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Knowledge and Behaviors Related to Hand Hygiene Among Al-Assad University Hospital Nurses

Dr. Sawsan gazal*

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□ ABSTRACT □

Compliance of health care workers to adhere to correct hand hygiene is reported to be poor in many countries although the techniques involved in hand hygiene are simple. This study yielded interesting findings regarding knowledge and behavior among a sample of 30 nurses in Al-assad university hospital in Lattakia. Nurses received a self administered paper questionnaire on knowledge and practices of hand hygiene at their workplace and were observed during their work. Only (14 %) of participants had very good knowledge about hand hygiene, with a significant difference in the level of knowledge according to the level of education as respondents with university degree were more likely to correctly identify the proper way of hand hygiene compared to those nurses who have a lower level of education. On the other hand, the overall hand hygiene compliance among nurses is 30%**.** Some of the key parameters associated with noncompliance have been clearly identified. Hand washing hygiene is a cheap and primary infection control procedure. Therefore, the study suggests some improvement by continuous education during shifts, seminars and posters, ensuring the availability of adequate hand washing utilities like soap, water taps, drying tissues and reducing work load to improve nurse to patient ratio**.**

Keywords: Knowledge, behavior, Hand hygiene, Hand washing , nurses**.**

***Professor, medical nursing/ critical care, faculty of nursing, University Tishreen, Syria .**

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معلومات وسلوكيات ممرضي مشفى الأسد الجامعي المتعلقة بتقنية غسيل الأيدي

الدكتورة سوسن غزال*

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□ ملخّص □

على الرغم من كون تقنية غسيل الأيدي تقنية بسيطة، سجل العديد من الأبحاث مستويات رديئة لالتزام العاملين في مجال الرعاية الصحية بتقنية غسيل الأيدي الصحيحة في العديد من البلدان. أجري هذا البحث لتقييم معلومات وسلوكيات 30 ممرض وممرضة من العاملين في مشفى الأسد الجامعي. تلقى الممرضون استبياناً شخصيا ًمتعلقاً بمعلومات ومهارات تقنية غسيل الأيدي في مكان عملهم، وتمت ملاحظتهم خلال العمل. سجل 14 % فقط من المشاركين مستوى جيد جداً فيما يتعلق بالمعلومات المتعلقة بتقنية غسيل الأيدي، مع فروقات ذات دلالة إحصائية متعلقة بمستوى التعليم حيث حدد المشاركون من خريجي الجامعة الطريقة الصحيحة لتقنية غسيل الأيدي بالمقارنة مع الدرجات العلمية الأقل. من جهة أخرى، كانت نسبة التزام الممرضين بتقنية غسيل الأيدي 30 %، مع تحديد العديد من العوامل التي تلعب دوراً في عدم الالتزام. تعتبر تقنية غسيل الأيدي تقنية بسيطة وغير مكلفة، وإجراءً أولياً من إجراءات ضبط العدوى، لذلك اقترح البحث إجراءات لتعزيز هذه التقنية عبر برامج تثقيفية خارج أوقات عمل الممرضين، وعبر سيمنارات وملصقات، بالإضافة إلى التأكيد على ضرورة توفر مستلزمات كافية للقيام بتقنية غسيل الأيدي كالصابون والماء المخصص، وورقيات التجفيف، وتقليل عدد ساعات العمل لتحسين نسبة عدد الممرضين للمرضى.

الكلمات المفتاحية: معلومات، سلوكيات، تصحح الأيدي، غسيل الأيدي، الممرضون

*أستاذة – قسم تمريض الحالات الحرجة – كلية التمريض– جامعة تشرين– اللاذقية– سورية.

Introduction:

The issue of healthcare-associated infections (HAIs) continues to be one of the most important public health problems in many countries throughout the world. [1,2]With advances in health care system, the threat to hospital-acquired infection (HAIs) still remains. [3]As one of the most common complications burden patients, complicate treatment, prolong hospital stay, increase costs and can be life threatening. [4]and results in morbidity, and mortality. [1,2]

Recent studies in Europe have shown that HAIs affect 4.6% to 9.3% of the hospitalized patients. In Europe, the estimated five million HAIs that occur annually have an assumed attributable mortality of 50,000 to 135,000 at a cost of €13 to €24 billion. In the United States, prevalence rates were estimated at 4.5% for 99,000 cases of excess mortality and an economic burden of US $6.5 billion in 2004. [4]The World Health Organization (WHO) estimates that approximately 30% of patients are affected by one or more episodes of HAI with associated morbidity and mortality. [5]

Many nosocomial infections are caused by pathogens transmitted from patient to another by way of health care workers (HCWs) not washed their hands between patients. [6, 7, 8]Numerous studies document the pivotal role of healthcare workers' (HCWs) hands in the propagation of micro-organisms within the healthcare environment and ultimately to patients.[9]Patients' skin can be colonized by transient pathogens that are subsequently shed onto surfaces in the immediate patient surroundings, thus leading to environmental contamination.As a consequence, HCWs contaminate their hands by touching the environment or patients' skin during routine care activities, sometimes even despite glove use. [10] It has been shown that organisms are capable of surviving on HCWs' hands for at least several minutes following contamination.[11, 12]Thus, if hand hygiene practices are suboptimal, microbial colonization is more easily established and/or direct transmission to patients or a fomite in direct contact with the patient may occur. [10]

It is well recognized that the risk of transmission of pathogens when providing medical care and the reduction in the rates of the incidence of HAIs can be kept low through appropriate standardized prevention procedures. [13]

Hand hygiene is considered the primary measure to reduce the transmission of nosocomial pathogens.[14] Terms used in the field have been reviewed and agreed as follows. Hand hygiene is a general term that applies to either handwashing, antiseptic handwash, antiseptic handrub, or surgical hand antisepsis. Handwashing refers to the action of washing hands with plain (nonantimicrobial) soap and water. Hand antisepsis refers to either antiseptic handwash or antiseptic handrub. Antiseptic handwash refers to the action of washing hands with soap and water or other detergents containing an antiseptic agent. Antiseptic handrub refers to the application of a waterless antiseptic agent to all surfaces of the hands to reduce the number of microorganisms present. Hand decontamination is used to describe the action of reducing bacterial counts on hands by performing antiseptic handrub or antiseptic handwash.[4]

Indications or opportunities for hand hygiene refer to situations where a hand hygiene action is recommended, regardless of whether the action is performed or not, or the cleansing agent chosen.[14]Adequate hand hygiene (HH) among hospital personnel could prevent an estimated 15% to 30% of the HAIs. [4]Evidence suggests that proper hand hygiene practice is regarded as the single most effective and simple inexpensive strategy for reducing the prevalence of hospital-acquired infections. [10, 15, 16, 17]Current best practices for hand hygiene for such high risk patients include the cleaning or degerming of

hands before and after patient contact, after touching patient equipment or environmental surfaces, before performing invasive procedures and after removing gloves. [18, 19]

Although semmelweis demonstrated more than century ago that hand washing itself was sufficient in reducing the incidence of HAIs. Compliance practice remains low. Failure to employ correct practice has been responsible for an increased incidence in HAIs. [6]Numerous studies over the last few decades have shown that HH compliance rates are generally less than 50% of all the opportunities. [4]However, many studies have examined the routine hand hygiene practices of health care workers, and most have found the overall adherence rates to be >50%. [20] Poor compliance is associated with lack of awareness among personnel. The other factors are personal and organizational attitudes towards interventions such as hand washing cost containment and logistical barriers. Studies have shown that HCWs have stated multiple reasons for non-compliance such as dryness of skin due to frequent use of skin disinfectants, being too busy, and wards being full and understaffing. [6]

Research Important and Goals

It is vital to understand that prevention and control strategies with demonstrated value must be implemented consistently and rigorously. Among the different strategies, the adherence to guidelines for hand hygiene is an essential ingredient for activities aimed to preventing the HAIs. Accordingly, among the HCWs. Nurses have a critical role to play in prevention efforts and they are an important population to study their level of knowledge, attitudes, and behavior regarding hand hygiene. However, up to date these issues have received only limited attention,[21]and adherence to good hand hygiene practice remains consistently poor in clinical setting. [16]Where as compliance of HCWs has rarely been examined in Syria, it is critical to understand current behaviors of HCW to develop appropriate, targeted interventions that might improve hand hygiene practice.

Consequently, the purpose of the present study was to delineate the level of knowledge, and appropriate use of hand hygiene procedures among a random sample of nurses in Lattakia hospitals

Material and Methods

Setting

The study was performed at 4 departments in emergency room, surgical ward, Intensive care units, medical ward, in Al-Assad Univesity Hospital.

Sample

The study targeted nurses. Non-random sampling (convenient sampling) was used to select participants. We selected convenient sample of 30 Eligible staff worked in 4 departments in emergency room, emergency care, Intensive care units, and cardiac care.

Nurses received a self administered paper questionnaire at their workplace and observed during their work:

1. An anonymous, structured, self-administered questionnaire, printed in arabic was pre-tested and used as the data collection instrument. Questionnaire on knowledge and practices on hand hygiene was administered to the nurses enrolled for the study. The questionnaire was divided into three sections:

- Section one had questions on data of the age of the nurses, sex, number of years of hospital experience and the education, junior nurses were those nurses that had less than 3 years of work experience in the hospital, and senior nurses were those nurses who had more than 3 years of work experience in the hospital.[6]

- Section two had questions on knowledge of hand hygiene measures.
- Section three had questions on practice of steps of hand hygiene to prevent hospital-acquired infections.. The investigator kept this part of the proforma and filled it after observing the work of the healthcare workers in the wards.

2. Each of the fields was given a score, Knowledge was assessed on a Likert-type scale (agree, 1 point; disagree or uncertain, 0 points); behavior/practice items were categorized as always (1 point) or sometimes or never (0 points).[16]

3. The nurses were asked to comment on probable reasons for non-compliance to hand hygiene

4. Each nurse in the study were observed regarding compliance with hand hygiene practices in the ward use where and when there were indications for hand hygiene use according to published guidelines. on three different occasions in 9 procedures. In this regard, hand hygiene use was indicated before and after the following procedures: wound care and change dressing, suction of secretion, venous catheterization, urinary catheter care, intravenous drug administration, preparation of intravenous solutions, blood specimen taking, endotracheal tube care, and patient contact.

5. To identify knowledge of nurses according to hand hygiene practice, we calculated the number of correct answers and then we calculated the percentage of this number to total number of answers (24 questions) to calculate the degree, we calculate value of degrees according to value of total degree. The value of degree average was (55 %), the highest degree was (88 %), and the lowest degree was (0%). Sons it, we divided the degree to four level (poor, middle, good, very good)

6. Logistic regression was used to predict indicators of good knowledge, attitudes, and practice. A P value #.05 was considered statistically significant.

Results and Discussion

Table (1): Distribution of sample according to demographic data

	Frequency	Percent
Age / year		
< 30	6	20 %
31-40	17	56,7 %
41-50	7	23.3 %
Total	30	100 %
Sex		
Male	7	23.3 %
Female	23	76.7 %
Total	30	100 %
Social status		
Married	23	76.7 %
Single	5	16.7 %
Divorced	1	3.3 %
Widower	1	3.3 %
Total	30	100 %
Level of education		
School of nursing primary	2	6.7 %

School of nursing secondary	5	16.6 %
Institute of nursing	21	70 %
Faculty of nursing	2	6.7 %
Total	30	100 %
Number of years of hospital experience / year		
< 3	3	10 %
3	2	6.7 %
>3	25	83.3 %
Total	30	100 %
Training courses		
yes	9	30 %
No	21	70 %
Total	30	100 %

Demographic characteristics of the participants are presented in Table 1. The nurses aged (31-40) had the highest percent of sample (56,7 %). The majority of participants were female, with (76.7 %) of them married. The level of education of highest percent of participant were Institute of nursing, with (83.3 %) of them > 3 years hospital experience, and (70 %) of them had no previous training courses.

Table (2): Range of results of nurses' knowledge

Value	Frequency	Percentage
Poor	0	0 %
Middle	17	56.7 %
Good	7	23.3 %
very good	6	20 %
Total	30	100 %

Table (2) reveals four levels of nurses worked in the wards in hospital as a results of knowledge' test: the middle level had highest percentage (56.7 %), the next level was good level with (23.3%) and then very good level, poor level respectively (20 %, 0%).

Table (3): relationship between the nurses' knowledge and their age, sex, number of years of hospital experience, and the education

T- test for one value	Test value	P value	Statistical significant
Age	0,654	0,581	Not significant
Sex	1,277	0,260	Not significant
Number of years of hospital experience	0,779	0,364	Not significant
Education	10,284	0,000	Statistically significant

Table (3) reveals that P value was less than 0,005 that is statistically significant; however there were differences statistically significant in nurses 'knowledge according to education. Where, as the differences in nurses 'knowledge according to sex, age, and the number of years of hospital experience were statistically not significant.

Table (3):Nurses 'knowledge according to the education

Level / Education	Middle		Good		Very good		Total	
	F	%	F	%	F	%	F	%
School of nursing primary	2	100	0	0	0	0	2	100
School of nursing secondary	4	80	1	20	0	0	5	100
Institute of nursing	10	47.7	7	33.3	4	19	21	100
Faculty of nursing	0	0	0	0	2	100	2	100

Table (3) reveals that the faculty of nursing nurses 'knowledge was highest value, where the percentage of nurses 'knowledge that is very good was 100 %, whereas, the knowledge of school nurses (primary) was 100 % middle.

Table (4): Range of results of nurses' practice

hand hygiene	Frequency	Percentage
Performed	11	36.7 %
Not performed	19	63.3 %
Total	30	100 %

Table (4) reveals that only 11 (36.7 %) nurses performed hand hygiene procedure, whereas 19 (63.3 %) not performed hand hygiene procedure.

Table (5): Nurses' perception about obstacles hindering the implementation of hand hygiene

Causes	Number	Percent
• Inadequate designs	24	80 %
• Insufficient of wallpaper	8	26.7 %
• Insufficient of hot water	8	26.7 %
• Insufficient supplies for hand decontamination	20	66.7 %
• insufficient time to accomplish hand washing	25	83.3 %
• lack of role model	11	36.7 %
• lack of priority over other procedures	16	53.3 %
• lack of supervision by senior staff	7	23.3 %
• shortage of staff number	10	33.3 %
• lack of staff knowledge	6	20 %

Table (5) reveals Nurses' perception about obstacles hindering the implementation of hand hygiene. A considerable number of participants (80 %) mentioned the inadequate designs as obstacles for implementation of hand hygiene. Insufficient of wallpaper(26.7 %) and Insufficient of hot water(26.7 %)were reported by nurses. A highest percentage of nurses (83.3 %) mentioned the insufficient time to accomplish hand washing as obstacles for implementation of hand hygiene. Regarding supplies, (66.7 %) of participants complained from insufficient supplies for hand decontamination and complained from shortage of staff (33.3 %). A considerable number of participants believe that they are

lacking knowledge regarding hand hygiene (20 %), among these are those related to the curriculum of the school of nursing.

Discussion

However hand hygiene is a single most effective preventive measure against hospital acquired infections, and can contribute to shorter hospital stay, reduction in patient morbidity and health care costs. Hand hygiene prevents cross infection in hospitals, Compliance of health care workers to adhere to correct hand hygiene are reported to be poor in many countries. While the techniques involved in hand hygiene are simple, the complex interdependence of factors that determine hand hygiene behavior makes the study of hand hygiene complex. [22, 23]

This study yielded interesting findings regarding knowledge and behavior among a sample of nurses in Al-assad university hospitals in lattakia.

Our findings demonstrate the limited knowledge in hospital about hand hygiene and the outcomes show that nurses are not allowed effective roles in containing and preventing infection by using hand washing procedures. Only (20 %) of participants had very good knowledge about hand hygiene. These findings are markedly lower compared with similar studies from Nepalese HCWs that identified good levels of knowledge toward infection control including hand hygiene,[29]and from university of Sri Jayeuardenepura, [25] and from Iran (66 %, 52%, 20 % respectively), [26]and Italy (53 %), [27]and 29 %. [28]

Analysis of the predictions of being more knowledgeable showed that there was a significant difference in the level of knowledge according to the level of education, because respondents with university degree were more likely to correctly identify the proper way of hand hygiene compared to those nurses who have a lower level of education. This association may be explained by the fact that those with university curricula were exposed to a high quality of education and, therefore, they have achieved more information on this topic. The same relationship between level of knowledge and level education was found in study performed in Italy. [29]

In our study the overall hand hygiene compliance among nurses is 36.7 %, this agrees with Patarakul[29] who reported that hand hygiene among HCWs before patient contact was less than 50%, and with Ariyaratne who reported that hand hygiene among nursing students was less than 50 %. [25] Also this compliance rate comes in agreement with Pittet[30] who observed 20000 opportunities for hand hygiene before implementing a hand hygiene campaign during routine patient care in a teaching hospital in Geneva and the compliance to HW was 38%. This gives an idea for need to programs in order to raise compliance to hand hygiene. On the other hand, our result was much better than Kim[31] who reported overall compliance of hand washing to be 22.1%.

In contrast, this study was noteworthy that nurses' handwashing compliance rate was less than that reported among Jordanian nurses (74,25%), [32]and among Turkish nurses (62.5%).[33]On the other hand, it is still less than the compliance rate of 80.2% among nurses in Hong Kong,[21]88% among HCWs in The Netherlands after applying an educational program,[34]and 84% among American nurses.[35]Despite some methodologic differencesthat make those findings not comparable, Jordanian nurses'handwashing compliance rate reported in this study is stillconsidered low when compared with handwashing protocols.[36]

The findings of the present study revealed that the mean percentage of nurses'knowledge regarding hand hygiene was not good, these results may be attributed to the fact that there is inconvenient placement of sinks, lack of adequate hand washing

equipments and supplies, insufficient time to accomplish hand washing, health habit, lack of role model, lack of priority over other procedures, lack of supervision by senior staff, lack of monitoring without infection control committee members. This could be also due to the fact that nurses were taking care not to be infected and wash their hands mainly for protection of themselves. This finding agree with other study finding which indicated that the hand washing was rarely performed, and the majority of nurses didn't wash their hands before and after carrying procedures and between different patients. As found by Ali,[37] nurses believe that hand washing is only required if their hands are physically soiled, visibly dirty, or have been in contact with soiled objects. Studies found that there was a scope for increasing the frequency of hand washing especially after activities likely to results in heavy contamination.

Conclusion and Recommendation

The current study explored nurses' knowledge, and compliance with hand washing. The study found that the level of knowledge concerning hand washing of the nurses was not satisfactory and a small percentage of nurses reported that they appropriately perform the hand washing in their working activity. Moreover, the study also revealed that the practice of this measure was found to be poor. Some of the key parameters associated with noncompliance have been clearly identified and corrective actions proposed. System change must be addressed in most hospitals. Hand washing hygiene is a cheap and primary infection control procedure, therefore, the study is suggesting the measure for improvement by continuous education during hand over of the shifts, seminar and posters, ensuring the availability of adequate hand washing utilities like soap, water taps, drying tissues and reducing work load by improving nurse to patient ratio

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