

# Effect of Children Hand Washing Practices on Infectious Disease Risk in Community Setting

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## ABSTRACT

**Background:** Hand washing is an important element for the children because the children are most vulnerable to suffer from contaminated hands. Children are at risk of many infectious disease due to poor hygiene practices. Hand hygiene play important role to reduce the spread of infectious diseases and to combat illnesses.

**Aim:** To see the effect of children hand washing practices on risk of infectious diseases in a community settings.

**Methodology:** An interventional study was conducted in the seven rural communities of Lahore, Pakistan in school settings. The sample size was 1076 school students in grade 4<sup>th</sup> and 5<sup>th</sup> divided into intervention and control group. A well-structured adopted questioner was used for collecting the data from the participant. Interventions were applied for 12 weeks. Ethical consideration was followed. Data was analyzed on SPSS (version 21.0) Descriptive statistics was applied to determine the demographics of students. Inferential statistics was applied to see the impact of educational interventions.

**Results:** Morbidity data results in two group depict profound differences. Result of Chi-square test are also evident that hand washing practices proved helpful to reduce disease burden in school children. p-value of <0.05 depict significant results.

**Conclusion:** Hand washing practices had statistically significant effect on risk of infection. Study results confirmed that hand- hygiene interventions are efficacious for preventing illnesses and reducing infection risk in children. This study mitigate the need to enhance children hand washing behavior to overcome the infectious ailments.

**Keywords:** Hand Washing, Educational Intervention, Infection Risk, Children.

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## INTRODUCTION

Hand hygiene decreases the spread of infections. Poor compliance with hand hygiene practices remains a challenge for control and prevention of infections all over the world<sup>1</sup>. A major problem of health issues in developing country is unhygienic environment particularly lack of hand washing that leads to health hazard especially in children. Children have no knowledge regarding the importance of hand washing. Appropriate hand hygiene is the simplest, most reasonable and valuable means to overcome the infection. Hand washing is especially important for the children because the children are most vulnerable to suffer from contaminated hands. Children are at risk of many infectious disease due to poor hygiene practices<sup>2</sup>. Hand hygiene play important role to reduce the spread of infectious diseases. Hand hygiene prevents many illnesses<sup>3</sup>. Many diseases are caused due to lack of poor hand washing practices. According to the World Health Organization hand hygiene stops sepsis and other infectious diseases. It is estimated that sepsis influence more than 30 million people in every year worldwide. Effective hand washing plays a key role to prevent infectious diseases<sup>4</sup>.

Proper hand washing significantly reduce the prevalence of diarrhea and pneumonia, which are leading causes of children morbidity and mortality worldwide. Handwashing with soap can decrease the threat of diarrhea episodes by 30–47% and respiratory infections

upto 23%<sup>5</sup>. Hand washing serves a significant part in combating respiratory infections. During 2016, incidence of the severe acute respiratory syndrome (SARS) was reduced 55 percent by washing hands more than 10 times a day. Washing hand with soap has been considered as one of the most cost-effective and simple intervention that saves children from diarrheal associated diseases<sup>6</sup>.

In Pakistan, mostly children die due to infections from diarrhea and respiratory infections. As a cost-effective life-saving intervention, hand washing can diminish the rate of diarrhea among children under five by almost 50 percent, and respiratory infections by nearly 25 percent. These illnesses and future health problems issues could be prohibited if children wash their hands properly<sup>7</sup>.

Factors accountable for the poor hand hygiene practices include lack of sinks and washing agent like soap, too much busy schedule, lack of proper knowledge regarding hand washing method, diminished threat of acquiring infections<sup>8</sup>. Barriers to hand washing are unavailability of soap, inaccessibility of clean water, lack of time, laziness, and possibly forgetfulness<sup>9</sup>. Hand washing with cleanser is an easy and reasonable way to minimize loose bowels and respiratory diseases (death 1.2 million per year): Hand washing is important for the prevention and spread of germ in the school and in the community. Because proper hand washing reduce the frequency of illnesses, so it is necessary to educate the primary school children about hand washing practices<sup>10</sup>.

A study evaluated the practices of personal hygiene in school going students. Results show that ability to define hand hygiene in school children was considerably high.

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Parents and teachers play a major role in delivering knowledge about personal hygiene<sup>11</sup>. Another study figure out the results of hand hygiene practices and its secondary factors in primary school children. The findings show that only 22% of students were aware of hand washing skills. It was concluded that hand washing have desirable outcomes and reduce the children absenteeism resulting from infectious ailment in school<sup>12</sup>.

A study explored the hand washing knowledge of school children. Results showed hand hygiene mean knowledge score of students regarding hand washing practices was 53.86 so a need for improving the skills of students about hand hygiene was emphasized<sup>13</sup>.

Behavior modification improve hand washing practices and minimize the risk of infection. The finding of the study shows that students' behavior toward the hand washing was 31% only. So, there was a need to modify students' behavior regarding hand washing practices<sup>14</sup>. Reasons for lack of hand washing practices from the students' perspective included: 'no need' (70.8%) and 'the hand-washing facilities were not clean to the required level' (62.3%). These findings indicate that school going students ignore hand-washing after different critical situations<sup>15</sup>.

A study on the knowledge and practices of school students about hand washing show that 37.67% children wash their hand for the prevention of disease, 53.34% children did not know how to wash their hands, and just 23.34% children wash their hand properly<sup>16</sup>.

Present study aimed to see the effect of children hand washing practices on risk of infectious diseases in a community settings.

## METHODOLOGY

An interventional study was conducted in the seven rural communities of Lahore, Pakistan in school settings. The sample size was 1076 school students in grade 4<sup>th</sup> and 5<sup>th</sup> divided into intervention and control group. A well-structured adopted questioner was used for collecting the data from the participant. Questionnaire was translated in Urdu for feasibility of students. Interventions involved health promotion activities related to significance of hand washing, timing regarding hand wash and washing practices were taught through demonstration, videos and pamphlets were distributed to the study population. Different techniques with the use of multiple agents were included to enhance student understanding of washing practices. Students were trained to reveal their practices

and reflect their understanding. Interventions were applied for 12 weeks. Students were followed for a period of next six months to see the effect of interventions. Morbidity related to multiple illnesses was examined in the two group. Data was collected on various ailments at multiple times to see variation in two groups. Ethical consideration were followed. All the information was provided before conducting the research. Data was analyzed on SPSS (version 21.0) Descriptive statistics was applied to determine the demographics of students. Independent t-test was used to see the difference in hand washing practices in study and control groups. Chi square test was used to see the impact of education on morbidity rate in children. Paired t-test was used to see the effect of educational programme in study group.

## RESULTS

Table 1 represents the distribution of participant by demographic characteristics. The data is summarized in terms of frequency and percentage.

Table 1: Description of Demographic Characteristics

Characteristics	Category	Children	
		Number	Percent
Grade	4 <sup>th</sup>	665	61.8
	5 <sup>th</sup>	441	38.2
Water Supply	Municipal Water Supply	748	69.5
	Personal Hand pump	328	30.5
Sinks at home	Two	706	65.6
	Three	370	34.4
Sinks that children access easily	One	750	69.7
	Two	298	27.6
	Three	28	2.6
Sink which have availability of soap	One	638	59.2
	Two	350	32.9
	Three	88	7.9

Above table gives the demographic profile of study participants. Education status depict that 665 children from 4<sup>th</sup> grade while 441 were 5<sup>th</sup> grade student. Municipal water supply was available in 748 and personal hand pump in 328 houses. Table also shows the availability of recourses that directly influence hand washing practices.

Table 2 shows the impact of hand washing practices in intervention group. Morbidity data results in two group depict profound differences. Result of Chi-square test are also evident that hand washing practices proved helpful to reduce disease burden in school children.

Table#2: Association of hand washing practices and risk of infection after educational interventions.

	Intervention Group (n=538)		Control Group (n=538)		(Chi-square) p-value	
	Present	Absent	Present	Absent		
GIT Illnesses	129(23.9)	409(76.1)	362(67.2)	176(32.8)	10.37	0.01*
Respiratory Illnesses	98(18.2)	440(81.8)	313(58.2)	225(48.8)	36.10	0.01*
Other Illness	50(9.3)	488(90.7)	410(76.2)	128(23.8)	94.85	0.01*

Table 3: Paired Sample Test of Pre and Post Interventional Data

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Post data Pre data	.362	.35802	.06648	-.49825	-.22588	-5.44	537	.000

The paired t-test value (-5.446) shows statistical significance at level of  $p < 0.05$ . P-value of pre and post-test is .000 which is less than 0.05 which shows a significant difference in pre and post scores of participants. The statistical value is evidence that the structured teaching program was effective in promoting hand washing behavior of children.

## DISCUSSION

Hygienic washing can play a significant role in the prevention of diseases. Hand washing performed appropriately with soap and water is the best element of a hand hygiene that decreases the threat of infection through hand contact. As in a study, hand washing is an easy and efficient measure to avoid the spread of fecal-oral disease and infectious disease among school children<sup>17</sup>.

This study verified that the low rate of hand washing was due to poor physical environment that inhibited children from practicing hand washing practices. These findings were in agreement with another study<sup>18</sup> that depict environmental factors contribute to children hand washing behaviors. Findings also predict the association of other factors like knowledge of hand washing practice, insufficient opportunities and lack of sanitation facilities with risk of contracting various diseases. Similar results are revealed in another study on hand washing practices<sup>19</sup>. The hand washing practice of primary school children with soap was improved after educational intervention in this study. Study outcome were parallel to the study<sup>20</sup> that shows that 97.4% student wash their hand after toileting with Soap and water, while 63.2% did hand washing practice with soap and water and 31.6% of student washed their hands before eating food with Soap and water. Proper Hand hygiene practices decrease the disease risk. The findings of the present study have demonstrated statistically significant improvement in infection risk after hand washing compared to control group. Similarly, a study shows remarkable decrease in disease burden of school children following hand washing practices<sup>21</sup>.

In this study, there was significant increase in score concerning hand washing practices of primary school children after health education programme ( $p < 0.05$ ) which was supported by the study<sup>22</sup> that accomplished that health education interventions cause a significant change in hand washing practices.

Findings elaborate the significance of hand washing practices in reducing morbidity rate in children. Compared to control group, intervention group had low disease level. Furthermore, interventions proved effective to reduce disease burden and infection risk was minimized. These findings are consistent with a study<sup>23</sup> that evaluated the relationship between hand washing and disease risk yielding similar evidences.

## CONCLUSION

Based on the findings of the current study, it is concluded that the hand washing practices of children in primary schools were improved after educational implementation. Hand washing practices had statistically significant effect on risk of infection. Study results

confirmed that hand- hygiene interventions are efficacious for preventing illnesses and reducing infection risk in children. This study mitigates the need to enhance children hand washing behavior to overcome the infectious ailments. Increased awareness regarding washing practices is a key to combat disease burden at primary level.

## RECOMMENDATIONS

1. To develop training programs for promoting hand washing behaviours that focus on the preventive aspect.
2. There is an urgent need for a systematic approach to care which should be based on creative factors to diminish infection risk in children.
3. To initiate a nationwide awareness campaign that follows primary prevention strategies as it has the potential to improve care and reduce costs.

**Grant Support & Financial Disclosures:** None

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