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**Serap Süzük,
Çiğdem Edis,
Arzu Çalık,
Serpil Akdoğan,
Selma Ünal**

The Compliance Rates of Hand Hygiene in Intensive Care Unit and Surgical Services at a State Hospital in Turkey

Türkiye'de Bir Devlet Hastanesi Yoğun Bakım Ünitesi ve Cerrahi Servislerinde El Hijyeni Uyum Oranları

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Serap Süzük
Public Health Institution of Turkey, National Antimicrobial Resistance Laboratory, Ankara, Turkey

Çiğdem Edis
Kırıkkale High Specialty Hospitals, Clinic of Infectious Diseases and Clinical Microbiology, Kırıkkale, Turkey

Arzu Çalık, Serpil Akdoğan, Selma Ünal
Kırıkkale High Specialty Hospitals, Infection Control Committee, Kırıkkale, Turkey

Serap Süzük (✉),
Public Health Institution of Turkey, National Antimicrobial Resistance Laboratory, Ankara, Turkey
E-mail: serapsuzuk@gmail.com
Phone: +90 532 682 49 23

SUMMARY *Objective:* The most efficient and most cost effective method for preventing health care associated infections is hand hygiene. Although hand hygiene is the most effective and simple method, compliance rates are very low among health care workers. It was aimed to evaluate the rates of compliance of healthcare workers in a state hospital.
Material and Method: In this study, totally 112 healthcare workers (31 doctors and 81 nurses) were evaluated with the 5-indication observation method in a period between January and July 2013.
Results: A total of 754 (65.9%) out of 1.144 cases were resulted in accurate hand washing and hand-rubbing. When the intensive care unit and surgical clinics were evaluated together, it was found that hand hygiene compliance rates were 51.26% in 199 cases and 66.85% in 591 cases for doctors and nurses, respectively.
Conclusion: Consequently, we think that pre-informed observations are important training instruments for hand hygiene compliance.
Keywords: Hand hygiene, the rate of hand hygiene compliance, informed observations

ÖZ *Amaç:* Sağlık hizmetleri ile ilişkili enfeksiyonların korunmasında en etkili ve maliyet olarak en uygun yöntem el hijyenidir. Ancak buna karşın, sağlık çalışanları arasında el hijyeni uyum oranı düşüktür. Bu çalışmada bir devlet hastanesinde sağlık çalışanları arasında el hijyeni uyum oranlarının değerlendirmesi amaçlandı.
Gereç ve Yöntem: Bu çalışmada Ocak-Haziran 2013 tarihleri arasında toplam 112 sağlık çalışanında (31 doktor ve 81 hemşire) el hijyen uyum oranı 5 endikasyon gözlem yöntemiyle değerlendirildi.
Bulgular: Değerlendirmeye alınan 1,144 kişinin 754'ü (%65,9) doğru el yıkama ve ovma ile sonuçlandı. Yoğun bakım ünitesi ve cerrahi kliniklerde çalışan doktor ve hemşireler birlikte değerlendirildiğinde, sırasıyla yoğun bakım ünitelerinde 199 kişide el hijyeni uyum oranı %51,26 ve cerrahi servislerde ise 591 kişide uyum oranı %66,85 bulundu.
Sonuç: Sonuç olarak, gözlemlerin haberli olarak yapılmasının el hijyeni uyumu için iyi bir eğitim aracı olduğunu düşünüyoruz.
Anahtar Kelimeler: El hijyeni, el hijyeni uyum oranı, haberli gözlem

Introduction

Healthcare-associated infections (HAIs) cause many problems as prolonged hospitalization, consumption of resources as well as increased morbidity and mortality, increasing cost and antimicrobial resistance. The protection methods are important in HAIs as well as other infection diseases (1). Hand hygiene practice is one of the most effective measures to prevent HAIs (2). Although hand hygiene is an effective and simple method, hand hygiene compliance among health care workers is very low (3).

Increased patient workload, decreased staffing, limited time, long distances to sinks, belief that use of glove obviates the need for hand hygiene and ignorance of or disagreement with guidelines and protocols have all contributed to poor compliance with hand hygiene and other routine infection control measures (4,5).

Evaluation of hand hygiene compliance among healthcare workers can be made via direct or indirect methods. Direct methods include direct observation, patient assessment or health care workers (HCW) self-reporting. Indirect methods include monitoring consumption of products, such as soap or hand rub, and automated monitoring of the use of sinks and hand rub dispensers. Direct observation is the gold standard to monitor compliance with optimal hand hygiene practice (1). National quality standards (NQS), that has standards of direct and indirect methods for the evaluation of hand hygiene compliance is used in all health care systems in Turkey. In our country, five moments for hand hygiene is used both hand hygiene procedure and evaluation of hand hygiene compliance (6). Therefore the aim of this study was to detect the compliance of hand hygiene among physicians and nurses and to compare the compliance of intensive care unit and surgery service.

Materials and Methods

Setting and Participants

This study was performed in a state hospital with 750 beds and step 2nd of intensive care unit (ICU) with 20 beds. This study was performed in ICU and surgical services from January 2014 to July 2014, totally 112 health workers with 31 physicians and 81 nurses.

Definitions

Every indication that require hand hygiene practice was termed to "opportunity", "washing" was defined as the proper hand washing with soap and water, "rubbing" was defined as the correct hand rubbing with alcohol-based hand rubs. Indications (five indication) were defined as before touching a patient, before a clean/aseptic procedure, after body fluid exposure risk, after touching a patient, after touching patient surroundings.

Monitoring Hand Hygiene by Direct Methods

Observations are usually performed by trained and validated observers who observe care activity directly and count the occurring hand hygiene opportunities and determine the proportion being met by hand hygiene actions. It is the only method available to detect all occurring hand hygiene opportunities and actions and to assess the number of times and appropriate timing when hand hygiene actions would be required during the care. It is essential that hand hygiene opportunities, indications, and actions are clearly defined. The results of the observations were recorded by the observer. Then, data was analyzed and the report was prepared for each department. Observer gave feedback about report of compliance hand hygiene for each department. According to the NQS, all healthcare workers in intensive care unit and 10% of all healthcare workers in surgical service was observed every three months. According to the NQS, observer prepared training programme for each occupational group. The programme included five moments for hand hygiene, right hand washing, right hand rubbing, use of gloves and the characteristics of alcohol-based hand rubs. The training was given to healthcare workers via face to face in working field by the observer.

Compliance

A healthcare worker was assessed for more than one opportunity in each observation. If right hand washing or hand rubbing was made for an opportunity, observer would give 1 (one), if not 0 (zero). The data obtained from observations were recorded in microsoft office excel 2010 program. The compliance rates of hand hygiene were determined as percentage for five moments, for ICU and surgical services and for each occupational group.

Compliance (%): Right Hand Hygiene Practice (washing or rubbing)/The number of opportunity

Statistical Analysis

The data were analyzed using SPSS program, version 17.0 and subjected to Chi-square test. At 95% confidence interval, $p<0.05$ was considered statistically significant.

Results

In this study, a total of 790 opportunities were evaluated for 112 healthcare workers with 31 physicians and 81 nurses and 503 (63.67%) of these opportunities was resulted in right hand washing and hand rubbing. Compliance rate of physicians was 51.26% and compliance rate of nurses was 67.85%. Compliance rate of nurses was significantly higher than that of physicians in both ICU and surgical services ($p=0.036$ and $p=0.000$, respectively). The highest general hand hygiene compliance rate of physicians was before a clean/aseptic procedure on the other hand the highest compliance rate of nurses is after body fluid exposure risk. The data of the general compliance is given in Table 1.

Compliance rate of physicians was 60.81% and compliance rate of nurses was 70.16% in ICU. Whereas the lowest compliance rate of physicians is after touching a patient hand, the lowest compliance rate of nurses is after body fluid exposure risk. The data of the compliance rate for ICU is given Table 2.

Compliance rate of physicians was 45.60% and compliance rate of nurses was 65.23% in general surgical services. Whereas the lowest compliance rate of physicians is after body fluid exposure risk, the lowest compliance rate of nurses is before a clean/aseptic procedure. The data of the compliance rate for general surgical services are given Table 3.

Discussion

HCAI is a major problem for patient safety and its surveillance and prevention must be a first priority for making health care safer. HCAI implies prolonged hospital stay, long-term disability, increased resistance of microorganisms to antimicrobials, massive additional financial burden, high costs for patients, their families, government's, and excess deaths. Therefore, preventive measures against infectious diseases are getting more important. Hand hygiene is basic, but very effective means of preventing the HCAI in healthcare. Although hand hygiene is a simple and cheap method, the compliance rate of hand hygiene in health workers is only about 40-50% in the world (1,3). In this study, it was found that the compliance rate of hand hygiene is 63.67% in health workers.

Direct observation is the gold standard to monitor compliance with optimal hand hygiene practice and also

Table 1. The compliance rate of hand hygiene in physicians and nurses

Five moment	Total opportunity	Physicians (n=31)				Nurses (n=81)				General compliance (%)
		Opportunity (%)	Hand washing (%)	Hand rubbing (%)	Compliance (%)	Opportunity (%)	Hand washing (%)	Hand rubbing (%)	Compliance (%)	
Before touching a patient	169	50	0	27	54.00	119	8	75	69.75	65.09
Before a clean/ aseptic procedure	88	8	0	8	100.00	80	4	34	47.50	52.27
After body fluid exposure risk	101	20	3	6	45.00	81	13	48	75.31	69.31
After touching a patient	209	55	2	24	47.27	154	31	82	73.38	66.51
After touching patient surroundings	223	66	0	32	48.48	157	24	82	67.52	61.88
Total compliance rate	790	199	5	97	51.26	591	80	321	67.85	63.67

Table 2. The compliance rate of hand hygiene in physicians and nurses in intensive care unit

Five moment	Total opportunity	Physicians (n=5)	Nurses (n=25)	General compliance in ICU	p
		Compliance	Compliance		
Before touching a patient	43	60.00	71.43	67.44	0.446
Before a clean/aseptic procedure	19	100.00	25.00	36.84	0.013
After body fluid exposure risk	31	60.00	80.95	74.19	0.213
After touching a patient	72	52.38	78.43	70.83	0.027
After touching patient surroundings	83	64.00	82.76	77.11	0.062
Total compliance rate	248	60.81	74.14	70.16	0.036

ICU: Intensive care unit

it is a training method for healthcare workers because, direct observation of healthcare workers may increase the awareness of hand hygiene in healthcare workers (7). According to the NQS, all healthcare workers in ICU and 10% of healthcare workers in general surgery services are evaluated every three months by the observer and it was found that the compliance rate in ICU and general surgery services are 70.16% and 60.70%. Since healthcare workers in ICU are evaluated more often than HCWs in general surgery services, we may have found that the compliance rate in ICU is higher than general surgery services. After body fluid exposure risk is the highest compliance rate in our hospital (69.31%).

Australia implements a similar hand hygiene programme that data have been collected nationally from a total of 782 hospitals from both the public and private sectors. The average compliance rate was 81% and the highest compliance rate is after body fluid exposure risk (8). In Kingdom of Saudi Arabia, the overall hand hygiene compliance rate of 163 healthcare workers reached 50.3% after a long education campaign, and was highest among the nurses (52.2%) (9).

Germany prepared the campaign that was adopted World Health Organizations (WHO) "Clean Care is Safer Care". This campaign was implemented in intensive care units and hematopoetic stem cell transplantation units at Hannover Medical School. During the campaign, compliance rate of hand hygiene increased both physicians and nurses. At the beginning of the campaign in 2008, compliance of physicians and nurses are 53% and 57%, physicians' compliance improved 64% in 2011 and nurses' compliance increased to 71.3% in 2009 (10).

WHO was started a campaign "Clean Care is Safer Care" globally. The goal of the campaign was to ensure that infection control is acknowledged universally as a solid and essential basis towards patient safety and supports the reduction of HCAIs and their consequences (11). In many countries, strategies were developed for hand hygiene practices and tools were made for multimodal hand hygiene (12). When many countries participated in this campaign, they contributed to the creation of global data (13). In Turkey, NQS prepared in accordance with this campaign has standards increasing compliance rate of hand hygiene (6). The hand hygiene program was created to increase hand hygiene compliance in hospitals in Taiwan. The compliance rate of hand hygiene increased from 43.32% to 95.6% in Taiwan (14). In Germany, it was to define the number of hand rubs needed for an individual patient care at the emergency department and to optimize hand hygiene compliance without increasing workload. At the end of the study, it was detected that compliance rate of hand hygiene increased from 21% to 45% (15).

Generally, compliance rates before patient contact were lower than after patient contact (16). In this study, it was also found that compliance rate was higher for after patient contact. Actually hand hygiene before patient contact and before a clean/aseptic procedure are more closely related with healthcare associated infection. Therefore, increasing hand hygiene compliance among health care workers in before patient contact and before a clean/aseptic procedure is more important (17).

In this study, direct observation was made in morning time, so this situation can be the most important limitation in this study. Because, compliance rates can be affected by higher motivation and less tired of the healthcare workers in the morning times. Electronic monitoring systems can provide objective measurement of hand hygiene compliance all day (18).

According human services quality standards, an alcohol-based hand rubs should be included for each patient (6). The equipment for hand hygiene should be accessible in the patient room. The rate of hand hygiene compliance of healthcare workers working in single rooms was higher (19).

In the hand hygiene program implemented in our hospital, feedback includes results of compliance rate must be given healthcare workers and hospital administrators in fourth times in year. Feedback is critical to the success of hand hygiene programs (20).

Table 3. The compliance rate of hand hygiene in physicians and nurses in general surgical services

Five moment	Total opportunity	Physicians (n=5)	Nurses (n=25)	General Compliance in GSS*	p
		Compliance	Compliance		
Before touching a patient	126	51.43	69.23	64.29	0.062
Before a clean/aseptic procedure	69	100.00	53.13	56.52	0.042
After body fluid exposure risk	70	30.00	73.33	67.14	0.007
After touching a patient	137	44.12	70.87	64.23	0.005
After touching patient surroundings	140	39.02	58.59	52.86	0.035
Total compliance rate	542	45.60	65.23	60.70	0.000

*GSS: General surgical services

In our country, the hand hygiene compliance at healthcare workers is usually to protect themselves. Furthermore, compliance with hand hygiene rules at the indirect contact with patients is poor (21,22). In our country, had hygiene compliance is low but it is getting improve in years (23). Studies performed in Turkey show that nurses have higher compliance rate than doctors. We are thinking that nurses have higher awareness and knowledge about hand hygiene in Turkey.

Increasing compliance rate of hand hygiene that is both simple and cheap in the controlling of healthcare associated infection is important. We believe that direct observation is useful toolkit for increasing compliance rate of hand hygiene, so this method should be expanded in the health care.

Author Contributions

Ethics Committee Approval: Not need. Informed Consent: All participants filled out consent form. Concept: Serap Süzük, Arzu Çalık, Design: Serap Süzük, Çiğdem Edis, Arzu Çalık, Data Collection or Processing: Arzu Çalık, Serpil Akdoğan, Selma Ünal, Analysis or Interpretation: Serap Süzük, Çiğdem Edis, Literature Search: Serap Süzük, Çiğdem Edis, Arzu Çalık, Writing: Serap Süzük, Çiğdem Edis, Peer-review: Internal peer-reviewed. Conflict of Interest: No conflict of interest was declared by the authors. Financial Disclosure: The authors declared that this study has received no financial support.

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