

EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE, PRACTICE AND ATTITUDE REGARDING HAND WASHING AMONG SCHOOL CHILDREN

A Pre-Experimental Study at a Selected School in Rajkot District, Gujarat

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Abstract : Hand hygiene is one of the simplest and most effective measures for preventing infection, and school children, who are in constant close contact and are often exposed to dirt, are particularly vulnerable. This study assessed the effectiveness of a structured teaching programme (STP) on knowledge, practice and attitude regarding hand washing among school children at a selected school in Rajkot district. A quantitative, pre-experimental one-group pre-test post-test design was adopted. Using stratified random sampling, 100 children (50 boys and 50 girls) of standards VI and VII, aged 10–12 years, were enrolled. Data were collected with a structured multiple-choice knowledge questionnaire (15 items), an observation checklist for practice and a modified three-point Likert attitude scale (20 items); the tool was highly reliable (test–retest $r = 0.95$). The STP, delivered by lecture-cum-demonstration, was followed by a post-test. In the pre-test 82% of children had inadequate knowledge and 70% had poor practice, whereas in the post-test 96% had adequate knowledge, 60% had excellent practice and 89% had the best attitude. Mean knowledge rose from 4.32 to 13.75, practice from 10.21 to 16.57 and attitude from 27.61 to 53.55; all differences were statistically significant (paired $t = 27.14, 20.02$ and 17.45 respectively; $p < 0.001$). No significant association was found between post-test scores and any selected socio-demographic or health-related variable. The STP was effective in improving knowledge, practice and attitude, and school-based hand-hygiene education led by nurses can help prevent infection among children.

IndexTerms - Structured Teaching Programme, School Children, Knowledge, Practice, Attitude, Hand Washing, Hand Hygiene

I. INTRODUCTION

Hand hygiene is a simple yet vital procedure that prevents the spread of infection, and it is defined as any method that removes or destroys microorganisms on the hands. Germs are found everywhere, are too small to be seen, and a person touches many objects every minute, so infection is easily acquired and spread. Infectious diseases continue to contribute substantially to global morbidity and mortality, and washing hands with soap and water is widely recognised as the most important and least expensive measure for preventing the transmission of pathogens.

Schools are potentially important places for learning new behaviours. They provide a stimulating environment in which teachers and peers act as stable role models, and children themselves can become agents of change within their families and communities by sharing what they learn, questioning existing practices at home and influencing siblings. Hand-washing education has been reported to reduce diarrhoeal illness and respiratory infections and to lower school absenteeism due to gastrointestinal illness. Preventing such infections also reduces antibiotic use and the likelihood of antibiotic resistance.

II. NEED FOR THE STUDY

Poor hand hygiene is a major cause of disease transmission from one person to another. Many children do not wash their hands before eating, after using the toilet or after playing on the school ground, and because they are playful and highly exposed to soil and other sources of infection they are vulnerable to illness. Diarrhoea and lower respiratory infections remain leading causes of death among children under five years of age worldwide, and Global Hand Washing Day (15 October) was established to promote hand washing with soap as the cheapest and most effective way of preventing them. Evidence also shows that compliance with hand hygiene is often low even among health professionals, which underlines the importance of building the habit early in life. The investigator therefore felt the need to assess the knowledge, practice and attitude of school children regarding hand washing and to evaluate the effectiveness of a structured teaching programme.

III. OBJECTIVES AND HYPOTHESES

The objectives were (1) to assess the knowledge, practice and attitude of school children regarding hand washing; (2) to evaluate the effectiveness of a structured teaching programme (STP) on knowledge, practice and attitude regarding hand washing;

and (3) to associate selected socio-demographic variables with knowledge, practice and attitude regarding hand washing.

H₁: There is a significant difference between pre-test and post-test knowledge, practice and attitude scores after the STP. **H₂:** There is a significant association between selected socio-demographic and health-related variables and post-test knowledge, practice and attitude scores.

The conceptual framework was based on the modified open system theory of Dorothy Johnson (1980), in which the children's pre-existing knowledge, practice and attitude (input) are transformed by the structured teaching programme (throughput) into enhanced knowledge, practice and attitude (output), with feedback to the system.

IV. RESEARCH METHODOLOGY

4.1 Research approach and design

A quantitative approach with a pre-experimental, one-group pre-test post-test design was used ($O_1 - X - O_2$, where O_1 is the pre-test, X the STP and O_2 the post-test). The independent variable was the STP on hand washing; the dependent variables were knowledge, practice and attitude regarding hand washing.

4.2 Setting, population and sample

The study was conducted in a school in a rural area of Rajkot district, Gujarat, which runs classes from kindergarten to standard 12 for both boys and girls. The target population was school children of standards VI and VII, and 100 children (50 boys and 50 girls; 25 boys and 25 girls from each standard) were selected by stratified random sampling, with each standard and section treated as a stratum and children drawn by lottery using attendance-register numbers. Children aged 10–12 years who could speak, read and write Gujarati or English were included; children unwilling to participate or on leave were excluded.

4.3 Tools and scoring

The tool was developed from the literature and expert opinion and had three parts: (I) socio-demographic variables (ten items) and health-related variables (five items); (II-A) fifteen multiple-choice knowledge questions (score 0–15; <50% inadequate, 51–75% moderately adequate, >75% adequate), (II-B) an observation checklist of the steps of hand washing for practice (poor, good, better and excellent categories) and (II-C) a modified three-point Likert attitude scale of 20 positive and negative statements (score range 20–60); and (III) the STP, covering definition, importance, indications, general steps and consequences of poor hand washing, delivered by lecture-cum-demonstration with a roller board, charts, a banner and pamphlets.

4.4 Validity, reliability, pilot study and data collection

Content validity was established by nursing and medical experts, and the tool was translated into Gujarati. Test-retest reliability was $r = 0.95$, indicating a highly reliable tool. A pilot study on 10 children confirmed feasibility. In the main study, written permission was obtained from the school authorities; the pre-test was administered, the STP was given to four batches of 25 children each, and the post-test was conducted with the same tool after an average of eight days.

4.5 Data analysis

Descriptive statistics (frequency, percentage, mean and standard deviation) were used to describe the sample and the levels of knowledge, practice and attitude; the paired t-test compared pre-test and post-test scores; and the chi-square test assessed association with selected variables. Significance was set at $p < 0.05$.

V. RESULTS AND DISCUSSION

5.1 Characteristics of the children

Half of the 100 children were aged 10–11 years and half 11–12 years, and boys and girls were equally represented. Most (62%) lived in rural areas, 55% belonged to nuclear families and 55% had a monthly family income of Rs. 5,001–10,000. Municipal water was the main water source (77%), 45% practised open-field defecation, and 89% had no previous source of knowledge about hand washing (Table 1).

Table 1: distribution of socio-demographic and health-related variables (N = 100)

Variable (categories)	n (%)
Age: 10–11 years / 11–12 years	50 (50.0) / 50 (50.0)
Gender: male / female	50 (50.0) / 50 (50.0)
Domicile: urban / rural	38 (38.0) / 62 (62.0)
Father's education: higher secondary / high school	40 (40.0) / 35 (35.0)
Mother's education: high school / primary school	39 (39.0) / 26 (26.0)
Father's occupation: labour / agriculture	47 (47.0) / 30 (30.0)
Mother's occupation: home maker / agriculture	67 (67.0) / 23 (23.0)
Family income/month: Rs. 5,001–10,000 / below Rs. 5,000	55 (55.0) / 37 (37.0)
Type of family: nuclear / joint / extended	55 (55.0) / 34 (34.0) / 11 (11.0)
Siblings: two / three / four and above / one	52 (52.0) / 25 (25.0) / 13 (13.0) / 10 (10.0)

Variable (categories)	n (%)
Water supply: municipality / bore well / public well	77 (77.0) / 15 (15.0) / 8 (8.0)
Drainage: closed / open	64 (64.0) / 36 (36.0)
Toilet practice: closed / open-field defecation	55 (55.0) / 45 (45.0)
Pet animals: none / cat / dog / rabbit	88 (88.0) / 9 (9.0) / 2 (2.0) / 1 (1.0)
Previous source of knowledge: none / teacher / mass media / health personnel	89 (89.0) / 8 (8.0) / 2 (2.0) / 1 (1.0)

5.2 Levels of knowledge, practice and attitude

In the pre-test most children had inadequate knowledge (82%) and poor practice (70%), while 76% had a merely good attitude. After the STP, 96% had adequate knowledge, 60% had excellent practice and 89% had the best attitude (Table 2, Fig. 1).

Table 2: levels of knowledge, practice and attitude in pre-test and post-test (N = 100)

Level	Pre-test n (%)	Post-test n (%)
Knowledge		
Inadequate	82 (82.0)	0 (0.0)
Moderately adequate	15 (15.0)	4 (4.0)
Adequate	3 (3.0)	96 (96.0)
Practice		
Poor	70 (70.0)	3 (3.0)
Good	17 (17.0)	10 (10.0)
Better	10 (10.0)	27 (27.0)
Excellent	3 (3.0)	60 (60.0)
Attitude		
Good	76 (76.0)	9 (9.0)
Better	6 (6.0)	2 (2.0)
Best	18 (18.0)	89 (89.0)

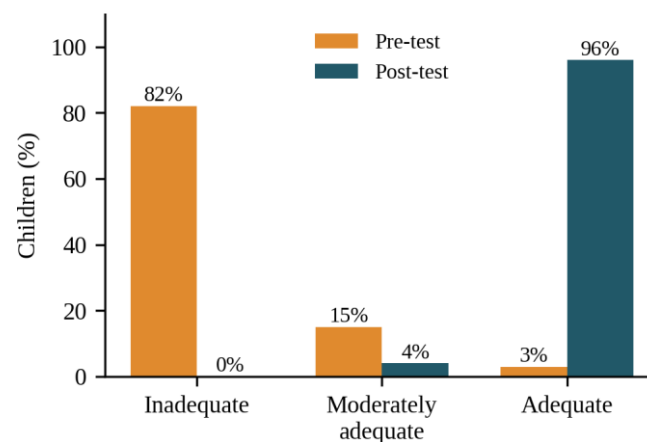


Fig. 1: knowledge levels of children in pre-test and post-test

5.3 Effectiveness of the structured teaching programme

Mean knowledge increased from 4.32 ± 3.44 to 13.75 ± 1.25 , mean practice from 10.21 ± 2.26 to 16.57 ± 2.37 and mean attitude from 27.61 ± 11.82 to 53.55 ± 9.59 . The paired t-test showed that all three improvements were statistically significant ($df = 99$, $p < 0.001$) (Table 3, Fig. 2), so hypothesis H_1 was accepted.

Table 3: comparison of pre-test and post-test mean scores (N = 100)

Variable	Test	Mean	SD	Mean gain	Paired t	p-value
Knowledge (max 15)	Pre-test	4.32	3.44	9.43	27.14	<0.001
	Post-test	13.75	1.25			
Practice (max 18)	Pre-test	10.21	2.26	6.36	20.02	<0.001
	Post-test	16.57	2.37			
Attitude (max 60)	Pre-test	27.61	11.82	25.94	17.45	<0.001
	Post-test	53.55	9.59			

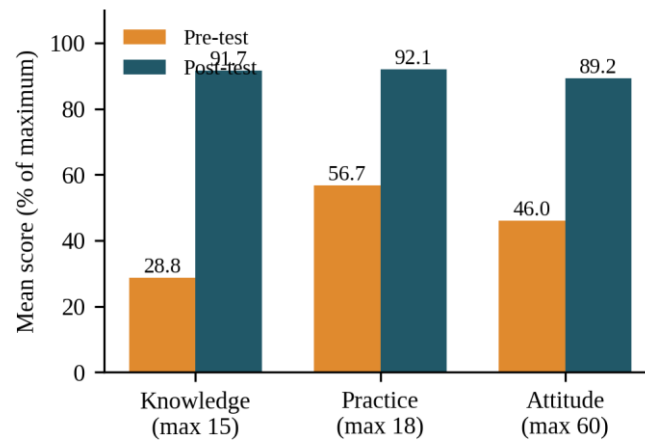


Fig. 2: mean pre-test and post-test scores as a percentage of the maximum score

5.4 Association with selected variables

Chi-square analysis showed no significant association between post-test knowledge, practice or attitude levels and age, gender, domicile, parental education and occupation, family income, type of family, number of siblings, source of water supply, drainage, toilet practice, pet animals or previous source of knowledge (all $p > 0.05$). Hypothesis H_2 was therefore not accepted. The improvement was thus consistent across children irrespective of their background, suggesting that the STP is suitable for a wide range of school children.

5.5 Discussion

Before the programme the children's knowledge, practice and attitude were low, which is in line with reports that hand-washing knowledge and practice among school children are inadequate and that a gap often exists between knowing and doing (Rabbi and Dey, 2013; Oyibo, 2012). After the lecture-cum-demonstration, knowledge improved markedly, with 96% of children reaching the adequate level. This agrees with earlier school-based interventions that showed gains in hand-washing knowledge and behaviour after health education (Garg et al., 2013; Rosen et al., 2006) and with a study by Shrestha and Angolkar (2023) in which the knowledge score rose from 53.8% to 77.54% after health education. The larger gain in the present study may reflect the combination of teaching with demonstration of the steps and the use of visual aids.

Practice also improved, with excellent practice rising from 3% to 60% and poor practice falling from 70% to 3%, indicating that demonstration and return demonstration help children translate knowledge into skill. Attitude scores nearly doubled, showing that children became more positive towards hand washing. The lack of association with demographic variables indicates that the programme worked equally well for children of different backgrounds, which supports its use in similar schools. Because the study had no control group, part of the change could be due to testing or other external influences, and this should be considered when interpreting the findings.

VI. NURSING IMPLICATIONS

Nursing education: nurse educators can encourage nursing students to organise hand-washing programmes for school children and should include evidence-based health education in the curriculum. **Nursing administration:** administrators can organise seminars, health camps and quiz programmes at least twice a year and support regular school health visits. **Nursing practice:** paediatric and community health nurses should provide periodic health education in schools, hospitals and communities to reduce morbidity among children. **Nursing research:** further research may examine the effect of hand washing on cross-infection and on childhood diarrhoea and respiratory infection.

VII. LIMITATIONS AND RECOMMENDATIONS

The study was limited to one school, a sample of 100 children, a single-group design without a control group, and a short follow-up period. It was also difficult to gather all students together because of differing timetables, which was overcome with the cooperation of teachers. Similar studies are recommended with larger samples, with control groups and longer follow-up, among children of other age groups, in rural and urban schools for comparison, and among mothers, parents and teachers.

VIII. CONCLUSION

The structured teaching programme was effective in significantly improving the knowledge, practice and attitude of school children regarding hand washing ($p < 0.001$), regardless of their socio-demographic and health-related characteristics. Regular nurse-led, demonstration-based hand-hygiene education in schools is a low-cost and practical strategy for preventing infection among children.

ACKNOWLEDGMENT

The authors thank the principal, teachers and children of the participating school, the expert panel, and the management of Shree H.N. Shukla Nursing Institute, Rajkot, for their support and cooperation.

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