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Effect of Hand Hygiene Education on Knowledge, Attitude and Practice of NICU and Pediatric Staff in Zanjan Hospitals

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Abstract

The purpose of this study was to determine the effect of hand hygiene education on knowledge, attitude and practice of NICU and pediatric staff in Zanjan hospitals. This study is a descriptive-analytic intervention conducted in the NICU and pediatric wards of Zanjan hospitals during a 6-month period (23 September 2014- 20 March 2015). A simple random method was used for sampling. The studied population included all NICU and pediatric staff (doctors, nurses and paramedics) in Zanjan hospitals. Data was collected by three questionnaires for demographics, knowledge on hand hygiene and attitude on hand hygiene, and one checklist to evaluate hand hygiene. The results were analyzed by SPSS, V18. Majority of 113 studied personnel were nurses (mean age = 30-40 years). ANOVA with repeated measure showed that hand hygiene education significantly (P-value <0.01) influenced the knowledge and attitude of NICU and pediatric staff (λ = 0.4, 0.3, 0.4 and 0.2). The mean scores of five factors of practice were different in pre-test and post-tests in different periods (P-value <0.01). As the results show, hand hygiene influenced knowledge, attitude and practice of UICU and pediatric staff. Staff awareness of proper hand washing process encourages them to comply with hand hygiene situations. Quality of health is under influence of knowledge, attitude and practice of staff.

Keywords: Education, Hand Hygiene, Hospital Infections, Knowledge, Attitude, Practice, Patient Safety

Introduction:

Healthcare-associated infections (HAIs) are one of the most common causes of death and increased morbidity of hospitalized patients in developing countries. A study conducted by World Health Organization (WHO) in 55 hospitals of 14 countries, including Eastern Mediterranean countries, indicated 8.7% HAI prevalence in different wards of hospitals (Morrison & Yardley, 2012).

According to WHO, 1400000 people suffer from complications of nosocomial infections throughout the world. In developing countries, preventable HAIs are estimated to be 40% and higher (WHO, 2012). It is also one of the most important problems in intensive care units (ICU). HAI affects 20% of patients hospitalized in these units and increases mortality by more than 30% (Orsi et al., 2006). Neonatal intensive-care unit (NICU) is sensitive to nosocomial infections which are often difficult to control (Shvshtryan, 1991). In NICU, newborns may be a source of infection for other infants and themselves (Masoumi Asl, 2007). The most common nosocomial infections of infants include blood infection or septicemia; other forms of nosocomial infections include respiratory infections, particularly pneumonia, urinary tract infections, surgical wound infections, ear, throat, nose and eye infections, gastrointestinal tract infections, skin and soft tissue infections (Haskins & Goldman, 2004). The most important way of infection in newborn babies is through hands of personnel (Masoumi Asl, 2007). Hand hygiene refers to any way of cleaning, washing or rubbing hands (WHO, 2006). Healthcare workers play a major role in prevention of nosocomial infections because of their direct care of patients (Motaki et al., 2011).

Compliance with hand hygiene means adequate hand hygiene for opportunities provided for hand hygiene. Crowded ward and use of gloves are considered as effective factors on poor compliance with hand hygiene (Pittet et al., 2000). Joint Commission on Accreditation of Health Centers requires hospitals to develop and implement infection control programs in which hand hygiene is an important element (Atapoor, 2012). Healthcare situations which require hand hygiene include: 1) before and after direct contact with patients; 2) after removing sterile and non-sterile gloves; 3) before handling any device used for invasive therapeutic interventions (regardless of whether gloves are worn); 4) after contact with body fluids or secretions, mucous membranes, skin injury or wound dressings in patients; 5) after contact with infected site and moving to clean site of the patient; 6) after contact with surroundings (including medical equipment) (Mostofian, 2010).

Despite easy, cheap and convenient hand hygiene, studies show that healthcare providers are less likely to comply with hand hygiene (Jenner et al., 2006; Creedon, 2005; Akyol, 2007). Review of studies on adherence to hand hygiene protocols shows that hand hygiene is practiced in intensive care units (30 to 40%) less than other wards (50% to 60%). In addition, hand hygiene adherence is reported for physicians (32%) and nurses (48%). Hand hygiene is practiced before (21%) and after (47%) contact with patients (Erasmus et al., 2010). Nurses report various reasons for less adherence to hand washing, such as lack of awareness, negligence, routine work, lack of washing and drying accessories, crowded wards, bad detergents and faulty management system (Akyol et al., 2006; Bilski & Kosinski, 2007) .

Studies consistently have proven that healthcare workers are not well aware of hand hygiene; the average compliance with hand washing is usually estimated to be below 50%, which varies based on the ward, labor groups and different conditions. Therefore, improved hand hygiene is the main challenge of nurses for infection control. The ‘clean care, safer care’ program is not only an action plan, rather a fundamental right for patients to gain access to high quality healthcare systems (Jarvis, 1994; Goldman & Larson, 1992). In recent years, many positive efforts have been made to reduce nosocomial infections. While

providing training and management guidelines, infection control nurses and committees have a strong emphasis on hand hygiene. Therefore, it seems essential to consider hand hygiene guidelines and practices, particularly in pediatric wards, to evaluate the effect of hand hygiene education on knowledge, attitude and practice of healthcare workers.

Theoretical basis of research:

Hand Hygiene

To all those that reduce or eliminate pathogens on the skin is applied. (Barbara et al., 2004)Some say it includes all the talent management, human resources, management and technology.

Awareness

Awareness is the amount of information that people acquire through training on various topics. (Poorhashemi, 2010). Awareness, including minor disputes and general reminder, methods and processes, patterns, structures or situations. (Saif, 2008).

Attitude

Especially the attitude of readiness to respond to a person, object or Vzyt.ngrsh think of more specific values are relatively low and stable.

Some attitudes remain stable over time, but most of them will be subject to change in case of accumulation of information and experience (democracy and Haider 2011).

Performance

Expression changes resulting from learning in a clear and visible behavior or potential behavior to become actual behavior (Shaban Hassan 1387, p. 128).

Research Background

The study, entitled "Review of the literature of hand hygiene in Iran" research papers published in the field of hand hygiene between the years 1996 to 2011 in Iran, by Miss Najafi and his colleagues examined a total of 14 articles, seven descriptive study, six laboratory study and an intervention study had been done. The study results showed poor hand hygiene in health care settings as well as low awareness, acceptance, and performance of health workers in the field, especially in intensive care units, respectively.

This article studies have methodological limitations pointed out the need for studies to evaluate the knowledge, skills and attitudes of different groups of nurses and medical staff have been emphasized. As well as studies to evaluate the effect of different interventional approaches in order to increase awareness and compliance to hand hygiene is essential personnel. (Najafi et al., 2012)

The joint study in collaboration with Marie-Louise with Maharlouie in 2012 in Sydney, Australia Research Center, Shiraz University of hand washing was important to determine the specific markers they reached to this conclusion Some factors influencing compliance and non-compliance with hand hygiene and a special interaction between hospitals and improve staff awareness on the benefits of hand washing by health care workers is admitting it. (Mac Lavs et al., 2012).

Another study conducted by "Anne Collins' and partners in order to achieve the reasons for hand hygiene in hospitals in America was conducted in three groups of employees shows that, in addition to hand hygiene Factors conducive environment forces external controller, the person has to have intrinsic motivation be strong. (Anne Collins et al, 2012).

Tavakoli and colleagues in a study in 2010 which aims to "investigate nursing supervisors' knowledge about hospital infection" of fire took place in hospitals, awareness supervisors desirable. (Mryvn et al., 2010)

In a study by Samadi Pour and colleagues to evaluate hand hygiene was conducted at the hospital showed that hand hygiene practice in internal ward nurses 4/34%, Department of Surgery 3/21%, a special section 7/15% and physicians 6/16 3/94% of the time in Ast.prstaran percent were wearing gloves but only in the 80/16% to sanitize the act would have only 20% of liquid alcohol. (Samadi Pour et al., 2008).

Barbara C. Sy.lam study that aimed to evaluate hand hygiene An.y.sy.yv units and its effects on the prevention of nosocomial infections in Queen Mary Hospital in Hong Kong were conducted in 2004 showed that, after initial examination hand hygiene introducing and maintaining the existing constraints, the planning was done in order to provide training to remedy any obstacles. Hand hygiene before patient contact and after contact Babymar from 40% to 53% from 39% to 59% increase. (Barbara et al., 2004)

Research methodology

The population, sample and sampling

This study was a descriptive-analytic intervention conducted in NICU and pediatric wards of hospitals in Zanjan during a 6-month period (23 September 2014- 20 March 2015).

The studied population consisted of all healthcare workers (doctors, nurses and paramedics) in NICU and pediatric wards of hospitals in Zanjan. The census method was used for sampling doctors, nurses and paramedics working in NICU and pediatric wards.

Research tools

To collect data, three questionnaires and one checklist were used, as follows:

1. Demographic questionnaire: it included eight questions about age, sex, marital status, education level, employment status, experience and workplace.
2. Hand hygiene questionnaire for knowledge: as an extension of HHQ, it included 12 multiple-choice questions (1 point for any correct response and zero for incorrect responses).
3. Hand hygiene questionnaire for attitude: it included 22 questions on a 5-point Likert scale (strongly disagree, disagree, unsure, agree and strongly agree). Knowledge and attitude questionnaires were completed by healthcare workers before intervention, two weeks after intervention and two months after intervention. Reliability (0.77) was tested by Cronbach's alpha; coefficient of correlation (0.89) was estimated for pre-test and post-test. In another study, Cronbach's alpha was reported for the total questionnaire (0.83) and for knowledge and attitude (0.83 and 0.87, respectively).

The standard checklist evaluated compliance with hand hygiene based on five factors:

1. Hand hygiene before contact with the patient
2. Hand hygiene before aseptic services
3. Hand hygiene after exposure to secretions and body fluids of the patient
4. Hand hygiene after contact with the patient

5. Hand hygiene after contact with the surrounding of the patient

A study was conducted by the Ministry of Health, in which compliance with hand hygiene was evaluated on healthcare workers. The checklist included five items to evaluate hand hygiene practice of healthcare workers in a yes or no form. To complete the checklist, four people considered as observers received trainings on how to complete the checklist. Reliability of observers was tested and confirmed after the trainings (Cronbach's $\alpha = 0.86$).

Hand hygiene education was the independent variable. Dependent variables included knowledge, attitude, practice as well as five factors of hand hygiene.

Hand hygiene questionnaire for knowledge and attitude was completed by 113 workers of the relevant wards before education, two weeks and two months after the intervention.

Prior to hand hygiene education, the checklist was completed for pediatric and NICU staff during one week in 350 situations (120 situations in Imam Hussain (AS) Hospital and 230 situations in Ayatollah Mousavi Hospital). Then, paramedics, nurses and doctors received educations based on the hand hygiene guideline of Ministry of health. Two weeks and two months after the education, observers completed the checklist during one week. The subjects received hand hygiene educations by the author and academic professors in two weeks. Education was in the form of lectures, questions and answers, representations and attendance in pediatric ward and NICU. Based on the hand hygiene guideline provided by the Ministry of Health, the addressed topics included the significance of hand hygiene in prevention of infection, patient safety promotion, correct hand washing technique and potential situations for compliance with hand hygiene.

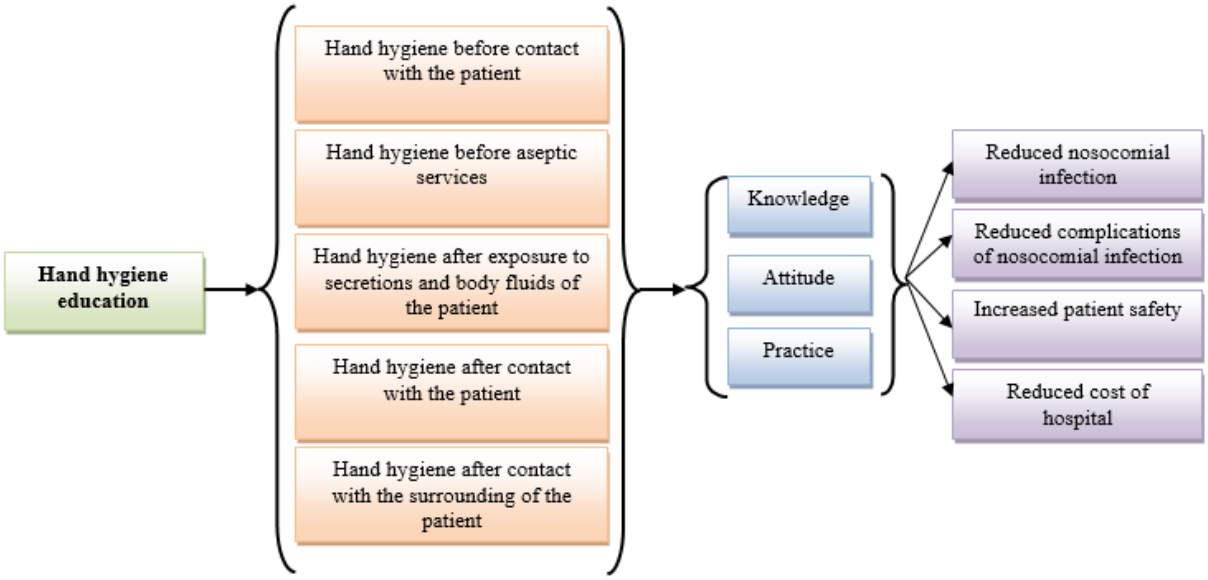


Figure 1: Conceptual Model (Ministry of Health and Medical Education, department of Patient Safety, 2010)

The Analysis of Data

Accordingly, the conceptual model was analyzed by SPSS software. We have used Descriptive statistics and inferential statistics such as ANOVA with repeated measure for analyzing data.

Research Findings

This study evaluated 113 subjects, including 20 doctors, 88 nurses and 5 paramedics (19.5% male and 80.5% female). The average age groups included subjects younger than 30 years (12.4%), 30-40 years (61.9%), 40-50 years (19.5%) and older than 50 years (6.2%). Education level of subjects varied from associate degree (10%), bachelor degree (43.4%), master degree (22.1%) and PhD (17.7%). Most of the subjects (36.3%) were contractually employed by the hospitals. The experience of subjects ranged from less than 5 years (14.2%), 5-10 years (30.1%), 10-15 years (28.3%), 15-20 years (13.3%) and more than 20 years (14.2%).

Knowledge, attitude and practice of healthcare workers were compared on three occasions to determine the effectiveness of hand hygiene education. As data was normally distributed, the ANOVA with repeated measures was used.

For the first and second hypotheses on the effect of hand hygiene education on the level of knowledge and attitude of NICU staff, the results showed that F-value was significant (P-Value <0/01); thus, there is a difference in mean scores of knowledge and attitude for pre-test, post-test and follow-up.

For the second and third hypotheses on the effect of hand hygiene education on the level of knowledge and attitude of pediatric staff, ANOVA with repeated measures showed a significant difference (P-Value <0/01), indicating the effect of hand hygiene education on the level of knowledge and attitude of pediatric staff.

Evaluation of the effect of hand hygiene education on the level of practice of NICU and pediatric staff showed a significant difference (p-value <0.01).

Table 1: effect of hand hygiene education on subjects

Variations	**Mean of squares**	**F**	**Sig**
Knowledge of NICU staff	75.282	74.979	0.000
Attitude of NICU staff	1224.445	45.101	0.000
Knowledge of pediatric staff	122.078	72.922	0.000
Attitude of pediatric staff	1173.802	42.624	0.000
Practice of NICU staff	2.945	22.546	0.000
Practice of pediatric staff	2.207	21.714	0.000

Table 2: summarized analytical tables and test results

Hypothesis	**Test**	**Value**	**Results**
Effect of hand hygiene education on knowledge of NICU staff	Repeated measures	74.979	Supported
Effect of hand hygiene education on knowledge of pediatric staff	Repeated measures	72.922	Supported
Effect of hand hygiene education on attitude of NICU staff	Repeated measures	45.101	Supported
Effect of hand hygiene education on attitude of pediatric staff	Repeated measures	42.624	Supported
Effect of hand hygiene education on practice of NICU staff	Repeated measures	22.546	Supported
Effect of hand hygiene education on practice of pediatric staff	Repeated measures	21.714	Supported

The above table shows that hand hygiene education generally influenced and improved knowledge, attitude and practice of healthcare workers.

The mean scores of five practices were different in pre-test and post-test at different periods; this is supported by its value (close to zero) and significance level. The practices included hand hygiene before contact with the patient (pretest 0.55 and posttest 0.58), before aseptic services (pretest 0.35 and posttest 0.49), after exposure to secretions and body fluids of the patient (pretest 0.49 and posttest 0.68), after contact with patient (pretest 0.44 and posttest 0.66) and after contact with the surroundings of the patient (pretest 0.51 and posttest 0.69).

The mean scores of the first and second posttests were higher for NICU staff than pediatric staff.

Conclusion:

Numerous studies support the effect of hand hygiene in reducing infectious transmitted by hand and nosocomial infections. Three infections are important factors in increased risk of development and prevalence of diseases as well as increased hospital costs. The incidence of these infections is estimated to be about 5-10%. These infections are the direct cause of death in 3% of patients. In addition, any nosocomial infection results in 4 to 5 hospitalization days and adds significant cost to the hospitals. Although hand hygiene is the most effective means of prevention of nosocomial infections, the overall level of hand hygiene compliance is low.

The significance of hand hygiene as one of the main concerns of developed countries has led to numerous studies in many countries, especially Europe and America. According to these studies, healthcare providers less tend to comply with hand hygiene despite its simplicity, cheapness and convenience (Jenner et al., 2006; Creedon, 2005; Akyol, 2007).

As the results of this study imply, hand hygiene education influences knowledge, attitude and practice of pediatric and NICU staff of Zanjan hospitals. Moreover, awareness of staff on correct hand washing process encourages them to adhere to hand hygiene situations. Quality of health care is influenced by knowledge, attitude and practice of healthcare workers.

In this regard, Beykmoradi et al found that a majority of the studied nurses were not trained for hand washing process. After the intervention, knowledge and attitude of nurses increased significantly. Moreover, their adherence to hand washing with alcohol solutions, soap and water increased; however, the increase was only significant for adherence to hand washing with alcohol solutions.

This study found that knowledge of healthcare workers on hand hygiene was low before intervention. Molkemakan (2008) showed that knowledge of nurses was not adequate for infection control; some nurses felt no need for hand washing when wearing gloves.

This study showed that nurses did not comply with hand hygiene in 83% of cases; they complied before contact with patients in 5%, after contact with patients in 13% and both before and after contact with patients in 9% of cases.

It was also recognized that health behaviors related to social habits, awareness of the need for little effort for hand hygiene, hospital performance and internal norms including friends positively influenced compliance with hand hygiene. Attitudes related to hand washing, selective performance of the hospital and society as well as infection control norms had significantly negative effects on hand hygiene practices of nurses.

Jalali and Tavakol (2002) found no significant difference between control and experimental groups in hand washing process and level of infection before intervention, while the difference was significant after intervention. The hand washing score of experimental group notably increased and the colony count decreased after intervention. In other words, education increased Feldman score and decreased hand infection of experimental group.

Practical suggestions:

The results of this study suggest that education significantly improves behavior, attitudes and practice of healthcare workers. One of the permanent tasks of infection control team is to train healthcare workers. In some cases, the results show good practice and compliance of staff and, in some others, the results reflect poor compliance. Therefore, effective educational programs on hand hygiene as the most important preventive strategy for nosocomial infections and their complications and one of the key components of patient safety promotion can increase the knowledge, attitude and practice of staff on hand washing processes.

References:

Akyol A.D, Ulusoy H, Ozen I. (2006). Hand washing: A simple, economical and effective method for preventing nosocomial infection in intensive care units. J Hosp Infect;62(4):395-405.

Anne Collins mclaughlin ,Fran walsh.self-reported reasons for hand hygiene in 3 groups of health care workers.American journal of infection control .2012;40:653-8

Atapoor, H., 2012. Medical errors and patient safety: human factors in medicine. s.l.:s.n.

Bilski B, Kosinski B. (2007). An analysis of selected hands hygiene habits in selected population of nursing staff. Med Pr, 58(4):291-7.

Barbara C.C.Lam,MBBS,FRCP(Edin,lond)FRCPCH(UK),FHKcpead (2004) : Hand hygeine practice in a Neonatal Intensive Care Unite : Amultimodal intrvention and impact on nosocomail infection

Creedon SA. (2005). Healthcare workers´ hand decontamination practices: Compliance with recommended guidelines. J Adv Nurs, 51(3):208-16.

Erasmus V, Daha TJ, Brug H, Richardus JH, Behrendt MD, Vos MC, et al. (2010). Systematic review of studies on compliance with hand hygiene guidelines in hospital care. Infect Control Hosp Epidemiol, 31(3):283-94.

Goldmann D, Larson E. (1992). Hand-washing and nosocomial infections. New England Journal of Medicine, 327(2):120-2.

Huskins WC, Goldman DA. (2004). Hospital Control Of Infection. In: Feigin RD, Cherry J, Demmler GJ, Kaplans(Editors). Text Book Of Pediatric Infection Disease. Philadelphia; Sanders, 2874-925.

Jarvis WR.(1994). Handwashing—the Semmelweis lesson forgotten? The Lancet. 344(8933):1311-2.

Jenner EA, Fletcher B(C), Watson P, Jones FA, Miller L, Scott GM. (2006). Discrepancy between selfreported and observed hand hygiene behavior in healthcare professionals. J of hospital infection, 63(4): 418-422.

Masoumi Asl Hossein. (2007). Country Guide Care System Of Nosocomial Infections. Tehran;Ministry Of Health And Medical Education, Center For Disease Control, 6-8, 150. [Text in Persian]

MCLaws Mary louise.maharlouie.N, yousefi F,Perdicting hand hygine among Iranian health care workers using the theory of planned behavior.American journal of infection control.2012; 40(4): 336-9

Morrison GL, Yardley L. (2012). What infection control measures will people carry out to reducetransmission of pandemic influenza? A focus group study. Available from: http://www.biomedcentral.com

Mostofian, F., 2010. hand hygiene instruction for healthcare providers. s.l.:ministry of health.

Motaki K, O'Mara NB, Kapoian T. (2011). The illustrated guide to infection control.

Najafi Ghezeljeh, T; Abbasnejad, Z; Rafie, F. (2012). "A review of hand hygiene in Iran", Iran Journal of Nursing, No. 80, 1-13.

Orsi GB, Scorzolini L, Franchi C, Mondillo V,Rosa G, Venditti M. (2006). Hospital – acquired infection surveillance in a neurosurgical intensive care unit. JHosp Infect. 64(1):23-9

Pittet D, Huggonet S, Harbarth S, et al. (2000). Effectiveness of hospital-wide programme to improve compliance with hand hygiene, 356:1307-1312.

Samadipoor E, Daneshmandi M, Salari MM. [Hand Hygiene practice in Sabzevar hospitals]. J Sabzevar Univ Med Sci. 2008;15 (1): 59-64. Persian

Shvshtryan Mahdi. (1991). Infections Of Neonatal Unit And The Role Of Nurses In Its Control.Proceedings Of The First Seminar Nurse Role In Prevention And Control Of Nosocomial Infections.Shahid Sadoghi Yazd University Of Medical Sciences. Pharmaceutical Distribution Company With Razi. [Text in Persian]

WHO. (2012). 'Improved hand hygiene to prevent health care associated infections'. Available from http://www.WHO.com. Accessed September 2012

World Health Organization. (2006). WHO guidelines on hand hygiene in healthcare (Advanced Draft),