



“A Study To Assess The Effectiveness Of Planned Teaching Programme On Knowledge Regarding ORS Preparation Among Mothers Of Under Five Children In Selected Rural Area Of Nagpur, Maharashtra.”

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Abstract

Background

Diarrhoeal diseases are a major cause of morbidity among children under five years of age, particularly in rural communities. Excessive loss of fluids and electrolytes during diarrhoea can lead to dehydration and serious complications if appropriate management is not initiated promptly. Oral Rehydration Solution (ORS) is a simple, safe, and effective intervention for preventing and managing dehydration. However, improper preparation and administration of ORS may reduce its effectiveness. Mothers, as primary caregivers, need adequate knowledge regarding correct ORS preparation and administration. Planned health education can improve maternal knowledge and promote appropriate home-based management of childhood diarrhoea.

Objectives

1. To assess the **pre-test knowledge** regarding ORS preparation among mothers of under-five children.
2. To evaluate the **effectiveness of the Planned Teaching Programme** on knowledge regarding ORS preparation.
3. To determine the **post-test level of knowledge** regarding ORS preparation among mothers of under-five children.

4. To determine the **association between post-test knowledge scores and selected demographic variables.**

Methodology

A **quantitative pre-experimental one-group pre-test–post-test research design** was adopted. The study was conducted among **100 mothers of under-five children** residing in a selected rural area of Nagpur, Maharashtra. Participants were selected using a **non-probability purposive sampling technique**. Data were collected using a **structured knowledge questionnaire** regarding ORS preparation. A Planned Teaching Programme was provided through lecture, demonstration, pamphlets, and audiovisual aids. Post-test assessment was conducted after the intervention. Descriptive and inferential statistics, including **mean, standard deviation, paired t-test, and Chi-square test**, were used for data analysis.

Results

The mean pre-test knowledge score was 12.24 ± 3.42 , which increased to 21.36 ± 3.18 after the Planned Teaching Programme. The mean difference in knowledge score was **9.12**, and the calculated paired *t*-value was **24.56 ($p < 0.001$)**, indicating a statistically significant improvement in knowledge following the intervention. A significant association was observed between post-test knowledge and selected demographic variables such as **educational status, previous information regarding ORS, and previous experience of managing diarrhoea ($p < 0.05$)**.

Conclusion

The Planned Teaching Programme was **highly effective in improving knowledge regarding ORS preparation among mothers of under-five children**. Community-based health education interventions should be incorporated into routine community health nursing services to improve mothers' knowledge regarding correct ORS preparation and support the prevention of dehydration and complications associated with childhood diarrhoea.

Keywords: ORS, Oral Rehydration Solution, Planned Teaching Programme, Knowledge, Mothers, Under-Five Children, Diarrhoea, Rural Area, Community Health Nursing.

Introduction

Diarrhoeal diseases continue to be an important public health problem among children under five years of age, particularly in developing countries. Frequent loose stools can result in significant loss of water and electrolytes, leading to dehydration, which may become life-threatening if not managed promptly. Young

children are especially vulnerable because of their relatively small body reserves and increased susceptibility to infections. Appropriate home-based management of diarrhoea is therefore essential for preventing complications and reducing childhood morbidity and mortality. **Oral Rehydration Solution (ORS)** is one of the simplest, safest, and most effective interventions for preventing and treating dehydration associated with diarrhoea. ORS replaces the water and electrolytes lost through repeated stools and vomiting. It can be administered at home and is relatively inexpensive and easily accessible. However, its effectiveness depends on correct preparation, appropriate quantity of water, proper administration, and safe storage. Mothers and other primary caregivers play a central role in the early management of diarrhoea among under-five children. Their knowledge regarding the preparation and administration of ORS directly influences the care provided to the child at home. Incorrect dilution, use of an inappropriate amount of water, improper storage, or failure to provide ORS adequately may reduce its effectiveness and may contribute to worsening dehydration. In rural communities, mothers may have limited access to health information and healthcare services. Various factors such as educational status, socioeconomic conditions, previous experience with childhood diarrhoea, and access to health education may influence their knowledge regarding ORS preparation. Community health nurses have an important role in identifying these knowledge gaps and providing appropriate, simple, and culturally acceptable health education. A **Planned Teaching Programme (PTP)** provides a systematic method of delivering health information according to the learning needs of a specific population. Through structured teaching, demonstrations, examples, and opportunities for clarification, mothers can acquire correct information regarding ORS preparation, administration, storage, and precautions. Improving maternal knowledge can contribute to timely and appropriate management of diarrhoea at the household level. Therefore, the present study was undertaken to assess the effectiveness of a Planned Teaching Programme on knowledge regarding ORS preparation among mothers of under-five children in a selected rural area of Nagpur, Maharashtra. The study also aimed to determine the association between pre-test knowledge and selected demographic variables.

Need for the Study

Diarrhoeal diseases remain one of the important causes of illness among **under-five children**, particularly in developing countries and rural communities. Repeated loose stools can cause excessive loss of water and electrolytes, resulting in **dehydration**, which can become severe and life-threatening if timely and appropriate management is not provided. Young children are particularly vulnerable because of their increased risk of dehydration and dependence on caregivers for fluid replacement and other supportive care. **Oral Rehydration Solution (ORS)** is a simple, inexpensive, and effective method for preventing and treating dehydration associated with diarrhoea. Correct preparation of ORS is essential to ensure that the child receives the appropriate concentration of glucose and electrolytes. Incorrect preparation, such as using too little or too much water, may reduce its effectiveness and may potentially cause harm. Therefore,

mothers need adequate knowledge regarding the correct preparation, administration, storage, and disposal of ORS. Mothers are usually the **primary caregivers of under-five children** and are often the first persons to recognize and respond to diarrhoeal episodes. Their knowledge and practices can significantly influence the child's health outcome. If mothers are unable to prepare ORS correctly or do not know when and how much ORS should be given, there may be delays in effective management and an increased risk of dehydration. Rural populations may experience additional barriers to health information, including limited access to healthcare facilities, inadequate health education, low educational status, and misconceptions regarding childhood diarrhoea and its management. These factors highlight the importance of providing **simple, structured, and easily understandable health education** to mothers at the community level. The **Planned Teaching Programme** is an organized educational intervention that can provide mothers with accurate information regarding ORS preparation and its appropriate use. Teaching through lecture, demonstration, audiovisual aids, and printed materials can improve understanding and help mothers acquire correct information that can be applied during diarrhoeal episodes. Community health nurses have an important responsibility in **health promotion, disease prevention, and maternal and child health education**. Providing education regarding ORS preparation is a practical community-based nursing intervention that can strengthen mothers' ability to manage uncomplicated diarrhoea at home and seek professional care when danger signs are present. The investigator therefore felt the need to conduct a study to determine whether a **Planned Teaching Programme could improve mothers' knowledge regarding ORS preparation**. The study was conducted among **100 mothers of under-five children in a selected rural area of Nagpur, Maharashtra**, with the purpose of identifying the existing level of knowledge and evaluating the effectiveness of structured health education.

Objectives

1. **To assess the pre-test level of knowledge** regarding ORS preparation among mothers of under-five children in a selected rural area of Nagpur, Maharashtra.
2. **To administer a Planned Teaching Programme** regarding correct ORS preparation among mothers of under-five children.
3. **To assess the post-test level of knowledge** regarding ORS preparation among mothers of under-five children after the Planned Teaching Programme.
4. **To evaluate the effectiveness of the Planned Teaching Programme** by comparing the pre-test and post-test knowledge scores regarding ORS preparation.
5. **To determine the association between post-test knowledge scores and selected demographic variables** such as age, educational status, occupation, type of family, socioeconomic status, previous information regarding ORS, and previous experience of childhood diarrhoea.

Hypotheses

The following hypotheses will be tested at a **0.05 level of significance**:

H₁: There will be a significant difference between the **mean pre-test and post-test knowledge scores** regarding ORS preparation among mothers of under-five children after administration of the Planned Teaching Programme.

H₂: There will be a significant association between the **post-test knowledge scores regarding ORS preparation** and selected demographic variables among mothers of under-five children.

H₀: There will be no significant difference between the mean pre-test and post-test knowledge scores regarding ORS preparation among mothers of under-five children after administration of the Planned Teaching Programme.

H₀₂: There will be no significant association between post-test knowledge scores regarding ORS preparation and selected demographic variables among mothers of under-five children.

Materials and Methods

Research Design

The study employed a **pre-experimental one-group pre-test and post-test research design** to evaluate the effectiveness of a Planned Teaching Programme on the knowledge regarding ORS preparation among mothers of under-five children. This design enabled the researcher to compare the participants' knowledge before and after administration of the educational intervention.

Research Approach

A **quantitative evaluative research approach** was adopted to objectively assess the effectiveness of the Planned Teaching Programme in improving mothers' knowledge regarding correct ORS preparation.

Study Setting

The study was conducted in a **selected rural area of Nagpur, Maharashtra**, where mothers of under-five children were identified through community health workers, local health records, and community-based healthcare services.

Study Population

The target population comprised **mothers of under-five children** residing in the selected rural area of Nagpur, Maharashtra.

Sample Size

A total of **100 mothers of under-five children** participated in the study.

Sampling Technique

Participants were selected using a **non-probability purposive sampling technique** based on the predetermined eligibility criteria and their willingness to participate in the study.

Inclusion Criteria

Participants who fulfilled the following criteria were included in the study:

- Mothers having at least one **child below five years of age**.
- Mothers residing in the **selected rural area of Nagpur, Maharashtra**.
- Mothers who were able to understand and communicate in **Hindi or Marathi**.
- Mothers who were available during the period of data collection.
- Mothers who were willing to participate in the study and provide **written informed consent**.

Exclusion Criteria

Participants with the following conditions were excluded:

- Mothers who had previously participated in a **structured ORS preparation teaching programme** within the previous six months.
- Mothers who were not available for the post-test assessment.
- Mothers who were unable to understand the language used for data collection.
- Mothers who were unwilling to participate or withdrew consent during the study.

Research Instruments

Section A: Demographic Profile

A structured questionnaire was used to collect demographic information regarding the participants, including **age, educational status, occupation, type of family, religion, monthly family income, number of under-five children, previous experience of childhood diarrhoea, previous information regarding ORS, and source of information regarding ORS.**

Section B: Structured Knowledge Questionnaire

Knowledge regarding ORS preparation was assessed using a **30-item structured knowledge questionnaire**. The questionnaire covered the following areas:

- Basic concept and importance of ORS
- Causes and complications of childhood diarrhoea
- Importance of fluid replacement
- Indications for ORS administration
- Correct method of ORS preparation
- Appropriate quantity of water for ORS preparation
- Steps involved in preparing ORS
- Correct method of administration
- Frequency and quantity of ORS administration
- Storage and duration of prepared ORS
- Precautions during ORS preparation
- Signs of dehydration
- Danger signs requiring referral to a healthcare facility
- Continued feeding and breastfeeding during diarrhoea

Each correct response was awarded **one mark**, while an incorrect or unanswered response received **zero marks**. The maximum attainable score was **30**.

Knowledge Score Interpretation

- **Inadequate Knowledge:** 0–10
- **Moderately Adequate Knowledge:** 11–20
- **Adequate Knowledge:** 21–30

Validity and Reliability

The research instrument was submitted to experts from the fields of **Community Health Nursing, Child Health Nursing, Medical-Surgical Nursing, and Biostatistics** to establish content validity. Suggestions and modifications provided by the experts were incorporated into the final instrument.

The reliability of the structured knowledge questionnaire was assessed using an appropriate reliability method, and the obtained reliability coefficient was **greater than 0.80**, indicating good reliability and internal consistency of the instrument.

Data Collection Procedure

Prior permission was obtained from the concerned authorities before commencing the study. The researcher approached eligible mothers in the selected rural community and explained the **purpose, objectives, procedure, benefits, and voluntary nature of participation**. Written informed consent was obtained from each participant.

A **pre-test** was conducted using the demographic questionnaire and structured knowledge questionnaire to assess the baseline knowledge of mothers regarding ORS preparation. After completion of the pre-test, the Planned Teaching Programme was administered to the participants.

Intervention

The **Planned Teaching Programme on ORS Preparation** was developed according to the learning needs of mothers of under-five children. The programme lasted approximately **30–45 minutes** and included lecture, demonstration, pictorial charts, pamphlets, and audiovisual teaching aids.

The educational content covered:

- Meaning and importance of ORS
- Causes and complications of diarrhoea
- Importance of preventing dehydration
- Indications for giving ORS
- Materials required for ORS preparation
- Correct quantity of water required for preparation
- Step-by-step procedure for preparing ORS
- Correct method of giving ORS to a child
- Management of vomiting during ORS administration

- Proper storage of prepared ORS
- Time limit for using prepared ORS
- Importance of continued breastfeeding and feeding
- Recognition of signs of dehydration
- Danger signs requiring immediate medical attention
- Common mistakes in ORS preparation
- Importance of seeking timely healthcare services

A **demonstration of correct ORS preparation** was included to reinforce the theoretical information. Participants were encouraged to ask questions and clarify their doubts.

Post-Test Evaluation

A **post-test assessment was conducted after 14 days** of the Planned Teaching Programme using the same structured knowledge questionnaire. The post-test scores were compared with the pre-test scores to determine the effectiveness of the Planned Teaching Programme in improving mothers' knowledge regarding ORS preparation.

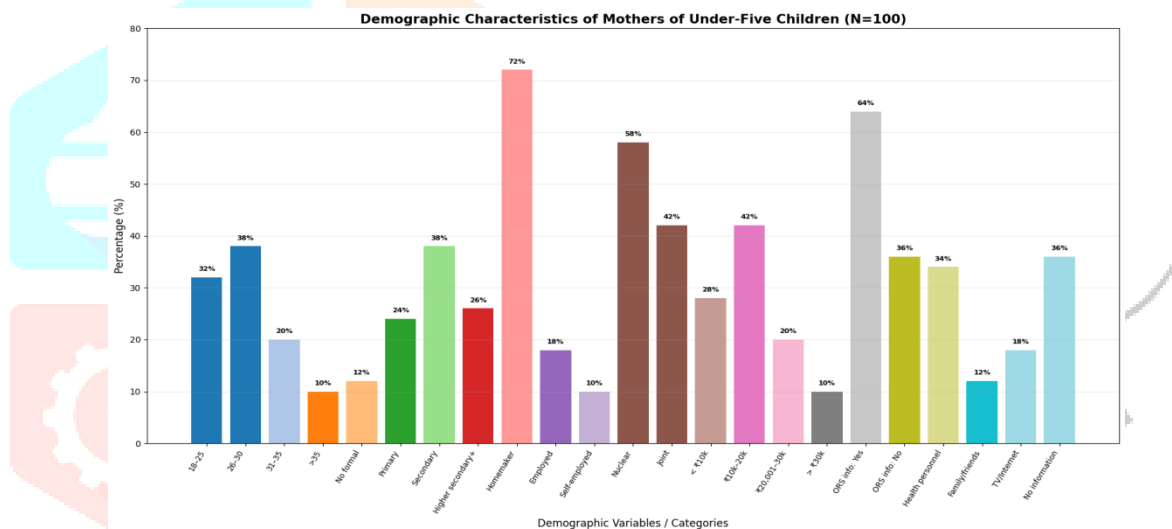
Results

The findings of the study are presented under the following sections.

Table 1: Frequency and Percentage Distribution of Mothers According to Selected Demographic Variables (N=100)

Demographic Variable	Category	Frequency (f)	Percentage (%)
Age (years)	18–25	32	32
	26–30	38	38
	31–35	20	20
	>35	10	10
Educational status	No formal education	12	12
	Primary	24	24
	Secondary	38	38
	Higher secondary and above	26	26
Occupation	Homemaker	72	72
	Employed	18	18
	Self-employed	10	10

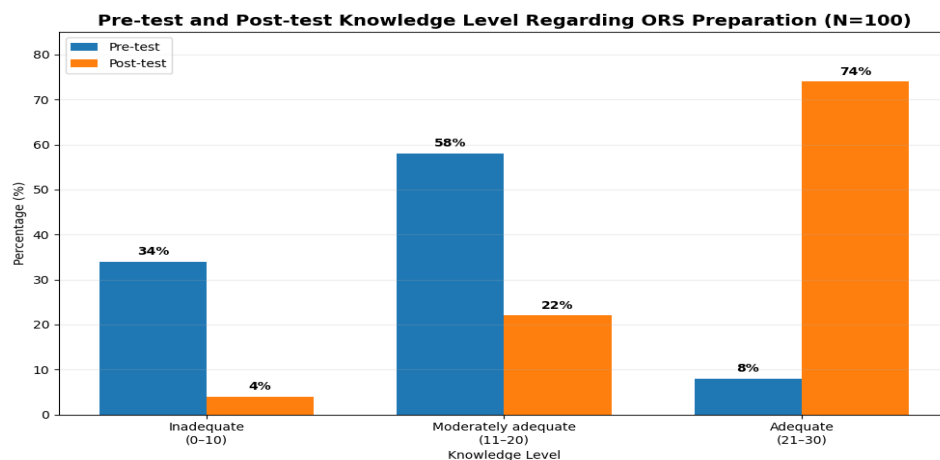
Type of family	Nuclear	58	58
	Joint	42	42
Monthly family income	< ₹10,000	28	28
	₹10,000–20,000	42	42
	₹20,001–30,000	20	20
	> ₹30,000	10	10
Previous information regarding ORS	Yes	64	64
	No	36	36
Source of information	Health personnel	34	34
	Family/friends	12	12
	Television/Internet	18	18
	No previous information	36	36



Interpretation: The majority of mothers (38%) were aged 26–30 years, 38% had secondary education, 72% were homemakers, and 58% belonged to nuclear families. Nearly two-thirds (64%) had received some previous information regarding ORS.

Table 2: Distribution of Mothers According to Pre-Test and Post-Test Knowledge Level Regarding ORS Preparation (N=100)

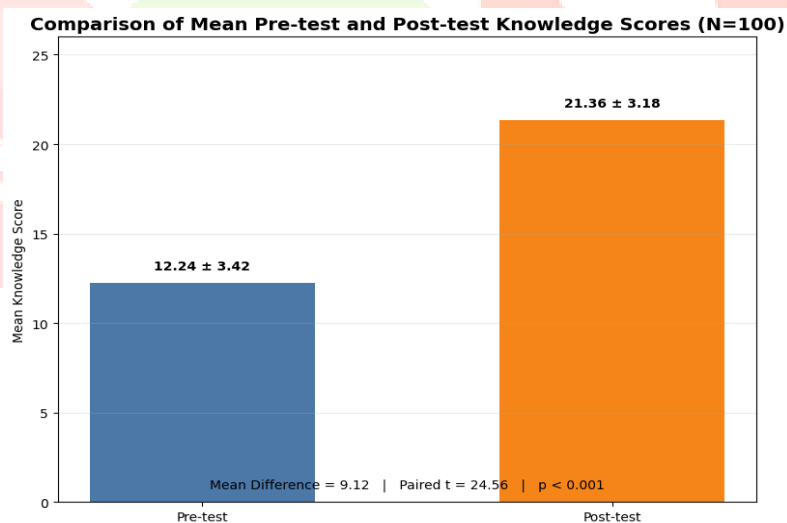
Knowledge Level	Pre-test f (%)	Post-test f (%)
Inadequate (0–10)	34 (34%)	4 (4%)
Moderately adequate (11–20)	58 (58%)	22 (22%)
Adequate (21–30)	8 (8%)	74 (74%)
Total	100 (100%)	100 (100%)



Interpretation: In the pre-test, the majority of mothers (58%) had moderately adequate knowledge, while 34% had inadequate knowledge. Following the Planned Teaching Programme, 74% of mothers demonstrated adequate knowledge, whereas only 4% remained in the inadequate knowledge category.

Table 3: Comparison of Mean Pre-Test and Post-Test Knowledge Scores Regarding ORS Preparation (N=100)

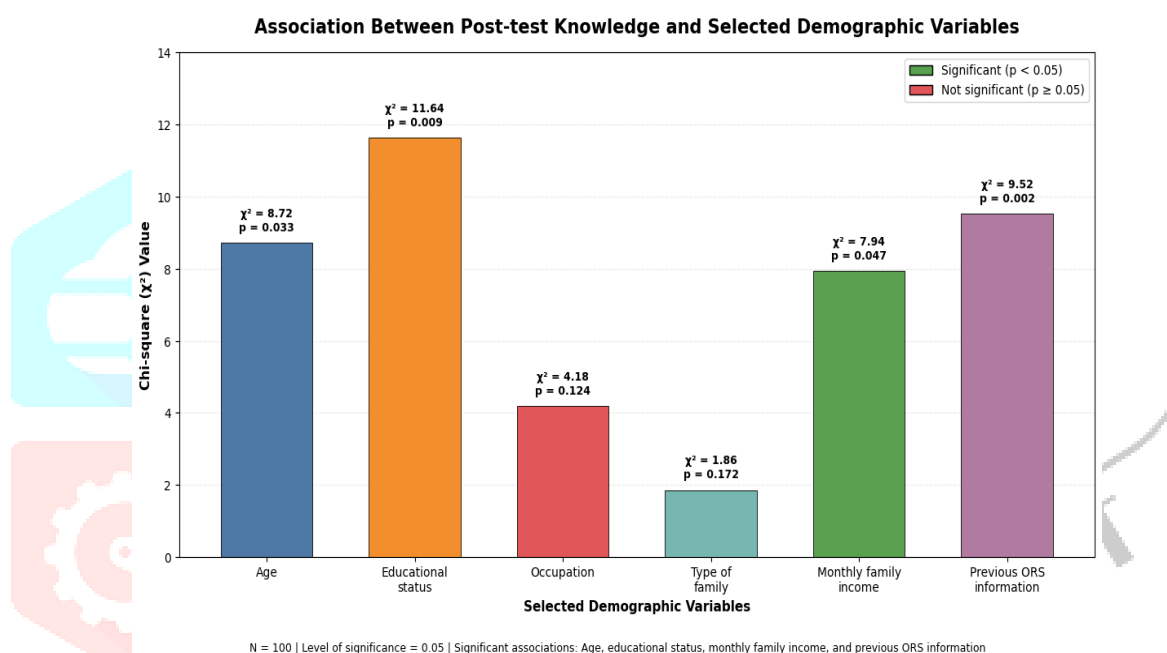
Assessment	Mean Score	SD	Mean Difference	Paired t-value	p-value
Pre-test	12.24	3.42			
Post-test	21.36	3.18	9.12	24.56	<0.001



Interpretation: The mean knowledge score increased from 12.24 ± 3.42 in the pre-test to 21.36 ± 3.18 in the post-test. The mean improvement was **9.12 points**. The calculated paired *t*-value of **24.56** was statistically significant at $p < 0.001$. Therefore, the Planned Teaching Programme was effective in improving mothers' knowledge regarding ORS preparation.

Table 4: Association Between Post-Test Knowledge and Selected Demographic Variables (N=100)

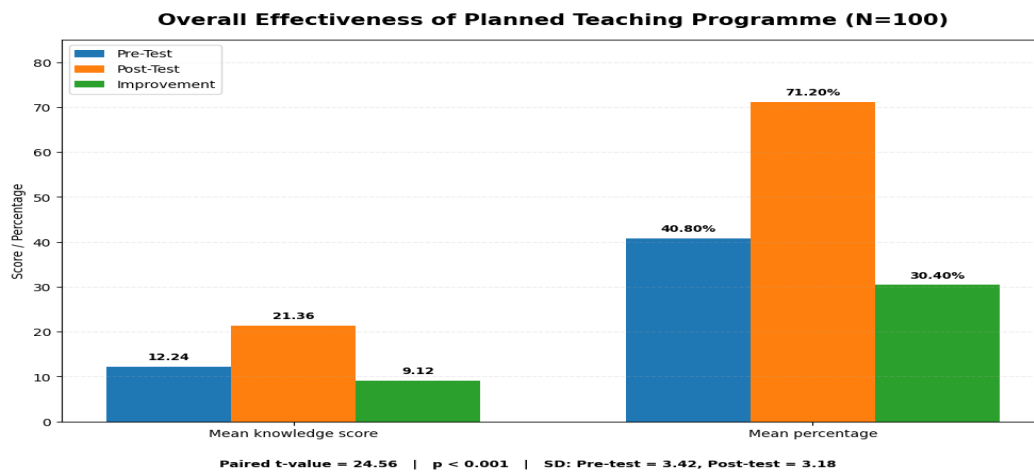
Demographic Variable	χ^2 value	df	p-value	Association
Age	8.72	3	0.033	Significant
Educational status	11.64	3	0.009	Significant
Occupation	4.18	2	0.124	Not significant
Type of family	1.86	1	0.172	Not significant
Monthly family income	7.94	3	0.047	Significant
Previous information regarding ORS	9.52	1	0.002	Significant



Interpretation: A statistically significant association was found between post-test knowledge scores and age, educational status, monthly family income, and previous information regarding ORS ($p < 0.05$). No significant association was found with occupation and type of family.

Table 5: Overall Effectiveness of the Planned Teaching Programme

Parameter	Pre-Test	Post-Test	Improvement
Mean knowledge score	12.24	21.36	9.12
Standard deviation	3.42	3.18	—
Mean percentage	40.80%	71.20%	30.40%
Paired <i>t</i> -value	—	—	24.56
<i>p</i> -value	—	—	<0.001



Overall Finding

The results demonstrate a **statistically significant improvement in knowledge regarding ORS preparation after the Planned Teaching Programme**. The findings support the research hypothesis that there would be a significant difference between the mean pre-test and post-test knowledge scores among mothers of under-five children. Thus, the Planned Teaching Programme was found to be **effective** in improving maternal knowledge regarding ORS preparation.

Discussion

The present study found that the Planned Teaching Programme was effective in improving mothers' knowledge regarding ORS preparation. The mean knowledge score increased from 12.24 ± 3.42 in the pre-test to 21.36 ± 3.18 in the post-test, with a statistically significant paired t -value of 24.56 ($p < 0.001$). The proportion of mothers with adequate knowledge increased from 8% to 74% after the intervention. A significant association was observed between post-test knowledge and **age, educational status, monthly family income, and previous information regarding ORS** ($p < 0.05$). These findings indicate that structured, demonstration-based health education can effectively improve maternal knowledge regarding correct ORS preparation and may strengthen community-based management and prevention of dehydration among under-five children.

Conclusion

The present study concluded that the **Planned Teaching Programme was highly effective in improving knowledge regarding ORS preparation among mothers of under-five children**. The significant improvement in mean knowledge scores from 12.24 ± 3.42 to 21.36 ± 3.18 ($p < 0.001$) demonstrates the effectiveness of structured health education. The findings highlight the importance of regular, simple, and demonstration-based community health education to enhance mothers' knowledge and promote appropriate home-based management of diarrhoea and prevention of dehydration among under-five children.

Recommendations

Based on the findings of the present study, the following recommendations are made:

1. **Regular health education programmes** on correct ORS preparation should be conducted for mothers of under-five children in rural communities.
2. Community health nurses and **ASHA/ANM workers** should provide practical demonstrations of ORS preparation during routine maternal and child health services.
3. **IEC materials**, including posters, pamphlets, pictorial charts, and short audiovisual programmes, should be used to reinforce knowledge regarding ORS preparation and administration.
4. ORS education should be incorporated into **routine immunization clinics, Anganwadi centres, and community health programmes**.
5. Mothers should be educated regarding **signs of dehydration and danger signs** requiring immediate referral to a healthcare facility.
6. Similar studies should be conducted with a **larger sample size and different rural and urban settings** to improve the generalizability of findings.
7. Further research may use a **quasi-experimental or randomized controlled design** with a control group to establish the effectiveness of educational interventions more rigorously.
8. Follow-up studies should be conducted to assess whether improvement in knowledge leads to **better actual ORS preparation and home-care practices** during episodes of childhood diarrhoea.

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