
Teaching Hand Washing Techniques in a Community Using Innovative Teaching-Learning Methods

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ABSTRACT

Background: Personal hygiene is of paramount importance in the prevention and spread of communicable diseases like diarrheal diseases, Typhoid, Cholera & Hepatitis. Though awareness programs are carried out through various media, it is doubtful how many of them are equipped with the proper techniques of washing hands in the real life situations. Our first year medical students are taught the essentiality of effective communication skills and the importance of hand hygiene. Through this project we teach hand washing to a community through demonstration, an innovative teaching-learning method. **Objective:** (1) To measure the level of knowledge about the importance and the proper methods of hand washing in a selected community of the same socio-economic status. (2) To quantify the effectiveness of this teaching-learning experience using a pre test and post test containing pre validated specific checklists. **Materials and Methods:** 64 first year medical students recruited after obtaining written informed consent, were trained using power point and demonstration. After dividing into 32 teams to visit 64 houses, where the first student demonstrated and the second one silently observed and filled the pre-validated checklists. **Result:** The scores of pre and post tests tabulated in excel and analyzed using Paired t-test showed statistical significance (2-tailed **p**-value < 0.001) which indicates that the effect of training through demonstration was significant. **Conclusion:** Through this project we could prove that demonstration is an effective and innovative learning method which can be incorporated more into our medical education.

Key words: Demonstration, Hand hygiene, High Impact Learning, Innovative Teaching- learning methods, Pre and post tests, Pre- validated check lists.

Introduction

Personal hygiene is an important attribute to the prevention and spread of communicable diseases. Proper hand washing techniques are of prime importance in achieving this goal.[1] Though we are creating awareness in the public about the importance of hand washing through various media, it is doubtful how many members of the public are equipped with the proper techniques of washing hands in real life situations. Through this project we are planning to conduct a demonstration of the proper technique as per the WHO norms and to make sure that those families have attained the skills of proper hand washing. Our first year medical students are learning the need as well

as the importance of hand washing techniques[2] as well as effective communication skills. So this will be an innovative teaching-learning experience for them as well. Considering the importance of personal hygiene in prevention of food borne communicable diseases like diarrheal diseases, Typhoid, Cholera & Hepatitis, , this subject of hand washing was chosen [3,4]. Vembalathupaadam being a village with majority of lower middle class families has the social relevance for such an awareness and health education[4,5]. Moreover, this medical college is the nearest referral center for the area chosen and the institution has a social and moral commitment in creating health awareness in this community. Above all, this particular subject seems to be very inspiring for the first year students so that they get to know the importance of the profession, role of health education in prevention of communicable diseases[6] and to learn through an innovative method of teaching others [7]. This particular subject also helped to boost the student's self

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confidence and to learn the importance of team work and effective communication [8,9]. Being a new subject away from the routine theory classes and dissections, the subject of teaching hand washing was well taken by the students and they could enjoy and put forth their full potential and commitment in this task [10,12]. The participating students were trained in the topic by attending lecture class using power point presentation and live demonstration and they were involved in preparing the teaching material. Then the actual teaching of the subjects were performed by students which included a briefing about the importance of hand hygiene, followed by live demonstration of proper hand washing techniques. The uniqueness of the project is that the students evaluated the knowledge of the subjects using specific check-lists when the subject demonstrated his/her routine technique of hand washing and there was specific pre-validated check lists for post tests as well.

Objectives:

1. To measure the level of knowledge about the importance and the proper methods of hand washing in a selected community of the same socio-economic status
2. To quantify the effectiveness of this teaching-learning experience using a pre test and post test containing preset specific checklists

Materials and Methods

Sample size: 64 first year medical students selected by random recruitment, after obtaining written informed consent. The staff were recruited from the Department of Community Medicine of PKDIMS with help from the HOD, as they are familiar with the geographic area and have an idea about the socioeconomic status of the community. Families of similar socioeconomic status were selected for the study with the help of social workers and health inspectors catering this area.

A planning committee was formed with the Principal as chairman, Heads of Community Medicine, Physiology and the Coordinator of the Medical Education Unit of the institution were members. The Principal by providing constant encouragement and support stood as the backbone of the project, without whom it would not have been possible. The Heads of the Department of Community Medicine and Physiology helped by permitting the staff from both the departments available for the project. Clearance from the management was sought and the Director of Operations rendered valuable support and encouragement. The college bus with the driver was provided which was a token of the incredible support from the management. The nearby village,

Vembalathupaadam was selected with the help of the Community Medicine department.

Preparation of check lists: Pre validated check lists were prepared based on the steps of hand washing formulated by the WHO. This helps in objective assessment of the learner, minimizing the subject bias. Pre and post tests were done for each subject.

The student volunteers were trained using lecture class with power point presentations. This was followed by a live demonstration session of the procedure. There was a debriefing and doubt clearing session as well. Subsequently flash cards of the hand washing technique were prepared, as per the WHO norms. This was followed by preparation of pre-validated check lists for pre-test and post-tests. Then the students were divided into a group of two to go to each house. So total 32 groups were made and each group was allotted with two houses each.

Actual performance: The team consisting of 64 student volunteers and the participating staff were taken to the selected area, Vembalathupaadam by the college bus at 9.00am. After a short debriefing session at the site, the students were assured that they will not be interfered and are the masters of themselves in the process. A group of two students went to their allotted 2 houses where the trainer student explained the need of proper hand hygiene to the household. Then the subject was requested to show his/her usual hand washing technique. Following that the trainer student demonstrated proper technique as per the WHO guidelines. The second student silently observed him and filled the checklists. Their role was reversed as they went to the next house. The student volunteers effectively visited 64 houses, excluding a few resistant households. After demonstration, the subject was asked to debrief and demonstrate what he/she learned and the post test check lists were filled accordingly for each step. Most of the subjects were able to perform the technique perfectly except a few, who were taught again so that they also learned effectively.

After successful completion of the project the team including the students and staff were brought back to the campus by the college bus and were dispersed after a light refreshments in the college canteen. The feedback of the students showed that they thoroughly enjoyed the project and welcomed such learning methods in future.

Check list filling: Pre Validated Check list was filled by the observer student while the subject showed hand washing before the training session. After the live demonstration by the trainer student, the subject was asked to debrief what she/he learned again by demonstrating. The observer student filled the post test check list while debriefing.

Results

The data of pre and post tests using pre validated checklists were tabulated in excel sheet and analyzed using Paired t-test. Graph [bar diagram] was also prepared. The results showed significance change in the post test.

Paired t-test:

Table 1: Paired sample statistics

	Mean	N	Std deviation	Std error mean
Pair 1 before	3.94	64	1.379	.172
after	8.39	64	.809	.101

Table 2: Paired samples test

	Mean	Standard deviation	Paired differences		
			Std mean error	95% confidence interval of the difference	
				lower	upper
Pair 1 before-after	-4.453	1.490	.186	-4.825	-4.081

Table 3: Paired samples test

	t	df	Sig.(2-tailed)
Pair 1 before-after	-23.910	63	.000

Table 4: Paired samples statistics

	Mean	N	Std deviation	p value
Pair 1 Before	3.94	64	1.379	< 0.001
After	8.39	64	0.809	

p value : < 0.001 [2tailed, sig]

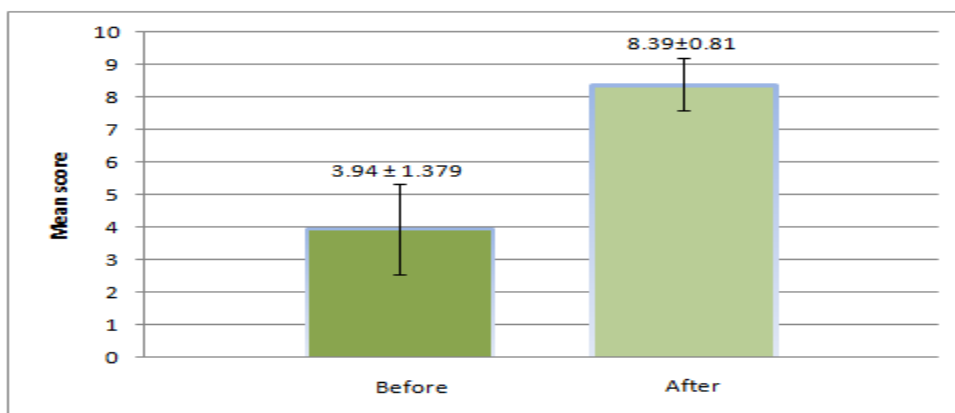


Fig 1: Bar chart showing the difference in mean scores before and after training

A paired t-test was run on the scores of 64 subjects who participated in the study to determine whether there was statistically significant difference in the mean, between the hand washing performance before and after training. The mean (\pm SD) of the score was 3.94 ± 1.38 before intervention (training) as opposed to 8.39 ± 0.81 after the training. A statistically significant increase of 4.45 [95% CI, 4.08 to 4.82] , $t(24) = 0.00$, $p < 0.001$ [2tailed, sig]. The standard error of the mean was 0.186 with a degree of freedom (df) of 63. We obtained a t-value (t) of 24 and the statistical significance (2-tailed p-value) of the paired t-test is 0.000. As the p-value is less than 0.001 (i.e., $p < 0.001$), it can be concluded that there is a statistically significant difference between the two variable scores. The mean score before training was 3.94 with a standard deviation of 1.379 from the mean. After training the score was 8.39 with a standard deviation of 0.809. The p value is < 0.001 which indicates that the effect of training through demonstration was significant.

Discussion

Creativity and innovation are gaining more importance in the development of the 21st century knowledge society [7]. Recent trends in medical education exhibit a paradigm shift from the conventional classroom teaching to the modern teaching methods. By promoting interactive learning through active participation and interrogative reasoning, remarkable transformation is occurring in the teacher-student relationship of the present times [8]. It is a known fact that students learn more when they are involved actively in learning than a passive listening in class rooms[9,11] Maintaining proper hand hygiene has a vital role in preventing food borne diseases and other epidemics. It is a known fact that observing proper hand washing techniques can prevent the spread of not only gastrointestinal but also respiratory illnesses like influenza to a great extends [5]. Hand hygiene is also important in preventing hospital acquired infections and hence the health care providers should be aware of the importance of hand hygiene [14]. Time and again medical students are informed about maintaining good hand hygiene practices, right from the beginning of their clinical rotations, in order to prevent nosocomial infections [12]. Hand hygiene is the most effective measure for preventing infections related to healthcare, and its impact on the reduction of these infections is estimated at 50% [12]. Studies show that Gram negative bacteria can be easily removed with hand washing alone [14]. Though there are strict guidelines

by the WHO regarding proper hand washing techniques[1] and there is ample number of publicity given to its importance, people especially in the rural pockets are unaware or are not keen to observe such hygienic practices[8,9]. There can be multiple factors contributing to this behavior [15] like lack of knowledge of the importance of preventing infections, a lack of understanding of the appropriate techniques or could be lack of time or even scarcity of water. Lack of motivation is another important cause [8,9,14]. In this study we demonstrated proper hand washing techniques to one member of each household. Total 64 people participated in the study that involved 64 families. Before the training and live demonstration none of them were able to demonstrate all the 9 steps perfectly. Whereas after the training 38 of them were able to do all the nine steps perfectly. Though the rest of them failed to perform one or two steps in the proper order, all 64 subjects performed 7 steps properly after the first demonstration. All of them were able to perform all 9 steps after retraining. This shows that the effectiveness of training was 100%. Learning is not a single event, rather is a process that changes behavior to produce outcome. This takes place in an environment competing priorities and time pressures. Learning requires more than simply taking a class [8]. The retention and application of the new knowledge and skills with attending a class varies from 10 to 30% based on the content [10]. Students are more receptive to innovative learning methods [11]. Here in this program, the student volunteers first explained the importance of hand hygiene to the subject and asked him/her to show the way he/she washes hands routinely. Then the student demonstrated proper hand washing technique in a one to one basis. The checklists were filled by the observer student then and there. The results tabulated shows that demonstration is a very effective way of teaching, especially in a community setting. Through teaching the household, the students also learned proper hand washing technique, which again is an innovative way to learn through teaching.[9] Focusing school curricula on creativity, innovation and entrepreneurship, members of the European Union are trying to strengthen the development of a creative and knowledge-intensive society [13]. Innovative teaching methods are introduced reinforcing the role of education and training aiming at this goal[18]. The increasing importance of seminars and tutorials being incorporated in our curriculum is an example of the same..High Impact Learning is a concept that encourages leadership involvement. This facilitates retention of knowledge to ensure that learning is a process that changes behavior and performance of an

individual [16]. In our project the students took leadership in the process of teaching and hence learning through community teaching [17]. This innovative learning technique can be used as a High Impact Learning method in medical education as well so that retention of knowledge becomes easier[20]. Since the p value was < 0.001, which showed that there was considerable change in the scores after the intervention (Training) proving that this training made a significant change in the learning of hand washing techniques [6]. Demonstration is an effective tool of teaching as it makes it interesting to the learner and gains his full attention. Hand hygiene being an important aspect in preventing communicable diseases and spread of epidemics, it is a cost effective method of primary prevention. Through this project, we could make sure that all the participant subjects are well-trained about the need and the proper technique of hand washing, which can cause a significant improvement in the health of the community, at the verge of the impending monsoon season [10].

Conclusion

Through this project we could prove that demonstration is an effective as well as an innovative learning tool. The students learned hand washing technique and its importance in a novel way that is through teaching the community. The stress level of the students was minimum and the learning was enjoyable as well. Learning through demonstration [through teaching others] can be incorporated as an innovative teaching-learning method in our medical education.

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Source of Support: Nil

Conflict of Interest: None