

Hand washing study in health care workers of a tertiary teaching hospital in Iran

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Abstract: Hospital acquired infections are a worldwide problem and cross contamination transmission causes 40% of them while many of these infections are transmitted by healthcare workers. This study was designed to survey the prevalence of hand washing in health care workers (HCWs) of Rasoul Akram hospital, a tertiary level teaching hospital of Iran University of Medical Sciences (IUMS). This descriptive cross-sectional study was done on 350 healthcare workers, such as medical doctors, nurses, nurse' aide and other HCWs of the hospital. Questionnaire of hand washing made by WHO was used to collect data, and SPSS18 was used to data analysis. P value less than 0.05 was assumed significant. Oral consent was taken from participants before filling the questionnaire. Forty one percent were male, and average age of participants was 32.3 year (SD = 6.8). Sixty five percent of the participants were routinely washing their hands. One hundred and twenty seven cases had been participated in hand washing workshop and 82.5% of them used hand washing routinely which was significantly more than nonparticipating ($p < 0.001$). Almost 48% of males and 76.8% of females did hand washing, which indicates a significant difference between males and females. Nurses had highest rate of hand washing (76.1%) and physicians had lowest (47.9%) and this was significant ($p < 0.001$). Sixty three percent of HCWs of internal medicine division, 50.8% of surgical ward, 69.5% of Emergency department, 87.5% of pediatric diseases section and 78.1% of gynecology section were doing routine hand washing.

Keywords: Hand Hygiene, Hand Washing, Hospital Acquired Infection, HAI, HCW

1. Introduction

Nosocomial infections (NI) are a worldwide problem with the prevalence of at least 5% in developed countries till 25% in developing world (1). It is estimated that cross-section transmission causes 40% of hospital acquired infections (2). Most of these infections are transmitted by contaminated hands of health care workers (3).

Epidemic study of NI clarified that many of these infections are related to not correct using of methods of decontaminations or not enough knowledge about these methods. With considering that hands of HCWs have great role in transmission of infectious agents and contaminated fomites from one patient to another, and from personnel to the patients, hand washing is the most important method in prevention of transmission. For this reason, it is recommended that hand washing must be emphasized routinely (4).

Although hand washing is one of the best ways of

prevention of nosocomial infections, but many of HCWs don't attend to the methods of hand sanitation and in practice, the time and frequency of hand washing is much less than it is expected (5). Other studies show that in many of health centers, tendency of HCWs to wash their hands is unexpectedly low (6-7).

Samadipour A. et al showed that hand washing rate was 34.4% in internal medicine department, 21.3% in surgery ward, 16.7% in ICU unit and it was 16.6% between physicians (8). Rungay S. et al reported that hand washing rate was 12.8% in physicians and 65.2% in nursing group (9). In study of Pittet D. et al average compliance of hand washing was 48% and noncompliance was the highest among physicians (10). The aim of this study is to know the rate and compliance of hand washing among health care workers of a tertiary teaching hospital in Tehran, Iran.

2. Methods

This cross-sectional analytic study was carried out in health care workers of Rasoul Akram teaching hospital of Iran University of Medical Sciences in 2011 from Iran. 350 cases of health care workers including physicians, nurses, nurse's aide and other health care workers entered this study. The sample group was chosen by non random and convenience methods. And WHO questionnaire about Hand Hygiene, especially five moments of hand hygiene (before touching a patient, before a procedure, after a procedure or body fluid exposure risk, after touching a patient and after touching a patients' surroundings) was used for gathering data. Data were analyzed by SPSS version 18 and student t-test and Chi-square test were used for analysis. P value <0.05 considered significant. Oral consent was received from all participants and the data were protected confidentially.

3. Results

Among 350 cases 143(40.9%) were male and 207(59.1%) were female. Mean age of cases was 32.3 years, ranging from 20 to 53 years. Forty two percent of cases were nurses, 35.4% doctors, 12.6% nurses aide and 10% other health care workers.

One hundred and eighteen cases were from internal medicine ward, 65 from surgical, 105 from emergency department, 8 from pediatrics diseases, 32 from gynecology and 22 cases from others.

One hundred and twenty seven cases had training course about hand washing. Sixty six percent washed their hands routinely and 119 of them did not. Almost 32% used soap and water, 10.9% soap, water and antibacterial, 15.7% alcohol-based, 39.4% soap, water and alcohol and 2.3% used soap, water, antibacterial and alcohol. And 33.4% of them did hand washing before contact with patients, 40% before entrance isolated room, and 86.9% washed their hands when they had contaminated of hands. Also 42.6% of cases without considering the participation in training course washed their hands before contact with wound, 337(95.4%) after contact with blood, 321(86.9%) after contact with contaminated subjects, 306(87.4%) after contact with wound and 218(62.3%) after tracheal suctioning. From HCWs who did hand washing, 83.1% washed their hands after physical contact with patients, 41.7% washed their hands after exit from isolated room, and 65.1% after taking of their gloves, 82.5% of cases who had been trained about hand washing, washed their hands routinely, but 55.6% of them who had not participated in hand hygiene training course, washed their hands, and the difference was significant ($p<0.001$)(table1).

Many of trained HCWs used soap, water and alcohol, but non trained used only soap and water that was statistically significantly different ($p<0.001$).

More than of 67% of trained HCWs washed their hands before contact with wounds but only 29% of non trained

personnel did hand washing before contact with wound, which was significantly different ($p<0.001$). One hundred and eighteen of trained HCWs and 173 of non trained had hand washing after examination of patients that is statistically different ($p<0.001$).

Table 1. Comparison of handwashing based of having a training course

Training course	Hand washing					
	Yes		No		Total	
	No.	Percent	No.	Percent	No.	Percent
Yes	104	81.2	23	18.8	127	36.3
No	124	55.6	99	44.4	223	63.7
Total	228	65.14	122	34.86	350	100

After contact with blood, about 94% of trained and 96% of non trained HCWs washed their hands which had no significant difference ($p>0.05$). The hand washing between trained (93.6%) and non trained (84%) of HCWs after contact with wound was significantly different ($p=0.005$). Seventy four of trained and 66(29.5%) of non trained HCWs washed their hands before entering the isolated room, and the difference was significant ($p<0.001$). After taking off the gloves, 76.2% of trained and 58.9% of non trained HCWs washed their hands that was significantly different ($p=0.001$). Also 58.7% of trained and 19.2% of non trained of HCWs washed their hands before examination of patients and this difference was significant ($p<0.001$). After exiting the isolated room, 65.8% of trained and 28.1% of non trained did hand washing; this difference was significant ($p<0.001$). And finally 84.9% of trained and 49.5% of non trained washed their hands after tracheal tube suctioning ($p<0.001$).

In this study, hand washing rate in females was 76.8%, which is significantly higher than males (48%) ($p<0.001$). Before contact with wound, 34.2% of males and 48.3% of females did hand washing ($p=0.006$). Hand washing in males (76.2%) was less than females (87.9%) after examining the patient ($p<0.001$). Among males, 91.6% washed their hands after contact with blood, but this was 98% in females ($p=0.005$). And the following situations, showed significant difference: After contact with wounds ($p=0.001$), before entrance to the isolated room ($p<0.001$), before examining the patients ($p<0.001$), after exiting isolated room ($p<0.001$) and after tracheal tube suctioning ($p<0.001$). There was no difference between males and females after taking off gloves ($p=0.2$).

Forty eight percent of physicians, 76.1% of nurses, 70.5% of nurses aide, and 74.3% of other personnel washed their hands routinely, this indicates a difference between physicians and the others ($p<0.001$)(table 2).

The rate of hand washing was 62.7% in internal medicine ward, 50.8% in surgery department, 69.5% in emergency unit, 87.5% in pediatric and 75% in gynecology departments ($p=0.03$)(table 3). There was no difference between age groups.

Table 2. Handwashing based on occupation of HCWs in a teaching hospital

Occupation	Washing		No washing		Total	
	No.(percent)	No.(percent)	No.(percent)	No.(percent)	No.(percent)	No.(percent)
Doctors	59(48)	65(52)	124	35.42		
Nurses	112(76.1)	37(23.9)	147	42		
Nurse' aide	31(70.45)	13(29.55)	44	12.57		
Others	26(74.3)	9(25.7)	35	10		
Total	228(65.14)	122(34.86)	350	100		

Table 3. Hand washing based on department in a teaching hospital

Department	Washing		No washing		Total	
	No.	Percent	No.	Percent	No.	Percent
Internal medicine	74	62.71%	44	37.29%	118	33.7%
Surgery	33	50.77%	32	49.23%	65	18.6%
Emergency	73	69.52%	32	30.48%	105	30%
Pediatrics	7	87.5%	1	12.5%	8	2.3%
Gynecology	24	75%	8	25%	32	9.1%
Others	17	77.27%	5	22.73%	22	6.3%
Total	228	65.14%	122	34.86%	350	100%

4. Discussion

Hand hygiene can reduce healthcare associated infections and no attention to hand hygiene causes spread of drug resistant microorganisms and outbreaks of infections. Therefore promotion of hand hygiene helps to control of outbreaks in hospitals.

Hands can transport pathogens from contaminated stuff, health care workers, and some patients to other ones. Hand washing is one of the important methods of prevention of transmission of infection. In order to protect patients from nosocomial infections, hand washing must be done, all the times and regularly (4). Although hand washing is the most important procedure in preventing nosocomial infections but the hospital staff don't pay attention to ways of and how cleaning hands. They usually use non-standard methods for hand washing and they do much less frequent and spend less time on that, unlike they claim(5). In this study 350 cases of hospital staff were surveyed. 36% of them were trained in a course about hand hygiene; it means high percentage of HCWs in a teaching hospital in capital city had not participated in teaching course about hand washing. In this study only 65% of cases said they washed their hands; that is similar to study of Harris AD. et al that compliance of handwashing was less than 50%(11).

The rate of hand washing was higher in nurses, that is like the study of Sessa A. et al, who stated female nurses had more positive attitude about disinfection procedures than males (12).

The percentage of personnel who used hand hygiene

procedures is like the study of Garcell HG et al in Havana , Cuba(13).

Although many of the healthcare workers specially physicians as a tertiary care center had awareness about the effectiveness of hand washing, but they did not perform in practice; It is similar to a study done in southwest Nigeria that showed good knowledge and attitude but poor practice among tertiary and secondary HCWs in Osogbo (14) and the study of Macdonald Duncan JM.et al (15).

Like the study of Caglar S. et al in NICU in Istanbul, Turkey(16), the difference between physicians and others was seen($p < 0.001$).

The effectiveness of training course to improve hand hygiene compliance of HCWs is important (17), Naikoba S. et al showed that educational intervention had influence on hand washing behavior, but it was short-term (16). In our study, in many situations, hand washing was done more and more in trained HCWs -who used alcohol-based hand rub too- than non trained subjects; although this was not designed for long-term. This study showed that training courses workshop had significant effect on hand hygiene and participation of personnel in training course can be very important in reducing nosocomial infection.

In this study, physicians washed their hands less than other groups significantly. It is very important because physicians are the core of health care system and their practice has many effects on habits of other HCWs.

Hand washing in pediatric and gynecology department was significantly higher than other wards.

The age of HCWs had no effect on hand washing, while its rate was higher in females.

Samadipour A. et al showed that hand washing was 34.4% in internal medicine department, 21.3% in surgery ward, 15.7% in ICUs and for physicians the rate was only 16.6% (8). In study of Rungay S. et al hand washing rate was in physicians 12.8% and in nurses 65.2%, just like our study(9).

Our study had several limitations: the sampling was not randomly, participants from different departments were not homogen, and facilities for hand washing were not enough in various parts of hospital.

5. Conclusion

This study shows that participating in hand hygiene training course has positive effect on HCWs' practice and females have higher rate of hand washing. It is suggested that training courses should be held routinely for all groups of HCWs.

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