

# Assess the Effectiveness of Structured Teaching Programme (STP) on Knowledge and Practice Regarding Segregation of Household Waste

Samudre Manjusha Manohar<sup>1</sup>, Raut Pranav Vishwanath<sup>2</sup>,  
Dr. Priyadarsini John<sup>3</sup>, Rosamma Sebastian<sup>4</sup>, Shid Shruti Santosh<sup>5</sup>,  
Shinde Nikita Sanjay<sup>6</sup>, Shinde Sakshi Dinesh<sup>7</sup>, Sutar Sanika Jagdish<sup>8</sup>,  
Tambe Rutuja Satish<sup>9</sup>, Thakare Falguni Sajan<sup>10</sup>,  
Thakur Smita Bhaskar<sup>11</sup>, Wakode Prachi Rameshwar<sup>12</sup>,  
Zende Kiran Vijaykumar<sup>13</sup>

<sup>1</sup>M.Sc.(N), Associate Professor , Community Health Nursing, Bel-Air College of Nursing, Panchgani

<sup>2</sup>M.Sc.(N), Lecturer, Community Health Nursing, Bel-Air College of Nursing, Panchgani

<sup>3</sup>PhD.(N), Principal, Bel-Air College of Nursing, Panchgani,

<sup>4,5,6,7,8,9,10,11,12,13</sup>B.Sc. (N), Students, Bel-Air College of Nursing, Panchgani

## Abstract:

**Introduction:** Waste is nothing but worthless object or substance, most often the result of human activities <sup>[1]</sup>. Indian is facing a growing waste management crisis due to rapid urbanization and increase of waste generation <sup>[2]</sup>. The current rate of solid waste generation in India stands at 0.34 kg per person per day. Waste segregation at source, particularly at the household level, is an integral component of sustainable solid waste management, which is a critical public health issue <sup>[1]</sup>. The agenda for Sustainable Development Goal [SDG] 2030, is "peace and prosperity for people and the planet" while tackling climate change and working to preserve oceans and forests. Totally there are 17 SDGs of them. SDG 6, 11 and 12 are related directly or indirectly to waste generation and management <sup>[3]</sup>.

**Aim:** To evaluate the effectiveness of a STP in improving the knowledge and practice of household waste segregation among women residing in Panchgani.

**Material and method:** A mixed research design was used with 100 participants for STP and 19 for Focused Group Discussion (FGD). A semi-structured questionnaire with 15 knowledge and 10 practice items ( $r=0.9$ ) was administered. Data was analyzed using frequency, percentage, mean, SD, chi-square.

**Result:** Mean knowledge score increased from 11.08 to 13.86, and practice score improved from 5.8 to 9.19 ( $p<0.0001$ ). Women in the FGD reported knowing about importance of segregating dry and wet waste and viewed it as a shared responsibility, and are practicing it regularly to protect and prevent harm to the waste collectors.

**Conclusion:** The findings of the study conclude that the STP effectively improved the women's knowledge and practice of household waste segregation. The observed improvements were statistically significant, confirmed the effectiveness of the intervention.

**Keywords:** Household waste, Segregation, Effectiveness, STP, Knowledge, Practice.

### **Introduction:**

The shift in lifestyle has significantly increased the proportion of waste, elevating global concern. India, with 1.4 billion population <sup>[1]</sup>, generates an amount of waste directly proportional to its population <sup>[4]</sup>. Although government programs like the Swachh Bharat Mission and Extended Producer Responsibility rules aim to improve the situation, challenges remain in infrastructure, funding, and public awareness <sup>[2]</sup>. India is anticipated to surpass Germany, Japan, and Brazil, which currently hold the 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> positions respectively, in terms of waste generation. The current rate of solid waste generation in India stands at 0.34 Kg per person per day, and is estimated to increase to 0.7Kg per person per day by 2025. As per Central Pollution Control Board, 2025 report, India generates approx. 1,60,038 tons of solid waste daily. However, only 50% of this waste is treated <sup>[5]</sup>. All forms of contamination, including soil, water, and air, are brought on by improper Municipal Solid Waste (MSW) disposal and management. The environment and human health might be endangered by the inappropriate treatment of solid wastes. The greatest health concerns for the general public are indirect, and are brought on by the proliferation of disease vectors, particularly flies and rodents <sup>[6]</sup>. Managing household waste responsibly is not just a personal duty; it's a vital step toward a sustainable future. Understanding the different types of household waste and the safe management practices associated with each type empowers us to make environmentally conscious decisions that protect our communities and the planet. By reducing, reusing, recycling, and properly disposing waste, we can significantly lessen its environmental impact, conserve resources, and contribute to a healthier ecosystem <sup>[7]</sup>.

### **Problem statement:**

“A study to assess the effectiveness of Structured Teaching Programme (STP) on knowledge and practice regarding segregation of household waste among women residing in Panchgani, Maharashtra.

### **Objectives of the study:**

1. To assess the existing knowledge and practice regarding segregation of household waste among women residing in selected areas of Panchgani.
2. To assess the knowledge and practice after providing STP on segregation of household waste and management.
3. To find out the association between knowledge score and practice regarding segregation of household waste among women and selected socio-demographic variables after STP.

### **Hypothesis:**

H0: There is no significant difference between pre-test and post-test knowledge scores after the STP.

H1: There is a significant difference between pre-test and post-test knowledge scores after the STP.

### **Review of literature:**

#### **1. Study related to the Knowledge of Waste Segregation and Management**

In the year 2019, K. Eshwari, et al. conducted a community-based cross-sectional study from the Southern part of coastal Karnataka, India, to assess the knowledge, attitude, and practices towards household solid waste management among semi-urban residents. A total of 441 households were

included in the study. The results of the study showed that the overall knowledge (60.3%), attitude (61.5%), and practices (72.8%) towards solid waste among the participants were nearly satisfactory<sup>[8]</sup>.

## **2. Study Related to the Practice of Waste Segregation and Management**

In 2022, Manas R B and Subhashree P studied household sanitation and menstrual hygiene management among women under the Swachh Bharat (Clean India) Mission in rural Odisha, India. The study surveyed 700 rural women and girls aged 15–45 years in Balesore district. Results showed that more than two-thirds (68.4%) of rural households use improved sanitation facilities, while around 30% of families have inadequate sanitation infrastructure<sup>[9]</sup>.

## **3. Study related to Structured Teaching Programme**

In 2023, Nanbur, Dongurum, et al. conducted a quasi-experimental study at Life-changing Eudaimonia Hospital, Jos, Nigeria, to evaluate the impact of a structured teaching programme on mothers' knowledge and utilization of oral rehydration solution (ORS) among children under five years with diarrhea. Seventy mothers participated in a pre-test/post-test design, and findings revealed a significant increase in both knowledge and proper utilization of ORS after a 3-hour structured educational session, demonstrating that targeted health education can improve home-based management of childhood diarrhea and reduce associated morbidity in developing countries<sup>[10]</sup>.

### **Material and Method:**

#### **Research approach:**

The researchers have adopted a mixed research approach.

#### **Research design:**

The researchers have adopted a Descriptive design to assess the effectiveness of Structured Teaching Programme (STP) on the knowledge and practice regarding segregation of household waste among women residing in Panchgani.

#### **Population:**

In this study the population comprised of all the women residing in Maharashtra.

#### **Sample:**

The sample selected for the present study comprised of women residing in selected areas of Panchgani, Maharashtra.

#### **Sample size:**

The sample size selected for this study was 100

#### **Sampling technique:**

In this study a non-probability, convenient sampling technique was used to select 100 women from three selected areas of Panchgani (Siddharthnagar, Bhimnagar and Lower Gaothan) who met the inclusion criteria during the data collection period.

#### **Inclusion criteria:**

1. Women 18 years and above.
2. Women who were willing to participate in the study.
3. Women available at the time of study.

#### **Data collection technique and tool:**

The researchers surveyed the area and selected women as per the inclusion criteria. Data collection tool was constructed according to the objectives of the study and validated by experts. An informed consent was taken from women prior to the study. A semi-structured questionnaire was prepared and data was

collected by administering the questionnaire and a Focused Group Discussion (FGD) was conducted to gain deeper insights into the participants' knowledge, attitudes, and practices regarding segregation of household waste. While pre-test and post-test scores provided quantitative data on the level of knowledge and practice FGD provided qualitative data.

**Development of the tool:**

The researchers prepared a Semi-structured questionnaire with MCQ's.

The questionnaire consisted of two sections. Section A included questions on demographic variables, section B-1 consisted of 15 MCQ's; each correct response was awarded 1 mark. Scores were categorized as below average (0–5), average (6–10), and above average (11–15). Section B-2 consisted of an observation checklist with a total of 10 categories of waste; each correct response awarded 1 mark. Scores were categorized as below average (0–3), average (4–6), and above average (7–10).

**Validity and reliability:**

The tool was validated by 09 experts from different specialties i.e. Community health nursing, pediatric nursing, medical surgical nursing, obstetrics and gynecology nursing and participatory learning and action network PLAN foundation followed which changes were made in the tool.

The reliability of the tool was calculated by using test retest method and it was found highly reliable with r value 0.9.

**Ethical considerations:**

- Permission for conducting the study was obtained from the Institutional Ethics Committee.
- Permission was obtained from the Head of the Institution.
- Written informed consent was obtained from the participants.
- Confidentiality of the information was maintained.

**Pilot study:**

A pilot study is a small-scale version or trial run of the major study to assess the feasibility of the study. The pilot study was conducted from 13/09/2025 to 15/09/2025 on 10 selected women from Siddharthnagar, Panchgani. The study was found to be feasible and practicable within the available resources and timeframe.

**Main study:**

The main study was conducted from 15/09/2025 to 18/09/2025 on 100 women to assess the effectiveness of STP on the knowledge and practice regarding segregation of household waste

The researchers approached the women, informed them about the objectives of the study, and obtained written informed consent from the participants, assured them that the data collected would remain confidential.

**Data analysis:**

The data analysis includes descriptive and inferential statistics. The analysis was based on the objectives and the hypothesis to be proved. The data related to existing knowledge was analyzed in terms of descriptive statistics.

**Results:**

1. The study showed that a majority of participants were between the age group of 41–50 years (28%) participants, and minimum belonged to the age group of 81–90 years (2%).
2. Among the 100 study participants, a majority completed their primary education (38%), graduates (21%), and others completed their post graduated and above (3%).
3. Most participants were housewives (77%).
4. Among the 100 participants, a majority of them belonged to nuclear family (70%), and the rest were from joint family (30%).
5. Majority of the participants had a monthly income less than 7,988/- (67%), and remaining was from upper lower monthly income of ₹ 23,870/- to 59,794/- (23%). Most of the participants (82%) had previous knowledge regarding segregation of household waste from session held by the Municipal Council, and 18% were found to have not received any prior information regarding segregation of household waste.

## Results of Focus Group Discussion (FGD)

**Knowledge:**

Participants commonly expressed that they are aware of the need to segregate household waste.

**Attitude:**

Women consistently described segregation of household waste as a collective family responsibility, highlighting strong support from both their relatives and the wider community.

**Practice:**

Most participants stated that they regularly separated dry and wet waste, mainly to prevent injuries and harm to the waste collector.

**Discussion:**

The findings of the study based on the objectives of the study:

**1. To assess the existing knowledge and practice regarding segregation of household waste among women in selected areas of Panchgani.**

The present study was conducted to assess knowledge and practice regarding segregation of household waste among women in selected areas of Panchgani. Among the 100 participants the mean pre-test knowledge score was above average (11–15) = 62, average (6–10) = 37, below average (0–5) = 1, the pre-test practice score was above average (7–10) = 37, average (4–6) = 56, below average (0–3) = 7. The findings of the study are similar to the study conducted in Karnataka, to assess the knowledge, attitude, and practices towards household solid waste management among semi-urban residents. There they found that the overall knowledge (60.3%), attitude (61.5%), and practices (72.8%) towards solid waste among the participants were nearly satisfactory<sup>[11]</sup>.

**2. To assess the knowledge and practice after providing the (STP) regarding segregation of household waste and management.**

The current study was conducted to assess knowledge and practice after providing the (STP) on segregation of household waste and management, using post-test of knowledge and practice. The results showed that knowledge after providing the (STP) was below average (0–5) = 0, average (6–10) = 0, above average (11–15) = 100, and for practice, the result after providing the (STP) was below average (0–3) = 0, average (4–6) = 9, above average (7–10) = 91 out of 100 participants. The findings of the study is similar to the study conducted by Maa janki college of nursing Hiranagar, Hamirpur to assess the

effectiveness of structured teaching programme on knowledge regarding household waste management among housewives were they found that majority of subjects 93.3% had adequate knowledge, 6.7% had moderately adequate knowledge and 0% had inadequate knowledge regarding household waste management<sup>[12]</sup>.

**3. To determine the association between post-test knowledge and practice scores with selected socio demographic variables.**

The study results indicate an improvement in the knowledge and practice scores regarding segregation of household waste among participants. The mean pre-test knowledge score was 11.08, which increased to 13.86 in the post-test. Similarly, the mean pre-test practice score was 5.8 , and the mean post-test practice score increased to 9.19. ( p value highly significant  $p < 0.0001$ ).The findings of the study is similar to the study conducted in Patna that proposes a maximum number of women (64%) had adequate knowledge regarding household waste management. Still, significant percentage (36%) of women was lacking the knowledge and attitude regarding household waste management which indicates the necessity of imparting knowledge regarding household waste management

**Focused Group Discussion (FGD)**

A Focused Group Discussion (FGD) was conducted in Bhimnagar and Siddharthnagar to explore participants' knowledge, attitudes, and practices regarding household waste segregation. Women were asked about their awareness, current practices, challenges, attitudes, and available support.

Participants reported that they segregate waste into separate bins. They stated that proper segregation prevents injuries to waste collectors from sharp or hazardous waste, motivating them to continue the practice. They also reported support from their families, community, and the Municipality, along with access to green and blue colour-coded bins. Most women reported no cultural or practical barriers to household waste segregation.

**Results of Focus Group Discussion (FGD)**

Knowledge: Participants were aware of the importance of segregating household waste.

Attitude: Women considered household waste segregation a shared family responsibility and reported support from their families and community.

Practice: Most participants regularly segregated dry and wet waste to help prevent injuries to waste collectors.

**Illustration:**

**Table 1: Analysis of the demographic data in terms of frequency and percentage.**

DEMOGRAPHIC VARIABLES		
Socio demographic variable	Frequency	Percentage (%)
Women's Age		
20-30 year	16	16%
31-40 year	21	21%
41-50 year	28	28%
51-60 year	17	17%
61-70 year	12	12%
71-80 year	3	3%
81-90 year	2	2%

<b>Education</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Illiterate	9	9%
Primary Education	38	38%
Secondary Education	29	29%
Graduate	21	21%
Postgraduate and above	3	3%

<b>Occupation</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Housewife	77	77%
Farmer	1	1%
Labour	9	9%
Self-employed	29	29%
Government job	21	21%
Any other specify	3	3%

<b>4. Type of Family</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Nuclear	70	70%
Joint	30	30%
Extended family	0	0%
Single parent family	0	0%

<b>5. Number of Family Members</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<5	56	56%
5-10	22	22%
>10	2	2%

<b>6. Monthly Income (according to Kuppaswamy Scale)</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Upper(1)Rs1,59,586/-and above	2	2%
Upper middle(2) Rs. 79,795/- -Rs.1,59,585/-	1	1%
Lower middle (3) Rs. 59,795/- -Rs.79,755/-	0	0%
Upper Lower(4) Rs. 23,870/- -Rs.59,794/-	30	30%
Lower(5)Rs. 7,988/-and below	67	67%

<b>7. Previous Knowledge about Segregation of Household Waste</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Yes	82	82%
No	18	18%

<b>8. Source of Information</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Newspaper	1	1%
Television	1	1%

Mobile	0	0%
Other	98	98%

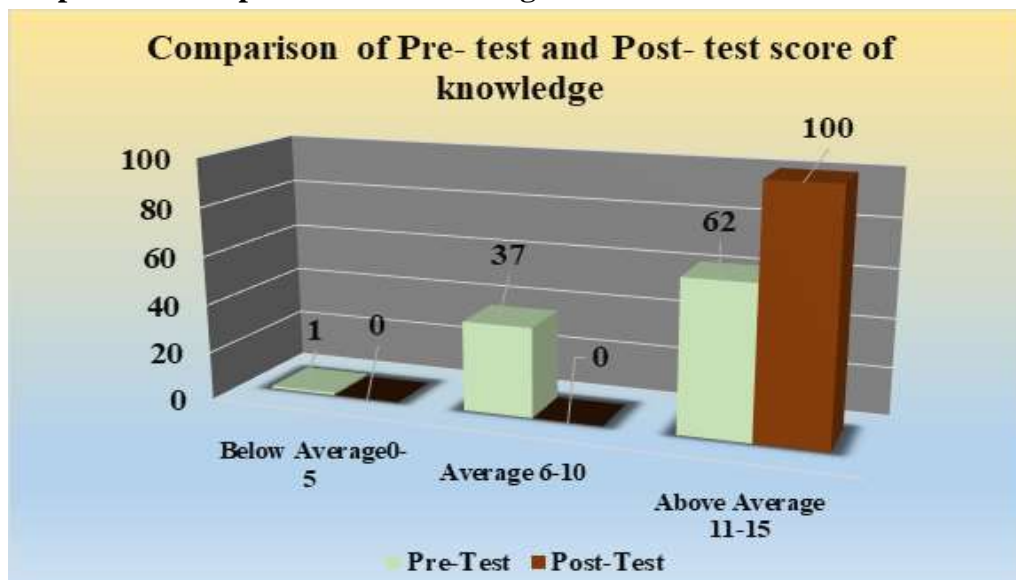
**Table 1:** The tables present the analysis of demographic data in terms of frequency and percentage. The majority of women (28%) were aged 41–50 years. Most participants (38%) had completed primary education, and their predominant occupation was housewife (77%). Most women (70%) belonged to nuclear families, and over half (56%) had fewer than five family members. A majority (67%) had a monthly income of Rs. 7,988 and below. Most women (82%) had prior knowledge of segregation of household waste, and nearly all (98%) received information about waste segregation from other sources.”

**Table 2: Analysis of data related to knowledge score of subjects regarding segregation of household waste.**

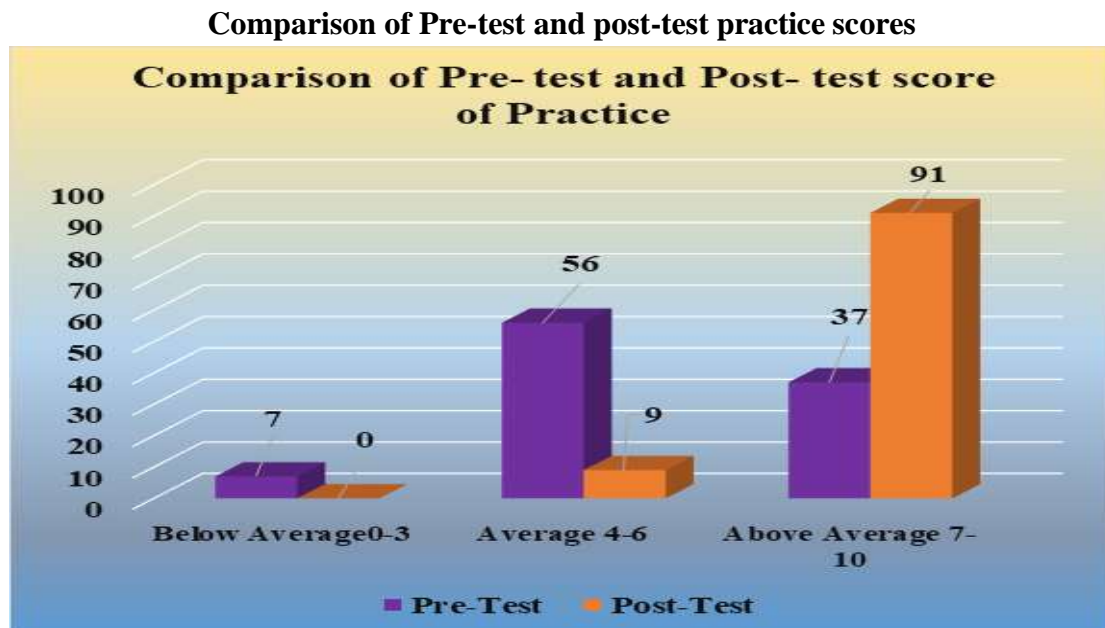
		Pre-test	Post-test	Mean difference	t value	p value
Level of knowledge	Mean	11.08	13.86	-2.780	15.340	<0.0001
	Standard deviation	1.818	0.4928	-1.812		
	Minimum	5.000	13.000	-8.000		
	Maximum	14.000	15.000	1.000		
	Median	11.000	14.000	-3.000		

Table 2 shows the comparison between pre-test and post-test knowledge score of subjects, with a significant increase ( $p = <0.0001$ ) in post-test knowledge score after STP regarding segregation of household waste.

**Comparison of pre- test and post- test of knowledge scores**



**Figure 1:** The graph shows the comparison of pre-test and post-test knowledge scores. The women have significantly increased in post-test score of knowledge to 100%.



**Figure 2: The graph shows the comparison of pre-test and post-test practice scores. 91% women had significantly increased their post-test practice scores.**

**Inference:** There was no association between knowledge and practice score regarding segregation of household waste with selected socio demographic variables after STP.

**Conclusion:**

The study concluded that there is a significant improvement in the knowledge and practice of segregation of household waste among women residing in Panchgani following the implementation of the STP. Both knowledge and practice of proper waste segregation showed a marked and statistically significant improvement. Post-test findings revealed that all participants achieved above-average knowledge scores, and the majority demonstrated above-average practice scores, indicating that the STP had a strong positive impact. The significant increase in mean knowledge and practice scores highlights that the STP was highly effective in enhancing understanding, promoting awareness, and encouraging appropriate waste segregation practices among the participants.

In addition to the quantitative findings, the (FGD) provided qualitative insights into participants’ perceptions and behaviours. The FGD revealed that participants possessed a basic level of knowledge about segregation of household waste and exhibited a positive attitude towards implementing these practices. They reported actively practicing proper segregation of waste at home, receiving consistent support from their families and the local municipal authorities, and facing no major challenges or cultural barriers while carrying out these practices. Overall, the combination of quantitative and qualitative findings underscores the effectiveness of the STP in improving knowledge, fostering positive attitudes, and promoting practical implementation of segregation of household waste among women in Panchgani.

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