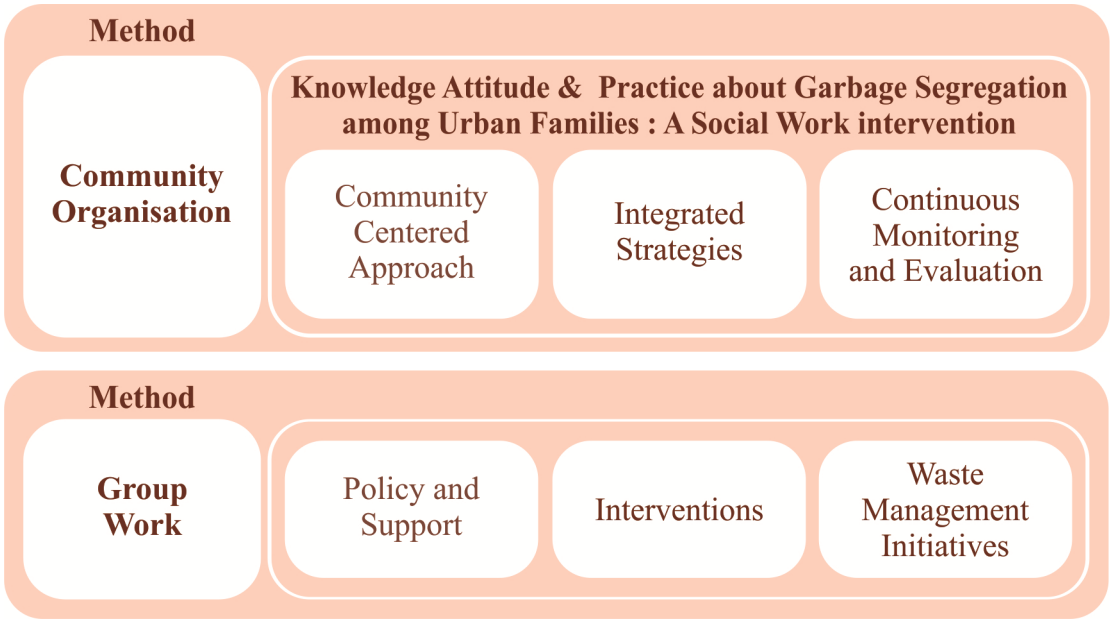
Proposed Social Work Intervention Model for Waste Management



5.7 Proposed Areas of Social Work Intervention

Figure No. 5.7

Proposed Areas of Social Work Intervention



1. **Community-Centered Approaches:** The success of the community engagement model in Dongarwadi emphasizes the importance of involving residents in waste management efforts. Community-centred approaches that promote local ownership and responsibility can lead to more effective and sustainable waste management practices.
2. **Integrated Strategies:** The multi-phase approach used in this study, combining education, behavior change, and infrastructure development, proves to be an effective strategy for improving waste management practices. Future initiatives should consider adopting similar integrated strategies to address the complex challenges of waste management.
3. **Continuous Monitoring and Evaluation:** To ensure the continued effectiveness of waste management interventions, regular monitoring and evaluation are essential. Tracking progress, identifying areas for improvement, and adapting strategies based on feedback and data can help maintain and enhance the impact of waste management efforts.
4. **Policy and Support:** Support from local government bodies, policy makers, and other stakeholders is crucial for the success and sustainability of waste management initiatives. Advocacy for supportive policies, adequate funding,

and infrastructure investment can contribute to the long-term effectiveness of waste management programs.

5. **Intervention:** The interventions conducted in Siddhivinayak Colony, MHADA Colony, Gokulnagar Pathar, Sahyog Nagar, Gosavi Vasti and Dongarwadi demonstrate that targeted and comprehensive approaches can lead to significant improvements in waste management practices. The positive outcomes observed in waste segregation, recycling, and community engagement highlight the potential for scalable waste management solutions in similar contexts. However, addressing the challenges of consistency in waste collection, infrastructure limitations, and sustaining behavioral changes is essential for achieving long-term success.
6. **Waste Management Initiatives:** The insights gained from this study offer valuable lessons for future waste management initiatives, emphasizing the importance of community involvement, integrated strategies, and continuous evaluation. By building on these successes and addressing the remaining challenges, it is possible to create more sustainable and effective waste management systems that contribute to cleaner, healthier, and more resilient communities.

5.8 Limitations of the Study:

- **Geographical Limitation:** The study is confined to Pune city and its connected suburban areas. This geographic restriction means that the findings may not be generalizable to other regions outside this specific area.
- **Scope of the Study Area:** The research was conducted in a limited geographical scope, focusing primarily on neglected and slum areas within the suburban parts of Pune. As a result, the study does not encompass more affluent or well-maintained areas, which could provide a broader perspective on waste management practices.
- **Time Constraints:** The study was subject to time limitations that affected its research design and methodology. The timeframe available was constrained, which impacted the extent of data collection and the inclusion of certain variables.

- **Sample Size and Selection:** Conclusions were drawn based on a limited sample size, which may not fully represent the diverse range of experiences and practices within the broader population. The sample was primarily selected from specific respondent groups.
- **Sample Composition:** The study primarily involved family members, political representatives, health inspectors, sanitary inspectors, and heads of sanitation organizations from the Pune Municipal Corporation's Karvenagar division and Warje area. This selective sampling may influence the generalizability of the findings.
- **Data Collection Method:** The study relied heavily on interviews with family members and their reported changes in waste management practices. This focus on qualitative data may limit the depth of insights into the broader population's waste management behaviors.
- **Focus on Specific Waste Types:** While there are various types of waste management practices, the research primarily emphasized the segregation of wet and dry waste. Other types of waste management were not thoroughly addressed in the study.
- **Sample Size Limitation:** The study's sample size was limited to 350 family members due to time constraints and other factors. This limited sample may affect the robustness and generalizability of the study's conclusions.
- **Secondary Data Sources:** The research utilized secondary data from governmental reports, websites, newspapers, and academic papers (ISSN/ISBN). However, other potential sources of secondary data were not considered, which may have impacted the comprehensiveness of the study.

❑❑❑

BIBILOGRAPHY

1. Abdul-Rahman F (2014) Reduce, reuse, recycle: Alternatives for waste management. NM State University Guide G-314: 4.
2. Agamuthu, P., & Babel, S. (2023). Waste management developments in the last five decades: Asian perspective. Waste Management & Research, 41(12). https://doi.org/10.1177/0734242X231199938
3. Agamuthu, P., & Babel, S. (2023). Waste management developments in the last five decades: Asian perspective. Waste Management & Research, 41(12). https://doi.org/10.1177/0734242X231199938
4. Ahmed, Z., Hasan, M. K., & Islam, J. (2023). Urban waste management and circular economy in Bangladesh: A systematic review. Journal of International Environmental Application & Science, 18(2), 55-63.
5. Ahmed, Z., Hasan, M. K., & Islam, J. (2023). Urban waste management and circular economy in Bangladesh: A systematic review. Journal of International Environmental Application & Science, 18(2), 55-63.
6. Alizadeh, H., Doostvandi, M., &Zandsalimi, M. (2024). Redefining sustainable urban development: A critical analysis in the wake of COVID-19. Sustainable Development. Advance online publication. https://doi.org/10.1002/sd.3018
7. Amasuomo, E., & Baird, J. (2016). The concept of waste and waste management. Journal of Management and Sustainability, 6(4),88. https://doi.org/10.5539/jms.v6n4p88
8. Amasuomo, E., & Baird, J. (2016). The concept of waste and waste management. Journal of Management and Sustainability, 6(4), 88. https://doi.org/10.5539/jms.v6n4p88
9. Andeobu, L., Wibowo, S., &Grandhi, S. (2021). A systematic review of e-waste generation and environmental management of Asia Pacific countries. Sustainability, 13(9), 4967. https://doi.org/10.3390/su13094967
10. Andeobu, L., Wibowo, S., &Grandhi, S. (2021). A systematic review of e-waste generation and environmental management of Asia Pacific countries. Sustainability, 13(9), 4967. https://doi.org/10.3390/su13094967
11. Appalachian State University. (2012). Waste reduction strategic plan: Working toward a zero-waste campus. North Carolina, United States.

12. Arizona State University. (2012). Waste management, ASU aim to eliminate solid waste [Press release].

13. Armijo de Vega, C., Ojeda-Benítez, S., &Ramírez-Barreto, M. E. (2003). Mexican educational institutions and waste management programmes: A university case study. Resources, Conservation and Recycling, 39(3), 283–296. https://doi.org/10.1016/S0921-3449(03)00028-2

14. Armijo de Vega, C., Ojeda-Benítez, S., &Ramírez-Barreto, M. E. (2008). Solid waste characterization and recycling potential for a university campus. Waste Management, 28(Supplement), S21–S26. https://doi.org/10.1016/j.wasman. 2008.01.009

15. Austin, J., Hatfield, D. B., Grindle, A. C., & Bailey, J. S. (1993). Increasing recycling in office environments: The effects of specific, informative cues. Journal of Applied Behavior Analysis, 26(2), 247–253. https://doi.org/10.1901/jaba.1993.26-247

16. Author(s). (2020). Sustainable urban community development: A case study from the perspective of self-governance and public participation. Sustainability, 12(2), 617. https://doi.org/10.3390/su12020617

17. Axinn, J., & Stern, M. J. (2008). "Social Welfare: A History of the American Response to Need."

18. Banerjee, P., Hazra, A., Ghosh, P., Ganguly, A., Murmu, N. C., & Chatterjee, P. K. (2019). Solid waste management in India: A brief review. In Waste management and resource efficiency (pp. 1027-1049). Springer. https://doi.org/10.1007/978-981-10-7290-1_86

19. Banerjee, P., Hazra, A., Ghosh, P., Ganguly, A., Murmu, N. C., & Chatterjee, P. K. (2019). Solid waste management in India: A brief review. In Waste management and resource efficiency (pp. 1027-1049). Springer. https://doi.org/10.1007/978-981-10-7290-1_86

20. Bansod, H. S., &Deshmukh, P. (Year). Biomedical waste management and its importance: A systematic review. Cureus. https://doi.org/10.7759/cureus.

21. Bansod, H. S., &Deshmukh, P. (Year). Biomedical waste management and its importance: A systematic review. Cureus. https://doi.org/10.7759/cureus.

22. Bolderdijk, J. W., Lehman, P. K., & Geller, E. S. (2012). Encouraging pro-environmental behaviour with rewards and penalties. In L. Steg, A. E. van den

Berg, & J. I. M. de Groot (Eds.), Environmental psychology: An introduction (pp. 233–242). Wiley.

23. Brenner, N., &Schmid, C. (2015). Towards a new epistemology of the urban? City, 19(2-3), 151-182. https://doi.org/10.1080/13604813.2015.1014712

24. Brown University. (2017). Tenth annual sustainability progress report.

25. Castells, M. (2010). The rise of the network society: The information age: Economy, society, and culture (Vol. 1). Wiley-Blackwell.

26. Chinese University of Hong Kong. (2015). CUHK introduces innovative ideas to promote waste reduction and recycling [Press release]. Retrieved from https://www.cpr.cuhk.edu.hk/en/press_detail.php?id=2103

27. Cole, L. (2003). Assessing sustainability on Canadian University campuses: Development of a campus sustainability assessment framework [Master's thesis, Royal Roads University]. Google Scholar.

28. Coracero, E. E., Gallego, R. J., Frago, K. J., & Gonzales, R. J. (2021). A long-standing problem: A review on the solid waste management in the Philippines. Indonesian Journal of Social and Environmental Issues (IJSEI), 2(3), 213-220. https://doi.org/10.47540/ijsei.v2i3.144

29. Coracero, E. E., Gallego, R. J., Frago, K. J., & Gonzales, R. J. (2021). A long-standing problem: A review on the solid waste management in the Philippines. Indonesian Journal of Social and Environmental Issues (IJSEI), 2(3), 213-220. https://doi.org/10.47540/ijsei.v2i3.144

30. Cortes, A. D. (2003). The critical role of higher education in creating a sustainable future. Planning for Higher Education, 31(3), 15–22.

31. Dave, D. (2022). Journey of waste management regulations in India: A historical account. CRDEEP Journals. Centre for Rural Development Ecology and Environment Protection (CRDEEP). https://doi.org/10.13140/RG.2.2.14106.11200

32. Dave, D. (2022). Journey of waste management regulations in India: A historical account. CRDEEP Journals. Centre for Rural Development Ecology and Environment Protection (CRDEEP). https://doi.org/10.13140/RG.2.2.14106.11200

33. Davis, M. (2006). Planet of slums. Verso.

34. Devine-Wright, P., & Clayton, S. (2010). Introduction to the special issue: Place, identity, and environmental behaviour. Journal of Environmental Psychology, 30(3), 267–270. https://doi.org/10.1016/j.jenvp.2010.01.002

35. Duque-Acevedo, M., Belmonte-Ureña, L. J., Cortés-García, F. J., & Camacho-Ferre, F. (2020). Agricultural waste: Review of the evolution, approaches and perspectives on alternative uses. Global Ecology and Conservation, 22, e00902. https://doi.org/10.1016/j.gecco.2020.e00902

36. Duque-Acevedo, M., Belmonte-Ureña, L. J., Cortés-García, F. J., & Camacho-Ferre, F. (2020). Agricultural waste: Review of the evolution, approaches and perspectives on alternative uses. Global Ecology and Conservation, 22, e00902. https://doi.org/10.1016/j.gecco.2020.e00902

37. Fournier, R. (2008). Recycling this! A look at campus recycling programs. In W. Simpson (Ed.), The green campus: Meeting the challenge of environmental sustainability (pp. 191–200). APPA.

38. Giuliani, M. V. (2003). Theory of attachment and place attachment. In M. Bonnes (Ed.), Psychological theories for environmental issues (pp. 137–170). Ashgate.

39. Hall, P. (1998). Cities in civilization: Culture, innovation, and urban order. Pantheon Books.

40. Hansen, W., Christopher, M., &Verbuecheln, M. (2002). EU waste policy and challenges for regional and local authorities. Ecological Institute for International and European Environmental Policy.

41. Hanson, B., Stall, S., Peng, G., & other authors. (2023, October 31). Garbage in, garbage out: Mitigating risks and maximizing benefits of AI in research. Nature. https://doi.org/10.1038/d41586-023-03316-8

42. Hanson, B., Stall, S., Peng, G., & other authors. (2023, October 31). Garbage in, garbage out: Mitigating risks and maximizing benefits of AI in research. Nature. https://doi.org/10.1038/d41586-023-03316-8

43. Harvey, D. (2003). The right to the city. International Journal of Urban and Regional Research, 27(4), 939-941. https://doi.org/10.1111/j.0309-1317.2003.00492.x

44. Horne, D., &Bhada-Tata, P. (2012). What a waste: A global review of solid waste management (Urban development series knowledge papers). World Bank.

45. Joshi, R., & Ahmed, S. (2016). Status and challenges of municipal solid waste management in India: A review. Cogent Environmental Science, 2(1), 1139434. https://doi.org/10.1080/23311843.2016.1139434

46. Joshi, R., & Ahmed, S. (2016). Status and challenges of municipal solid waste management in India: A review. Cogent Environmental Science, 2(1), 1139434. https://doi.org/10.1080/23311843.2016.1139434

47. Kumar, A., & Agrawal, A. (2020). Recent trends in solid waste management: Status, challenges, and potential for future Indian cities – A review. Current Research in Sustainable Structures, 1, 100011. https://doi.org/10.1016/j.crsust. 2020.100011

48. Leal Filho, W., Hunt, J., &Kovaleva, M. (2021). Garbage patches and their environmental implications in a plastisphere. Journal of Marine Science and Engineering, 9(11), 1289. https://doi.org/10.3390/jmse9111289

49. Mouratidis, K. (2021). Urban planning and quality of life: A review of pathways linking the built environment to subjective well-being. Cities, 115, 103229. https://doi.org/10.1016/j.cities.2021.103229

50. Mundhe, N., &Jaibhai. (2014). International Journal of Computer Applications, 100(10), 24. https://doi.org/10.5120/17514-1202

51. Popple, P. R., &Leighninger, L. (2019). "Social Work, Social Welfare, and American Society."

52. Priti, &Mandal, K. (2019). Review on evolution of municipal solid waste management in India: Practices, challenges and policy implications. Journal of Material Cycles and Waste Management, 21(4), 1263–1279. https://doi.org/10.1007/s10163-019-00883-5

53. Priti, &Mandal, K. (2019). Review on evolution of municipal solid waste management in India: Practices, challenges and policy implications. Journal of Material Cycles and Waste Management, 21(4), 1263–1279. https://doi.org/10.1007/s10163-019-00883-5

Retrieved from https://asunow.asu.edu/content/waste-management-asu-aimeliminate-solid-waste.

54. Rihn, A. (2021, December 2). A brief history of garbage and the future of waste generation. [Blog post].

55. S k, M. M., Qamar, S., &Sethy, T. (2023). Solid waste management in Indian perspectives: A comprehensive review. Journal Name, 12(1), 35-45.

56. S k, M. M., Qamar, S., &Sethy, T. (2023). Solid waste management in Indian perspectives: A comprehensive review. Journal Name, 12(1), 35-45.

57. Scott, A. J., &Storper, M. (2015). The nature of cities: The scope and limits of urban theory. International Journal of Urban and Regional Research, 39(1), 1-15. https://doi.org/10.1111/1468-2427.12134

58. Soja, E. W. (2000). Postmetropolis: Critical studies of cities and regions. Wiley-Blackwell.

59. Throwing away to somewhere: The global community is overwhelmed by a growing trash problem. (2020, February 10). Wp.nyu.edu. Retrieved from https://wp.nyu.edu/dispatch/2020/02/10/throwing-away-to-somewhere-the-global-community-is-overwhelmed-by-a-growing-trash-problem.

60. UN-Habitat. (2020). World cities report 2020: The value of sustainable urbanization. United Nations Human Settlements Programme (UN-Habitat). https://unhabitat.org/wcr/

61. Wen, Y., & Lu, Y. (2021). A comparative study of garbage classification practice in different countries. In Proceedings of the Fourteenth International Conference on Management Science and Engineering Management (pp. 603-612). Springer. https://doi.org/10.1007/978-3-030-49889-4_47

62. Wilson, D. C. (2020). Learning from the past to plan for the future: An historical review of the evolution of waste and resource management 1970–2020 and reflections on priorities 2020–2030 – The perspective of an involved witness. Waste Management & Research, 38(7), 663-677. https://doi.org/10.1177/0734242X20945334

63. Wilson, D. C. (2020). Learning from the past to plan for the future: An historical review of the evolution of waste and resource management 1970–2020 and reflections on priorities 2020–2030 – The perspective of an involved witness. Waste Management & Research, 38(7), 663-677. https://doi.org/10.1177/0734242X20945334

64. Zastrow, C. (2014). "Introduction to Social Work and Social Welfare: Empowering People."

WEBSITES:

1. Association of Cities and Regions (ACR) (2021), The impact of the Covid-19 pandemic on municipal waste management systems, https://acrplus.org/images/technical-reports/2021_ACR_Impact_COVID19_pandemic_on_municipal_waste_management_systems.pdf
2. Balkan Green Energy News (2019), RCERO Ljubljana recovering 95% of waste generated by one-third of Slovenia's population, https://balkangreenenergynews.com/rcero-ljubljana-recovering-95-ofwaste-generated-by-one-third-of-slovenias-population/ Balkan Green Energy News, (2021),
3. Serbia ranked worst in Europe by household waste recycling, as Croatia sees second biggest increase, https://balkangreenenergynews.com/serbia-ranked-worst-ineurope-by-household-waste-recycling-as-croatia-sees-second-biggest-increase/
4. Bronska,J. (2021), Illegal waste exports to Poland on the rise, https://www.dw.com/en/polandsgrowing-problem-with-illegal-european-waste/a-55957224 BNAMERICAS (2018),
5. Court halts construction of Mexico City waste-to-energy plant, https://www.bnamericas.com/en/news/court-halts-construction-of-mexico-city-waste-to-energy-plant1 Cambridge Econometrics, Trinomics, ICF, 2018.
6. Impacts of circular economy policies on the labour market Final report and Annexes. Available at: https://op.europa.eu/en/publication-detail/-/publication/fc373862-704d-11e8-9483-01aa75ed71a1/language-en.
7. https://diversedaily.com/the-impact-of-urban-growth-on-dam-development-in-urban-areas/
8. https://www.studysmarter.co.uk/explanations/geography/global-resource-management/sustainable-water/
9. https://www.constructionplacements.com/importance-of-urban-infrastructure-planning-and-management/
10. https://fastercapital.com/content/Urbanization--City-Limits--Urbanization-and-Malthusian-Pressures.html
11. https://thesolutionsjournal.com/building-sustainable-resilient-urban-water-strategy/

12. https://www.frontiersin.org/journals/water/articles/10.3389/frwa.2021.694817/full
13. https://www.ourfuturewater.com/2023/09/29/climate-resilience-and-water-supply-innovative-strategies-for-urban-water-management/
14. https://www.tutorchase.com/answers/ib/geography/how-does-urbanisation-affect-water-management-strategies
15. https://aithor.com/essay-examples.
16. https://pmc.gov.in/en/swm
17. https://pcmcindia.gov.in/swachh-bharat-abhiyan.php
18. http://mpcb.gov.in/waste-management/municipal-solid-waste
19. https://swachhbharaturban.gov.in
20. https://cpcb.nic.in>municipal-solid–waste

BOOKS:

1. Author: Lal Das, D. K. Year: (2005). 'Tittle: Design of social research.' Publication: [Rawat Publications], ISBN NO: 8170339847, 9788170339847.
2. Kulkarni, V. V. (2010-2013). Community organisation process and social work. [Current publication].ISBN NO:ISBN13 : 9788189065980,ISBN10 : 818906598X
3. Bapat, S. P. 'Prayanwaranshastra' Shree Sainaath Publication.
4. Santosh Shintre: 'ChaluShatakNisargParyawaranAani Bharat' (Majestic Publishing house) ISBN13: 9789383678396.
5. Mrs.NilaPathare .Paryawaransikshan. [Chitanyaprakashan Kolhapur].
6. Sarli, V. J., Tapkir, D., & Chauhan, D. (Year). Paryaransikshan. NityaNutunPrakashan.
7. Waste Management: A Guide for Practitioners_ by Richard C. Porter
8. Waste Reduction and Recycling_ by Jeffrey S. Gaffney
9. Waste Management and Minimization_ by Ramesh Chandra
10. Waste to Wealth: A Guide to Waste Management and Recycling_ by R. K. Trivedy
11. Waste Management: An Integrated Approach_ by S. K. Singh
12. Waste Reduction, Recycling, and Sustainability_ by George Tchobanoglous
13. Waste Management and the Environment_ by R. M. Harrison
14. Waste Management: A Review of the Current State of the Art_ by A. J. Chandler

15. Waste Management and Pollution Control_ by P. A. Vesilind

16. Waste Management and Sustainability_ by J. R. Mihelcic

17. Social Work Intervention Research _ by D.K.Lal Das

18. Karyakartyachi Diary_ by Dr Chandrakant Purl

❑❑❑

APPENDICES

Annexures - A : INTERVIEW SCHEDULE

Tilak Maharashtra University, Pune.

I am Devend B. Suryawanshi Research Scholar, M.S.W. (Social Work) Department, Tilak Maharashtra University, Pune. Doing Doctor of Philosophy (Ph.D.) under the guidance of Dr. Prakash Yadav (Head of Department of Social Work, Tilak Maharashtra University and Pune) under **Board of Moral and Social Sciences**. The title of my thesis is "The knowledge, attitude and practice about garbage segregation among urban families: A social work intervention study in Pune city".

We humbly request you to cooperate by providing some information about garbage collection in and around you. I assure that the information obtained in this questionnaire will always be kept confidential and used only for research purposes.

Part A

General Information

1) Interview details:

Field Worker Name				
Verified by Researcher	**Interview venue**	**Date**	**Time**	**Guide Signature**
		/ / **2023**		

Comment:

2) Details of Interviewee:

Interviewee Name	
Current residential address	
Native Village / Taluka / District	
Education of interviewee	
Mob. Number	
E-male	

3) Home ownership:(Type of family resident):

S. No	Type	✔	From (Year)
1	Traditional Plot (Old) - House / Bungalow / Building		
2	Flat - Purchased		
3	Flat - Rented		
4	Separate sitting house		
5	Rented Rooms		
6	Small – House/Rooms (from Govt. Scheme)		
7	Own tiny house/ rooms (Blighted area)		
8	Rented tiny house/ rooms (Blighted area)		

4) Educational level of the family:

A) Uneducated
B) 1st to 10 th
C) 11 th to 12 th
D) Degree & above

5) Average age of family:

A) Below 18 Years
B) Above 18 Years

6) Type of family:

A) Nuclear family
B) Joint-extended family
C) Single parent family
D) Childless family
E) Step family

7) Annual Family Income:

A) Rs -100000 Rs
B) 100000 Rs – 300000 Rs
C) 300000 Rs – 600000 Rs
D) 600000 Rs –900000 Rs
E) 900000 Rs – Above

Part-B

Garbage awareness

(Collection, Segregation, Distribution, Disposing, Shipping)

S. N.	Questions	Strongly Agree (1)	Agree (2)	Disagree (3)	Strongly Disagree (4)	Unanswered (5)
1.	I know the garbage and its harmfulness for my family.					
2.	In the cities of Pune, public awareness is created on the topic of Garbage Collection and Distribution through society and I respond to it.					
3.	Information is given to the public and efforts are made to get response to the conference on waste management and processing in Pune city.					
4.	My family members knows about the garbage and its harmfulness.					
5.	I collect the garbage in my home and ship at proper place.					
6.	My family members collect the garbage and ship at proper place.					
7.	In my home I and my family members are taken care about collected garbage should be store in proper manner.					

S. N.	Questions	Strongly Agree (1)	Agree (2)	Disagree (3)	Strongly Disagree (4)	Unanswered (5)
8.	I and my family members are aware about not to drop any type of garbage anywhere in and around the surrounding space.					
9.	I feel that there is a need for waste management around me and I am ready to try for it.					
10.	My neighbours respond well to any suggestion of uncleanliness and physical ailments.					
11.	If I or my family members catch waste elsewhere, we give ideas to the concerned persons regarding its disposal.					
12.	To whom we give ideas about waste disposal, they do not ignore it and dispose it according to the rules.					
13.	My family and I have good family ties with neighbours and they can listen to ideas about waste segregation.					
14.	I and my family members clearly knows about the garbage and its types.					

S. N.	Questions	Strongly Agree (1)	Agree (2)	Disagree (3)	Strongly Disagree (4)	Unanswered (5)
15.	Garbage truck comes daily to carry wet and dry waste to our area					
16.	I and my family stores the (wet and dry) garbage in separate dustbins.					
17.	I and my family aware about the disposing method of PMC with segregation.					
18.	I and my family unaware about the PMC garbage collection system so we drop garbage in and around area.					
19.	I and my family member disposed of E-waste (Cell, wire, electric-electronic waste etc.) as per PMC rules.					
20.	We transfer the garbage with proper segregation to PMC's garbage vehicle/private garbage vehicle.					
21.	PMC did not provide a vehicle for garbage collection so we hired a private agency/private garbage vehicle for garbage collection.					

S. N.	Questions	Strongly Agree (1)	Agree (2)	Disagree (3)	Strongly Disagree (4)	Unanswered (5)
22.	In our area only dry and wet Garbage transfer to the PMC vehicle.					
23.	If large amount of waste is generated (flowers, garlands, food wrappers and other waste material) then we dump it in the area or (Mula--Mutha) river area.					
24.	There is no any alternate adjustment for E-garbage in our area.					
25.	Garbage storage and segregation is being done well in my neighbourhood.					
26.	We drop e-garbage near free-space or around without prior intimation.					
27.	We arranged for daily collection of wet waste in our locality and then transferred it for organic fertiliser as directed by PMC					
28.	I, my neighbours and our community are aware about waste collection.					

S. N.	Questions	Strongly Agree (1)	Agree (2)	Disagree (3)	Strongly Disagree (4)	Unanswered (5)
29.	If I do some enlightenment about waste management, people around me will accept it.					
30.	People who do not follow the rules of waste management feel that there will be a difference after the Intervention.					
31.	I am aware about my community and spread out proper information about the garbage collection around my community.					
32.	I and my family attend all programs (events, ceremonies, weddings, puja) arranged by the community and follows rules for garbage dispose.					
33.	In the community around me, meetings are held from time to time regarding waste.					
34.	All the members of my society are ready to follow the instructions regarding garbage.					

S. N.	Questions	Strongly Agree (1)	Agree (2)	Disagree (3)	Strongly Disagree (4)	Unanswered (5)
35.	As per information spread by me & instructions given by the PMC, community around me follows rules of garbage dispose.					
36.	Small businesses(vegetable sellers and other small vendors) in my area are not seen spreading garbage on the road or anywhere else.					
37.	Government action is taken if the waste in my locality is not segregated properly.					
38.	As per rules and regulations, for disposal of garbage our community (society) handles big dustbins and dispose it properly.					
39.	In my area, representatives of private organizations are seen working on garbage management.					
40.	According to my neighbours the waste management work done by private organizations on segregation is satisfactory.					

S. N.	Questions	Strongly Agree (1)	Agree (2)	Disagree (3)	Strongly Disagree (4)	Unanswered (5)
41.	Due to the irregularity of the garbage vehicle, the wet garbage is stored in the house causing bad smell.					
42.	There is proper co-ordination between government waste management department and private waste management organizations for waste disposal.					
43.	Private garbage separators in my area have separate equipment (Dustbins) for wet and dry garbage collection.					
44.	The management system of Pune Municipal Corporation visits our area from time to time and tries to segregate wet and dry waste.					
45.	I notice that PMC's Wet and Dry Garbage Management is getting support from the people of my locality.					

S. N.	Questions	Strongly Agree (1)	Agree (2)	Disagree (3)	Strongly Disagree (4)	Unanswered (5)
46.	With the efforts of government and private garbage management organizations, my locality is becoming clean and disease free.					
47.	In order to make Pune clean and beautiful, the Municipal Corporation needs to do some new experiments on garbage management.					
48.	Pune Municipal Corporation needs to do some new experiments in waste collection and processing to convert it into product.					
49.	Researchers and organizations who are experimenting with waste collection and management should get support from the government in the form of grants.					
50.	Pune Municipal Corporation needs to take serious steps regarding waste research and effective planning.					

❑❑❑

Annexures -II : Glossary of Terms

1. **Economic Burden**: The financial strain on local governments and communities to manage the increasing amount of waste produced by urban populations.
2. **Infrastructure Deficiency**: The lack of necessary facilities and systems, such as dustbins and waste processing plants, to handle urban waste efficiently.
3. **Social Maturity**: The level of awareness and responsibility individuals or communities exhibit toward environmental and waste management practices
4. **Community Organization**: A process involving voluntary or involuntary participation of a community to identify and solve issues or meet objectives.
5. **Urbanization**: The movement and settlement of people from rural areas to urban cities, involving infrastructure, housing, and public services development.
6. **Municipal Corporation**: A local governing body in cities, responsible for urban planning, sanitation, public health, and local taxes.
7. **Recycling**: The process of converting waste into reusable material to prevent wastage of potentially useful materials.
8. **Smart Cities Mission**: An initiative by the Indian government to create sustainable, technology-driven urban spaces with improved infrastructure and governance.
9. **Urban Local Bodies (ULBs)**: Administrative units that govern cities and towns, responsible for local civic administration.
10. **Smart Cities**: Urban areas that use digital technology to enhance performance, well-being, and reduce costs and resource consumption.
11. **Circular Economy**: A sustainable economic model aimed at minimizing waste and making the most of resources by reusing, recycling, and refurbishing.
12. **Solid Waste Management (SWM)**: A comprehensive approach to managing waste generated by human activity, involving collection, transportation, processing, recycling, and disposal.
13. **Biomedical Waste**: Waste generated from medical activities, often containing infectious materials, requiring special handling and disposal.

14. **Refuse-Derived Fuel (RDF)**: Fuel produced from combustible components of municipal solid waste.
15. **Public-Private Partnership (PPP)**: A collaborative arrangement between public and private sectors to deliver public infrastructure and services
16. **Waste-to-Energy (WTE)**: A process of generating energy in the form of electricity or heat from waste
17. **Sustainable Development**: Development that meets the needs of the present without compromising the ability of future generations to meet their needs.
18. **Waste Generation**: The production of waste materials by human activity, particularly due to urbanization and industrial processes.
19. **Unplanned Urbanization**: The rapid and unregulated growth of cities, leading to issues such as inadequate infrastructure and waste management.
20. **Health Hazards**: Risks to public health due to improper waste disposal, leading to unsanitary conditions and disease outbreaks.
21. **Environmental Degradation**: The deterioration of the environment through the improper disposal of waste, affecting soil, water, and air quality.
22. **Segregation Challenges**: The difficulties encountered in separating waste materials into categories for proper disposal, particularly in rapidly urbanizing areas.
23. **Cultural and behavioural Factors**: Social attitudes, beliefs, and practices that influence waste management behaviours, often contributing to improper disposal.
24. **Inconsistent Regulations**: Variations in the enforcement and application of waste management laws across different regions, leading to inefficiencies.
25. **Data Analysis**: The process of organizing, structuring, and extracting meaning from collected data, often involving complex and non-linear interpretation.
26. **Intervention Analysis**: A method used in time series data to study the effects of an intervention or event on the data patterns.
27. **Socio-Economic Background**: The social and economic circumstances that influence individuals' behaviors, attitudes, and living conditions.
28. **Pre-Intervention Stage**: The initial stage before an intervention is applied, during which baseline data is collected.
29. **Post-Intervention**: The stage following an intervention, during which the effects of the intervention are measured.

30. **Time Series Analysis**: A method of analysing a sequence of data points collected over time to identify patterns and trends.
31. **Primary Data**: Original data collected directly from the source, often through surveys or observations.
32. **Secondary Data**: Data collected from existing sources, such as reports, publications, or other research studies.
33. **Qualitative Research**: A research method focused on understanding human behaviour and experiences, often using interviews, observations, and open-ended data
34. **Quantitative Research**: A research method focused on quantifying variables and analysing statistical relationships between them.
35. **Segregation of Waste**: The process of separating waste materials into categories such as wet, dry, and hazardous.
36. **Public Health**: The science and practice of protecting and improving the health of people and their communities.
37. **Littering**: The act of improperly disposing of waste materials in public spaces, leading to environmental pollution.
38. **Social Justice**: The fair distribution of resources, opportunities, and privileges within a society, often a goal of community organization.
39. **Community Participation**: Involvement of community members in the decision-making process to address issues affecting their local area.

❑❑❑

Annexures -III : Photos of During PRE & POST Intervention

PRE - INTERVANTION

AREA 1 - SIDDHIVINAYAK COLONY GARBAGE CONDITIONS






AREA 2 - MHADA COLONY GARBAGE CONDITIONS






AERA 3 - GOKULNAGAR PATHAR GARBAGE CONDITIONS






AREA 4 - SAHYOG NAGAR GARBAGE CONDITIONS






AREA 5 & 6 – GOSAVI VASTI & DONGARWADI GARBAGE CONDITIONS









NEAR SCHOOLS & RIVER SIDES GARBAGE CONDITIONS









PRE INTERVENTION DATA COLLECTIONS

SIDDHIVINAYAK COLONY, MAHADA COLONY, GOKULNAGAR PATHAR, SAHYAOG NAGAR, GOSAVI VASTI & DONGAR WADI
















सहयोगनगर येथील कचरागाडी बंद

INTERVENTION SESSIONS, PI DATA COLLECTION, GARBAGE AWARENESS CAMPIGIN & STARTING OF GARBAGE TEMPOS AT SIDDHIVINAYAK COLONY, MAHADA COLONY, GOKULNAGAR PATHAR, SAHYAOG NAGAR, GOSAVI VASTI & DONGAR WADI










INTERVENTION SESSIONS AND SELFIE WITH KACHARA - GARBAGE AWARENESS RALLY

SIDDHIVINAYAK COLONY, MAHADA COLONY, GOKULNAGAR

PATHAR, SAHYAOG NAGAR, GOSAVI VASTI & DONGAR WADI










SELFIE WITH KACHARA - GARBAGE AWARENESS RALLY






PMC AUTORITIES AND SWaCH OFFICIALS MEETS
















AFTER POST INTERVENTION SITUATIONS AT

SCHOOLS, SIDDHIVINAYAK COLONY & MAHADA COLONY

















AFTER POST INTERVENTION SITUATION

AT GOSAVI VASTI & DONGAR WADI





AFTER POST INTERVENTION SITUATIONS

AT GOKULNAGAR PATHAR & SAHYAOG NAGAR





❑❑❑

THE KNOWLEDGE, ATTITUDE AND PRACTICE ABOUT GARBAGE SEGREGATION AMONG URBAN FAMILIES: A SOCIAL WORK INTERVENTION STUDY IN PUNE CITY

A Thesis

SUBMITTED TO THE

TILAK MAHARASHTRA VIDYAPEETH, PUNE

FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN

SOCIAL WORK

Under the Board of Moral and Social Sciences Studies

Estd 1921

BY

SURYAWANSHI DEVEND BHADURAO

(Registration No. 15521002666)

UNDER THE GUIDANCE OF

DR. PRAKASH SADASHIV YADAV

Associate Professor and Former HOD, Social Work Department

Tilak Maharashtra Vidyapeeth, Pune

MAY – 2026

80_Recommendations

Summary of the Research Study :

Introduction is the first chapter of the research study, divided into eleven sub topics. In this section, the researcher focused on community development in rapid urbanization in the world. The researcher majorly focused on Pune has led to a sharp rise in municipal solid waste. Improper garbage segregation at the household level is a major barrier to effective waste management, causing environmental pollution, health hazards, and overburdened landfills. Many urban families lack knowledge, motivation, or consistent segregation practice. This failure at the source disrupts the entire chain of recycling and composting. Consequences include environmental pollution of soil, air, and groundwater. Health hazards affect waste pickers and communities near overburdened landfills. The KAP gap highlights the need for community-based behavioral interventions. Hence, this study assesses KAP and tests social work intervention for sustainable segregation in Pune.

In the second chapter Review of Literature, the researcher reviewed 64 research papers (policy documents) and 18 books related to solid waste management, garbage segregation, KAP studies, and social work interventions. The literature was critically analyzed and differentiated under various thematic aspects to identify trends, findings, and gaps. Most studies focus on technical or municipal-level waste management, not household-level KAP. Limited empirical data exists on the segregation behavior of urban families in Pune specifically. While social work's role is acknowledged, no structured intervention study has measured its effectiveness on KAP in Pune's urban wards. Six studies linked segregation practices to broader community development outcomes. The review establishes that household segregation is a critical yet understudied area. This study addresses the gap by assessing KAP among Pune's urban families and testing a social work intervention model to create sustainable change.

Research Methodology is the third chapter, which begins with a Problem Statement: 'Despite PMC awareness campaigns, many urban families lack adequate knowledge, hold negative attitudes, or fail to practice source segregation consistently. This gap between policy and household behavior limits the success of "Swachh Bharat" and "Zero Waste" initiatives. The researcher set eight objectives to gain goal

of the tile. To assess the existing knowledge, attitude, and practice (KAP) levels regarding garbage segregation among urban families in Pune. To identify socio-economic and cultural factors influencing segregation behavior. To design and implement a social work intervention model for improving KAP. To evaluate the effectiveness of the intervention on changing household waste practices. Descriptive cum intervention study was conducted for Urban families from selected suburban areas of Pune City. Multi-stage sampling was used to select 350 households. Tools: Structured interview schedule for KAP assessment; Focus Group Discussions; Observation checklist. Intervention: Social work methods including awareness drives, street plays, home visits, IEC material distribution, and formation of resident groups. Duration: 9 months. Data Analysis: Pre-test and post-test design. SPSS was used for statistical analysis, including Wilcoxon Signed Rank Test & Two Standard Deviation method.

In chapter four, Data Analysis and Interpretation, all collected data was analyzed by the researcher. The output of the work is as follows:

- **Knowledge-related** improvement: Pre-intervention, only 42% families knew the correct wet vs dry segregation rules. Post-intervention, this rose to 78%.
- **Attitude:** 60% initially felt segregation was "PMC's job". After the intervention, 81% agreed it was a household responsibility.
- **Practice:** Actual segregation compliance improved from 28% to 67% based on observation. Main barriers were a lack of time, space, and motivation.
- **Social Work Impact:** Group work and community mobilization were more effective than pamphlets alone. Women and children emerged as key change agents.

Chapter no five deals with Major Findings, Conclusion and Suggestions which shows: There is a significant gap between knowledge and practice of garbage segregation among Pune's urban families. Targeted social work interventions using participatory methods can positively change attitudes and practices. Sustained behavior change requires continuous community engagement, local leadership, and municipal support. Social Work Implications: The study recommends integrating professional social workers in municipal waste management programs, using SHGs and schools as entry points, and a policy focus on incentive-based segregation models.

Conclusion:

The findings derived from six selected areas within the Warje locality indicate that 'targeted interventions' have had a positive impact on waste management practices in these regions. By focusing on education, behavioral change, and infrastructure development, these interventions successfully achieved improved waste segregation, reduced improper waste disposal, and enhanced community participation.

The progress achieved through these Interventions underscores the potential for scalable waste management solutions in similar urban and semi-urban contexts. These findings underscore the necessity of community participation, consistent communication and awareness-raising, to sustain long-term changes in waste management.

Suggestions:

For Respondents

- **Accept and Adopt Daily Segregation Practices:** Families must consistently segregate wet, dry, and hazardous waste at the source using color-coded bins.
- **Actively Participate in Awareness Programs**: To stay informed and updated, participants should actively take part in community meetings, workshops, and cleanliness drives organized by the administration and NGOs.
- **Ensure the proper disposal of waste:**Families should hand over segregated waste to collection workers and ensure that it is not subsequently mixed together again.

NGOs (Non Government Organisations)

- **Conduct Public Awareness Campaigns Regularly:** NGOs should organize workshops, door-to-door campaigns and demonstrations regarding proper waste segregation techniques.
- **Adopt Innovative Methods of Communication:** Skillfully and effectively utilization of social media, street plays, and audio-visual materials to bring about lasting behavioral change.
- **Collaboration with Local Authorities:** To implement and monitor waste management programs, NGOs should work in collaboration with local municipalities and municipal corporations.

Government - Pune Municipal Corporation (PMC), State & Central Government :

- **Improve Waste-related Infrastructure and Services:** Authorities such as the Pune Municipal Corporation should ensure an adequate supply of waste bins and an efficient collection system based on waste segregation.
- **Strengthen Public Awareness Initiatives:** Implement consistent and comprehensive campaigns through media, schools, and community programs.
- **Strict Enforcement of Rules and Regulations:** To ensure compliance with regulations, laws related to waste segregation should be enforced through a combination of proper oversight, punitive measures, and incentives.
- **Providing support for Training and Capacity Building:** Implementing effective waste management measures through the utilization of innovative technologies. Providing up-to-date training to officials and sanitation workers, as well as extending assistance to NGOs and social workers.

Recommendations :

- **Enhance the Effectiveness of Awareness Programs:** To reinforce proper knowledge regarding waste segregation, regular and well-planned awareness campaigns should be conducted at the community level, focusing primarily on practical implementation.
- **Provision of Infrastructure:** Municipal authorities must ensure the availability of color-coded waste bins in all urban areas, as well as a reliable service for door-to-door waste collection and segregation.
- **Incentives and Penalties:** With the aim of fostering a sense of responsibility, implement a reward system for families that properly segregate waste, and provisions for penalties for those who fail to comply with the regulations.
- **Regular Monitoring and Evaluation:** To assess the effectiveness of the measures implemented and to make necessary improvements, regular follow-ups and surveys should be conducted.
- **Regular Training for Waste Workers:** Sanitation workers should receive appropriate training and support to efficiently handle segregated waste, as well as to emphasize the importance of segregating waste at the source.

- **Collaboration with NGOs and Social Workers:** To implement community-based initiatives, sustain behavioral changes, and ensure the success of intervention programs, it is essential to strengthen partnerships with non-governmental organizations (NGOs) and social work professionals.
- **Consistent Use of Media and Technology:** Effectively utilize social media, mobile apps, and local communication channels to raise awareness, send reminders, and track waste segregation practices.

❑❑❑

Tilak Maharashtra Vidyapeeth

Declared as a Deemed to be University Under Section 3 of UGC Act 1956
Reaccredited by NAAC with'B++'Grade
ISO21001 : 2018 Certified

Plagiarism Report **Ph.D.** *Date- 11/10/2025*

Suryawanshi Devend

Department – Social Work

PRN - 15521002666

Title – "The Knowledge, Attitude And Practice About Garbage Segregation Among Urban Families: A Social Work Intervention Study In Pune City"

Chapter 1 **INTRODUCTION**	13%
Chapter 2 **REVIEW OF LITERATURE**	14%
Chapter 3 **RESEARCH METHODOLOGY**	9%
Chapter 4 **ANALYSIS & INTERPRETATION**	5%
Chapter 5 **CONCLUSION/FINDINGS/RECOMMENDATIONS**	7%

Dheeraj Singh 11/8/2026.

Head of Ph.D. Department