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Research Article

Effectiveness of a Structured Teaching Program on Knowledge and Practice of Hand Washing among Primary School Children in Udaipur, Rajasthan

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Abstract

Background: Hand hygiene is a simple, cost-effective, and highly efficient measure for preventing infectious diseases, especially among children. Despite its proven importance, hand washing practices remain suboptimal, contributing to the burden of preventable infections. This study was conducted to evaluate the effectiveness of a Structured Teaching Program (STP) on knowledge and practice regarding hand washing among primary school children.

Methods: A quantitative evaluative approach with a pre-experimental one-group pre-test post-test design was adopted. The study was conducted among 80 primary school children aged 7–11 years in selected schools of Udaipur, Rajasthan, using purposive sampling. Data were collected using a validated self-structured questionnaire covering socio-demographic variables, knowledge (15 MCQs), and practice (9 checklist items). A STP was implemented between pre-test and post-test. Data were analyzed using descriptive and inferential statistics, including paired t-test and correlation analysis.

Results: Post-intervention findings showed a significant improvement in both knowledge and practice regarding hand washing. In the post-test, 55% of children had adequate knowledge compared to none in the pre-test, and 70% demonstrated adequate practice compared to none in the pre-test. The mean knowledge score increased from 14.8 to 23.9, and the mean practice score increased from 8.8 to 15.3, both statistically significant ($P < 0.05$). A low positive correlation ($r = 0.1748$) was found between post-test knowledge and practice.

Conclusion: The STP was effective in significantly improving both knowledge and practice of hand washing among primary school children.

Keywords: Hand washing, knowledge, practice, primary school children, structured teaching program

Introduction

Hand hygiene is one of the most effective and economical measures for preventing the spread of infectious diseases. The importance of hand washing was first highlighted by Ignaz Semmelweis in 1846, when he observed higher mortality rates in doctor-managed maternity wards and introduced chlorine hand washing, significantly reducing deaths. Despite initial resistance, his discovery laid the foundation for modern infection control practices.[1] By the late 19th century, hand washing with soap became a key component of public health, contributing to a decline in diarrheal and respiratory infections, which remain leading causes of morbidity and mortality among children under 5 years of age.[2]

Proper hand washing with soap and clean running water effectively removes harmful microorganisms and reduces the transmission of diseases.[3] Globally, diarrhea and

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pneumonia account for millions of child deaths annually, many of which are preventable through improved hygiene practices.[4] However, despite the availability of soap in many households, its use at critical times – such as after defecation and before handling food – remains inadequate. Children are particularly vulnerable to infections due to frequent exposure to contaminated environments such as soil, shared objects, and play areas. Therefore, early education and reinforcement of proper hand-washing practices are essential to promote healthy behaviors and prevent illness.[5]

According to the Centers for Disease Control and Prevention, hand washing is the single most effective method to prevent the spread of infections.[3] Poor hygiene practices contribute significantly to disease transmission, especially among vulnerable populations such as children. Germs can easily spread through direct contact, shared toys, and touching the face, increasing the risk of communicable diseases. Establishing proper hand hygiene habits during childhood is crucial for ensuring long-term health and well-being.[6,7]

In this context, the present study aims to assess the effectiveness of a Structured Teaching Program (STP) on knowledge and practice regarding hand washing among primary school children at selected primary schools of Udaipur, Rajasthan. The objectives of the study are to assess the pre-test and post-test levels of knowledge and practice regarding hand washing among primary school children, to implement and evaluate the effectiveness of the STP, and to correlate post-test knowledge and practice scores.

Methodology

This study adopted a quantitative evaluative research approach to assess the effectiveness of an STP on knowledge and practice regarding hand washing among primary school children. A pre-experimental one-group pre-test post-test design was used.

The study was conducted in selected primary schools of Udaipur, Rajasthan. The target population comprised primary school children aged 7–11 years studying in standards 2nd to 5th. A sample of 80 children was selected using a non-probability purposive sampling technique.

Data were collected using a self-structured questionnaire consisting of three sections: sociodemographic data, knowledge assessment (15 multiple-choice questions), and practice assessment (9 checklist items). The tool was validated by experts and found reliable (r = 0.7291 using the split-half method).

The procedure involved conducting a pre-test to assess baseline knowledge and practice, followed by implementation of the STP, and a post-test to evaluate its effectiveness.

Data were analyzed using appropriate descriptive and inferential statistics.

Results

Table 1 shows the distribution of primary school children according to their demographic characteristics. Among the 80 participants, a higher proportion of children (55%) belonged to the age group of 9–11 years, while 45% were aged 7–9 years. In terms of gender, the majority were males (63.75%) compared to females (36.25%). Most of the children (75%) were from urban areas, whereas 25% were from rural areas. Regarding the educational status of fathers, more than half (51.25%) had secondary education, followed by 35% who were graduates or above, while smaller proportions had primary education (10%) or were illiterate (3.75%). Similarly, most mothers (51.25%) had primary education, followed by secondary education (25%), graduation and above (13.75%), and 20% were illiterate. Concerning occupational status, 40% of fathers were government employees, followed by

Table 1: Distribution of sample according to sociodemographic variables (*n*=80)

Sr. No.	Demographic variables	Frequency	Percentage
1.	Age (in years)		
a)	7–9 years	36	45
b)	9–11 years	44	55
2	Gender		
a)	Male	51	63.75
b)	Female	29	36.25
3	Area of residence		
a)	Urban	60	75
b)	Rural	20	25
4.	Educational status of father		
a)	Illiterate	03	3.75
b)	Primary education	08	10
c)	Secondary education	41	51.25
d)	Graduation and more	28	35
5.	Educational status of mother		
a)	Illiterate	08	20
b)	Primary education	41	51.25
c)	Secondary education	20	25
d)	Graduation and more	11	13.75
6.	Occupational status of father		
a)	Labor	18	22.50
b)	Agriculture	07	8.75
c)	Govt. Employee	32	40
d)	Business and others	23	28.75
7.	Occupational status of mother		
a)	Home maker	36	45
b)	Agriculture	07	8.75
c)	Govt. Employee	14	17.50
d)	Business and others	23	28.75
8.	Monthly family income		
a)	Below Rs. 10000/-	07	8.75
b)	Rs. 10001–15000/-	13	16.25
c)	Rs. 15001–20000/-	59	73.75
d)	Rs. 20001 and above	01	1.25
9.	Type of family		
a)	Nuclear family	38	47.50
b)	Joint family	15	18.75
c)	Extended family	27	33.75
10	Source of information		
a)	Teachers	27	33.75
b)	Mass media	15	18.75
c)	Health personals	18	22.50
d)	None	20	25

business/other occupations (28.75%), laborers (22.50%), and agriculture (8.75%). In contrast, nearly half of the mothers (45%) were homemakers, while others were engaged in business/other work (28.75%), government jobs (17.50%), and agriculture (8.75%). The majority of families (73.75%) had a monthly income between Rs. 15,001 and 20,000, while smaller groups earned Rs. 10,001–15,000 (16.25%), below Rs. 10,000 (8.75%), and above Rs. 20,000 (1.25%). With regard to family type, most children (47.50%) belonged to nuclear families, followed by extended (33.75%) and joint families (18.75%). Finally, teachers were the main source of information for 33.75% of children, followed by health personnel (22.50%), mass media (18.75%), while 25% reported having no prior source of information.

Table 2 depicts the level of knowledge regarding hand washing among primary school children in pre-test and post-test assessments. In the pre-test, the majority of children (65%) had inadequate knowledge, while 35% had moderately adequate knowledge, and none of the children demonstrated adequate knowledge. However, in the post-test, a marked improvement was observed, with no children remaining in the inadequate category. Instead, 45% of the children achieved moderately adequate knowledge, and a majority of 55% attained adequate knowledge. This indicates that the STP was effective in significantly improving the knowledge of hand washing among primary school children.

Table 3 illustrates the practice scores regarding hand washing among primary school children in the pre-test and post-test assessments. In the pre-test, the majority of children (60%) demonstrated inadequate practice, while 40% showed moderately adequate practice, and none had adequate practice. Following the STP, a significant improvement was observed in the post-test results, where no children remained in the inadequate category. About 30% of the children exhibited moderately adequate practice, while a majority of 70% achieved adequate practice. These findings indicate that the STP was effective in improving hand washing practices among primary school children.

Table 4 presents the comparison of effectiveness of pre-test and post-test mean scores of knowledge and practice regarding hand washing among primary school children. The mean knowledge score increased from 14.8 (standard deviation [SD] = 4.24) in the pre-test to 23.9 (SD = 3.45) in the post-test, with a mean difference of 9.1. The calculated paired "t" value of 14.879 was found to be statistically significant at the 0.05 level. Similarly, the mean practice score improved from 8.8 (SD = 3.14) in the pre-test to 15.3 (SD = 2.22) in the post-test, with a mean difference of 6.5. The paired "t" value of 15.08 was also statistically significant at the 0.05 level. These findings indicate that the STP was effective in significantly improving both knowledge and practice regarding hand washing among primary school children.

Table 5 shows the correlation between post-test knowledge and practice regarding hand washing among primary school children. The mean post-test knowledge score was 23.9 (SD = 3.45), while the mean post-test practice

Table 2: Distribution of samples according to their pre-test and post-test score of knowledge

Level of knowledge regarding hand washing among primary school children	Sample group			
	Pre-test score		Post-test score	
	Frequency	Percentage	Frequency	Percentage
Inadequate	52	65	0	0
Moderately adequate	28	35	36	45
Adequate	0	0	44	55

Table 3: Distribution of samples according to their pre-test and post-test score of practice

Practice score regarding hand washing among primary school children	Sample group			
	Pre-test score		Post-test score	
	Frequency	Percentage	Frequency	Percentage
Inadequate	48	60	00	0
Moderately adequate	32	40	24	30
Adequate	0	0	56	70

Table 4: Comparison of effectiveness of pre-test and post-test score of knowledge and practice regarding hand washing among primary school children

Variable	Observation	Mean	SD	Mean difference	paired "t" value	Significance
Knowledge regarding hand washing	Pre-test	14.8	4.24	9.1	14.879	Significant at 0.05 level
	Post-test	23.9	3.45			
Practice regarding hand washing	Pre-test	8.8	3.14	6.5	15.08	Significant at 0.05 level
	Post-test	15.3	2.22			

SD: Standard deviation

Table 5: Correlation between post-test knowledge and practice scores regarding hand washing among primary school children

S. No	Variable	Mean	SD	"r" value
1	Knowledge regarding hand washing	23.9	3.45	r=0.1748
2	Practice regarding hand washing	15.3	2.22	

SD: Standard deviation

score was 15.3 (SD = 2.22). The calculated correlation coefficient (r = 0.1748) indicates a low positive correlation between knowledge and practice. This suggests that although knowledge and practice are somewhat related, the relationship is weak, implying that an increase in knowledge does not necessarily lead to a proportionate improvement in practice among the children.

Discussion

The present study was conducted to assess the effectiveness of an STP on knowledge and practice regarding hand washing among primary school children. The findings revealed a significant improvement in both knowledge and practice scores after the intervention, indicating that STP is an effective educational strategy to promote proper hand hygiene among school children.

In the present study, pre-test results showed that most children had inadequate knowledge (65%) and inadequate practice (60%) regarding hand washing. This finding is consistent with a cross-sectional study conducted among school children in Mumbai, India, which reported poor knowledge and inadequate hand-washing practices, with only a small proportion of children following the correct steps of hand hygiene.[8] This indicates that a lack of awareness and improper hygiene behavior is a common issue among school-aged children, especially in developing settings.

After implementation of the STP, the present study showed a marked improvement in both knowledge and practice, with 55% of children achieving adequate knowledge and 70% achieving adequate practice in the post-test. Similar findings were reported in a quasi-experimental study where mean knowledge and practice scores increased significantly after STP intervention, confirming its effectiveness in improving hygiene behavior among children.[9] Another study also reported a significant increase in post-test scores, supporting that STPs lead to better learning outcomes and improved hand-washing behavior among school children.[10]

The present study also found a significant difference between pre-test and post-test scores, indicating that STP had a strong impact on improving both knowledge and practice. This is supported by another study where a structured teaching intervention resulted in a statistically significant improvement in hand hygiene knowledge and practice among children, with better post-test performance compared to pre-test results.[11,12] These findings confirm that structured teaching methods, including demonstrations and interactive learning, are effective in improving health-related behaviors in children.

The correlation analysis in the present study showed a low positive relationship between knowledge and practice (r = 0.1748), indicating that improvement in knowledge does not always strongly translate into improved practice. This finding is supported by a study which reported that although STP improved both knowledge and practice, the relationship between them remained weak, suggesting that behavior change is influenced by multiple factors beyond knowledge alone.[11,13] Factors such as availability of water and soap, parental reinforcement, school environment, and habitual behavior may also play an important role in ensuring consistent hand-washing practices.

Overall, the findings of the present study are consistent with existing literature, which strongly supports that STPs are effective in improving both knowledge and practice regarding hand washing among school children. However, sustaining behavioral change requires continuous reinforcement, the availability of proper hand washing facilities, and the involvement of teachers and parents in reinforcing hygiene practices.

Conclusion

The STP was effective in improving both knowledge and practice regarding hand washing among primary school children. Post-test results showed a significant increase in scores compared to pre-test levels. However, the weak correlation between knowledge and practice indicates that knowledge alone is not enough to ensure proper practice. Regular reinforcement is needed to sustain good hand hygiene behavior.

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Conflict of Interest

The author, Shailly, declares that there are no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. The author confirms that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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