



ASSOCIATION OF INFECTION CONTROL KNOWLEDGE WITH DEMOGRAPHIC VARIABLES AMONG NURSING STUDENTS AT PRIVATE INSTITUTE IN KARACHI

Khadija Al Shukhali¹, Amir Sultan², Javed Iqbal^{3*}, Afsha Bibi⁴, Umar Farooq⁵, Dr Maliha B.Thapur⁶, Dr. Asfand yar Khalid⁷, Nasir Ali⁸, Dr Waqar Munir⁹, Adnan Yousef¹⁰, Dr Umema Mumtaz¹¹

¹Executive Director of Nursing/Midwifery Hamad Medical Corporation Doha Qatar

²Assistant professor Tasleem College of Nursing and health sciences.

^{3*}Nursing Department, communicable disease center-Hamad Medical Corporation, Doha Qatar.

⁴MSN Scholar at Ziauddin University Faculty of Nursing and midwifery

⁵Final year BSN Student in Suvastu School of Nursing and Health Sciences Karachi

⁶Consultant Division of Infectious Disease/Medicine Communicable disease center-Hamad Medical.

⁷Medical Education, Hamad medical Corporation Doha Qatar PO.BOX 3050.

⁸Monitoring and evaluation specialist.

⁹Consultant of Infectious Disease/Medicine Communicable disease center Hamad Medical Doha Qatar.

¹⁰Final Year MBBS Student United Medical College Karachi.

¹¹MC College of medical and Health sciences.

NOTE:- All authors contributed equally to this work .

***Correspondence Author:** Javed Iqbal

* Email: jiqbal3@hamad.qa (0000-0003-2627-685X)

Abstract

Background: Nurses and health care professionals spend time with patient with different microorganism so they are advised to use necessary precaution to stop the spread of infection such as hand washing and personal protective equipments (PPE).

Aim: This study aimed to measure the knowledge regarding infection control and find their association with demographic variables among nursing students at private institutes in Karachi, Pakistan.

Methodology: In two private nursing colleges in Karachi, this cross-sectional analytical study was conducted between September 2022 and December 2022. Using a suitable sampling technique, 214 first- and second-year nursing students were enlisted. The study measured nursing students' knowledge of infection control using a valid and reliable instrument.

Results: Regarding infection control, the results indicate that 21.5 individuals have moderate knowledge, and 78.5% of participants have a moderate level of knowledge. Furthermore, there are no significant differences between the infection control knowledge score and working hospital, age, gender, academic year, or clinical placement.

Conclusion: The majority of participants had good knowledge of infection control, and did not significantly differ between age groups, genders, academic years, clinical placements, or working hospitals. To develop measures for infection control among healthcare workers; hospital, clinical placement, age, gender, education level, and other demographics should all be considered.

Keywords: Infection control knowledge, Nursing Student, Association, demographic variables

Introduction

The term "infection" refers to the growth and dissemination of microorganisms such as fungi, yeast, viruses, and bacteria inside the body. Moreover, infections can originate from any body part and spread throughout it. Furthermore, "infection control" describes procedures and policies to stop infection transmission in medical facilities and other public areas. This includes utilizing personal protection equipment (PPE), washing your hands frequently, disinfecting and sanitizing your surroundings, taking isolation precautions, and being vaccinated (1). As well as utilizing traditional methods and upholding the healthcare environment, nurses are essential in preventing and stopping illness from spreading (2). Basic infection control practices are necessary in the healthcare industry to lower the frequency of infections linked to hospitals (3).

All of the standard precautions that nurses and other healthcare professionals advise and regularly use to stop the spread of infection are also required to stop the infection. These include hand hygiene, wearing gowns, eye protection, coughing etiquette, and properly disposing of sharp objects. Isolation precautions are also frequently employed to reduce the risk of disease transmission by touch, droplet, and airborne contact. Infection prevention control (IPC) strategies were used to lower the incidence of HAIs, disease, and death rates and improve patient quality care (4). Moreover, if the infection is not control can lead to hospital-acquired infection. HAI is "an infection acquired at a healthcare facility in a patient who had neither the infection nor its incubation at the time of admission (5). Hospital-acquired infections (HAIs) significantly negatively impact patient morbidity and death rate (6). Hospital-acquired infections (HAIs), which contribute to rising disease, death, and financial pressure, are the main challenge to patient care. Due to daily patient visits, the medical department has a high patient-staff collaborating closely, including student involvement. As a result, students may transmit HAI through inadequate understanding and behaviors, impacting the quality of care (7). The frequency of HAIs varies across hospitals from 5.7% to 19.1%. According to more current data, the prevalence of HAIs in hospitals across Europe and the USA is 3.2% and 6.5%, respectively (8, 9). According to a multicenter prospective study conducted in Brazilian intensive care units, HAIs accounted for 60% of sepsis cases, indicating that HAIs are comparatively more important in the epidemiological burden in low- and middle-income nations (10).

Improper hygiene due to poor waste management in healthcare is one factor that might lead to HAIs. HAIs can occur due to a lengthy stay in the intensive care Unit (ICU), an insufficient medical equipment supply, and a lack of knowledge about the infection. ICP is a control precaution used by healthcare workers. HAIs can become more severe as a result of this. However, there is a hospital a survey on ICP was conducted. HAIs can be prevented in 35 to 55% of cases, according to studies (11). Study results reveal that infections obtained outside the hospital can lead to sepsis complications, accounting for as much as 70% of sepsis cases (12).

Moreover, promoting and using infection prevention and control methods is a significant responsibility of Health care providers (13). Infection control is critical to patient safety, and healthcare professionals, particularly nursing students, play a crucial role in preventing and controlling the spread of HAIs (14). However, studies have shown that nursing students often lack

adequate knowledge and understanding of infection control principles, which can lead to suboptimal practices in clinical settings (15)

Along with this, Pakistan is a developing country, and many infectious diseases are still present, and during the clinical area, nursing students were in direct contact with patients. Therefore, there is a need to measure nursing students' knowledge of infection control, especially 1st year and 2nd-year students, because they don't have much experience controlling the infection. So, this study aims to assess the knowledge of an infection and its association with demographic variables.

Methodology

This cross-sectional analytical study was conducted in two private nursing schools in Karachi, Suvastu School of Nursing and City Institute of Nursing, from September 2022 to December 2022. Both 1st year and 2nd-year students were part of the study. Moreover, the sample size was calculated through open EPI version 3.0 with a 95% confidence interval with a total population of 450, and the obtained sample size was 214. The participants were recruited through a convenience sampling technique. Furthermore, the data were collected through a reliable tool adopted for the study (7) The tool has two components. Component I: Consists of socio-demographic data, which have five questions, gender, age, year of the study, clinical placement, and types of hospital. Component II: Consists of seventeen questions related to knowledge regarding infection control. The tool scoring system 1-2-3 means. 1 means neutral, 2 means to disagree, and 3 means agree. The total score of the questionnaire is 1-51. Those who obtained 1-25 were considered to have a low level of knowledge, 26-35 moderate level of knowledge, and 36 to 51 with high levels of knowledge regarding infection control. A pilot study was conducted for 10% of the population, and the calculated Cronbach's alpha value was 0.723 (7).

Students who agreed to participate in the study after explaining the goals and objectives to the conventional participants gave informed consent, and the respondents were assured that their data would be kept confidential and would be used only for analysis. They had the right to leave the study at any time. The study was approved by an ethical review committee, and permission for data collection was obtained from each setting. SPSS version 26 was used, frequency percentage was used for the demographic variables, and the association of knowledge with demographic variables was assessed using an independent T-test and an ANOVA test.

Results

Table 1 shows the results of demographic variables among 241 participants; males were 94.4% of the participants, and 5.6% were females. Furthermore, regarding their age, 67.3% of nursing students aged between 20-24 years, 31.8% between 25-30 years, and 0.9% aged more than 30 years. Concerning their academic year, 68.2% from 1st year and 31.8% from 2nd year. Moreover, regarding their clinical placement, 6.1% of nursing students worked in the cardiac ward, 40.7% in the medical ward, 13.6% in the surgical ward, 31.8% in ER, and 7.9% in the pediatric ward. Regarding their working hospitals, 10.3% worked in specialized care hospitals, 71.0 worked in tertiary care hospital tertiary hospitals, and 18.75% of nursing students worked in outpatient departments.

Table 1 Socio-demographic data n=214

| Variables | Frequency | Percentage |
|---------------------------|-----------|------------|
| Gender | | |
| Male | 202 | 94.4 |
| Female | 14 | 5.6 |
| Age | | |
| 20-24 years | 144 | 67.3 |
| 25-30 years | 68 | 31.8 |
| More than 30 years | 2 | 0.9 |
| Study Year | | |
| 1st year | 146 | 68.2 |
| 2nd year | 68 | 31.8 |
| Clinical Placement | | |
| Cardiology ward | 13 | 6.1 |
| Medical Ward | 87 | 40.7 |
| Surgical ward | 29 | 13.6 |
| ER | 68 | 31.8 |
| Pediatric Ward | 17 | 7.9 |
| Others | 0 | 0 |
| Clinical Hospital | | |
| Specialized care hospital | 22 | 10.3 |
| Tertiary care | 152 | 71.0 |
| Outpatient hospital | 40 | 18.7 |

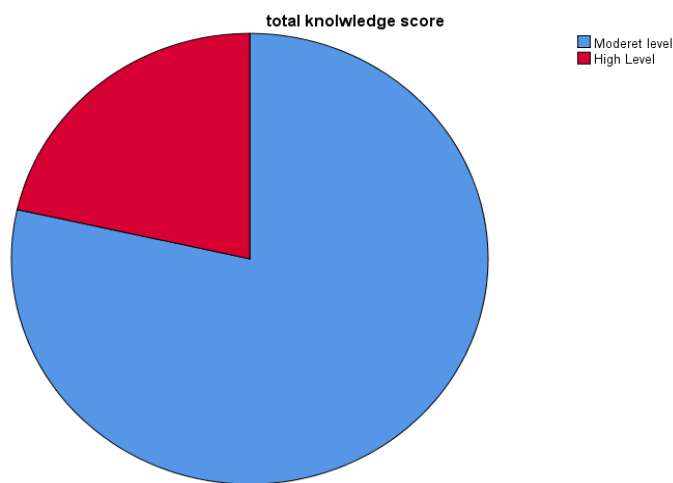


Table 2 shows the overall result of the knowledge score, in which 78.5% have a moderate level of knowledge and 21.5 have a high level of knowledge regarding infection control.

Table 2 Level of knowledge

| Total Knowledge Score | | |
|------------------------------|-----------|---------|
| Level of knowledge | Frequency | Percent |
| Low level | 0 | 0 |
| Moderate level | 168 | 78.5 |
| High Level | 46 | 21.5 |
| Total | 214 | 100.0 |

Table 3 shows the result of the association of Demographic Variables with knowledge score. Furthermore, no significant differences were found in the age group, gender, academic year, clinical placement, and working hospital with the infection control knowledge score.

Table 3 Association of Demographic Variables with Knowledge Score

| Demographic variable | n=214 | Knowledge mean±std |
|----------------------------|-------|--------------------|
| Age | | |
| 20-24 years | 144 | 33.4514±1.8762 |
| 25-30 years | 68 | 33.4412±1.86389 |
| Above 30 years | 2 | 33.5000±3.53553 |
| p-value² | | 0.999 |
| Gender | | |
| Male | 202 | 33.4455±1.87136 |
| Female | 12 | 33.5000±2.02260 |
| P value¹ | | 0.81 |
| Study year | | |
| 1st year | 146 | 33.4452±1.85335 |
| 2nd year | 68 | 33.4559±1.93502 |
| P value¹ | | 0.54 |
| Clinical placement | | |
| Cardiology | 13 | 33.1538±1.90815 |
| Medical | 87 | 33.2529±1.91820 |
| Surgical | 29 | 33.4828±1.86357 |
| ER | 68 | 33.72063±1.77752 |
| Pediatric | 17 | 33.5294±2.09516 |
| Others | 0 | 0 |
| P value² | | 0.606 |
| Working hospital | | |
| Specialized care | 22 | 32.6818±1.80967 |
| Tertiary care | 152 | 33.5526±1.86210 |
| Outpatient department | 40 | 33.4750±1.90798 |
| P value² | | 0.125 |

1An Independent T-test has been applied

2Annova Test has been applied

P-value<0.05 is considered significant

Discussion

Nursing students have a vital role in the prevention of infection. Moreover, most of the healthcare team, the nurses, and nursing students have the most direct patient contact and are, therefore, more susceptible to HAIs. One of the main reasons for the high HAI incidence worldwide is a lack of awareness (16, 17). Therefore, this study aims to assess the Nursing student's knowledge regarding infection control.

The present study result showed that the majority of the participants were male. Similarly, a study conducted in Jordan is almost similar to ours. They showed that more than half of the study participants were male (18). In contrast, another study showed that most participants were female 58% (19). This may be due to the different countries and different populations.

The present study result shows that 99.1% of participants aged between 20-30 years. Similarly, another study's findings inconsistent with our findings revealed that 100% of participants were aged between 20-30 years (20). This finding suggests that the sample is relatively homogenous regarding age, which could limit the generalizability of the study's findings to other age groups.

The present study results showed that 40.5% of participants worked in the Medical and 31.5 % in the ER. Similarly, a study conducted in Jordan almost matched our results showing that 33.1% worked in the medical unit and 25.1% in the emergency unit (18). These findings suggest that medical and emergency units are essential for healthcare service delivery, and healthcare

professionals are more likely to be employed in these areas. Furthermore, the consistency of the results across the two studies indicates that the distribution of healthcare professionals across different areas of healthcare delivery may be relatively consistent across different populations.

The current study finding shows that 78.5% of the participants have a moderate level of knowledge regarding infection control. Findings; parallel with our findings, they showed that 72% of the participants have good knowledge regarding infection control (19). On the other hand, the research showed that most participants had inadequate knowledge of infection control (21). Nursing students who understand infection control will be able to recognize infectious disease outbreaks and stop them before they happen in hospital environments. Doing this decreases the likelihood that patients may have infections while receiving care (22). Furthermore, nursing students who comprehend the fundamentals of infection control can better address their patients' demands with high-quality care. They will be knowledgeable about the correct use of personal protective equipment (PPE), isolation protocols, and other infection control techniques that can stop the spread of illness.

Furthermore, the present findings revealed that 21.5% of participants have a high level of knowledge of infection control. Another study result is almost parallel to our findings and shows that 40% of the participants have a high level of knowledge regarding infection control (16). Similarly, another study revealed that nursing students have a high level of knowledge (14.68 ± 2.83) (23). Infections acquired in healthcare settings can be costly to treat and result in more extended hospital stays for patients. By preventing these infections, nursing students with knowledge about infection control can help to reduce healthcare costs and improve efficiency in healthcare delivery (4).

Moreover, the current findings revealed no significant differences in the age group, gender, academic year, placement, and working hospital with the infection control knowledge score. In this regard, a study from Saudi Arabia found no association between infection control knowledge with demographic variables (23). Furthermore, a study discovered no correlation between gender and knowledge score 4. In the same way, another study likewise discovered no correlation between gender and age and knowledge score (p -value 0.32 and 0.99) (22). The results might imply that contextual or demographic factors unaffected the acquisition or retention of infection control knowledge. This could facilitate the emphasis of educators and healthcare professionals on delivering infection control instruction pertinent to all nursing students, irrespective of their circumstances or surroundings. The findings may be constrained by the study's sample size or selection criteria. A more extensive or varied sample size might be able to show variations in infection control knowledge scores between various contextual or demographic groupings.

Limitations of the study

The study might have only concentrated on a few variables, such as age, gender, academic year, placement, and working hospital, impacting infection control knowledge. Other elements like past schooling or training could also impact knowledge level. Furthermore, it's possible that the evaluation of knowledge on infection control was constrained and only touched on a few areas of infection control. This might not provide a clear picture of the participant's general level of knowledge.

Conclusion

The majority of participants in the survey, 78.5%, had a moderate degree of knowledge of infection control, while 21.5% had a high level of knowledge, according to the study. According to the study, scores on infection control knowledge did not significantly differ between age groups, genders, academic years, placements, or working hospitals. These findings imply that healthcare personnel of all ages, genders, educational backgrounds, placements, and facility types should be the focus of initiatives to increase their knowledge of infection control. More study is required to find practical methods for raising healthcare staff members' awareness of infection control.

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