

A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Prevention of Waterborne Diseases among School Children in Selected Schools at Kamrup District, Assam

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Abstract: ***Background and Objectives:** Water is one of the vital natural resources for human life. Water occupies 70 percent earth's surface of which a small amount of fresh water is available for human use. School children are at higher risk to get various waterborne diseases which are transmitted by contaminated water. **Method:** A quantitative research approach with pre-experimental one-group pre-test-post-test design was adopted. 100 school children were selected by using non probability consecutive sampling teaching. The study was conducted at two schools of Kamrup (R) District, Assam. Demographic proforma, a self administered structured questionnaire on knowledge regarding prevention of waterborne diseases was utilized for data collection. **Result:** The result of the study revealed that pre-test mean knowledge score was 10.89 ± 4.832 and post-test mean knowledge score was 21.89 ± 3.021 with mean difference was 11.00. The comparison was tested using paired t-test with obtained ($t=25.03$) at $df=99$ was statistically significant at $p<0.05$. The gender of school children, education of father and any information regarding water borne disease was found statistically significant association with the pre-test knowledge scores. **Conclusion:** The findings of the study concluded that knowledge of the school children regarding prevention of waterborne diseases was increased after implementation of structured teaching programme.*

Keywords: Effectiveness, Structured Teaching Programme, Knowledge, Prevention of Waterborne diseases, School children

1. Introduction

“Water is life’s matter and matrix, mother and medium. There is no life without water”

– Albert Szent-Gyorgyi

Waterborne diseases are serious problem health as they can spread rapidly affecting large sections of the population mostly school children, lead to a very high disease burden and have a major impact on the economy in developing countries such as India where water pollution and open defecation, poor sanitation and hygiene practices lead to high incidence of waterborne diseases.

In India, around three lakh children die of water-borne diseases every year, with diarrhoea alone causing more than 50 per cent of the deaths. Despite the primary sources of water in the country – groundwater and surface water being highly contaminated, only 32 per cent of the Indian households get water from a treated source. The groundwater in most of the Districts of 24 Indian states has high concentrations of metals and heavy metals. Water sources across the country are also contaminated with high levels of pathogenic organisms. Consuming this raw water poses serious health risks in the form of diseases like typhoid, cholera, acute dysenteric diarrhea etc .It leaves around 37.7 million people suffering every year, and causes a loss of almost 73 million working days annually, which, in

turn, brings about a decline in national productivity, resulting in considerable economic burden.^[1]

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2. Background of the study

In developing countries, waterborne diseases are the leading illness factor among children and among water borne diseases diarrhea holds first rank for causing death among children. Waterborne diseases are mainly acquired by drinking contaminated water. Water borne diseases spread through many ways like contaminated water, poor environmental hygiene, poor personal hygiene, poor food hygiene etc.

Diarrhea is one of the leading causes of deaths in children under five age group globally. The National Family Health Survey – 5 shows that the prevalence of childhood diarrhea

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has increased from 9%–9.2% from 2016-2020 in India. Bihar reported highest prevalence rate (13.7%) followed by Meghalaya (10.4%) and Assam reported 5.5%^[3].

Need of the study

The World Health Organization says that every year more than 3.4 million people die as a result of water related diseases, making it the leading cause of disease and death around the world. Most of the victims are young children, the vast majority of whom die of illnesses caused by organisms that thrive in water sources contaminated by raw sewage^[4].

According to Indian water portal report annually about 37.7 million Indians are affected by waterborne diseases, 1.5 million children die of diarrhea. Waterborne diseases such as cholera, acute diarrheal diseases, typhoid and viral hepatitis continue to be prevalent in India and have caused 10,738 deaths, over the last five years since 201^[5].

During community posting, the investigator found that one of the main reason of absenteeism in the schools are some illness like diarrhea, vomiting, fever which are caused by ingestion of contaminated food and water. So the investigator felt to create an awareness regarding preventive measures for water borne diseases among the school children.

Based on the review of literature, the investigator felt that, there is a need for structured teaching program which will improve the knowledge on prevention of waterborne diseases to promote, protect and maintain health of school children.

3. Literature Review

“Our review says these appears to be bigger than in the past”

-Bob Dietz

“Literature review is defined as a broad, comprehensive, in depth, systematic critique and synthesis of scholarly publications, unpublished, print and online materials, audio-visual materials and personal communications”^[6]

Sharma D (2019) conducted a survey on “Water-borne Diseases in rural areas of Banasthali, Rajasthan (India)” reported that 42-45% people suffer from gastrointestinal issues and undergone treatment in primary health care centers for recovery. In all, 10-14% mortality has been accountable to water borne infections. Individuals of all ages get infected by contaminated water but infants, females and geriatrics were found most susceptible. 85-90% villagers use cotton cloth for filtration of contaminated water for drinking purposes. Villagers frequently suffered from variety of waterborne infectious due to poor sanitation and drainage facilities, unhygienic condition and absence of waste water disposal system etc.^[7]

Arya A, Bishat V et.al (2019) conducted a quantitative descriptive study on “Knowledge regarding water borne disease and its prevention” revealed majority of the 67% students had average knowledge regarding water borne

diseases. There was significantly no association found between level of knowledge regarding water borne diseases and selected demographic variables (age, education status of the parents and previous knowledge regarding water borne diseases). The study was concluded that the school going children had average knowledge regarding water borne diseases. It is recommended to conduct awareness programme among school going children regarding water borne diseases and its prevention^[8].

Yadav N, Mirza Y et.al (2021) conducted a study on “A study to assess the knowledge regarding prevention of water borne diseases (Cholera, Diarrhea, Typhoid fever) among school going children in selected community area at Meerut”. The aim of the study was to assess the knowledge regarding prevention of water borne diseases (Cholera, Diarrhea, Typhoid fever) among school going children in selected community area at Meerut. The result showed that there was a prevalence of water borne diseases increasing per year, and school going children, age group between 6-12 and also find that there was less old cases comes in both years (2018 & 2019) comparison to new cases in community area at Meerut^[9].

Deepika (2021) conducted a study on “A study to evaluate the effectiveness of planned teaching programme on knowledge regarding prevention of waterborne diseases among mother of children age group 11 to 13 years in Adampur, Kotra, Bhopal, [M.P]”. A experimental research design was used on among 30 mothers of children age group 11 to 13 years by purposive sampling technique at selected Adampur, The study reported that about Pre test score of 9.6 & post test score of 18.6, level difference of 9. In this mean value of Pre-test score is 9.6 & SD is 10.55 & the mean value in the post test score is 18.6, the overall t Test is 5.016, P value is <0.001 that is statistically significant. The study indicated that the effectiveness of Planned Teaching Programme, in increasing the knowledge of Mothers regarding prevention of Waterborne disease in children^[10].

4. Problem Statement

“A study to assess the effectiveness of structured teaching programme on knowledge regarding prevention of waterborne diseases among school children of selected schools at Kamrup District, Assam”.

Objectives

General objective: To determine the effectiveness of structured teaching programme on knowledge regarding prevention of selected waterborne diseases among school children.

Specific objectives

- 1) To assess the level of knowledge regarding prevention of waterborne diseases among school children of selected schools at Kamrup District, Assam.
- 2) To evaluate the effectiveness of structured teaching programme on knowledge regarding prevention of waterborne diseases.
- 3) To find out the association between pre-test knowledge scores regarding prevention of waterborne diseases

among school children with selected socio demographic variables.

Operational Definitions

- 1) **Effectiveness** – In this study effectiveness refers to gained knowledge regarding prevention of waterborne diseases among school children through structured teaching programme by post test scores.
- 2) **Structured Teaching Programme** – In this study structured teaching programme refers to systematically structured teaching strategies (lecture cum demonstration) for a group of school children to provide information about the prevention of waterborne diseases involving causes, manifestation, treatment and prevention.
- 3) **Knowledge** – In this study knowledge refers to familiarity, awareness or understanding of someone or something such as facts, information, description or skills which is acquired through experience or education by perceiving, discovering or learning about diarrhea and typhoid.
- 4) **Prevention of waterborne diseases:-** In this study, prevention of waterborne diseases refers to the action taken to remove the possibility of waterborne diseases occurring in school children by creating awareness to the school children regarding prevention of water borne diseases by maintaining water hygiene and hand washing. A waterborne disease refers to diseases spread through contaminated water and in this study diarrhea and typhoid are chosen inculcate knowledge among school children.
- 5) **School children** – In this study, school children refers to children who are studying in 6th and 7th standard of selected school at Kamrup District, Assam.

Assumption of the study

- School children will have inadequate knowledge regarding prevention of waterborne diseases.
- The Structured Teaching Programme will improve the knowledge regarding prevention of waterborne diseases of school children.

Hypothesis

All the hypothesis will be tested at 0.05 level of significance
H₁- There is a significant difference between pre test knowledge score and post test knowledge score regarding prevention of waterborne diseases among school children.
H₂- There is a significant association between pre test knowledge score regarding prevention of waterborne diseases among school children with selected socio-demographic variables.

Delimitation

The study is delimited to -

- Children studying in 6th and 7th standard of selected school.
- Children who understand Assamese.

5. Research Methodology

“Research is an organized method for keeping you reasonably dissatisfied with what you have”

- Charles Kettering

A quantitative research approach with pre-experimental one-group pre-test-post-test design was adopted. 100 school children were selected by using non probability consecutive sampling teaching. The present study consists of dependent variable, independent variable and socio- demographic variables.

1: Independent variable – Structured teaching programme regarding prevention of waterborne diseases.

2: Dependent variable – Knowledge of the school children.

3: Demographic variables- Age, sex, educational status of father, educational status of mother, occupational status of father, occupational status of mother, types of family, food pattern of family, type of water facility available, previous information about waterborne diseases in terms of yes or no and if yes, source of previous information.

6. Analysis and Interpretation

The analysis and interpretation of the data were done descriptive and inferential statistic based on objectives and hypothesis formulated using “t” test and “chi square” test. The analysis of collected data was organized under the following sections:

Section I: Findings related to description of participant’s demographic characteristics

Section II: Findings related to description of frequency and percentage distribution of pretest and posttest level of knowledge regarding prevention of waterborne diseases among school children.

Section III: Findings related to effectiveness of structured teaching programme on knowledge regarding prevention of waterborne diseases.

Section IV: Findings related to association between pre-test levels of knowledge regarding prevention of waterborne diseases among primary school children with their selected socio-demographic variables.

Section I: Findings related to description of participant’s demographic characteristics

Table 1: Showing Frequency and Percentage Distribution of Demographic Variable (N=100)

Sl No	Demographic Variables	Frequency Distribution	Percentage Distribution
1	Age		
	a. 11-12 years	66	66
	b. 13-14 years	34	34
2	Sex		
	a. Male	53	53
	b. Female	47	47
3	Educational status of father		
	a. No formal education	28	28
	b. Primary education	3	3
	c. Secondary education	7	7

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	d. Higher secondary education	51	51
	e. Graduation and above	11	11
4	Educational status of mother		
	a. No formal education	26	26
	b. Primary education	16	16
	c. Secondary education	18	18
	d. Higher secondary education	34	34
	e. Graduation and above	6	6
5	Occupational status of father		
	a. Daily wages	28	28
	b. Private employee	32	32
	c. Government employee	5	5
	d. Business man	35	35
6	Occupational status of mother		
	a. Housewife	96	96
	b. Daily wages	2	2
	c. Private employee	1	1
	d. Government employee	1	1
7	Type of family		
	a. Nuclear	91	91
	b. Joint	9	9
8	Food pattern of family		
	a. Vegetarian	20	20
	b. Non vegetarian	80	80
9	Type of water facilities available		
	a. Well water	61	61
	b. Bore well water	1	1
	c. Public water supply	31	31
	d. Other sources	7	7
10	Have you get any information regarding waterborne disease		
	a. Yes	37	37
	b. No	63	63
11	If yes, from where you got the information		
	a. Media	10	27
	b. Family	6	16.2
	c. Peer group	0	0
	d. Teacher	21	56.8

Section II: Findings related to description of frequency and percentage distribution of pretest and posttest level of knowledge regarding prevention of waterborne diseases among school children.

Table 2: Frequency and percentage distribution of pretest and posttest level of knowledge regarding prevention of waterborne diseases among school children (N=100)

Level of knowledge	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
Inadequate knowledge	63	63	0	0
Moderate knowledge	30	30	31	31
Adequate knowledge	7	7	69	69

Table 3: Descriptive statistics showing score range, Mean, Median, and SD of pre-test and post-test level of knowledge regarding prevention of waterborne diseases among school children (N=100)

Characteristics	Pre-test	Post-test
Score Range	1-24	15-29
Mean	10.89	21.89
Median	10	22
Mode	10	21
Std. Deviation	4.832	3.021

Section III: Findings related to effectiveness of structured teaching programme on knowledge regarding prevention of waterborne diseases.

Table 4: Effectiveness of structured teaching programme on knowledge regarding prevention of waterborne diseases among school children (N=100)

Comparison of level of knowledge	Mean	SD	Mean Difference	t test value	Df	p value
Pre-test	10.89	4.832	11.00	25.03	99	0.001**
Post-test	21.89	3.021				

*P<0.05 level of significance

NS-Non significant

Section IV: Findings related to association between pre-test level of knowledge regarding prevention of waterborne diseases among primary school children with their selected socio-demographic variables.

Table 5: Association between pre-test level of knowledge regarding prevention of waterborne diseases among school children with their selected demographic variables (N=100)

Sl. No.	Demographic variables	Pre-test level of knowledge			χ^2 value	df	p value
		Inadequate	Moderate	Adequate			
1	Age in years • 11-12 years • 13-14 years	45 18	17 134	4 3	2.237	2	0.327 ^{NS}
2	Gender • Male • Female	38 25	14 16	1 6	6.049	2	0.049*
3	Educational status of father • No formal education • Primary education • Secondary education • Higher secondary • Graduation and above	10 3 5 40 5	14 0 1 9 6	4 0 1 2 0	20.84	8	0.008*
4	Educational status of mother • No formal education • Primary education • Secondary education • Higher secondary • Graduation and above	15 11 13 22 2	8 4 3 12 3	3 1 2 0 1	8.013	8	0.432 ^{NS}
5	Occupational status of father • Daily wages • Private employee • Government employee • Business man	18 18 1 26	9 11 4 6	1 3 0 3	9.958	6	0.126 ^{NS}
6	Occupational status of mother • Housewife • Daily wages • Private employee • Government employee	60 1 1 1	29 1 0 0	7 0 0 0	1.652	6	0.949 ^{NS}
7	Type of family • Nuclear • Joint	56 7	28 8	7 0	1.235	2	0.539 ^{NS}
8	Food pattern of family • Vegetarian • Non vegetarian	15 48	5 25	0 7	2.530	2	0.282 ^{NS}
9	Type of water facilities available • Well water • Bore well water • Public water supply • Other sources	34 0 24 5	20 1 7 2	7 0 0 0	9.083	6	0.169 ^{NS}
10	Have you get any information regarding water borne disease • Yes • No	29 34	8 22	0 7	7.690	2	0.021*

*P<0.05 level of significance

NS-Non significant

7. Discussion

Objective 1: To assess the level of knowledge regarding prevention of waterborne diseases among school children

The assessment of knowledge regarding prevention of selected water borne diseases among 100 school children, (63%) of participants had inadequate knowledge followed by (30%) of participants had moderate knowledge and (7%) had adequate knowledge in pre-test where as in post-test majority (69%) of participants had adequate knowledge and (31%) of participants had moderate knowledge regarding waterborne diseases. In this study the overall mean pre-test score was 10.89 with standard deviation 4.832 and mean post-test score was 21.89 with standard deviation 3.021.

The above findings were supported by a on study “Effectiveness of structured teaching program on knowledge of selected water borne diseases among school children” conducted by **V. Yasodha (2014)**, where pre- test knowledge on water borne diseases among school children, 81 (81%) had Inadequate knowledge, 18 (18%) were moderately adequate and 1 (1%) had adequate knowledge and post- test knowledge on water borne diseases among school children, 100 (100%) had adequate knowledge; no one had inadequate and moderately adequate knowledge^[11].

Objective 2: To assess the effectiveness of structured teaching programme on knowledge regarding prevention of waterborne diseases.

Average post-test mean knowledge score 21.89±3.021 was higher than the pre-test mean knowledge score 10.89±4.832. The median post-test knowledge score (22) also showed

higher than the median pre-test score (10). The post score (SD=3.021) seemed to be less dispersed than the pre test score (SD=4.832). So it is evident that post test knowledge were higher than the pre test knowledge.

Findings showed that pre-test mean knowledge score was 10.89 ± 4.832 and post-test mean knowledge score was 21.89 ± 3.021 with mean difference was 11.00. The comparison was tested using paired t test with obtained ($t=25.03$) at $df=99$ was statistically significant at $p < 0.05$ level. The conclusion indicated that structured teaching programme was effective in improving the knowledge regarding prevention of waterborne diseases among school children.

Hence, findings concluded that there was significant difference between pre-test knowledge score and post test knowledge score regarding prevention of waterborne diseases among school children at 0.05 level of significance. H_1 hypothesis was accepted.

Vanish V and P Vimala (2016) were conducted a study on "Effectiveness of plan teaching programme on prevention of waterborne diseases among school children". The result revealed that the overall mean post-test knowledge sample 27.9 was greater than mean pre test knowledge 18.72. SD of pre test and post test was 2.79 and 1.79 respectively and mean difference was 9.18 which indicate effectiveness of plan teaching programme^[12].

Objective 3: To find out the association between pre- test knowledge score regarding prevention of waterborne diseases among school children with selected socio-demographic variables

Chi – square (χ^2) values calculated to find out the association between knowledge of school children with their selected demographic variables. The chi squares value revealed that gender of school children, education of father and any information regarding water borne disease was found statistically significant association at $p < 0.05$ level. The other demographic variables such as age, educational status of mother, occupational status of father and mother, type of family, food pattern of family and type of water facilities available were statistically non significant with pre-test level of knowledge regarding prevention of waterborne diseases among school children.

Hence result concluded that the hypotheses H2 (There will be a significant association between the pre-test knowledge scores with their selected demographic variables among school children) is accepted.

The above findings were supported by a study on "Effectiveness of Planned Teaching Programme Regarding Prevention of Food and Water Borne Diseases Amongst Upper Primary School Children in a Selected School" was conducted by **Anu Harshad Joshi (2019)**. The study results revealed that association of selected demographic variable and pre-test knowledge with gender calculated "t" value (5.03) was more than table value of "t" (1.97). Hence it was concluded that there is association between knowledge score and gender of sample^[13].

8. Nursing implication of the study

Nursing Education

- Health education is a vital function of the nurse and community health nurse can organize for mass education in the community regarding prevention of waterborne diseases using different AV aids.
- Teachers can utilize this structured teaching program to teach the students in class room.

Nursing Administration

- The present study enables the nursing administrator to identify the need for developing appropriate preventive programme on prevention of waterborne diseases.
- This study will encourage the community health Nurse administrator to conduct in service education programme related to prevention of selected water borne diseases of among grass-root level health worker as well as school teacher.

Nursing Research

- The nurse can conduct more studies regarding prevention of various waterborne diseases to create more awareness among community people and make them updated with the recent data or findings related to waterborne diseases.
- This study can be a baseline for the future studies to build upon.

9. Recommendations

- A comparative study can be conducted in rural and urban schools among school children regarding prevention of waterborne diseases.
- A similar type of study can be conducted by using alternative teaching strategies educational session.
- The same study can be done on a larger population for more valid generalization of results.
- The study can be conducted regarding complications of water borne diseases.
- The similar study can be conducted in another setting.

10. Limitations

- The study is limited to school children who are studying in 6th and 7th standard which can be generalized for whole population.
- The research study is limited to 100 school children which do not represent the whole population.
- The tool was structured and hence responses were limited.

11. Conclusion

The present study was conducted to evaluate the effectiveness of structured teaching programme on knowledge regarding prevention of waterborne diseases among the school children in selected schools at Kamrup District, Assam. The results revealed that majority, (63%) of participants had inadequate knowledge followed by (30%) of participants had moderate knowledge and (7%) had adequate knowledge in pre-test, whereas in post-test,

majority (69%) of participants had adequate knowledge and (31%) of participants had moderate knowledge regarding waterborne diseases. The result also revealed that there were statistically significant association between sex of school children, education of father and any information regarding water borne disease with pre-test level of knowledge regarding prevention of waterborne diseases among school children. After conducting the study, the investigator found that the structured teaching programme is very effective medium to improve level of knowledge and create awareness among school children.

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