An Investigation of the Efficacy of a Structured Educational Program on Understanding Waterborne Illnesses Among Rural Residents in Selected Villages of Rohtas.

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Abstract-
The researchers conducted a study to assess the effectiveness of a structured educational program aimed at enhancing knowledge about waterborne illnesses among residents of rural areas in certain villages of Rohtas. ***Aim and objective:*** *To gauge the initial knowledge level regarding the prevention of waterborne diseases among the rural population in selected villages of Rohtas. The research aimed to evaluate the knowledge level after the implementation of a structured teaching program and to determine the effectiveness of this program in preventing waterborne diseases. The methodology involved a pre-experimental design, utilizing a one-group pre-test and post-test design, which was carried out in a selected village in Rohtas. Purposive sampling was utilized to select both the sample and change agents. The intervention involved implementing a structured health teaching program on waterborne diseases using a planned teaching approach. Assessment of participants' knowledge levels regarding waterborne diseases before and after the intervention was conducted using a self-structured questionnaire.* ***Results:*** *The analysis of the study results indicated that the mean score for knowledge of waterborne diseases in the pre-test was 6 with a standard deviation of 1.9638, while in the post-test, the mean score increased to 17.90 with a standard deviation of 2.86. The obtained paired t-value of 19.9130 was found to be statistically significant at a p-value of less than 0.0001.*

Keywords: *Level Of Knowledge, Planned Teaching Program, Water-borne diseases.*

INTRODUCTION

Every aspect of existence depends on water. Water use has risen significantly in the last few decades, and in numerous places, the water supply is reaching critical levels. Every human person on the planet has the basic need for an adequate amount of clean, fresh water to drink, but millions of people throughout the world are said to be without it. The development of industry, growing urbanisation, and the growing usage of synthetic organic compounds have detrimental effects on freshwater ecosystems. The existence of heavy metals, persistent organic pollutants (POPs), and detrimental nutrients in numerous groundwater and surface water sites has emerged as a health issue of considerable concern. Internationally, diseases transmitted through water represent a substantial risk to human health. Diarrheal illnesses claim the lives of 1.8 million people annually, 1.5 million of whom are children under the age of five. In addition to preventing diarrheal illnesses by almost 90%, having access to clean drinking water, basic sanitation, and hygiene education can also enhance health, lower poverty, and advance socioeconomic development. The United Nations adopted the seventh Millennium Development Goal (MDG) in 2000, which is to cut in half the percentage of the population that does not have sustainable access to basic sanitation and safe drinking water by the year 2015. Although they are easy to explain, waterborne infections are difficult to comprehend. Perhaps one of the most significant developmental

setbacks is the widespread absence of clean water access and adequate sanitation facilities for all individuals [1-4].

OBJECTIVES

1. To evaluate the baseline knowledge regarding the prevention of water-borne diseases among the rural population in specific villages of Rohtas.
2. To evaluate the post-test level of knowledge after planned teaching program.
3. To evaluate the efficacy of the structured educational program in preventing waterborne diseases.

OPERATIONAL DEFINITION:

- **Effectiveness:** Refers to the variations found between the pre- and post-test knowledge scores on water-borne illnesses and their prevention among rural populations.
- **Planned Teaching Programs:** Refers to the methodically planned educational activities intended to educate rural populations, applying an audio-visual device (AV aid), about specific water-borne illnesses and how to prevent them.
- **Waterborne Diseases:** Refers to a serious illness or sickness that people can get from drinking or coming into contact with contaminated water when swimming. They had cholera, hepatitis A, and typhoid.
- **Typhoid :** Anyone who has had a fever for longer than a week along with any two of the following conditions: A toxic physical appearance, a coated tongue, and mild bradycardia splenomegaly exposure to the confirmed instance, perforation, etc.
- **Viral Hepatitis :** Acute sickness usually manifests as right upper quadrant discomfort, anorexia, acute jaundice, dark urine, and malaise. The biological indicators include >2.5 times the upper limit of serum alanine aminotransferase and elevated urine urobilinogen.
- **Cholera:** Whenever it is at its worst, there is an abrupt onset of acute watery diarrhoea, which can be fatal due to severe dehydration.
- **Prevention:** Refers to actions taken, when diseases are already present in the population, to stop the entrance of new diseases, strengthen population resistance, and lower the likelihood of infection spreading.

ASSUMPTION

The study assumes that

- Population of rural area will participate in the study willingly.
- Planned teaching about Water-born diseases will be effective in gaining knowledge about prevention of water-born diseases among the participants.
- Community health nurses have a crucial responsibility in preventing waterborne diseases.

HYPOTHESIS:

- ✓ **RH_1** : There is expected to be a notable disparity between the pre-test and post-test knowledge scores of the rural population concerning waterborne diseases and preventive measures.
- ✓ **RH_2** : A substantial variation is anticipated in the knowledge levels of the rural population across the selected variables.

METHODOLOGY:

RESEARCH APPROACH

The study employed a quantitative research approach.

RESEARCH DESIGN

The research design chosen for this study is a pre-experimental single-group pre-test and post-test design (Table 1).

Table 1 DIAGRAMMATICAL REPRESENTATION OF RESEARCH DESIGN

Group	Pre-test	Treatment	Post-test
People of the village	01	X	02

01 - Assessment of pre-test knowledge on water-borne diseases.

X – Demonstration of planned teaching programme.

02 – Assessment of post- test level of knowledge after planned teaching programme.

SETTING OF THE STUDY

The research took place in Jamuhar, Rohtas Bihar.

STUDY POPULATION

Target Population

The study encompassed the entire population of Jamuhar village as its target population.

Accessible Population

The available population for the study comprised all individuals residing in Jamuhar village, Rohtas Bihar.

STUDY SAMPLE

The individuals residing in Jamuhar village, Rohtas Bihar, who met the inclusion criteria and were present at the designated locations during data collection, constituted the study's sample.

SAMPLE SIZE

The sample size consists of 30 villagers who were given teaching programme through planned Teaching programme.

SAMPLING TECHNIQUE

The sampling technique was non probability purposive sampling technique.

SAMPLE SELECTION CRITERIA

Inclusion Criteria

Study includes:-

1. Both males and females.

Exclusion Criteria

Study excludes:-

1. who are people absent on the day of data collection period.

2. Sick people.

3. Mentally and physically challenged people.

RESEARCH VARIABLES OF THE STUDY

Independent Variables

The independent variable in this study is the structured teaching program focusing on waterborne diseases.

Dependent Variables

In this study, the dependent variable is the extent of understanding regarding waterborne diseases.

DEVELOPMENT AND DESCRIPTION OF THE TOOL

Data collection tools refer to the methods or instruments employed by the researcher to examine the primary variables in the research issue [5,6].

Development of the tool

A well-designed structured questionnaire was formulated following a thorough review of literature and consultation with medical, nursing, and statistical experts to ensure content validity. The construction, pre-testing, and reliability assessment of the questionnaire were conducted using the test-retest method.

Description of tool

The tool for data collection consists of 2 sections:
Section A: Demographic Data.
Section B: Consists of 20 Items related to knowledge related to water born diseases .

Scoring And Interpretation: The knowledge score and interpretation is mentioned in Table 2.

KNOWLEDGE	**SCORE**
GOOD	11-20
AVERAGE	06-10
POOR	01-05

Table 2: Scoring And Interpretation

CONTENT VALIDITY OF THE TOOL

Tool was submitted to 5 experts compromising of Faculty of Selected Nursing colleges they are expert from various speciality in nursing subjects such as Community Health Nursing, Medical Surgical Nursing, Child Health Nursing and Mental Health Nursing.

RELIABILITY OF THE TOOL

The tool's reliability was evaluated through the test-retest approach, involving the selection of three individuals from the same village setting. The tool was administered on two occasions, with a 14-day interval between each administration. The reliability score= 0.95 by using Karl Pearson's correlation Coefficient formula. The tool was found to be reliable.

ETHICAL CONSIDERATION

The researcher adhered to ethical principles throughout the research study.

Human rights

- ✓ The study was proposed among the experts of the Institutional Ethics Committee and got the permission to carry out the study.
- ✓ The study details was also explained to the Sarpanch of Jamuhar Village, Rohtas, Bihar, to carry out the study got the permission.
- ✓ Content validity was ensured by soliciting input from professionals in community health nursing, medical-surgical nursing, pediatric nursing, and psychiatric nursing.

Beneficence

- ✓ The participants were informed about the potential advantages and risks involved.

Dignity

- ✓ The participants received comprehensive explanations regarding the study procedures, and their involvement was guaranteed. Informed consent was acquired from all participants, who were granted the autonomy to decide on their participation and withdraw at any point during the study.

Confidentiality

Confidentiality and anonymity pledge was ensured. The study participants were also ensured for maintaining the confidentiality of their details.

Justice

The study participants were treated with justice.

PILOT STUDY

The structured questionnaire was administered to three villagers who met the criteria for sample selection, aiming to assess the clarity and comprehensibility of the questionnaire. The pilot study lasted for a duration of 14 days and served to evaluate the practicality and feasibility of the proposed methodology. Results revealed that participants typically spent an average of 10 minutes completing the questionnaire, aiding in assessing the tool's suitability in terms of language, clarity, sequence, and relevance of items. Notably, participants involved in the pilot study were not included in the main study.

DATA ANALYSIS AND INTERPRETATION

ORGANIZATION OF DATA

The gathered data were organized and displayed in tables and sections corresponding to the study objectives.

Section I: Description of frequency and percentage distribution of demographic variables among people.

Section II: Description of pre-test level of knowledge on Water-borne diseases.

Section III: Description of post-test level of knowledge on Water-borne diseases.

Section IV: Comparison of pre-test and post-test level of knowledge on Water-borne diseases.

Section I: Description of frequency and percentage distribution of demographic variables among people.

Table 3 shows the Description of frequency and percentage distribution of demographic variables among people like age, Sex, Education and Occupation.

S.NO.	DEMOGRAPHIC VARIABLES	FREQUENCY	%
1	**Age**		
	a) 20-25 yrs	11	36.66
	b) 26-30 yrs	10	33.33
	c) 31-35 yrs	7	23.33
	d) Above 35 yrs	1	3.33
2	**Sex**		
	a) Male	16	53.33
	b) Female	13	43.33
	c) Transgender	3	10
3	**Education**		
	a) Less than high school	8	26.6
	b) Intermediate / Diploma	14	46.66
	c) Graduation	7	23.33
	d) Post-Graduation	1	3.33
4	**Occupation**		
	a) Farmer	9	30
	b) Government job	9	30
	c) Business	7	23.33
	d) Private job	6	20

TABLE 3: SHOWING FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES

Section II: Description of pre-test level of knowledge on Water-borne diseases.

Table 4 and Fig 1 shows Description of pre-test level of knowledge on Water-borne diseases.

TABLE. 4: PRE-TEST OF LEVEL OF KNOWLEDGE ON WATER-BORNE DISEASES.

VARIABLES	KNOWLEDGE LEVEL					
	POOR		AVERAGE		GOOD	
	N	%	N	%	N	%
OVERALL	11	36.66	19	63.33	0	0

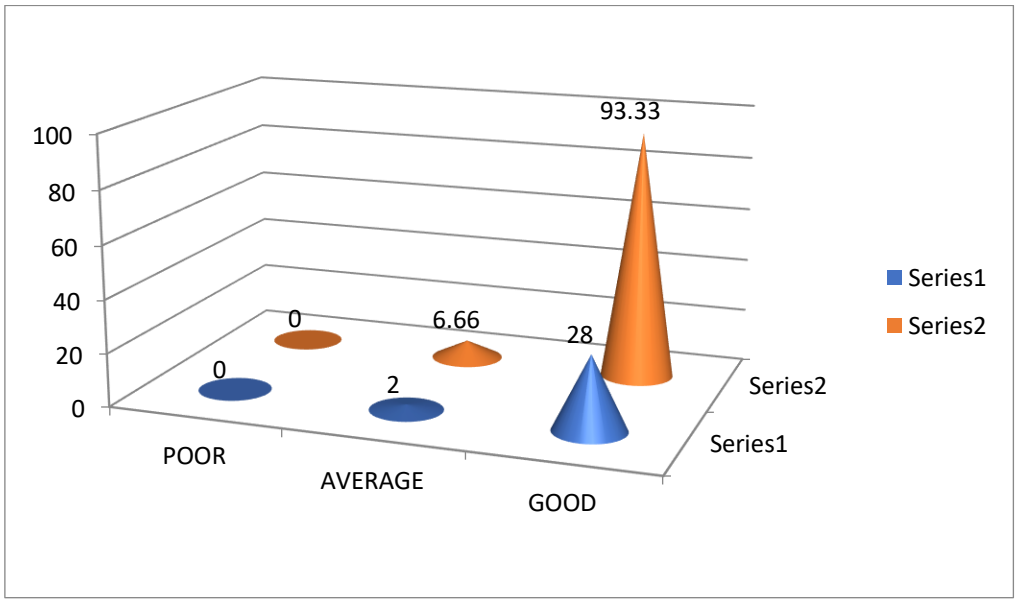


Fig.1 DESCRIPTION OF FREQUENCY AND PERCENTAGE OF PRE-TEST OF LEVEL OF KNOWLEDGE ON WATER-BORNE DISEASES.

Section III: Description of post-test level of knowledge on Water-borne diseases.

Table 5 and Fig 2 shows Description of post-test level of knowledge on Water-borne diseases.

TABLE. 5: POST TEST LEVEL OF KNOWLEDGE ON WATER-BORNE DISEASES.

VARIABLES	KNOWLEDGE LEVEL					
	POOR		AVERAGE		GOOD	
	N	%	N	%	N	%
OVERALL	0	0	2	6.66	28	93.33

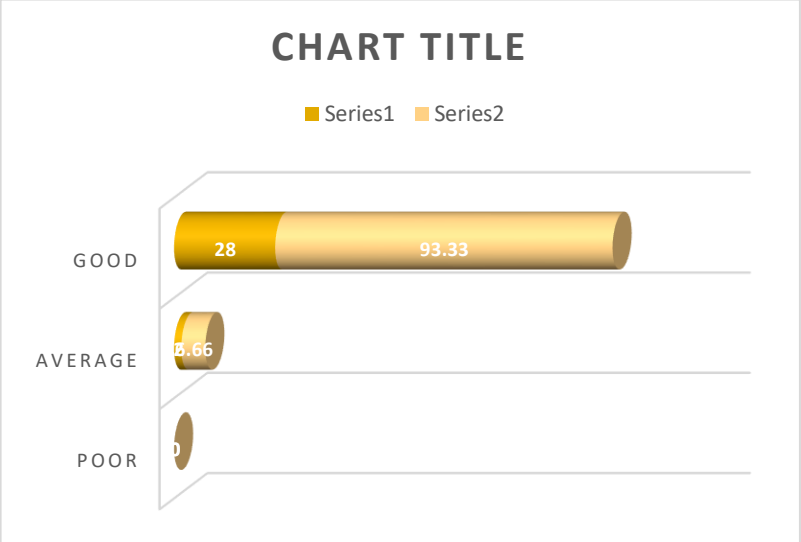


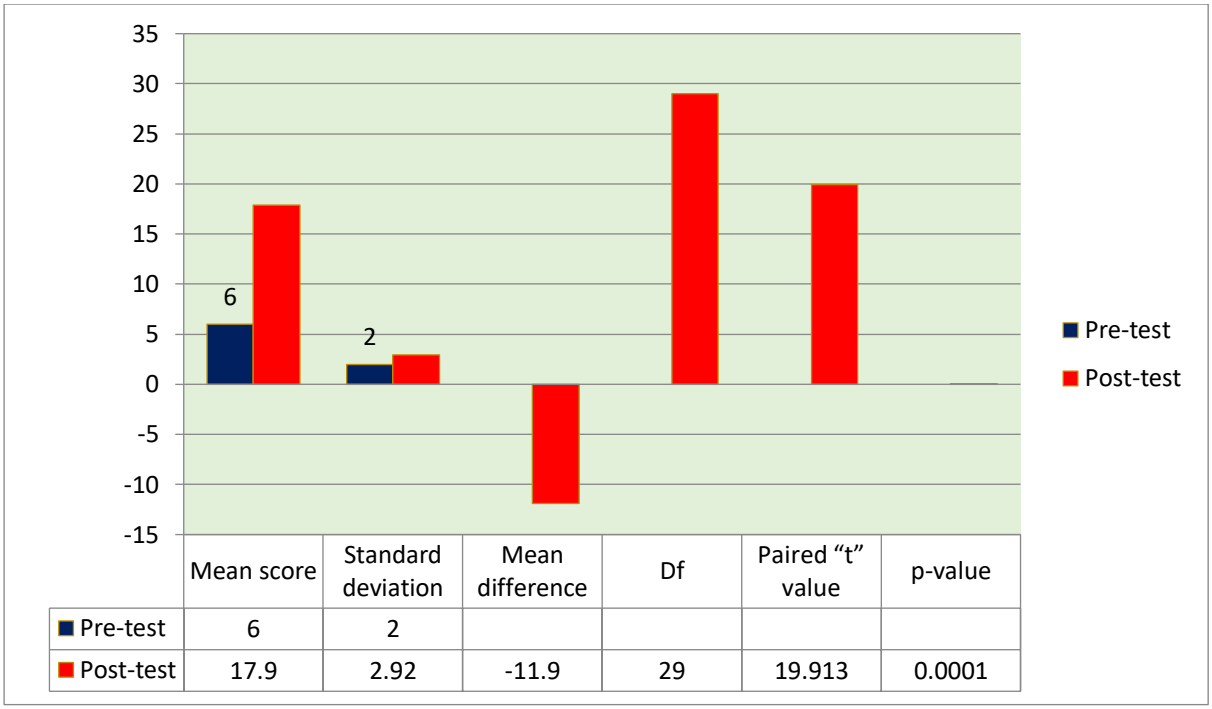
Fig 2: POST TEST LEVEL OF KNOWLEDGE ON WATER-BORNE DISEASES

Section IV: Comparison of pre-test and post-test level of knowledge on Water-borne diseases.

Table 6 and Fig 3 shows the VALUE OF MEAN SCORE, SD, MEAN DIFFERENCE, MEAN PERCENTAGE, DEGREE OF FREEDOM, PAIRED T TEST AND P VALUE.

TABLE 6: VALUE OF MEAN SCORE, SD, MEAN DIFFERENCE, MEAN PERCENTAGE, DEGREE OF FREEDOM, PAIRED T TEST AND P VALUE.

Knowledge	Mean score	Standard deviation	Mean difference	Df	Paired "t" value	*p*-value
Pre-test	6	2.00	-11.9	29	19.9130	0.0001
Post-test	17.90	2.92				



	Mean score	Standard deviation	Mean difference	Df	Paired "t" value	p-value
Pre-test	6	2				
Post-test	17.9	2.92	-11.9	29	19.913	0.0001

FIG 3: SHOWING THE VALUE OF MEAN SCORE, SD, MEAN DIFFERENCE, MEAN PERCENTAGE, DEGREE OF FREEDOM, PAIRED T TEST AND P VALUE.

DISCUSSION

According to the World Health Organisation, water-related diseases account for over 3.4 million deaths annually, making them the primary cause of sickness and death worldwide. Little children make up the majority of the victims, and the great majority of them pass away from diseases brought on by microorganisms that live in raw sewage-contaminated water sources. This pre-experimental study was conducted in order to reduce the incidence level and raise awareness of water-borne diseases among the villagers' population. The goal of the current study was to evaluate how well the village's planned education programme has informed residents about water-borne illnesses and how to prevent them. The study sample of thirty village residents was randomly selected. The researcher discovered The participants in the study were found to be cooperative by the investigator. Imogene King's Conceptual System, Theory of Goal Attainment, and Transactional Process served as the foundation for this study's conceptual framework. The collected data underwent analysis, utilizing both descriptive and inferential statistics to assess the hypothesis. This article presents a discussion of the study findings with the goal of drawing conclusions based on the goals, relevant literature, and hypothesis [7,8].

The first objective was to assess the pre-test knowledge on selected water borne diseases and its prevention among people of village.

During the evaluation of the pre-test knowledge level on waterborne diseases among the village residents, it was found that 36.66% exhibited insufficient knowledge, 63.33% displayed moderately adequate knowledge, and none demonstrated adequate knowledge. The findings of this study indicated that 36.66% of the participants belonged to the age bracket of 20-25 years, 33.33% fell within the age range of 26-30 years, 23.33% were aged between

31-35 years, and 3.33% were older than 35 years. The study reveals many of the people are had less knowledge in pre test and gain around 93.33% of knowledge in post-test [9].

The second objective was to assess the post-test knowledge on selected water borne diseases and its prevention among people of village.

Upon evaluating the post-test knowledge levels, none of the participants exhibited inadequate knowledge (6.66%); instead, 6.66% displayed moderate knowledge, while the majority (93.33%) demonstrated adequate knowledge. Researcher conducted a research on 136 food handlers and evaluated changes in knowledge, attitudes, and self-reported hand washing behaviours after using flip charts and posters to provide them with three months of health education, provided support for this work. There has been a notable rise in awareness regarding hand hygiene practices, such as cleaning hands before handling food (23.5%) and maintaining neat and clipped nails (8.1%). The relevance of health education about personal hygiene in preventing water-borne illnesses is highlighted by the findings.

The third objective was to evaluate the effectiveness of Planned teaching programme regarding knowledge of Water borne disease and its prevention among people of village.

The data indicates a notable enhancement in knowledge levels following the implementation of the structured teaching program. The mean knowledge score increased from 6% in the pre-test to 17.90% in the post-test, reflecting an average knowledge gain of 63.33% compared to the pre-test. This finding is consistent with the study conducted in 2010, providing further validation for the present study. Health education. who carried out a study on kindergarten hand washing programmes, demonstrates the efficacy of structured hand washing programmes that have taken into consideration children's developmental stages. Research demonstrates that intervention groups showed a notable improvement in their hand-washing habits [10].

IMPLICATIONS OF THE STUDY

The study's findings hold importance for the nursing profession, with significant implications for various aspects including community nursing practice, nursing research, nursing education, and nursing administration.

NURSING PRACTICE

The results of the study showed a substantial correlation between the village residents' demographic characteristics and their level of knowledge about preventing water-borne illnesses. In addition to serving as a resource for the public, community health nurses can teach individuals about water-borne illnesses and their preventative measures at the most basic level. In rural locations, the community health nurse must inform the villagers about water-borne illnesses and how to prevent them. The villagers should receive health education on the value of maintaining clean water along with a chart paper. People should receive instruction and information on appropriate hygiene practices, including how to wash their hands properly at home. It is possible to clarify the planned teaching program's emphasis on water hygiene and water-borne disease prevention. In-service education on personal cleanliness, the prevention of water-related diseases, food hygiene, and appropriate environmental hygiene should be provided to all health care personnel, including nurses, midwives, auxiliary nurses, and nurses working in community centres.

NURSING EDUCATION

The survey unequivocally found that people's awareness of water-borne disease prevention is insufficient. In order to impart knowledge, nursing staff members must possess sufficient training and undertake public health education campaigns on the avoidance of water-borne illnesses, with a focus on high-risk members of the community. The curriculum for community health nursing has to be reinforced and expanded to cover more topics related to diseases that are frequently contracted by villagers due to unsanitary conditions and tainted water. The curriculum for female health workers needs to be improved and should cover additional information about environmental cleanliness, food hygiene, personal hygiene, and the prevention of diseases linked to water. The study also highlights the unique requirements for creating health education materials.

NURSING ADMINISTRATION

Nursing health administrators at all levels—national, state, district, institutional, and local—should concentrate on raising public awareness of the need to enhance village residents' access to high-quality water hygiene, environmental sanitation, personnel hygiene, and preventive health services. It is recommended that the nurse administrator set up training sessions and suitable educational materials concerning hand washing technique and drinking water cleanliness for the village residents. Administrators can plan educational events to raise awareness of the value of maintaining good water hygiene and preventing water-borne illnesses in local communities and schools. The community's nurse administrator should organise for regular health education sessions on the prevention of water-borne illnesses and inspire the residents of the hamlet. For the purpose of preventing water-borne illnesses and promoting personal hygiene, the nurse administrator ought to suggest to the supervisor that appropriate posters and images be provided for the health post's walls.

IMPLICATIONS IN NURSING RESEARCH

The study's results aid professional nurses and village residents in initiating further investigation by establishing a foundation. Additionally, the study offers a starting point for conducting comparable research in diverse environments.

RECOMMENDATIONS FOR FURTHER STUDY

Based on the outcomes of this study, it is recommended that future research efforts replicate the study with a larger sample size to validate the results and broaden their applicability. Additionally, conducting a descriptive study to evaluate the knowledge, attitudes, and practices of village residents concerning water hygiene, personal hygiene, sterilization of children's bottles, and environmental hygiene could be beneficial. A comparative investigation could be undertaken to explore the resemblances or distinctions in the knowledge and practices of rural villagers. Mass health education programme can be arranged to educate the public on safe drinking water, water borne diseases and its prevention.

CONCLUSION

The village's residents are less knowledgeable of water-borne illnesses, their causes, and preventative treatments. They are also unaware of the best ways to maintain their water hygiene and environmental sanitation and

appropriate toileting habits. According to this survey, the villagers have significantly increased their awareness of the planned water-borne disease education programme.

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