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Original investigation

Comparing the Effect of Lecture and Practical Demonstration Methods on Hand Hygiene in Elementary Students

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ABSTRACT

Objectives: This study aimed to compare the effect of lecture and demonstration on knowledge and performance of hand-washing in elementary students of Kermanshah in 2018.

Methods: This experimental study was conducted in 2018 with 90 students of fourth grade elementary school in Kermanshah, Iran. Students were randomly divided into three groups including demonstration education, lecture education and a control group. Data were collected using a checklist of hand-washing performance and a researcher-made questionnaire for measuring knowledge. The intervention was conducted in three sessions for both education groups. Data analysed with SPSS 22.0, using one-way ANOVA, and Repeated Measures tests.

Results: The mean age of students was 9.3±0.4 years. There were no significant differences between knowledge and performance of hand-washing in three groups before educational intervention. Mean scores of knowledge and performance immediately after, and one month after intervention was higher in two education groups than control group ($p<0.001$). There was no significant difference in mean changes of knowledge between two groups; before and immediately after the intervention ($p=0.631$), and before and one month after the intervention ($p=0.149$). There was also no significant difference between the performance scores; immediately after compared to before intervention in two groups ($p=0.089$), but one month after intervention, the changes in performance scores was significantly higher in demonstration group ($p<0.001$).

Conclusion: This study showed that lectures and demonstrations are effective ways to increase students' knowledge in the field of hand hygiene. Also this study suggests that practical demonstration method for teaching hand wash behaviour is more effective than lecture methods in children.

Keywords: demonstration, hand hygiene, hand-washing, lecture

INTRODUCTION

School plays a decisive role in promoting the health of children and adolescents. Health education programs in the early years of the school have significant and sustained effects on knowledge, attitudes and behaviors in adulthood (1). Attention to health issues in educational environments is considered to be the most effective and basic factor in the physical and mental development of students, especially at childhood (2). Due to the importance of hand hygiene in prevention communicable diseases especially influenza, international organizations such as the Centers for Disease Control and Prevention (CDC) have published comprehensive guidelines aimed to accurate education and updating them frequently (3). Despite the importance of hand hygiene and the existence of relevant guidelines, evidence suggests that most individuals at institution and organizations do not adhere to hand hygiene (4). Hence, various assessments are conducted on hand hygiene in different countries in order to identify the weaknesses in its implementation and related factors (5).

Health education is an essential element in the development of health, with the emphasis on preparing people through providing knowledge and information and demonstrating skills and health experiences in which people can have more control over their health (6). Educational planning is one of the components of health education and requires the selection of appropriate methods. Choosing a suitable educational method for the children's health education is an important consideration in the prevention of communicable diseases in the community (7).

Lecture regarded as one of the traditional methods of health education has been considered as the first educational method from a long time ago. Lecture used extensively in educational efforts, but today, with significant advances in educational technology, there are many other varied methods for education including Group discussion, Role play, Demonstration, Problem solving, etc. (8).

Practical Demonstration is one of the effective and appropriate methods in health education and it has been suggested that demonstration can be used to conducting education at different levels from primary education to complete learning (9). Many studies in the world have examined the effects of health education on hand hygiene, which is mainly carried out in advanced countries (10). However, it seems that in Iran, studies that compare the effects of different methods of health education on hand hygiene in students are not sufficient. Therefore, the present study was conducted to compare the effects of two education methods including lecture and practical demonstration on knowledge and performance of healthy hand washing in elementary school students of Kermanshah, Iran.

METHODS

Study design and sample

The present study was a three armed randomized control trial which was conducted during April and May of 2018. The population of this study consisted of 4th grade elementary school students in Kermanshah, the west part of Iran. Sampling was done using multi-stage random sampling method. Firstly, one of the three education districts of Kermanshah (District 3) was randomly selected and a list of girls 'schools in that district was prepared. Then three schools were selected randomly amongst all of the elementary schools covered by this district (50 girls' schools). From those, a school was assigned for lecture instruction and one allocated for demonstration educational intervention. Also another school was assigned for control group. In the final stage, one class of fourth grade in selected schools was designated for participation in the study. It should be noted that three selected schools have similar educational facilities. In total, 90 patients met the inclusion criteria and participated in study, with equal distribution of 30 students per each group.

Inclusion and exclusion criteria

The inclusion criteria for the present study were: studying in fourth grade, student and parent informed consent to participate in the study, lack of severe skin disease in both hands, and lack of disability in hands practice. Students were informed that they could exclude from the study if they were not satisfied with continuing the participation in each step of study.

Instruments

The data collection tools consisted of a two-part questionnaire, and a checklist on hand-washing performance. The first part of the questionnaire consisted of five questions about the status of demographic information. The second part included 15 questions that were used to measure the knowledge of the participants about hand hygiene. For each correct answer, one score was assigned, and no score received for the wrong answer. The third part of the data collection tool was a pictorial checklist to assess the correctness of hand washing behaviour, in which the correct behaviour of hand washing was divided into six stages, each item rated from zero to three score.

To determine the face and content validity, the data collection tool was sent to ten specialists of health education and health promotion according to which, necessary corrections were made based on their comments. Using experts' opinions, the validity of the knowledge questionnaire was confirmed using the Content Validity Ratio (CVR) of 0.89, and Content Validity Index (CVI) of 0.82. Accordingly, CVR and CVI of performance checklist were 0.85 and 0.80, respectively.

A two-week test-retest method was also used for reliability assessment of the knowledge questionnaire according to which acceptable coefficient of 0.75 was obtained. To evaluate the inter-rater reliability of the checklist, five health caregivers rated the checklist items separately on role playing by one role player's student. None of the five examiners were aware that the participant only plays a role in this regard. The role player performed the six steps of hand-washing in 5 times for five health caregivers quite similarly. Mean score given to the role player by health caregivers was 11, whereas the score of a role playing according to the checklist guideline was 12. Hence, the inter-rater reliability of the data collection checklist in the multiple measurements (by different examiners) was approved.

Intervention

Two different educational methods which used in this study were lecture (group A), and practical demonstration (Group B). For each group, three 45-minute training sessions were held. At the first session, personal hygiene and advice on hygiene was presented. Hand-washing skills were also assessed in both groups in this session. The second session focused on infectious diseases, the importance of washing hands and the time needed to wash the hands. In the third session, the procedures of hand washing were taught, according to which in demonstration group was presented as a practical demonstration, but in the lecture group only by explaining and using the hand-washing poster. The control group did not receive any intervention during the study implementation.

Ethical consideration

The purpose of the study was explained to students and their parents. Written consent form was obtained from parents. Questionnaires were anonymous and confidentiality of information was ensured. This study received ethics approval from the Research Ethics Committee of Kermanshah University of Medical Sciences (No: IR.KUMS.REC.1397.020). To meet the ethical issues, after the intervention and evaluation, all stages of the training program were performed for the control group.

Table 1. Comparison of knowledge and practice in the study groups; before, immediately after, and one month after the intervention

Variable	Groups	Scores (Mean ± SD)			Repeated Measures	
		Before education	Immediately after education	One month after education	Partial Eta Squared	p-value
Knowledge	Demonstration	11.10±2.05	13.60±1.23*	13.20±1.06*	0.588	p<0/001
	Lecture	10.35±2.03	13.65±1.22*	12.55±1.39*	0.727	p<0/001
	Control	11.20±2.21	11.65±2.15**	11.15±2.25**	0.060	p=0.299
	p-value*	P=0.382	p<0/001	p=0.001		
Practice	Demonstration	5.55±2.16	13.35±1.84*	11.85±2.15*	0.874	p<0/001
	Lecture	4.8±1.73	10.70±1.56**	8.15±1.75**	0.817	p<0/001
	Control	5.20±1.96	6.4±1.98***	5.90±1.55***	0.139	p=0.068
	p-value*	p=0.485	p<0/001	p<0/001		

*One-way ANOVA
Bonferroni post-hoc: * >** >***, significance level of <0.05

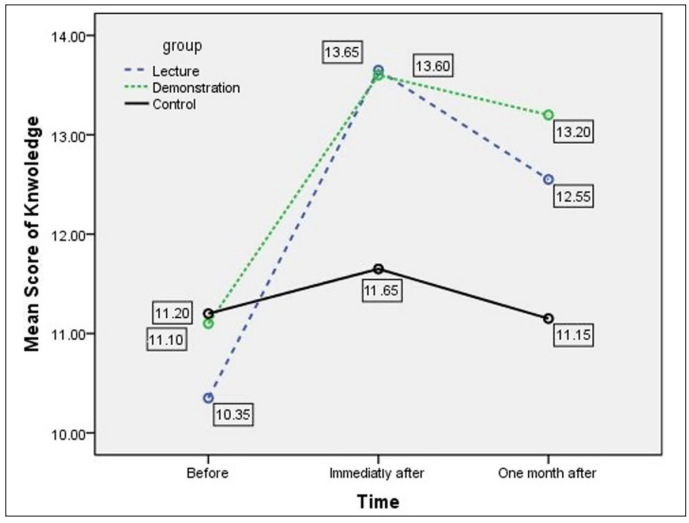

Figure 1. Repeated measures of knowledge mean scores in three groups during three measurements.

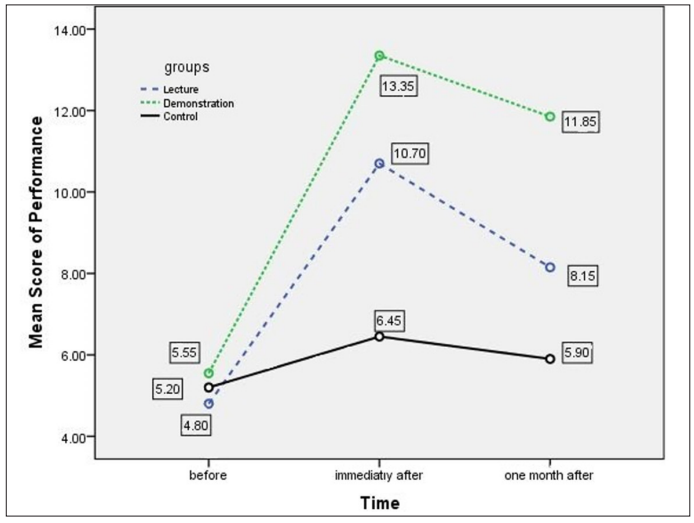

Figure 2. Repeated measures of performance mean scores in three groups during three measurements.

Statistical Analysis

SPSS software version 22.0 was used for data analysis. The collected data were analysed using descriptive statistics (such as frequency, mean and standard deviation). One-way ANOVA, independent T-test, and Repeated Measure test were used the effect of education on dependent variables. The significance level of p<0.05 was considered.

RESULTS

The mean age of students was 9.3±0.4 years. Totally, 67.8% of their fathers were employees, and most of their mothers (60%) were housewives. 50% of the parents had college education and others had a diploma or lower education.

As shown in Table 1, according to the results of the study, there were no significant differences between knowledge and performance of hand-washing in three groups before educational intervention. One-way ANOVA test showed that knowledge and performance of students immediately after, and also one month after education were different significantly amongst the three groups. Subsequently, the Bonferroni post hoc test was used to the multiple comparisons between groups according to which Knowledge scores were not significantly different in the two intervention groups but were significantly lower in the control group (Table 1).

Also, the Bonferroni post hoc test showed that the performance score immediately after and one month after the intervention was significantly higher in the practical group than the lecture group. It was also significantly lower in the control group than in the two groups.

As shown in table 1, according to the results of the one way repeated measures ANOVA test, the effect of intervention in two educational groups on knowledge and hand washing performance in students at different evaluation times was significant (p<0.001).

Figure 1 and 2, illustrate the repeated measures of knowledge and performance mean scores in three groups during three measurements.

DISCUSSION

The results of this study showed that educational intervention had a significant effect on students' knowledge immediately after intervention and one month after intervention, using two methods of lecture and practical demonstration. However, although in both groups the intervention has increased the knowledge of individuals, but the type of intervention has no significant effect on the increase in knowledge, and both methods have had an impact on the increase of knowledge of students. In contrast, the results of a similar study showed that role playing and demonstration were more successful approaches to increasing the student awareness about health behaviour (11). The results of a systematic review on educational interventions in students showed that generally, participatory interventions such as group discussion, role playing, and practical demonstration as well as audiovisual methods have had a greater impact on increasing the knowledge of students than lecture method (12). In this study, considering that the intervention to increase students' knowledge in both lecture and presentation methods was almost the same and the main difference was in hand washing practice training, therefore, the results showed no difference in students' knowledge in the two groups after intervention.

The results of the study in the field of performance showed that educational intervention had a significant effect on the hand washing performance immediately after, and one month after the intervention, in both the lecture and demonstration groups. A similar study showed that the average number of hand washing after intervention in the intervention group was significantly increased, and the frequency of daily hand washing after the intervention in the intervention group was significantly more than the control group (13).

In the present study, the performance scores of two intervention groups showed a significant difference immediately after the intervention, which was consistent with the previous studies (11). Similarly, the performance of students on hand washing skills one month after the intervention in demonstration group was significantly higher than the lecture group. In a study on oral health behaviours, performance one month after the education in students with the multimedia training method was significantly higher than the lecture group (14). Another study also showed that role playing method was more effective in nutrition practice one month after education compared to the lecture method (11). This confirms that demonstration is a better way to learn and improve memory when students actually see and perform the behaviour, but in the students of the lecture group, given that the content was only explained to students, they had a relatively lower increase in practice immediately after the intervention, and forgot a major part of the training one month after the intervention compared to the demonstration group.

Limitation

Student congestion and time constraint in elementary schools were the limitations of this study that led to a number of disruptions to completing the checklist. However, the researchers attempted to minimize the limitations by justifying and informing the students about the purpose of the study, as well as clarifying any ambiguities.

CONCLUSION

The results of this study showed that lecture and demonstration are effective ways to increase students' knowledge in the field of hand hygiene. Also this study suggests that practical demonstration method for teaching hand wash behaviour is more effective than lecture methods in children. Given the high level of communication among children in schools and child care facilities, there is a high risk of spreading infectious diseases especially influenza in schools. Implementing the targeted and cost effective hand washing programs can reduce infectious diseases, students' absence, antibiotic resistance, and the cost of disease treatment.

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Informed Consent: Written consent was obtained from the parents.

Compliance with Ethical Standards: Written permission was received from the Ethics Committee of Kermanshah University of Medical Sciences (Approval number: IR.KUMS.REC.1397.020).

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REFERENCES

1. Marks R. Schools and health education: what works, what is needed, and why? Health Educ 2008;109:4–8. [CrossRef]
2. Henry M. The Simpsons, Satire, and American Culture. US: Palgrave Macmillan; 2012. p.201. [CrossRef]
3. Boyce JM, Pittet D, Healthcare Infection Control Practices Advisory Committee; HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Guideline for Hand Hygiene in Health-Care Settings: Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. MMWR Recomm Rep 2002;51:1–45. https://www.cdc.gov/mmwr/PDF/rr/rr5116.pdf
4. Lam BCC, Lee J, Lau YL. Hand hygiene practices in a neonatal intensive care unit: a multimodal intervention and impact on nosocomial infection. Pediatrics 2004;114:e565–e571. [CrossRef]
5. Zandiyeh M, Borzou R. The level of hand hygiene compliance by operating room personnel of Educational Hospitals in Hamadan University of Medical Science. J Holistic Nurs Midwifery 2012;22:23–29. https://www.sid.ir/en/Journal/ViewPaper.aspx?ID=271111
6. Murray JJ, Nunn JH, Steele JG. The prevention of oral disease, 4th ed. Oxford University Press; 2003.
7. Biezen R, Grando D, Mazza D, Brijnath B. Visibility and transmission: complexities around promoting hand hygiene in young children-a qualitative study. BMC Public Health 2019;19:398. [CrossRef]
8. Lee A, Tsang KK, Lee SH. Youth health promotion and health promoting schools: what should be the aims? Asia Pac J Public Health 2000;12:S55–S57. https://pubmed.ncbi.nlm.nih.gov/11338740/
9. King S. Provision of alcohol hand rub at the hospital bedside: a case study. J Hosp Infect 2004;56:S10–S12. [CrossRef]
10. Pittet D, Allegranzi B, Boyce J, World Health Organization World Alliance for Patient Safety First Global Patient Safety Challenge Core Group of Experts. The World Health Organization guidelines on hand hygiene in health care and their consensus recommendations. Infect Cont Hosp Epidemiol 2009;30:611–622. [CrossRef]
11. Hazavehie SMM, Taghdisi MH, Mohaddes Hakkak R, Hasan Zadeh A. The Effects of Three Teaching Methods of Lecture, Training Game and Role Playing on knowledge and Practice of Middle School Girls in Regard to Puberty Nutrition. Strides Dev Med Educ 2007;3:126–133. https://www.sid.ir/en/journal/ViewPaper.aspx?id=100886
12. Dehdari T, Khezeli M, Bakhtiyari M, Nilsaz M. Health Education Interventions on Student Nutrition: A Systematic Review. J Health 2012;3:62–72. http://healthjournal.arums.ac.ir/article-1-67-en.html
13. Khorasani S, Peyman N. The Effect of Education Based on Social Cognitive Theory on Hand Washing of Primary School Students. Health System Research. 2017; 13: 297-304
14. Andarkhora F, Bohrani M, Goodarzi A. Comparison of the Effect of Lecture and Multimedia Screening on Oral Health Behaviour of Students in Tehran. MCS 2018;4:213–220. [CrossRef]