

Original article

Effects of “Bacterfree Hand Intervention” on the knowledge, attitude of handwashing and its technique, among pre-schoolers in Wilayah Persekutuan, Malaysia.

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Abstract

Background and objective: Through contaminated hands, number of infectious disease can be transmitted from one person to another. *Salmonella spp*, *E. coli* O157, norovirus and adenovirus that can cause diarrheal and respiratory infections are transmitted either directly or indirectly via contaminated objects. Children are at higher risk of getting such infections as they lack natural immunity and understanding of the importance of good hygiene. Hand washing is one of the most important factors in controlling the spread of the microorganisms. This study aimed to determine the knowledge and attitude of hand washing and the hand washing technique, in relation to “Bacterfree Hand Intervention” among pre-schoolers. **Materials and methods:** This cluster-randomized trial involved 146 pre-schoolers from 3 different pre-schools in Wilayah Persekutuan was conducted from April to August 2015. Participants were interviewed twice; pre and post intervention. Face-to-face interview was done using guided questionnaires that include questions on knowledge and attitude of hand washing and its techniques. A group of students were given single intervention i.e. posters and the other group participated in “Bacterfree Hand Intervention” program which consisted of storytelling, posters and demonstration. **Results:** There were significant increase of knowledge (median (10.00 vs 11.00, $P < 0.001$) and technique (6.00 vs 6.00, $P = 0.020$) after intervention in single intervention group while the attitude (median 6.00 vs 6.00, $P = 0.871$) was remained unchanged. Meanwhile, the median of knowledge, attitude and hand washing techniques in multiple intervention group increased significantly after intervention. **Conclusions:** This study highlighted the need of comprehensive educational programs that include various mode of delivery to create awareness regarding the importance of hand hygiene among pre-school children. This is very important to establish healthy environment and eventually prevent communicable diseases in the community.

Keywords: Handwashing; Pre-Schoolers; Knowledge; Attitude; Technique; Intervention

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Introduction

Good handwashing reduces the spread of diseases through foodborne and faecal-oral transmission. Through contaminated hands, number of infectious disease can be transmitted from one person to another. *Salmonella spp*, *E. coli* O157, norovirus and adenovirus that can cause diarrheal and respiratory

infections are transmitted either directly or indirectly via contaminated objects. Centre for Disease and Control stated that the diarrheal disease-associated death is estimated to reduce by 50% with the practice of hand washing with soap and water¹. Children are at higher risk of getting such infections as they lack natural immunity and understanding of

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the importance of good hygiene. Usually children are taught with this basic principle at home. However, when the children are in school, parents are not around to evaluate them, often decreasing their parents’ reinforcement².

Studies had shown that hand washing practice was affected by several factors; Inadequate facilities such as un-refilled soap dispenser and present of hot air dryers contributed to low soap usage and lack of drying. This particular problem makes it difficult for children to maintain adequate hand hygiene behaviour in schools³.

People’s bad behaviour should be changed. Bowen et al. stated that it was difficult to change the handwashing behaviour of some people⁴. A study in Ethiopia found that knowledge, awareness, training on hand hygiene and sanitation and parents’ health package status were factors that influenced hygiene behaviour⁵. Nevertheless, continuous education and promotion have been shown to result in better hand washing knowledge, attitude and practices. For children, it also helped in reducing school absenteeism⁶.

This present study focused on the effect of single and multiple intervention on the knowledge, attitude of handwashing and of handwashing among pre-schoolers in Wilayah Persekutuan, Malaysia. We hoped that the findings of this study would help in restructuring health educati

Materials and method

Study population

This cluster-randomized study involved pre-schoolers aged 5 and 6 years old studying in afternoon session at preschools under Majlis Agama Islam Wilayah Persekutuan (MAIWP) in Malaysia. There were 8 preschools running afternoon session with a total of 694 pre-schoolers. The calculated sample size was 149. Only 3 pre-schools (total number of students 352) were randomly selected using “Stat Trek Random Number Generator” Software after considering the inclusion and exclusion criteria. Cluster randomization method was used to allocate the preschools into multiple intervention (Group A) or single intervention (Group B) group.

Study Instrument and Data collection

There were pre and post questionnaires to evaluate the knowledge, attitude and handwashing technique. Participants were interviewed face to face about the knowledge, attitude and handwashing techniques before interventions were given. For handwashing technique, the respondents were asked to do demonstration on how they washed their hands. The

steps that was shown were ticked by the interviewers in the guided questionnaire. The interviewers were briefed and had been trained on asking the questions to minimize bias among interviewers. “Bacterfree Hand Intervention” comprised of storytelling, hand washing technique demonstration with hands-on and posters were provided to Group A while only posters given to Group B. Posters were stacked on the wall at the level where it can be seen clearly by the pre-schoolers. After a week, the pre-schoolers were re-interviewed about the knowledge, attitude and technique of hand washing.

Ethical consideration: This study was conducted with approval from both the Ethics Committee for Study Involving Human of Universiti Putra Malaysia (JKEUPM) and Majlis Agama Islam Wilayah Persekutuan (MAIWP). Written informed consent was obtained from the parents.

Data Analysis

Statistical calculations was performed using the standard statistical software package, SPSS 21.0 for Windows (LEADTOOLS ©, LEAD technologies, Inc, US). Median and range was calculated for all normally distributed continuous variables. Mann-Whitney test was used to compare the variables between each group. Wilcoxon signed rank test was used to analyse the frequency of handwashing on pre and post intervention of both groups. In all statistical analyses, a ‘P’ value of < 0.05 (95% confidence interval) was considered to be statistically significant.

Results

A total of 150 names were selected, with 97.3% (146) returned rate. More than half (52.1%, 76) of respondents were at the age of 6 years old and the rest were 5 years old. Seventy eight (53.4%) of them were girls. Three preschools were selected namely Tadika X, Tadika Y and Tadika Z. Table I showed the distribution of respondents based on the pre-school location.

Table 1: Distribution of respondents by pre-school location

Schools	Frequency (n)	Percent (%)	Cumulative percent (%)
Tadika X	40	27.4	27.4
Tadika Y	31	21.2	48.6
Tadika Z	75	51.4	100.0
Total	146	100.0	

Mann-Whitney test was used to calculate the comparison of hand washing technique knowledge and attitude of handwashing before and after intervention and between multiple intervention group (Group A) and single intervention group (Group

B). Table 2 showed that pre intervention technique and knowledge between the two group were not significantly different. However, post intervention technique, knowledge and attitude were significantly different between group A and B.

Wilcoxon Rank Signed Test was used to calculate changes of knowledge, technique and attitude score after intervention among 75 students in Group A (Table 3) and among 71 students in Group B (Table 4). For group A that were provided with multiple intervention, showed significant difference in pre and post knowledge, technique and attitude. Meanwhile, group B showed significant difference only in pre and post knowledge and technique.

Table 5 outlined the number of respondents that demonstrated the hand washing steps, pre and post intervention. In summary, all numbers increased after intervention, both in Group A and B.

Discussion

This present study showed that knowledge on hand washing was increased after both single and multiple interventions. It showed that the interventions were easy to understand and the children had good interest in learning new things. However, this new knowledge should be reminded and reinforced time to time in order to ensure long lasting memory. Parents and teacher should also be involved in providing adequate facilities for the children to translate their knowledge into action and to maintain compliance. Hand hygiene knowledge was found to be associated with hand hygiene compliance. Those who had good knowledge on hand hygiene had 3.8 times more compliance than those who had poor knowledge⁷. In contrast, Sharma et al. proved that good knowledge might not be converted into actions. In her study, 82% doctors and 59% nurses claimed to have knowledge regarding proper hand hygiene technique⁸. However, the figure was not transformed into practices due to several reasons such as heavy workload, lazy attitude, lack of time and inadequate motivation.

According to the World Health Organization (WHO), there are 11 steps in assessing proper handwashing technique. In this study, the respondents were being observed on how they wash their hands according to the WHO guidelines. They were divided into single (group B) and multiple intervention groups (group A). The single intervention group was given only a poster on the proper step of handwashing while the multiple intervention group was provided with storytelling, demonstration and poster on the proper

step of handwashing. Before intervention, most respondents in both group only knew and practiced 5 steps of handwashing. Most of them demonstrated the following steps: 1) Using water 2) Using soap 3) Wash palm to palm 4) Rinse with water and 5) Dry both hands with towel. After intervention, we could see huge improvement in the knowledge of proper hand washing techniques in both groups. This findings indicated that instillation of knowledge could result in change of behaviour. Multiple interventions group had higher frequency of respondents with correct technique as compared to the single intervention group. It exhibited that multiple interventions with various mode of teaching and learning stimulate better learning processes in terms of understanding and memorizing. This was also supported by a study by Spencer et al. which indicated that children who received the most frequent and variable education on handwashing showed the most improvement in their handwashing habit and technique⁹.

Single intervention (posters) increased the knowledge on hand washing and its proper technique. Nevertheless, the intervention did not increase their attitude towards hand washing. This result indicated that written instruction only was not adequate for children. Being children, they need more active intervention that include verbal and physical involvement such as playing games, storytelling and demonstrations with hands-on experiences.

In conclusion, this study suggested that with various method of interventions, the compliance of handwashing behaviour can be increased. Child learns best during young age. Hence, a comprehensive educational program that include various mode of deliveries to create awareness regarding the importance of hand hygiene should begin as early as possible. This is very important to establish healthy environment and eventually prevent communicable diseases in the community. Regular reinforcement and reminders are important to ensure compliance.

Author's Contribution

All contributors participated in face to face interview and during intervention. MHM and NAE were medical students who prepared all the groundwork and the manuscript. TZMTJ was the main supervisor for the student who gave ideas, monitor their project and improve the manuscript. NAM was the co-supervisor who involved mainly in the groundwork and improve this final manuscript. None of the authors have any competing interests.

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