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Nursing Students Knowledge and Practice Regarding Handwashing in Riyadh Elm University: A Cross-Sectional Survey

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Abstract

Hand hygiene is one of the most important procedures performed in health care institutions by all the staff providing health care to patients. Less compliance to hand hygiene and lack of performing hand hygiene among students when going to the patient ward during their clinical rotation in the hospital provoked to focus on this study.

Descriptive research design was utilized under cross-sectional survey. The data was collected by both questionnaires to assess the nursing student's knowledge and checklist to assess the students practice level. The adapted questionnaire was pre-tested before the conduct of the study. A number of 27 nursing students represent the total sample of the study. They were selected using convenience sampling technique. Once the data were collected, it was analyzed with statistical treatment using SPSS version 22.0.

Main findings have shown that nursing students were highly knowledgeable in performing handwashing during recommended situations and handwashing is a habit to their personal life. Completing the task than performing hand hygiene was the area need to focus among nursing students. There is a significant relationship between demographic characteristics and knowledge and practice level.

Keywords: Handwashing, Knowledge, Practice, Training Needs

Introduction

Hand hygiene is the most cost-effective intervention to prevent the transmission of infectious diseases. The promotion of handwashing significantly improves the sanitation of the populations (Tadesse *et al*., 2017; Mbakaya *et al*., 2017) [12, 9]. Studies have shown that about 80% of diseases are associated with poor hygiene among developing countries (WHO, 2006) [14]. With this, nurses have greater role in wider community knowledge about handwashing because they were in the frontline of patient care. Nurses as the future professional nurse have the responsibility to maintain primary prevention. Their daily interactions with patients should foster initiatives on developing their knowledge and practices making them adaptable to protect themselves from infection.

Hand hygiene is one of the most important procedures performed in health care institutions by all the staff providing health care to patients as well as by healthy people who visit these facilities in order to receive preventive treatment. Although it is a well-known procedure and precedes every form of medical treatment, it is frequently performed in a careless way, too fast, without the application of proper preparations and also without observing recommended rules (wearing jewellery or clothes which cover wrists). Numerous scientific studies prove that lack of compliance with this simple procedure results in transmitting pathogens to patients and constitute a frequent cause of hospital infections transferred by direct contact. (Gniadek, A. *et al* (2021) [4].

Despite considerable evidence of handwashing effectiveness to limit hygiene-related infection, healthcare provider including nurses failed to complied with the proper handwashing and moments of hand hygiene (Bimerew, 2022) [3]. Data regarding practices of handwashing among student nurses remained scarce. Since part of daily hospital duty in the hospital needs hand hygiene, decreasing the risk of infection and transmission of infectious agents should be eliminated if not, reduced. Yet, one incident strikes the researchers was the lack of performing hand hygiene among students when going to the patient ward during their clinical rotation in the hospital. This is in relation to the moments of hand hygiene, an approach where nursing staff needs

to perform hand hygiene. These five moments is essential in protecting not only the patient but the disease-related infection transmission to the healthcare provider. Thus, this study will seek to assess the knowledge and practices on handwashing among nursing students.

Materials and Methods

Research design and Sample

A quantitative descriptive research design using a Cross-sectional survey approach was utilized in this study. This study was performed in Riyadh Elm University located in Riyadh City. The study population composed of nursing students. The sample size of this study was 27 nursing students. Sample was selected using convenience sampling design. Eligibility criteria includes: Of any age, and gender and any marital status while exclusion includes those who are unwilling to be a part of this study.

Tool validity and reliability

In order to test the instrument for content validity, the data gathering tool was submitted to panel of experts for scrutiny. They were evaluated for clarity, relevance and contents. Once their suggestions and recommendations were made, a pilot testing was undertaken to 10 students who were not part of the actual study and the Cronbach alpha was applied. This pilot testing guides the researcher in determining the ambiguous questions, vague statement and estimate the duration of answering the questionnaire.

Implementation methods and data collection

The main data gathering tool was adapted and composed of three sections: The first section – this contains the demographic characteristics of the respondents. The second part – this part measures the level of knowledge of the nursing students to handwashing. This comprised of 26 items about handwashing with a 5-point Likert scale. The last part is the practice part which will be observed by the researchers which was measured done correctly (<20), done correctly (>20) and not done. Once the permission letter to conduct the study was secured, the researcher personally administered the questionnaire. It has consent and the purpose of the study was explained thoroughly to the study participants.

Study Preparation

Before conducting the survey, the researchers see to that all necessary documents and approval letters were at hand. The researchers attend training process as they used before collecting the data.

Ethical consideration

The researcher respects the rights of study participants, treat data with confidentiality with no harm for the subject. All study participants provided a verbal consent prior to participation in the study. An approval from university was taken and permission from study area was taken (IRB Riyadh Elm University).

Statistical treatment of data

After retrieving the data collected, it was entered in SPSS version 22.0 for analysis and interpretation. The following statistics measures were used. Descriptive statistics was used (frequency and percentage distribution), the mean and standard deviation distribution and paired T –test to test the hypotheses.

Results and Discussion

Table 1: Demographic Characteristics of the Nursing Students

Variable/s		Frequency	Percentage
Gender	○ Male	5	18.5
	○ Female	22	81.5
Age group:	○ 20-25 years	17	63.0
	○ 25-30 years	7	25.9
	○ 30-35 years	3	11.1
Marital Status	○ Married	7	25.9
	○ Unmarried	20	74.1
Training regarding hand washing	○ No	3	11.1
	○ Yes	24	88.9

Table 1 presents the demographic profile frequency distribution and percentages. The data shows that majority of the nursing students were female accounted for 81.5% of 22 out of 27 participants. As for the age, almost two thirds of them were 20-25 age group or 63 percent of the total population. It also indicates that most of them undergo training regarding handwashing with 24 or 88 percent of the total under study. Nursing is a discipline dominated by female students. For Florence Nightingale, she considered nursing as an appropriate job for women as their they have the image of nurturing, humble and self-sacrificing became prevalent where qualities such as compassion aligned to nursing attributes. Similarly, Mahalik *et al*., (2005) [8] explained that female were usually nice in relationship, modesty, caring which are needed in patient care. However, it is in contrast to Hentschel *et al*., (2019) [7] who reported that male are more antigenic than women which they believed that women are less assertive and weaker leaders than men.

Table 2: Level of Knowledge of the Nursing Students Regarding Handwashing

Statement/s	Weighted Mean	Description
Hand hygiene is considered as an important part of patient care	4.56	Highly knowledgeable
REU emphasize the importance of hand hygiene	4.48	Highly knowledgeable
The importance of hand hygiene is emphasized by my head nurse/ charge nurse	4.52	Highly knowledgeable
I have a duty to act as a role model for other healthcare workers	4.37	Highly knowledgeable
When busy, it is more important to complete my task than to perform hand hygiene	3.70	Knowledgeable
Performing hand hygiene in the recommended situations can reduce patient mortality	4.48	Highly knowledgeable
Performing hand hygiene in recommended situations can reduce medical costs associated with hospital-acquired infections	4.33	Highly knowledgeable
I can't always perform hand hygiene in recommended situations because my patient's needs come first	3.85	Knowledgeable
Prevention of hospital-acquired infections is a valuable part of a healthcare worker's role	4.33	Highly knowledgeable
I follow the guidelines of senior healthcare workers when deciding whether or not to perform hand hygiene	4.44	Highly knowledgeable
An infectious disease in a healthcare setting may threat my life or career	4.26	Highly knowledgeable
I believe I have the power to change poor practices in the workplace	4.41	Highly knowledgeable
Failure to perform hand hygiene in the recommended situations can be considered negligence	4.07	Knowledgeable
Hand hygiene is a habit for me in my personal life	4.59	Highly knowledgeable
I am confident I can effectively apply my knowledge of hand hygiene to my clinical practice	4.37	Highly knowledgeable
I try to remember performing hand hygiene in recommended situations	4.70	Highly knowledgeable
I would feel uncomfortable reminding a health professional to wash his hands	4.19	Knowledgeable
Performing hand hygiene after caring for a wound can prevent from infection transmission	4.11	Knowledgeable
Dirty sinks can be a reason for not washing hands	4.44	Highly knowledgeable
Lack of soap can be a reason for not cleansing hands	4.48	Highly knowledgeable
Performing hand hygiene after caring for a wound can protect from transmission of infectious diseases	4.41	Highly knowledgeable
Cleansing hands after going to the toilet can reduce transmission of infectious disease	4.56	Highly knowledgeable
Performing hand hygiene before touching a patient can protect from transmission of infectious diseases	4.41	Highly knowledgeable
Performing hand hygiene before any procedure can protect the patient from transmission of infectious diseases	4.41	Highly knowledgeable
Performing hand hygiene after any procedure or any exposure to body fluid is mandatory to help protect both you and the patient	4.52	Highly knowledgeable
Performing hand hygiene after touching the patient can help decrease the risk of infection transmission	4.44	Highly knowledgeable
Total Average Mean	4.36	Highly knowledgeable

The Table 2 illustrates the level of knowledge of the nursing students regarding handwashing. Based on the table, it can be seen that nursing students were highly knowledgeable in handwashing. It garnered a total average mean of 4.36 indicating highly knowledgeable. Despite the highly knowledgeable results, the need for strategies was considered as some of the areas were low. For Bimerew *et al*., (2022) [3], continuous monitoring and evaluation should be put in place with the aim of translating knowledge into action, changing attitudes into positive behavior, and promoting/maintaining correct hand washing techniques. This is crucial to maintain standards in level of knowledge and attitudes and consistent correct practices of hand washing.

It is clearly seen that on the statement *I try to remember performing hand hygiene in recommended situations* got the highest weighted mean of 4.70 interpreted as highly knowledgeable. It was followed by *hand hygiene is a habit for me in my personal life* which has 4.59 weighted means. The present study indicates that healthcare professionals were required to perform hand washing and follow the five moments of hand hygiene to protect the clients. According to World Health Organization, 7 out of 100 patients in acute care hospitals from high-income countries and 15 from low to middle income countries will acquire at least one hospital associated infection due to their hospital stay. This agreed to the current study that hand washing should be performed in all recommended situations and become a habit throughout life. Hand Hygiene Australia (2023) [5] cited that microorganisms were collected in the hands on everyday life make people vulnerable to infections. Teaching a good hand hygiene sets up lifelong habits to stop the spread of infection. Handwashing is one of the most important ways to prevent infection.

Furthermore, the table also shows that there are five areas that the nursing students were knowledgeable only. The two that got the lowest means were statements of *I can't always perform hand hygiene in recommended situations* and *when busy, it is more important to complete my task than to perform hand hygiene* with an average mean of 3.85 and 3.70 respectively. This suggests that nursing students have a fair attitude with regards to completing the task when the ward is busy. The following the 5 moments of hand hygiene is a guideline with a goal of protecting every patient. It relates on the study of Shinde and Mohite (2014) [11] that showed nurses took negative attitude toward hand hygiene. They argued that it is always necessitate learning for good attitude to acquire the required knowledge and practical skills about hand hygiene.

Table 3: Practice Level of the Nursing Students regarding Handwashing

Variable		Frequency	Percentage
After going to the toilet	○ Done correctly (< 20 s)	10	37.0
	○ Done correctly (> 20 s)	16	59.3
	○ Not done	1	3.7
Before caring for a wound	○ Done correctly (< 20 s)	6	22.2
	○ Done correctly (> 20 s)	21	77.8
After caring for a wound	○ Done correctly (< 20 s)	6	22.2
	○ Done correctly (> 20 s)	19	70.4
	○ Not done	2	7.4
After touching potentially contaminated objects	○ Done correctly (< 20 s)	7	25.9
	○ Done correctly (> 20 s)	19	70.4
	○ Not done	1	3.7
After contact with blood or body fluid	○ Done correctly (< 20 s)	6	22.2
	○ Done correctly (> 20 s)	20	74.1
	○ Not done	1	3.7
After inserting an invasive device	○ Done correctly (< 20 s)	6	22.2
	○ Done correctly (> 20 s)	20	74.1
	○ Not done	1	3.7
Before entering to the isolation room	○ Done correctly (< 20 s)	6	22.2
	○ Done correctly (> 20 s)	20	74.1
	○ Not done	1	3.7
After physical contact with a patient	○ Done correctly (< 20 s)	4	14.8
	○ Done correctly (> 20 s)	22	81.5
	○ Not done	1	3.7
After exiting from the isolation room	○ Done correctly (< 20 s)	6	22.2
	○ Done correctly (> 20 s)	20	74.1
	○ Not done	1	3.7
After contact with a patient's secretions	○ Done correctly (< 20 s)	6	22.2
	○ Done correctly (> 20 s)	20	74.1
	○ Not done	1	3.7
before physical contact with a patient	○ Done correctly (< 20 s)	6	22.2
	○ Done correctly (> 20 s)	20	74.1
	○ Not done	1	3.7
After removing gloves	○ Done correctly (< 20 s)	5	18.5
	○ Done correctly (> 20 s)	21	77.8
	○ Not done	1	3.7
If they look or feel dirty	○ Done correctly (< 20 s)	7	25.9
	○ Done correctly (> 20 s)	18	66.7
	○ Not done	2	7.4

Table 3 presents the practice level of the nursing students regarding handwashing. Based on the data, majority of the nursing students performed well the procedure. The most evident about done correctly (>20) were the performance of *after physical contact with a patient*, *before caring for a wound*, and *after removing gloves* with percentage of 81.5 and 77.8 respectively. This shows a good compliance with hand hygiene. Further, Pittet (2000) emphasized that training increased the capacity of healthcare workers to hand hygiene compliance. It can be crucial in terms of hand hygiene compliance; and by extension, post-training follow-up may contribute to better hand hygiene (Allengranzi *et al*, (2010) [2].

Meanwhile, the nursing students failed to practice well the handwashing on the following circumstance: *After caring for a wound* and *if they look or feel dirty* with an average mean of 7.4%. This shows that completing the task is more important than performing hand hygiene. For Yildirim *et al*., (2008) as cited by Aliyu *et al*., (2019) [1] reported that adherence to recommended handwashing practices remains unacceptably low, rarely exceeding of situations in which hand hygiene is indicated. The current results further revealed that nursing students were non-compliant on recommended situations where handwashing is needed.

Table 4: Relationship between Demographic Characteristics of Nursing Students and their Levels of Knowledge on Handwashing

Variables	N	p value	Level of Significance	Results	Interpretation
Gender	27	0.09	0.05	Significant	Reject the H_o
Age	27	0.74	0.05	Significant	Reject the H_o
Marital Status	27	0.19	0.05	Significant	Reject the H_o
Training regarding handwashing	27	0.26	0.05	Significant	Reject the H_o

The Table 4 shows that relationship between demographic profile and the level of knowledge of the nursing students. Based on the table, it can be seen that there is a significant relationship between the demographic characteristics and level of knowledge. Since the p-value is greater than the significance level of 0.05 (p-value > SL), the null hypothesis is rejected. This means that gender, age, marital status and training were predictor of knowledge on handwashing. This relates with the study of Tahmasebi *et al*., (2022) [13] that of all nursing employees who participated in the study, 56.6%

had good knowledge of hand hygiene, 71.3% an impartial or neutral attitude towards this practice and 64.5% a high perception of it. A statistically significant relationship was obtained between knowledge and education (P=0.029), perception and age range (P=0.002), work experience (P=0.029), and ward of workplace (P=0.014). Structured, regular and continuous educational programs with various and effective methods to maintain, promote and remove nursing employees' deficit of knowledge should continue more seriously.

Table 5: Relationship between Demographic Characteristics of Nursing Students and their level of Practice on Handwashing

Variables	N	p value	Level of Significance	Results	Interpretation
Gender	27	0.13	0.05	Significant	Reject the H_o
Age	27	0.56	0.05	Significant	Reject the H_o
Marital Status	27	0.43	0.05	Significant	Reject the H_o
Training regarding handwashing	27	0.24	0.05	Significant	Reject the H_o

The Table 4 shows that relationship between demographic profile and the practice level of the nursing students. Based on the table, it can be seen that there is a significant relationship between the demographic characteristics and practice level. Since the p-value is greater than the significance level of 0.05 (p-value > SL), the null hypothesis is rejected. This inferred that there is a correlation between variables and practice level on handwashing. Similarly, the study of Hattab *et al*., (2021) [6] revealed that the nurses' knowledge toward infection control record 38%, 41%, and 21% for low, moderate, and high knowledge respectively. In comparison, nurses practices record 47%, 42%, and 11% for low, moderate, and high practices respectively. Most of the study sample 62% was females while 38 % of the subject was males. The age group (20-29) takes the highest percentage (38%), In addition, about (27.3%) of the nurses who works in critical care units have 1-5 years of experience. Significant statistical associations were found between nurses knowledge and practice from one hand and years' experience on the other hands $p \leq 0.05$.

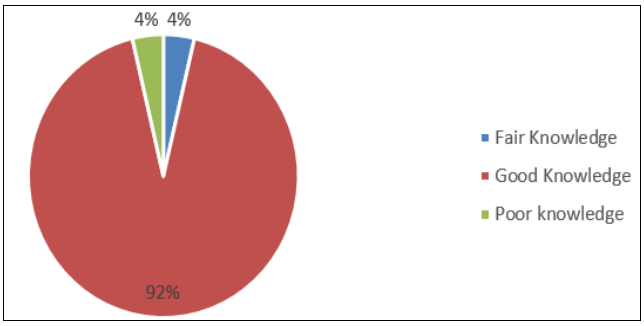

Fig 1: Overall Levels of Knowledge of the Nursing Students

Fig 1 revealed that the overall knowledge of students regarding hand washing was good with 92%.

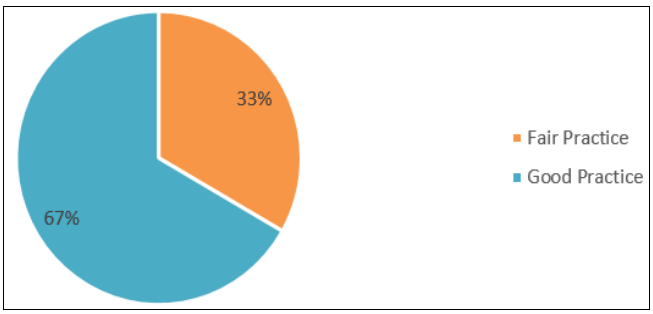

Fig 2: Overall Levels of Practice of Nursing Students

Fig 2 revealed that the overall practice of students regarding hand washing was good with 67% and 33% fair practice.

Conclusion

This study highlights the knowledge and practice level of nursing students regarding handwashing in preparation as future professional nurses. Nursing students were highly knowledgeable in handwashing especially in performing during recommended situations serving as a habit to their personal life. The nurses performed well on handwashing during after physical contact with a patient, before caring for a wound, and after removing gloves. Gender, age, marital status and trainings attended were predictor of successful handwashing.

Recommendations

Based on the conclusion, the following recommendations were drawn:

1. There is a need for regular training among nursing students in relation to hand hygiene.
2. There should be periodic monitoring on doing hand hygiene relative to hand hygiene opportunities.
3. Frequent feedback to the nursing students regarding their hand hygiene performance
4. Performed a similar study to wider participants to generalize the findings of the study.

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