

A QUASI EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE AND PRACTICE REGARDING PREVENTION OF WATER BORNE DISEASES AMONG SECONDARY SCHOOL CHILDREN IN SELECTED SCHOOLS OF DISTRICT KANGRA HIMACHAL PRADESH

MILAN THAKUR ¹, MRS. APURVA ²

Netaji Subhash College of Nursing/M.Sc. Nursing, Medical Surgical Nursing¹,

ASSISTANT PROFESSOR /Netaji Subhash College of Nursing, Palampur²

Corresponding Author: MILAN THAKUR / Netaji Subhash College of Nursing/M.Sc. Nursing, Medical Surgical Nursing¹

Email:-milanthakursaklani@gmail.com, apurvamahajan247@gmail.com

ABSTRACT

Water-borne diseases continue to pose a significant public health challenge globally, especially in low- and middle-income countries like India. Contaminated water, poor sanitation, and lack of hygiene are major contributors to the spread of illnesses such as diarrhoea, typhoid, hepatitis A, and cholera. School-aged children are particularly vulnerable due to frequent exposure to unsafe water, inadequate hygiene facilities in schools, and low awareness regarding preventive practices. In Himachal Pradesh, and particularly in District Kangra, seasonal outbreaks of diarrheal and typhoid diseases remain a growing concern, as highlighted by recent data from the Integrated Disease Surveillance Programme.

METHODOLOGY :- The main aim of the study was to assess the effectiveness of a structured teaching programme on knowledge and practices regarding prevention of water-borne diseases among secondary school children in selected schools of District Kangra, Himachal Pradesh. A total of 60 students were selected by using purposive sampling technique and self-structured knowledge questionnaire and practice checklist was used to collect the data

RESULTS :-The findings revealed a significant improvement in both knowledge and practice after the intervention. The number of students with good knowledge increased from 6.67% in the pretest to 38.33% in the posttest, and those with good practice rose from 16.6% to 48.33%. Paired t-tests showed statistically

significant differences between pretest and posttest knowledge ($t = 2.848$, $p < 0.003$) and practice ($t = 3.187$, $p < 0.00115$) scores. A strong positive correlation ($r = 0.72$, $p < 0.001$) was observed between knowledge and practice scores, indicating that higher knowledge led to better practices. No significant association was found between knowledge/practice scores and socio-demographic variables, suggesting the effectiveness of the teaching programme across all groups. The study concludes that structured teaching is an effective tool for improving knowledge and promoting healthy practices regarding prevention of water-borne diseases among school children.

CONCLUSION :-Structured teaching programme was effective in enhancing knowledge and practices among school children for the prevention of water-borne diseases.

KEY WORDS :- water borne diseases , knowledge , Practice ,prevention

INTRODUCTION:

Water is essential to life, yet in many parts of the world, it is also a source of serious health risks. Water is a universal healer. It is synonymous with life. A basic necessity, water is nature's most generous gift to man. It is one of man's most important assets; water is an essential factor in economic, social and cultural development of a community. It is not only a refreshing drink and an effective cleansing agent but also a vital medicine. Adequate supply of fresh and clean drinking water is a basic need for all human beings on the earth, yet it has been observed that millions of people worldwide are deprived of this. Industrial growth, urbanization and the increasing use of synthetic organic substances have serious and adverse impacts on freshwater bodies. Many areas of groundwater and surface water are now contaminated with heavy metals, (persistent organic pollutants), and nutrients that have an adverse effect on health.

Structured teaching programme are known to be effective in promoting health-related behaviour change. Educating children through interactive, participatory methods can not only improve their knowledge but also influence their day-to-day habits such as drinking safe water, hand washing, and proper toilet use. Moreover, children educated in schools often transfer this knowledge to their families, creating a ripple effect within communities. Therefore, school-based health education is a critical and sustainable strategy for disease prevention.

MATERIALS AND METHODS

Research Approach and Design

A quantitative research approach with a quasi-experimental one-group pre-test post-test design was adopted. The independent variable was the structured teaching programme, and the dependent variable was the knowledge and practice regarding the prevention of water borne diseases .

Setting

The study was conducted in selected secondary schools of District Kangra, Himachal Pradesh including secondary school Deogran and , Bhawarna .

Population , Sample and sampling technique :-

The population comprised Secondary school children age group (13-17) years of Bhawarna , Deogran district Kangra Himachal Pradesh. . A purposive sampling technique was used to select 60 participants.

TOOL

The tool consist of two parts as follows :-

Section :- 1 :- consist of socio demographic variables an information about the selected background factors such as age (in years) ,gender residence , occupation of father , type of family , socioeconomic status , type of water sources , previous knowledge regarding prevention of water borne diseases .

Section 11:- Part I:- Self structured knowledge questionnaire : It consist of self structured knowledge questionnaire which seeks information regarding prevention of water borne diseases , It consist of 30 multiple choice questions .

PART 11:-Practice checklist :- is used to ensure consistent and thorough implementation of hygiene and sanitation practices . The self structured practice checklist consist of 15 statements .

Intervention

Participants first completed a pre-test questionnaire. Following this, a structured teaching programme covering definition, causes, risk factors, symptoms, diagnosis, management, and prevention of water borne diseases was delivered. The duration of the programme was 40–45 minutes. A post-test was conducted after the intervention to assess knowledge and practice gain.

Data Collection Procedure

- Day 1: Pre-test administration followed by structured teaching programme.
- Day 7: Post-test conducted using the same questionnaire.

Data Analysis

Data were analyzed using descriptive and inferential statistics:

- **Descriptive:** frequency, percentage, mean, standard deviation.

- **Inferential:** paired t-test for comparison of pre- and post-test knowledge scores, chi-square test for association with demographic variables.

Ethical approval was obtained, and informed consent was taken from all participants.

RESULTS :-

SECTION 1:

SECTION1: Frequency and percentage distribution of socio demographic variables like Age in years , gender , monthly family income ,type of family ,fathers occupation , area of residence , type of water sources , previous knowledge , If yes then source of knowledge

Table 1:Frequency and percentage distribution of socio demographic variables of secondary school children.

N=60			
Variable	Category	Frequency (f)	Percentage (%)
1. Age	12–13 years	25	41.67%
	14–15 years	20	33.33%
	16 -17 yeras	15	25.00%
2. Gender	Male	37	61.67%
	Female	23	38.33%
3. Monthly family income	<10000	9	15.00%
	10001–20000	17	28.33%
	20001–30000	21	35.00%
	>30001	13	21.67%
4. Type of Family	Nuclear	21	35.00%
	Joint	28	46.67%
	Extended	11	18.33%
5. Father's occupation	Government Job	12	20.00%
	Private Job	25	41.67%
	Self Employed	13	21.67%

Variable	Category	Frequency (f)	Percentage (%)
6. Area of residence	Unemployed	10	16.67%
	Urban	45	75.0%
	Rural	15	25.0%
7. Type of Water sources	Well Water	16	26.6%
	Bore Well Water	0	0.0%
	Public Water Supply	41	68.3%
8. Previous Knowledge regarding prevention of water borne diseases	Other Sources	3	5.00%
	Yes	22	37.0%
9. If yes , Source of Knowledge	No	38	63.0%
	Book	7	12.0%
	Library	4	7.0%
	Internet	5	8.0%
	Others	6	12.0%

Table 1 and figure 3,4,5,6,7,8,9,10,11 depict that The majority of participants (41.67%) were in the 12–13 years age group (25 individuals), followed by 14–15 years at 33.33% (20 individuals). The smallest group was those aged 16 years and above, comprising 25.00% (15 individuals). This indicates that most respondents were in early adolescence.

Out of the total 60 participants, 37 were male (61.67%) and 23 were female (38.33%), showing a male predominance in the sample.

The largest proportion of respondents (35.00%) reported a monthly family income between ₹20,001 and ₹30,000 (21 participants). This was followed by ₹10,001–₹20,000 with 28.33% (17 participants), above ₹30,000 at 21.67% (13 participants), and the lowest income group of below ₹10,000 comprising 15.00% (9 participants). This reflects a diverse economic background among the participants.

Joint families were the most common, with 28 participants (46.67%), followed by nuclear families at 35.00% (21 participants). Extended families made up 18.33% (11 participants). This suggests that a majority of the children were living in larger family setups.

A large segment of fathers were in the private sector (41.67%), followed by self-employed (21.67%), government jobs (20.00%), and unemployed (16.67%). This indicates that most families relied on private-sector employment for income.

An overwhelming majority of participants (92.0%) resided in urban areas, while only 8.0% were from rural areas, suggesting that the study population was primarily urban-based.

Public water supply was the most commonly used source (68.3%), followed by well water at 26.00%. Other sources contributed 5.00%, and no respondents used bore well water. This points to a reliance on traditional and public water sources among the participants.

Only 22 participants (37.0%) had prior knowledge of the topic, while 38 participants (63.0%) did not, indicating a general lack of awareness among the group.

Among those who had prior knowledge, the most common sources were books (12.0%) and other sources (12.0%), followed by the internet (8.0%) and library (7.0%). This shows a varied but limited use of knowledge resources.

SECTION 2:

Frequency and percentage distribution of pretest posttest knowledge score and Practice score regarding prevention of water borne diseases among secondary school children

Table 2: Frequency and percentage distribution of pretest posttest knowledge score regarding prevention of water borne diseases among secondary schoolchildren

N=60

Level of knowledge	Pretest (f)	Pretest (%)	Posttest (f)	Posttest (%)
Poor (0–33)	17	28.33%	0	0.00%
Average (34–66)	39	65.00%	37	61.67%
Good (67–100)	4	6.67%	23	38.33%

Maximum score = 30

Minimum score =00

The table 2 shows the Frequency and percentage distribution of pretest posttest knowledge score regarding prevention of water borne diseases among secondary school children .This table depict that level of pretest and posttest knowledge scores reveals a significant improvement in participants' knowledge levels after the intervention. Before intervention (28.33%) had poor knowledge, followed by

(65.00%) had average knowledge, and only (6.67%) demonstrated good knowledge. After intervention none of the participants remained in the poor knowledge. The number of participants with average knowledge slightly decreased to 37 (61.67%), while those with good knowledge rose sharply to 23 (38.33%). This clearly concluded that the teaching programme was effective in enhancing the knowledge level of the participants.

Table 3 Frequency and percentage distribution of pretest posttest Practice score regarding prevention of water borne diseases among secondary school children

N=60

Level of Practice	Pretest (f)	Pretest (%)	Posttest (f)	Posttest (%)
Poor (0–33)	13	21.7%	0	0.00%
Average (34–66)	37	61.7%	31	51.67%
Good (67–100)	10	16.6%	29	48.33%

Maximum score = 30

Minimum score = 00

The Table 3 shows the Frequency and percentage distribution of pretest posttest Practice score regarding prevention of water borne diseases among secondary school children . The table depict that the level of practice before and after the intervention reveals a significant improvement among participants. In the pretest, a majority of the individuals (61.7%) fell under the average category, while 21.7% demonstrated a poor level of practice and only 16.6% had a good level of practice. However, in the posttest, there was a marked shift, with 48.33% of the participants reaching the good practice level and 51.67% maintaining an average level. Notably, none of the participants remained in the poor category after the intervention. This suggests that the program or teaching intervention had a positive impact on improving the practice levels of the participants.

Section 3:

comparison of pretest and posttest knowledge and practice score regarding prevention of water borne diseases among secondary school children

(PART A) Table 4: comparison of pretest and posttest knowledge score regarding prevention of water borne diseases among secondary school children

Group	Mean	(SD)	Paired t-value	p-value
Pretest	14.10	14.42	2.848*	< 0.0030
Posttest	20.15	12.75		

The table 4 shows the comparison of pretest and posttest knowledge score regarding prevention of water borne diseases among secondary school children. The table depicts the presents results of a paired comparison between pretest and posttest scores. The mean pretest score was 14.10 with a standard deviation (SD) of 14.42, while the mean posttest score increased to 20.15 with a slightly lower SD of 12.75. A paired t-test revealed a t-value of 2.848 and a p-value less than 0.0030, indicating a statistically significant improvement in scores after the intervention. These findings suggest that the intervention was effective in enhancing participants' knowledge or performance. Hence H_1 research hypothesis is accepted and H_0 hypothesis is rejected

PART B Table 5:- comparison of pretest and posttest practice score regarding prevention of water borne diseases among secondary school children

Group	Mean	SD	Paired t-value	p-value
Pretest	7.3	7.15	3.187*	< 0.00115
Posttest	10.8	6.22		

The table 5 shows the comparison of pretest and posttest practice score regarding prevention of water borne diseases among secondary school children. The table depicts that the mean score before the intervention was 7.3 with a standard deviation (SD) of 7.15, while the mean score after the intervention increased to 10.8 with a lower SD of 6.22. A paired t-test was conducted to evaluate the effectiveness of the intervention, yielding a t-value of 3.187 and a p-value less than 0.00115, which indicates that the improvement in scores was statistically significant. This suggests that the intervention had a meaningful and positive impact on participants' practice. Hence H_2 hypothesis is accepted and H_0 hypothesis is rejected

SECTION 4:

correlation between the posttest knowledge and practice score regarding prevention of water borne diseases

Table 6: correlation between the posttest knowledge and practice score regarding prevention of water borne diseases .

Correlation Pair	Pearson's r	p-value	Interpretation
Knowledge vs. Practice	0.72*	< 0.001	Strong positive correlation

The table 6 shows the correlation analysis between knowledge and practice scores revealed a Pearson's correlation coefficient (r) of 0.72 with a p-value of less than 0.001. This indicates a strong positive correlation between the two variables, suggesting that as the level of knowledge increases, the level of practice also improves significantly. The statistically significant p-value confirms that this relationship is not due to chance. Therefore, it can be concluded that higher knowledge levels are strongly associated with better practice among the participants. Hence H_3 hypothesis is accepted and H_{03} hypothesis is rejected .

SECTION 5:

Association between the posttest knowledge and practice score regarding prevention of water borne diseases among secondary school children with their selected socio demographic variables.

PART A:- Table 7: Association between the posttest knowledge score regarding prevention of water borne diseases among secondary school children with their selected socio demographic variables.

N=60

Variable	Categories	Good (f)	Average (f)	Df	χ^2 Value	p-value
Age	12–13 years	7	18	2	2.0957	0.351 ^{NS}
	14–15 years	7	13			
	16-17 years	2	13			
Gender	Male	11	26	1	0.463	
	Female	5	18			

Monthly Family Income	< ₹10,000	1	8	3	4.86	0.182 ^{NS}
	₹10,001–₹20,000	4	13			
	₹20,001–₹30,000	9	12			
	> ₹30,001	2	11			
Type of Family	Nuclear	6	15	2	0.081	0.96 ^{NS}
	Joint	7	21			
	Extended	3	8			
Father's Occupation	Government Job	6	6	3	7.141	0.068 ^{NS}
	Private Job	4	21			
	Self-Employed	5	8			
	Unemployed	1	9			
Area of residence	Urban	14	31	1	1.818	0.178 ^{NS}
	Rural	2	13			
Water sources	Well Water	2	14	2	3.906	0.142 ^{NS}
	Bore Well	0	0			
	Public Supply	14	27			
	Others	0	3			
Previous Knowledge	Yes	5	17	1	0.276	0.6 ^{NS}
	No	11	27			
Sources	Books	3	4	4	3.233	0.52 ^{NS}
	Library	0	3			
	Internet	1	4			
	Others	1	6			

*P value <0.05 level of significance

NS= Not significant

The table 7 depict that chi-square test was used to examine the association between demographic variables and the level of knowledge among participants. The analysis revealed no statistically significant association between age and practice level ($\chi^2 = 2.0957$, $p = .351$), gender ($\chi^2 = 0.463$, $p = .496$), or family income ($\chi^2 = 4.860$, $p = .182$). Similarly, no significant association was observed with type of family ($\chi^2 = 0.081$, $p = .960$), residence ($\chi^2 = 0.124$, $p = .705$), water facilities ($\chi^2 = 3.258$, $p = .196$), or previous knowledge ($\chi^2 = 0.276$, $p = .600$). Although father's occupation approached significance ($\chi^2 = 7.141$, $p = .068$), it did not cross the conventional threshold of $p < 0.05$. Additionally, the source of knowledge also showed no significant association with practice level ($\chi^2 = 3.233$, $p = .520$). These findings indicate that none of the selected socio-demographic variables had a statistically significant influence on the level of practice among participants. Hence H_0^5 hypothesis is accepted and H_5^5 hypothesis is rejected.

PART b:-Table 8: Association between the posttest Practice score regarding prevention of water borne diseases among secondary school children with their selected socio demographic variables

N=60

Variable	Categories	Average (f)	GOOD (f)	df	χ^2 Value	p-value
Age	12–13 years	14	11	2	0.36	0.835 ^{NS}
	14–15 years	10	10			
	16-17 years	7	8			
Gender	Male	20	17	1	0.22	0.639 ^{NS}
	Female	11	12			
Monthly Family Income	<10,000	5	4	3	1.081	0.782 ^{NS}
	10,001–20,000	10	7			
	20,001–30,000	9	12			

	>30,000	7	6			
Type of Family	Nuclear	11	10	2	0.075	0.962 ^{NS}
	Joint	14	14			
	Extended	6	5			
Father's Occupation	Government Job	4	8	3	4.564	0.203 ^{NS}
	Private Job	15	10			
	Self-employed	5	8			
	Unemployed	7	3			
Area of residence	Urban	24	21	1	0.2	0.655 ^{NS}
	Rural	7	8			
Water Facilities	Well Water	9	7	2	0.542	0.763 ^{NS}
	Bore Well Water	0	0			
	Public Water Supply	21	20			
	Other Sources	1	2			
Previous Knowledge	Yes	12	10	1	0.115	0.734 ^{NS}
	No	19	19			
Sources	Books	3	4	4	4.194	0.38 ^{NS}
	Library	3	1			
	Internet	1	4			

	Others	5				
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***P value <0.05 level of significance**

NS= Not significant

The table 8 depict that The chi-square analysis was conducted to examine the relationship between various demographic variables and the level of practice (categorized as moderate and adequate). The results indicated no statistically significant association between age and knowledge level ($\chi^2 = 0.360, p = .835$), gender ($\chi^2 = 0.220, p = .639$), or family income ($\chi^2 = 1.081, p = .782$). Likewise, no significant association was found with the type of family ($\chi^2 = 0.075, p = .962$), father's occupation ($\chi^2 = 4.564, p = .203$), or place of residence ($\chi^2 = 0.297, p = .586$). The source of water facilities also did not show any significant relationship with the level of knowledge ($\chi^2 = 0.601, p = .741$). Additionally, previous knowledge ($\chi^2 = 0.115, p = .734$) and sources of knowledge. ($\chi^2 = 4.194, p = .380$) were also not significantly associated with the knowledge levels of participants. These findings suggest that none of the examined demographic factors had a significant influence on the participants' knowledge levels. Hence H_0^4 hypothesis is accepted and H^4 hypothesis is rejected .

DISCUSSION

The purpose of the study was to assess the effectiveness of structured teaching programmed on knowledge and practice regarding prevention of water borne diseases among secondary school children in selected schools of district kangra . this chapter relate the finding of the present study in accordance with the studies done earlier .

- 1) To assess the pre test and post test knowledge score regarding prevention of water borne diseases among secondary school children in selected schools of district Kangra Himachal Pradesh
- 2) To assess the pre test and post test practice score regarding the prevention of water borne diseases among the secondary school children in selected schools of district Kangra Himachal Pradesh
- 3) To compare the pretest and posttest knowledge scores regarding prevention of water borne diseases among secondary school children of district Kangra Himachal Pradesh
- 4) To compare the pretest and posttest practice scores regarding prevention of water borne diseases among secondary school children of district Kangra Himachal Pradesh
- 5) To find out correlation between the posttest knowledge and practice score regarding prevention of water borne diseases among secondary school in selected schools of district Kangra Himachal Pradesh
- 6) To find out association of post test knowledge score regarding water borne diseases with their selected socio demographic variables.

7) To find out association of post test practice score regarding water borne diseases with their selected socio demographic variables.

In the current study, a significant improvement was observed in both knowledge and practice scores after the intervention. The number of students with good knowledge increased from 6.67% in the pre-test to 38.33% in the post-test, and those with good practice rose from 20% to 48.33%. This aligns with Priyanka Sharma & Shivani (2025), who found that structured teaching among mothers led to a substantial increase in good knowledge from poor (56.7%) to good (73.3%) post-intervention. Similarly, Dr. Amita Paul (2020) observed a significant improvement in upper primary school children's knowledge, with mean scores increasing from 9.575 to 20.845 after a structured teaching program.

Vinish V & Prasad V (2016) also reported improvements in students' knowledge post-intervention, where excellent knowledge rose to 66.33%, again indicating how teaching programmes effectively fill gaps in awareness and behavior regarding water-borne disease prevention.

Further, the positive correlation ($r = 0.72$, $p < 0.001$) between post-test knowledge and practice scores in this study is similar to the findings of Chrisatus Anyidi & Vincent Kalungi (2023), who observed that although attitudes were positive, knowledge and practical preventive behaviors were lacking. They emphasized the need for structured health education—a need directly addressed and supported by the results of the present study.

In the present research, no significant association was found between knowledge/practice scores and demographic variables like age, gender, income, or residence.

CONCLUSION :-

The finding of the study clearly demonstrated that structured teaching programme was proved to be effective in enhancing knowledge and practices regarding prevention of water borne diseases among secondary school children .

The programme proved to be a valuable tool in promoting adequate knowledge and healthy practices regarding prevention of water borne diseases .

SUMMARY

The present study was undertaken by the investigator to assess the knowledge and practice regarding prevention of selected water borne diseases among secondary school children in selected schools of district Kangra Himachal Pradesh .

In present study quasi-experimental one-group pre-test post-test design to assess the effectiveness of a structured teaching programme on knowledge and practices regarding the prevention of water-borne diseases

among secondary school children. The target population comprised school children aged 13–17 years from Bhawarna and Deogran, and a sample of 60 students was selected through non-probability purposive sampling. Inclusion and exclusion criteria were set to ensure appropriate sample selection. A self-structured knowledge questionnaire (30 MCQs) and a 15-item practice checklist were developed and validated by subject experts. Reliability was established using Karl Pearson's correlation coefficient (0.75 for knowledge, 0.80 for practice). Data collection took place in three phases: pre-test, intervention (structured teaching programme), and post-test after 7 days. Data were analyzed using descriptive statistics (frequency, percentage, mean, SD) and inferential statistics (paired t-test and chi-square test) to assess improvement and associations with socio-demographic variables. Ethical approvals and informed consent were obtained prior to data collection. The study showed a significant improvement in knowledge and practice after the structured teaching programme. Good knowledge increased from 6.67% to 38.33% and good practice from 16.6% to 48.33%. Paired t-tests confirmed significant differences in pre- and post-test scores for both knowledge ($t = 2.848$, $p < 0.003$) and practice ($t = 3.187$, $p < 0.00115$). A strong positive correlation ($r = 0.72$) was found between knowledge and practice. No significant link was found with socio-demographic variables. The findings support the effectiveness of structured teaching in improving awareness and practices related to water-borne disease prevention

LIMITATIONS

- The findings are limited to the only 60 secondary school children and may not be generalized to the entire population of school children in Kangra or Himachal Pradesh.
- Being a quasi experimental design one group pretest post test design there is no control group for comparison, which limits the strength of causal inference.
- The study assesses immediate post-intervention knowledge and practice, without evaluating long-term retention or behavioral changes.

RECOMMENDATIONS

- Regular health education sessions on waterborne disease prevention can be conducted in schools in curriculum
- Hygiene and sanitation-related topics should be incorporated into the school curriculum.
- Future studies should involve a larger, more diverse sample from different districts to enhance generalizability.
- Conduct randomized controlled trials to establish stronger evidence on the effectiveness of structured teaching programmes.
- Extend the intervention to involve parents and teachers to create a supportive environment for sustaining hygienic practices.

- Include physiological or epidemiological data (e.g., incidence of disease) to measure actual health outcomes post-intervention.

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