

ORIGINAL
INVESTIGATION

Assessment of Knowledge and Behavior on Hand Hygiene in Health Care Workers

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ABSTRACT

Objective: Hand hygiene is a basic measure for the control of hospital-acquired infections. However, sustained compliance with hand hygiene in health care workers is poor. The purpose of this study was to investigate the practices and knowledge level about hand hygiene among health care workers in our hospital.

Materials and Methods: This study was performed in Diyarbakir Training and Research Hospital in May 2013. A total of 179 health care workers (HCWs) were included in the study. A questionnaire was administered to HCWs to assess their knowledge and practices on hand hygiene. Statistical Package for the Social Sciences (SPSS) 16.0 program was used for the evaluation of data.

Results: Of 179 patients in the study, 123 (68.7%) were male and 56 (31.3%) were female. The mean age was 28.7 years (18-56 years). A hundred and thirty-three (74.3%) of HCWs had received training on hand hygiene. However, it was determined that the knowledge levels and practices of HCWs on hand hygiene were inadequate.

Conclusion: It is important that health care workers should be educated about hand hygiene. In addition, it is necessary to improve the physical conditions of our hospital.

Keywords: Health care workers, hand hygiene, education

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INTRODUCTION

Hospital infection (HI) is a significant health concern in developed and developing countries and has recently gained more importance due to its morbidity, mortality, and cost (1). Hand hygiene is the main factor for the prevention of HIs and prevents the contamination of pathogen microorganisms through contact and fecal-oral route (2). One of the first examples on this issue was the observation of Semmelweis in 1847. Semmelweis decreased the rate of maternal mortality from 22% to 3% by requiring the physicians to wash their hands before the delivery (3). In the studies conducted recently, compliance with hand hygiene among health workers was lower than 50% (4-7). Although the methods and study groups of these studies are different from each other, it is a fact that hand-hygiene compliance rate is low globally (8). This can be resulted from inadequate infrastructure of the intensive care units (ICU) and from the health workers' not adopting the habit of hand washing. In this study, we aimed to evaluate hand washing practices of the physicians and nurses working in our hospital and their knowledge on this issue.

MATERIALS and METHODS

Our hospital is a training and research hospital with 1067 bed capacity and 2927 personnel. Thirty five health workers from internal medicine clinics, 55 workers from surgical clinics, 11 workers from the dialysis unit, 33 workers from the intensive care unit, 9 workers from the laboratory, 21 workers from the outpatient clinics, 1 worker from the burn unit, and 14 workers from the emergency department (total, 179 health workers) voluntarily participated in the survey. They were given these questionnaire forms and asked to complete them. Each person given the form was informed about the purpose of the survey and answering techniques in detail. The questionnaire form that was designed to collect data consisted of two parts. The first part included questions about demographic features, such as the age and occupation of the participants. The questions in the second part were about receiving training on hand hygiene after graduation, their need for training, the method they used for hand hygiene, the duration of hand washing and scrubbing, the frequency of hand washing, the cases in which they mostly provide hand hygiene, the situations requiring hand hygiene, problems encountered in the practice of hand hygiene, the use of antiseptic for hands and if not used, its reason, hand hygiene before wearing glove and after taking off glove, their belief in increased compliance as a result of observation, and warning their co-workers about hand hygiene.

Statistical analysis

The data obtained were evaluated by calculating counts and percentages.

RESULTS

In the first part of the survey, demographic data of the hospital personnel were collected. Of the participants, 123 (68.7%) were male and 56 (31.3%) were female. The mean age was 28.7 ± 6.49 years (18-56 years). Among these 179 health workers, 127 (70.9%) were nurse, 17 (9.5%) were specialist physician, 14 (7.8%) were health officer, 8 (4.5%) were paramedics, 7 (3.9%) were cleaning staff, 3 (1.7%) were emergency medical technician, 2 (1.1%) were midwife, and 1 (0.6%) was practicing physician. Their educational background and duration of working are mentioned in Table 1.

A hundred and thirty three (74.3%) of workers stated that they received training on hand hygiene after graduation. Despite this, 131 (73.2%) of them emphasized that they needed more education. Fourteen (8%) stated that they provided hand hygiene before contacting a patient, whereas 118 (66.5%) provided hand hygiene after contacting a patient. Of them, 113 workers (63.6%) mentioned that they practiced hand hygiene after contacting any body fluid and 27 (15.2%) practiced before an aseptic procedure. In addition, 65 workers (36.3%) stated that they paid attention to hand hygiene after contacting the family of a patient. On the other hand, 161 (89.9%) specified that they did not practice hand hygiene after taking off glove and 134 (74.9%) did not practice before wearing glove (Table 2). Fifty workers (28%) used normal soap, 82 (46%) used antiseptic soap, and 47 (26%) used hand antiseptic (Table 3). A hundred and thirty nine (77.6%) health staff told that wearing glove was sufficient for protection. Of them, 134 (74.9%) stated that they did not practice hand hygiene before wearing glove and 161 (89.9%) specified that they did not provide hand hygiene after taking off glove. A hundred and thirteen workers did not use hand antiseptic. The reasons for this included distrust (47.7%), restricted time (15.9%), workload (14.1%), dry hands associated with the use of antiseptic (10.9%), its unpleasant smell (7%), and the feeling of stickiness (4%). With regard to the problems encountered for the practice of hand hygiene, the most frequent one was workload (Table 2).

DISCUSSION

Most of HIs result from inappropriate patient care practices. The hands of health workers are accepted to be the most important way for the transmission of nosocomial infections, and therefore, hand washing is the most effective method for the prevention of hospital infections (9). However, many studies have revealed that most of health staff does not wash their hands when necessary (10, 11). Providing behavioral change among health workers is currently one of the most compelling issues in infection control (12). One of the most important reasons for not practicing hand hygiene among health staff is lack of knowledge and education. The factors leading to noncompliance also include their ignorance on hand hygiene guidelines and on the transmission of microorgan-

Table 1. Demographic features of health workers

	Feature	Number	%
Gender	Male	123	68.7
	Female	56	31.3
Age distribution	18-28	77	43
	29-39	89	49.7
	40-50	10	5.4
	>50	3	1.5
	Occupation	Nurse	127
	Specialist physician	17	9.5
	Health officer	14	7.8
	Paramedics	8	4.5
	Cleaning staff	7	3.9
	Emergency medical technician	3	1.7
	Midwife	2	1.1
	Practicing physician	1	0.6
Educational status	Doctorate	17	9.5
	Graduate	4	2.2
	Undergraduate	90	50.3
	Associate's degree	38	21.3
	High school	23	12.8
	Secondary education	7	3.9
Working year	0-5 years	65	36.3
	6-10 years	83	46.3
	11-15 years	20	11.2
	>16 years	11	6.2

isms (8). Although 133 (74.3%) of health personnel in this study stated that they took training on hand hygiene after graduation, the knowledge about the fact that hospital infections can be decreased through compliance with hand hygiene is still insufficient. Despite the high rate of taking training, 131 (73.2%) mentioned that they need more education on the issue. The most important reasons for noncompliance with hand hygiene include not being able to reach hand hygiene products, skin irritation, use of glove, workload, the institution's not giving priority to hand hygiene, and insufficient time (8). The results obtained in this study are also similar. The most frequent reason was stated to be workload by the staff (54.7%), which shows insufficient number of the health personnel in our hospital. The second most frequent reason was the hardly reachable places of the washbasins. This suggested that the washbasins in the clinics should be built in easily accessible locations as soon as possible. Moreover, the lack of supplies is one of the significant reasons and the role of the hospital administration is

Table 2. Evaluation of the behaviors of participants

Questions	Yes n (%)	No n (%)
Did you take education on hand hygiene after graduation?	133 (74.3)	46 (25.7)
Do you need more education on hand hygiene?	131 (73.2)	48 (26.8)
Are gloves enough for protection?	139 (77.6)	40 (22.4)
Does knowing that you are observed increase your compliance with hand hygiene?	94 (52.5)	85 (47.5)
Is it necessary to practice hand hygiene before patient care?	81 (45.2)	98 (54.8)
Is it necessary to practice hand hygiene after patient care?	127 (71)	52 (29)
Is it necessary to practice hand hygiene while passing from contaminated area to clean area in the same patient?	101 (56.4)	78 (43.6)
Is it necessary to practice hand hygiene before invasive procedure?	61 (34)	118 (66)
Is it necessary to practice hand hygiene after invasive procedure?	99 (55.3)	80 (44.7)
Is it necessary to practice hand hygiene after contact with the family of patient?	156 (87.1)	23 (12.9)
Is it necessary to practice hand hygiene before aseptic procedure?	76 (42.4)	103 (57.6)
Is it necessary to practice hand hygiene after invasive procedure?	111 (62)	68 (38)
Is it necessary to practice hand hygiene after contacting body secretions?	168 (93.8)	11 (6.2)
Is it necessary to practice hand hygiene while passing from one patient to another?	73 (40.7)	106 (59.3)

important to resolve this issue. In the study of Demirdal et al. (13), excessive workload, damaged hands, and hardly accessible places of the washbasins were found to be among the reasons for poor hand hygiene. In addition, in the study conducted by Karabey et al. (14), the reasons of poor compliance were revealed to be lower health staff/patient ratio, excessive use of glove, and insufficiencies in the infrastructure of ICU (the number of washbasins, its distance, paper towel, hand antiseptic, etc.).

The use of glove among health workers became more common after the pandemic of AIDS that began in 1980s (15). There are some studies suggesting that the use of glove increases noncompliance (16, 17). The use and change of glove cannot replace the practice of hand hygiene. Not practicing hand hygiene after taking off glove is defined as noncompliance. Health staff should be informed that wearing glove does not provide complete protection against contamination due to the hands. Similarly, in our study, 139 (77.6%) workers stated that wearing glove was sufficient for protection and 161 (89.9%) told that they did not practice hand hygiene after taking off glove. In workers, 63.2% specified that they did not use hand antiseptic and leading causes of this were distrust (47.7%) and restricted time (15.9%). According to the recently published guidelines, the primary practice, recommended in the absence of visible contamination, is the use of alcohol-based hand disinfectant. Moreover, it has been revealed that the use of these disinfectants prevents the loss of time spent for hand washing (18). It is difficult to comment on the frequency of daily hand washing because the frequency of working was not observed. However, considering that the departments of the participants in the study are busy clinics, it is a fact that the frequency of hand washing is low. In a study conducted in our country, the frequency of hand

washing in the intensive care unit was found to be 12.9% (14). In our study, the number of workers who stated that they were not supported sufficiently by the administration for the practice of hand hygiene was 116 (64.8%). This may have resulted because of hardly accessible location of washbasins, especially in the clinics, and insufficiency of supplies. Moreover, with regard to the indications of hand hygiene, it can be believed that the higher rate of compliance after procedures may have been due to the instinct of self-protection rather than patient-protection.

CONCLUSION

Lack of knowledge and education is the most important obstacle for motivation. Providing behavioral changes among health staff is one of the most challenging issues of infection control at present (19). The lack of knowledge on hand hygiene was also detected in our hospital, which warns us, the infection control committee, about the necessity for increasing training programs that are more effective. Furthermore, it has been reemphasized that the administration should provide the necessary support for the practice of hand hygiene. Therefore, a further multi-directional and multi-disciplinary study is needed.

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Peer-review: Externally peer-reviewed.

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Table 3. Evaluation of participants' knowledge level

Questions	Yes (%)	No (%)
What do you use for hand hygiene?		
Normal soap	50 (28)	
Antiseptic soap	82 (46)	
Hand antiseptic	47 (26)	
Can you easily reach hand hygiene products?	74 (41.3)	105 (58.7)
Do you practice hand hygiene before wearing glove?	45 (25.1)	134 (74.9)
Do you practice hand hygiene after taking off glove?	18 (10.1)	161 (89.9)
Do you use hand antiseptic?	66 (36.8)	113 (63.2)
What are the reasons for not using hand antiseptic?		
I do not trust.	54 (47.7)	
I have no time.	18 (15.9)	
It smells unpleasant.	8 (7)	
It gives the feeling of stickiness.	5 (4.4)	
I have too much workload	16 (14.1)	
It dries my hands	12 (10.9)	
Does knowing that you are observed increase your compliance with hand hygiene?	94 (52.5)	85 (47.5)
Do you warn your co-workers who do not display compliance with hand hygiene?	69 (38.5)	110 (61.5)
How often do you wash your hands?		
Frequently	25 (13.9)	
Sometimes	143 (79.8)	
Rarely	9 (5)	
When they are contaminated	2 (1.3)	
What are the problems you encounter for the practice of hand hygiene?		
Workload	98 (54.7)	
Lack of supplies	21 (11.7)	
Hardly accessible locations of the washbasins	37 (20.6)	
Deformity caused by hygiene agents in the hands	23 (13)	
Does the administration provide sufficient support for hand hygiene?	63 (35.2)	116 (64.8)
Do you continue performing your habits instead of complying with hand washing procedures?	65 (36.3)	114 (63.7)

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REFERENCES

- Jarvis WR. Selected aspects of the socioeconomic impact of nosocomial infections: Morbidity, mortality, cost and prevention. *Infect Control Hosp Epidemiol* 1996; 17(8): 552-7. [\[CrossRef\]](#)
- 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. Society for Healthcare Epidemiology of America/Association for Professionals in Infection Control/Infectious Diseases Society of America. *MMWR Recomm Rep* 2002 Oct 25; 51(RR-16): 1-45, quiz CE1-4.
- Dilek Arman. El yıkama ve el dezenfeksiyonu. Doğanay M, Ünal S (editörler). *Hastane İnfeksiyonları*. 1. Baskı. Ankara: Bilimsel Tıp Yayınevi. 2003.p.91-107.

4. Albert RK, Condie F. Hand-washing patterns in medical intensive-care units. *N Engl J Med* 1981; 304(14): 1465-6. [\[CrossRef\]](#)
5. Doebbeling BN1, Stanley GL, Sheetz CT, Pfaller MA, Houston AK, Annis L. Comparative efficacy of alternative hand-washing agents in reducing nosocomial infections in intensive care units. *N Engl J Med* 1992; 327(2): 88-93. [\[CrossRef\]](#)
6. Dubbert PM, Dolce J, Richter W, Miller M, Chapman SW. Increasing ICU staff handwashing: Effects of education and group feedback. *Infect Control Hosp Epidemiol* 1990; 11(4): 191-3. [\[CrossRef\]](#)
7. Graham M. Frequency and duration of handwashing in an intensive care unit. *Am J Infect Control* 1990; 18(2): 77-81. [\[CrossRef\]](#)
8. Pittet D. Improving compliance with hand hygiene in hospitals. *Infect Control Hosp Epidemiol* 2000; 21(6): 381-6. [\[CrossRef\]](#)
9. Yorgancı K, Çakmakçı M. El yıkama: Yoğun bakım infeksiyonlarını önlemede etkin bir yöntem. *Ulusal Travma Dergisi* 1997; 3: 164-8.
10. Steere AC, Mallison GF. Handwashing practices for the prevention of nosocomial infections. *Ann Intern Med* 1975; 83(5): 683-90. [\[CrossRef\]](#)
11. Albert RK, Condie F. Handwashing patterns in medical intensive care units. *N Engl J Med* 1981; 304(24): 1465-6. [\[CrossRef\]](#)
12. Pittet D. The Lowbury lecture: Behavior in infection control. *J Hosp Infect* 2004; 58(1): 1-13. [\[CrossRef\]](#)
13. Demirdal T, Uyar S, Demirtürk N. Bir Üniversite Hastanesinde Çalışanlarda El Yıkama Uygulamalarının ve Bilgi Düzeylerinin Değerlendirmesi. *The Med J of Kocatepe* 2007; 8(3): 39-43.
14. Karabey S, Ay P, Derbentli S, Nakipoğlu Y, Esen F. Handwashing frequencies in an intensive care unit. *J Hosp Infect* 2002; 50(1): 36-41. [\[CrossRef\]](#)
15. Occupational Safety and Health Administration. 29 CFR Part 1910.1030. Occupational exposure to bloodborne pathogens: Final rule. *Federal Register* 1991; 29CFR Part 1991; 1910: 1030.
16. Khatib M, Jamaledine G, Abdallah A, Ibrahim Y. Handwashing and use of gloves while managing patients receiving mechanical ventilation in the ICU. *Chest* 1999; 116(1): 172-5. [\[CrossRef\]](#)
17. Thompson BL, Dwyer DM, Ussery XT, Denman S, Vacek P, Schwartz B. Handwashing and glove use in a long-term-care facility. *Infect Control Hosp Epidemiol* 1997; 18(2): 97-103. [\[CrossRef\]](#)
18. Boyce JM, Pittet D. Healthcare Infection Control Practices Advisory Committee. Society for Healthcare Epidemiology of America. Association for Professionals in Infection Control. Infectious Diseases Society of America. 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. *Infect Control Hosp Epidemiol* 2002; 23(3): 3-40. [\[CrossRef\]](#)
19. Pittet D. The Lowbury lecture: Behavior in infection control. *J Hosp Infect* 2004; 58(1): 1-13. [\[CrossRef\]](#)