IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 3, Issue 4 Ver. II (Jul-Aug. 2014), PP 56-60
www.iosrjournals.org

Effectiveness of hand hygiene teaching on knowledge and compliance of hand washing among the students at a selected school in Mugalivakkam village, Kancheepuram District

*Rubanprem Kumar S.A, **Dr.Aruna S, **Sasikala M
**Student (MSN), College of Nursing, Sri Ramachandra University, Porur, Chennai, Tamil Nadu, India.*
***Reader (MSN), Faculty of Nursing, Sri Ramachandra University, Porur, Chennai, Tamil Nadu, India*
*** Asst.Professor (MSN), Faculty of Nursing, Sri Ramachandra University, Porur, Chennai, Tamil Nadu, India*

Abstract: Background: *One of the major health problems in our country is unsanitary conditions especially poor hand hygiene leads to a rigorous public health hazard to children in the school. Children are not aware of important of hand hygiene at school level. Health education is considered necessary for better knowledge.* ***Materials and Methods:*** *Quantitative quasi experimental randomized one group pretest and posttest design study was carried out to find out the effectiveness of hand hygiene teaching on knowledge, compliance and to correlate the level of hand hygiene knowledge with compliance of hand washing among the students. The knowledge was assessed by questionnaire and compliance was assessed by sterile hand swab collection to do bacteriological culture test in the microbiology laboratory. Among six primary schools in the Mugallivakkam village at Kancheepuram District one primary school was selected using simple lottery method. Five students from 2nd, 3rd, 4th and 5th standard were selected using simple random sampling. The total sample size was 20. The period of data collection was from 16-6-2012 to 13-7-2012. The 20 primary school students were split into four subgroups of each consisting of five school children. Then teaching programme on hand hygiene was given using laptop. Posttest was conducted on knowledge and compliance after three weeks.* ***Results:*** *The mean value of knowledge between the pretest and posttest showed a vast statistically significant difference at $p<0.001$ level and there was a extremely important difference in the mean score of the various pathogens in the hand flora which was estimated to assess the compliance indicators to hand hygiene between the pretest and posttest at $p<0.001$ level. Conclusion: This study imposes importance of suitable health teaching intervention through proper structure to the school children, for enhancement concerning hand hygiene among them, all over the country.*

Keywords: *Handwashing, Prevalence of bacteria, Health Education, School Children, compliance*

I. Introduction

Fecal oral diseases transmission among school children is mainly due to unhygienic hands. In 18th century itself Semmelweis Ignac mentioned about the connection among disease and contaminated hands, and confirmed that common infection such as diarrhea, common cold and child hood fever can be reduced effectively by proper hand washing technique. From that time, numeral studies encompass that contaminated hands can carry various types of disease producing organisms[1]. Effective hand washing technique is supposed to decrease transmission infection by reducing possible microorganisms and also by washing away the dirt, which could also port microorganisms and permit their endurance for longer periods of time. The two major deadly diseases among children are diarrhea and acute respiratory infection which can be effectively reduced by proper hand washing was pointed out by many systemic reviews. [2, 3,4,5,6] In spite of being proven by many studies proper hand washing with soap is not a widespread practice in our community. Internationally, there is an extensive difference in the hand washing performance and the use of soap. [7] A study was conducted among 302 rural, urban slums and non-slum area residents at West Bengal on prevalence of hand washing practice revealed that after defecation 98% of them used soap to wash their hands after defecation but only 69% of them did so after clean-up their child defecation. In rural area only 71% of them used soap to wash their hands after toileting while 26% of them washed with mud but during their child's defecation cleaning only 5% used soap. [8] Prevalence of streptococci was found among 52.9% of children's hands. [9,10] Hand washing with soap at important times, for instance after defecation or toilet use or while preparing food, is an simple, effortless and inexpensive intervention that can decrease the occurrence of diarrhea, by almost 50%, usually diarrhea kills 1.1 million under five children per year and also reduce 25% occurrence respiratory infections (it kill 1.2 million per year) "Soap is not in short supply, even in developing countries," says UNICEF. "The vast majority of poor households have soap in the home. The problem is that soap is used for laundry or bathing, but rarely for hand washing." Compliance of hand washing study among the school students in India is limited specially by the nurses as well reviews support that knowledge and practice about hand hygiene is poor hence researcher

decided to study a study to assess the effectiveness of hand hygiene teaching on knowledge and compliance of hand washing among the students at a selected school.

The objectives of the study were as follows:

1. To determine the effectiveness of hand hygiene teaching on knowledge
2. To assess the effectiveness of hand hygiene teaching on compliance
3. To correlate the knowledge on hand hygiene with compliance of hand washing

In order to accomplish the objective of the study; the hypotheses were formulated and tested. The hypothesis one (H_1) of this study was that "There is a significant difference in the knowledge of hand washing among students during post test after hand hygiene teaching". The hypothesis two (H_2) of this study was that "there is a significant difference in the compliance of hand washing among students during posttest after hand hygiene teaching"

II. Materials and Methods

Evaluative research approach was selected for the study. Research design adapted was quantitative quasi experimental randomized one group pretest and posttest design. Among six primary schools in the Mugallivakkam village at Kancheepuram District one primary school was selected using simple lottery method. Five students from 2nd, 3rd, 4th and 5th standard were selected using simple random sampling. The total sample size was 20. The period of data collection was from 16-6-2012 to 13-7-2012. The study was carried out after obtaining approval from the Chairman, Nursing Education, Sri Ramachandra Faculty of Nursing and institutional students ethics committee. Official permission was obtained from the school. The tool used for the study consisted of two sections, demographic variables and structured questionnaire for knowledge on hand washing. The total number of questions in the knowledge instrument was 20. The correct answer was given a score of one and the wrong answer a score of zero. The maximum total score was 20 and the score ranged as

Adequate knowledge - 76 -100% (16-20)

Moderately adequate - 51- 75% (11-15) Inadequate knowledge - 0 - 50% (1-10)

Compliance to hand washing was assessed by hand swab culture. Hand swab culture was done to find out the significant presence and growth of pathogens in the hands of the children before and after intervention. The hand swab culture was done in the microbiology laboratory at Sri Ramachandra Hospital. The common pathogens investigated were Streptococcus aureus, Staphylococcus epidermis, Streptococcus salivaris, Enterococcus faecalis, Streptococcus pneumonia and Streptococcus pyogens. The culture result obtained from the samples were categorized for every investigated pathogens as follows

Significant presence of pathogens ≥1,20,000 cu mm

No significant presence of pathogens

< 1,20,000 cu mm

Intervention is a laptop assisted teaching. It is an organized method of teaching about definition, aim, purpose, steps, and advantages of hand hygiene and nail care. Teaching was imparted by the investigator through lecture cum discussion methods using images and PowerPoint presentation as a story form in a group session of 30 minutes and hand washing was demonstrated with discussion for 15 minutes followed that return demonstration by each student for 15 minutes. A total of four groups with five students in each group were grouped for teaching session. Reinforcement demonstration and return demonstration was done on 7th and14th days of intervention.

Post test was done 21 days after intervention teaching for the group. The collected data were analyzed by descriptive statistics, mean and standard deviation to estimate the averages of the study variables. The inferential statistics, chi square was used to find out the association between the dependent and demographic variables and paired't' test to assess the effectiveness of hand hygiene teaching on knowledge and compliance on hand washing among the students.

The conceptual framework of this study is based on Weidenbach heping art nursing art theory According to this theory factual and speculative knowledge, judgement and skills are necessary for effective nursing practice. This theory has three compenents identification, ministration and validation. In this study identification refers to the assessment of the demographic variables, level of knowledge and compliance of school children. Ministration in this study is the process of inculcating knowledge on hand hygiene through laptop teaching program with animation motion images slides to the school children. Validation refers to desired change in the level of knowledge and compliance among school children on effectiveness of hand hygiene as measured by the post test.

III. Results

Among the 20 children 55% of them were males and 45% of them were females. With regard to the educational status of mothers of school children, eight (40%) had primary school education and six (30%) had

secondary school education and no formal education. Regarding the area of residence majority (85%) of the students lives in rural areas. Considering the monthly income of the family five (25%) were from a economically backward class and 10 (50%) of them were from low middle class family. Regarding the type of family, majority of the students 15 (75%) were from nuclear family and five (25%) of them were from joint family. The data regarding the previous knowledge on hand washing shows that, five (25%) of the students had information through their parents, nine (45%) of them got information through teachers and five (25%) grasped information from mass media.

During the pretest two (10%) students had moderately adequate knowledge and 18 (90%) students had inadequate knowledge. In the posttest, 13 (65%) of the students had adequate knowledge and seven (35%) had moderately adequate knowledge on hand hygiene (Table1). There was a highly significant difference in the mean value of knowledge between the pretest and posttest at $p<0.001$ level (Table2).

Table1. Frequency and percentage distribution of level of knowledge (N=20)

Level of knowledge	Pretest		Posttest	
	No.	%	No.	%
Adequate knowledge	00	00	13	65
Moderately adequate	02	10	07	35
Inadequate Knowledge	18	90	00	00

Table 2. Comparison of mean value of knowledge on hand hygiene between pretest and posttest (N=20)

Variables	Pretest		Posttest		't' and p value
	Mean	SD	Mean	SD	
Knowledge	6.15	1.95	16.25	1.83	18.621 0.000***

*****p<0.001 Level of significance**

The level of compliance with hand washing among school students during the pretest and posttest revealed that. During pretest there was a significant presence of Streptococcus aureus 15 (75%), Staphylococcus aureus 18 (90%), Streptococcus salivaris 19 (95%), Enterococcus feacalis 17 (85%), Streptococcus pneumonia 19 (95%) and Streptococcus pyogens 17 (85%) among the students. During posttest there was no significant presence of Streptococcus aureus 18 (90%), Staphylococcus aureus 18 (90%), Streptococcus salivaris 20 (100%), Enterococcus feacalis 19 (95%), Streptococcus pneumonia 20 (100%) and Streptococcus pyogens 18 (90%) among the students. And there was a highly significant difference in the mean score of the various pathogens in the hand flora which was estimated to assess the compliance indicators to hand hygiene between the pretest and posttest at $p<0.001$ level (Table3).

Table 3. Mean difference, Standard Deviation, Paired t value and p value of the compliance indicators to hand washing (N=20)

Compliance indicators	Pretest	Posttest	Mean difference	Paired 't' and p value
	Mean &SD	Mean &SD		
Streptococcus aureus	78275.5 ±16597.2	32801 ±10773.9	54525	10.865 0.000***
Staphylococcus aureus	145018 ±10773	69613.5±17257.9	75404.7	16.911 0.000***
Streptococcus salivaris	149371 ±13754.35	62955±22733.9	86416.65	12.482 0.000***
Enterococcus feacalis	145795± 13240	81789.65 ±10189.2	64005.42	15.31 0.000***
Streptococcus pneumonia	148571± 3450.33	71723 ±18301.2	76848	13.129 0.000***
Streptococcus pyogens	142822.4 ±14548	84409 ±2414	58413	12.396 0.000***

*****p<0.001 Level of significance**

IV. Discussion

Present study shows that during the pretest two (10%) students had moderately adequate knowledge and 18 (90%) students had inadequate knowledge. In the posttest, 13 (65%) of the students had adequate knowledge and seven (35%) had moderately adequate knowledge, matching to the above findings the study also revealed that mean knowledge score on hand washing during pretest was 6.15 and during posttest it was 16.25 with the mean difference of 10.10 and the corresponding paired 't' value was significant at $p< 0.000$ level. In this study 80% improvement was noted after teaching. The study done by Kennan [9] also revealed similar findings that the hand hygiene intervention increased 40% of the knowledge level among target population.

Compliance to hand washing was estimated with hand swab culture. The common pathogens that were present in hand were Streptococcus aureus, Staphylococcus aureus, Streptococcus salivaris, Enterococcus feacalis, Streptococcus pneumonia and Streptococcus pyogens. There was a highly significant difference in the mean score of all pathogens in the hand flora between the pretest and posttest at $p<0.001$ level. The study confirmed the existence of pathogenic microorganisms on the hands of 95% of the children. Similarly Amravati, Maharashtra, had also confirmed the incidence of potential pathogens on hands of students. The common pathogens isolated were Staphylococcus sp. (23%), E. coli (20%), Klebsiella sp. (10%), Micrococcus sp. (9%), Proteus sp. (7%), Citrobacter sp. (7%), Streptococcus sp. (7%), Enterobacter sp. (6%), Enterococcus sp. (4%), Pseudomonas sp. (3%) and Salmonella sp. (2%). The researchers also established decline in hand infectivity after hand washing. [10]

A positive correlation was noted between the level of knowledge and compliance during pretest and posttest in study group. The correlation coefficient value of knowledge and compliance during pretest and posttest was found to be 0.63 and 0.85 respectively. Similarly the research done by Greene also had showed school-based cleanliness and sanitation intervention condensed Escherichia coli infectivity on pupils' hands in western Kenya and also found a significant positive correlation between the knowledge and a significant reduction in Escherchia coli contamination.

Association of demographic variables with the level of knowledge during pretest revealed that there was a significant association between the education of the mother and the level of knowledge on hand washing at $p<0.05$. These findings were consistent with the study done by Schmidt .

V. Recommendations

Recommendations for the future study include:

1. A similar study could be replicated with larger sample size.
2. A similar study could be done for longer duration.
3. A similar study can be conducted to compare the effectiveness of hand rub and alcohol soap based hand washing.
4. The same study could be conducted as comparative study between the urban and rural students.

VI. Conclusion

Nurses have an important role of creating awareness about hygienic practice in both clinical and community areas. Nursing is an art as well as science. The hands on skill can only be improved if the nurses have a sound knowledge. So the nursing curriculum plays an important role in moulding the future nurses. Curriculum should be prepared and updated with the inclusion of topics including the school health programme and measures to reduce the infections due to unclean hands.

Acknowledgements

It is my pride to be a part of the Sri Ramachandra University and I thank the Managing Trustee, for permitting me to use available resources in the University. I extend my gratitude to my esteemed teachers and eminent guides Prof. P.V. Ramachandran, M.Sc.(N)., Chairman Nursing Education, Dr. S. Aruna, M.Sc(N)., Ph.D., Reader, Dept of Community Health Nursing and Mrs. R. Poongodi, M.Sc.(N)., Asst. Prof., Dept. of Community Health Nursing Sri Ramachandra College of Nursing, Sri Ramachandra University for their never ending guidance, support for the completion of my research.

References

[1]. Best M, Neuhauser D. Ignaz Semmelweis and the birth of infection control. Qual Saf Health Care 2004;13:233-4.
[2]. Lanata CF. Problems in measuring the impact of hygiene practices on diarrhoea in a hygiene intervention study. In: Cairncross S, Kochar V, editors. Studying hygiene behaviour methods, issues and experiences. New Delhi: SAGE; 1994. p. 127-34
[3]. Huttly SR, Morris SS, Pisani V. Prevention of diarrhoea in young children in developing countries. Bull World Health Organ 1997;75:163-74.
[4]. Curtis V, Cairncross S. Effect of washing hands with soap on diarrhoea risk in the community: A systematic review. Lancet Infect Dis 2003;3:275-81.
[5]. Cairncross S. Editorial: Hand washing with soap - A new way to prevent ARIs? Trop Med Int Health 2003;8:677-9.

[6]. Jefferson T, Del Mar C, Dooley L, Ferroni E, Al-Ansary LA, Bawazeer GA, et al. Physical interventions to interrupt or reduce the spread of respiratory viruses: Systematic review. BMJ
[7]. Curtis V, Danquah LO, Aunger RV. Planned, motivated and habitual hygiene behaviour: An eleven country review. Health Educ Res 2009;24:655-73.
[8]. Ray SK, Dobe M, Maji S, Chakrabarty D, Sinha Roy AK, Basu SS. A pilot survey on hand washing among some communities of West Bengal. Indian J Public Health 2006;50:225-30.
[9]. Vivas AP, Gelaye B, Aboset N, Kumie A, Berhane Y, Williams MA. Knowledge, attitudes and practices (KAP) of hygiene among school children in Angolela, Ethiopia. J Prev Med Hyg 2010;51:73-9.
[10]. Kenna., Mc. (2009). The effects of hand hygiene promotion and intervention . Archives of community Nurse, 23(6), 40-41.
[11]. Tambekar DH, Shirsat SD. Handwashing: A cornerstone to prevent the transmission of Diarrhoeal Infection. Asian J Med Sci 2009;1:100-3.