



Research Article

Volume-04|Issue-01|2024

Undergraduate Nursing Students Knowledge and Practices Towards the Prevention of Nosocomial Infections

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Article History

Received: 05.02.2024

Accepted: 18.02.2024

Published: 26.02.2024

Citation

Hamukonda, S., Emvula, O., Mbapaha, C. (2024). Undergraduate Nursing Students Knowledge and Practices Towards The Prevention of Nosocomial Infections). *Indiana Journal of Agriculture and Life Sciences*, 4(1), 21-26.

Abstract: Healthcare-associated infections (HAI), are infections that arise during patient treatment in a hospital or other. Healthcare-associated infections are known to increase the length of stay, health care costs, and mortality. The objective of the study was to assess and describe the knowledge and practices of the 3rd year degree nursing students regarding the prevention of nosocomial infections at the University of Namibia Main Campus in Windhoek. A quantitative research design was adopted in the study with 86, 3rd year degree nursing students taking part in this study. A self-administered questionnaire was handed out to participants during their theoretical block and also a survey created from Google documents was shared online through a link. Majority (51.8%) of the participants showed a fair understanding of what nosocomial infections are. Regarding the causes of nosocomial infections (51.8%) strongly agreed and 32.4% agree to the correct definition of nosocomial infections. Majority (77%) of the participants showed good practices towards nosocomial infections. This study reveals that the knowledge on the prevention of nosocomial infections was fair among the participants.

Keywords: *Noso-comial Infection, Health care-associated infection (HAI, Infection Prevention Control*

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INTRODUCTION AND BACKGROUND

Nosocomial infection is an infection or sickness one acquires after being in the hospital 48 hours after admission. It's also known as a hospital acquired infection, meaning one gets this infection after being in the hospital. Patients and health care workers bring germs inside the hospital and at times there is an exchange of deadly germs without knowing (Brennan, 2021). Health care-associated infection (HAI), also referred to as "nosocomial" or "hospital" infection, is an infection occurring in a patient during the process of care in a hospital or other health care facility which was not present or incubating at the time of admission (World Health organization, 2020). HAI results in prolonged hospital stays, long-term disability, increased resistance of microorganisms to antimicrobials, massive additional costs for health systems, high costs for patients and their family, and unnecessary deaths (WHO, 2020).

In hospitals, nurses play a vital part in healthcare and are frequently the unsung heroes. They serve on the front lines of disease prevention, primary health care delivery, including promotion, prevention, treatment, and rehabilitation, and are frequently the first to recognize medical emergencies World Health Organization (WHO, 2020).

Globally, infections are considered a serious public health concern (WHO, 2020). There are

approximately 1.7 million patients worldwide who contract NCIs each year (Raofi et.al, 2023).

According to Mirowska & Kiersnowska (2021) nosocomial infections are one of the most important problems of the health care system and that one of the top goals for the hospital's quality management system should be the efficient control of hospital infections. Hospital infections should be on the list of potential unfavorable events for which suitable remedial and preventive measures are developed, out of concern for patient safety and the caliber of medical services delivered.

There are differences in nurses' understanding and application of the prevention of hospital acquired infections. Several studies have revealed that the majority of healthcare professionals lack the necessary training and experience (Bayleyegn *et al*, 2021).

A cross-sectional pilot was study conducted among medical and nursing students in University Malaya, Malaysia, that discovered. The knowledge, attitude, and perception median scores were 13, 29, and 41, in that order. Regarding knowledge, attitude, and perception, the students scored higher in 66%, 59%, and 63% of cases, respectively. When it comes to attitude, medical students scored higher than nursing students (Ponnampalavanar & Imtiaz, 2021). In comparison to participants with lower knowledge scores, individuals

with greater knowledge scores were more likely to have a higher infection control attitude score.

A study done in Morocco on nursing students and results indicated that the majority of students 88.7%, obtained unsatisfactory general knowledge score of more than 5 (<5). Additionally, the Attitudes and Practices score for the majority of the students (10) was below average. 58% of students received a total score that was less than or equal to 15 (Baba *et al*, 2023). This indicated that student nurses have poor knowledge about nosocomial infections and the attitudes & practices are below average because usually when one has poor or little knowledge it leads to casual approach to the matter at hand and routine practices.

A cross sectional study was done in the Western Cape on 301 nursing students and results showed that the majority of the students were overall evaluated as having good level of knowledge (47.4%) and poor attitude (41.7%) scores, with little difference in practice scores observed between different years of study. It is advised that more rigorous examinations during clinical training that concentrate on infection prevention and control be used at the undergraduate level, along with interactive infection control courses that encourage critical thinking (Rahiman *et.al*, 2018)

Shitemo, (2020) also carried out a quantitative descriptive study in a private hospital in Namibia in 2020, with 122 nurses making up the target group. According to the study's findings, 80% of participants had sufficient information, 84.4% had a favorable opinion of Infection Prevention Control (IPC), and 40% followed IPC practices. The nurses had sufficient understanding of and a favorable attitude toward IPC, but efforts should be made to increase their adherence to the IPC practice. No published study in Namibia specifically about nosocomial infection on student nurses, thus prompted the researchers to carry out this study to assess the student nurses' knowledge and practices towards nosocomial infections.

The purpose of the study is to determine the knowledge and practice of undergraduate student nurses' knowledge and practices towards nosocomial infections prevention. The study objectives were to assess undergraduate student nurses' knowledge and practices towards nosocomial infections prevention.

METHODS

Design

A quantitative research approach was employed in the study. Cross-sectional, descriptive research design was used to determine, describe the knowledge and practices towards the prevention of nosocomial infections among undergraduate nursing students.

Setting

This study was conducted at the School of Nursing of the University of Namibia (UNAM), main campus in Windhoek, Namibia. This campus is one of the four campuses offering nursing education to both undergraduate, as well as postgraduate nursing students.

Participants and Sampling

The target population of the study was all 109, while the study population was 86, third year degree nursing students at UNAM, Main campus in Windhoek. This population was selected because this cohort were more exposed to units where nosocomial infections may occur. A total number of 77 students were recruited, representing a response rate of 90%. This study is quantitative study in nature and used random sampling to ensure equal inclusivity in the study. Yamane's formula according to Adam (2020) was used to derived at a sample size of 86 students.

Data Collection

Self-administered questionnaires and online survey in the form of Google forms were used to collect data from the nursing students. The questionnaire allowed different closed ended questions and Like-rt scale questions. The questionnaire had 4 sections, section A - which was demographic data, age, gender & level of education; Section B -then assessed their knowledge about nosocomial infections, Section C -assessed their attitudes and lastly Section D - their practices to prevent nosocomial infections. Likert scale comprised of five levels: 5. strongly agree, 4. agree, 3. neutral, 2. strongly disagree, 1. Disagree to assess their responses.

Data collection only occurred after gaining ethical clearance from the University of Namibia ethical committee. Data were collected from students during their clinical placement at the selected health facilities. Questionnaires were distributed to participants after obtaining consent. The questionnaires were also shared through Google form through a link to the respondents. After completion, the questionnaires were collected by the researcher and kept safe and store throughout data analysis. Data is only accessible by the research team.

Ethical clearance was obtained from the Decentralized Research Ethical Committee of the School of Nursing and Public Health at University of Namibia (Ethical Clearance Number: **SoNEC: 30/2023**). Informed consent was obtained from all individual participants. The study was voluntary; thus, participants had the right to withdraw from the study. Anonymity and confidentiality were ensured by protecting the identity of the participants.

Statistical Analysis

The quantitative data collected from the closed ended questions was categorized and analyzed using the Google forms linked with Google Excel sheets. Nominal or ordinal data, percentages were only descriptive statistics to table and graphs.

RESULTS

Socio- Demographic Characteristics of participants

The 86% of the students that took part, Females: 60 (81.1%) and Males: 14 (18.9%)

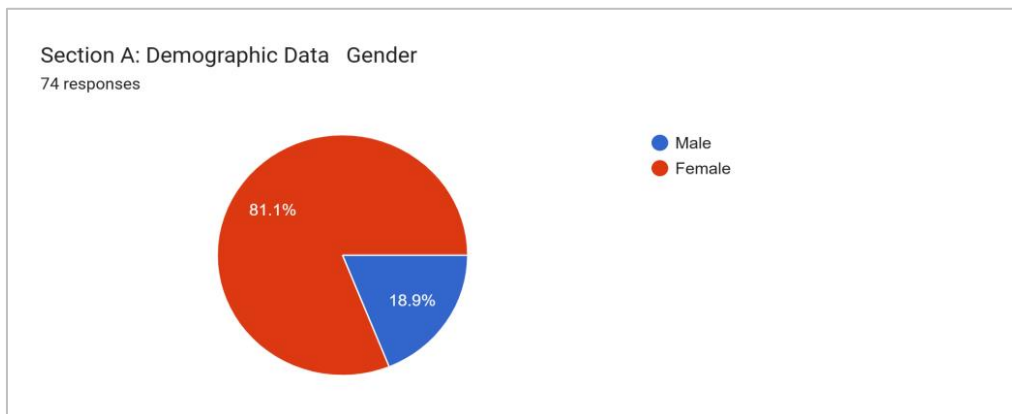


Figure 1: Participants gender

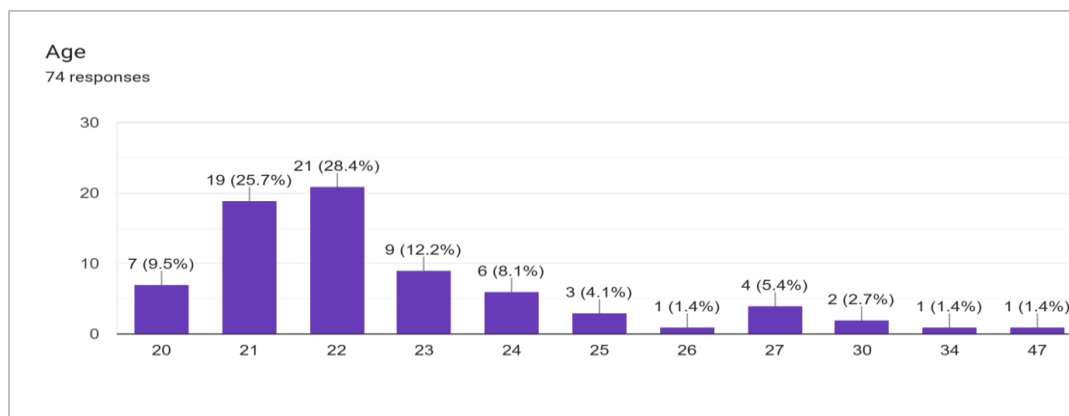


Figure 2: Age of participants

Majority of the students that took part are aged 22: 21 responses at 28.4% and 21 years: 19 responses at 25.7%.

Table 1: Participants Marital Status

Marital Status	Responses	Percentages
Married	3	4.1%
Single	71	95.9%
Divorced	0	0%

Table 1 indicates the participants marital status, married: 4.1% (3 participants), single: 95.9% (71 participants). None of the participants are divorced.

Table 2: Highest educational level obtained

Total Participants	Qualifications	Responses	Percentage
74	Degree	2	2.7%
74	Diploma	3	4.1%
74	Certificate	6	8.1%
74	Grade 12	63	85.1%

Majority of the participants are undergraduates, 63 responses (85.1%), with a few of the participants having qualifications of certificate: 8.1% (6 participants), diploma 4.1% (3 participants) and degree: 2.7% (2 participants)

Table 3: Religion

Religion	Responses	Percentages
Christian	70	94.6%
Muslim	1	1.4%
Others	3	4.1%

Presented in the table above is the participant's religion. A large number of the participants 94.6% (70 participants) are Christians, 1.4% (1 participant) is a Muslim and 4.1% (3 participants) is of other religions.

Research Question Results

Knowledge of participants (n= 74)

Presented in the table below are the participants' responses to the questions of their knowledge on nosocomial infections. Majority of the participant showed a fair understanding of what nosocomial infections are and the causes of nosocomial infections. A fair amount of the participants which is 51.8% strongly agreed and 32.4% agree to the correct definition of nosocomial infections. 45.9% of the participants strongly agreed to nosocomial infections are caused by poor hospital hygiene. Majority of the

students, 62.2% (good amount) strongly agreed to apply standard precaution regardless of their diagnosis but unfortunately a low amount of the participants 41.9%

strongly agreed that nosocomial infections can lead to sepsis or even death.

Table 4: Knowledge of participants (n= 74)

Variables	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
Nosocomial infections are infection(s) acquired during the process of receiving health care that was not present during the time of admission	43 (51.8%)	24 (32.4%)	5 (6.8%)	2 (2.7%)	0 (0%)
Nosocomial infections are caused by poor hospital hygiene.	34 (45.9%)	27 (36.5%)	8 (10.8%)	4 (5.4%)	1 (1.4%)
Nosocomial infections are always caused by antibiotic-resistant bacteria.	9 (12.2%)	12 (16.2%)	34 (45.9%)	16 (21.6%)	3 (4.1%)
Any patient admitted in the hospital is at risk of getting nosocomial infections	23 (31.1%)	33 (44.6%)	7 (9.5%)	10 (13.5%)	1 (1.4%)
Health care workers contribute to the spread of nosocomial infections	18 (24.3%)	32 (42.3%)	20 (27%)	4 (5.4%)	0 (0%)
Only patient who had surgery acquired nosocomial infections	2 (2.7%)	5 (6.8%)	15 (20.3%)	38 (48.6%)	16 (21.6%)
Nosocomial infections are also known as Hospital acquired infections	44 (59.5%)	23 (31.1%)	6 (8.1%)	1 (1.4%)	0 (0%)
Standard precaution apply to all patients regardless of their diagnosis	46 (62.2%)	24 (32.4%)	4 (5.4%)	0 (0%)	0 (0%)
Nosocomial infection cannot be present at admission; rather, it must develop at least 48 hours after admission	26 (35.1%)	26 (35.1%)	13 (17.6%)	8 (10.8%)	1 (1.4%)
Nosocomial infection can lead to sepsis or even death	31 (41.9%)	33 (44.6%)	8 (10.8%)	2 (2.7%)	0 (0%)

Participants practice on prevention of Nosocomial infection

Presented in the table below are the participants' responses to the questions about their practices towards nosocomial infections prevention. Majority of the participants showed good practices towards nosocomial infections prevention, 77% of the participants strongly agreed and 20.3% agreed to washing their hands after using the toilet. A fair number of participants 50% strongly disagreed to placing stable patients with patients with communicable diseases together. 60.8% of the participants strongly agreed to washing hands before and after direct contact with patients.

When it comes to disinfecting equipment after each patient use e.g. thermometer, 78.4% of the participants strongly agreed to carrying that practice out. 74.3 % of the participants also strongly agreed to monitoring patients' vital signs daily including temperature, because this is usually the first warning sign of an infection developing.

A very good amount of the participants, 81.1% strongly agreed to using a new syringe and needle for each injection of a patient, if this kind of practice is not done it would lead to a deadly spread of infections. 71.6% of the participants also strongly agreed to always wearing a mask when dealing with critical patients. Overall the participants showed good practices towards nosocomial infections.

Table 5: Practices of Participants on Prevention of Nosocomial Infections(N=74)

Variables	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
I wash my hands after using the toilet	77% (57)	20.3% (15)	2.7% (2)	0% (0)	0% (0)
We place patients with communicable diseases with other stable patients	2.7% (2)	8.1% (6)	8.1% (6)	31.1% (23)	50% (37)
I always wash my hands before and after direct contact with patients	60.8% (45)	27% (20)	10.8% (8)	1.4% (1)	0% (0)
I always wash my hands before starting my shift and at the end of my shift	54.1% (40)	28.4% (21)	10.8% (8)	6.8% (5)	0% (0)
I always disinfect my equipment after each patient use e.g. thermometer	78.4% (58)	20.3% (15)	1.4% (1)	0% (0)	0% (0)
We monitor patients vitals including temperature daily	74.3% (55)	21.6% (16)	4.1% (3)	0% (0)	0% (0)
I use a new syringe and needle for each injection of a patient	81.1% (60)	17.6% (16)	0% (0)	1.4% (1)	0% (0)
I always clean the vulva before inserting a female urinary catheter	71.6% (53)	23% (17)	4.1% (3)	1.4% (1)	0% (0)
Bed linens of patients are changed daily	54.1% (40)	33.8% (25)	12.2% (9)	0% (0)	0% (0)
I always wear a mask when dealing with critical patients	71.6% (53)	21.6% (16)	5.4% (4)	1.4% (1)	0% (0)

DISCUSSIONS

Socio- Demographic Data

Majority of the participants in this study were females and also that was the same in a study carried out by Hamid (2019) in Saudi Arabia. In this current study the mean age was 22 years and majority of the participants (95.9%) were unmarried, which is a bit different to a study by Hamid (2019).

The Knowledge of Nosocomial Infection Among the Student Nurses

In this current study, the results indicated that the participants had a fair knowledge and understanding of nosocomial infections and a few of the participants actually do not understand what nosocomial infections are. About what causes nosocomial infections, participants had a good understanding, many strongly agreed that it is caused by poor hospital hygiene and also that health care workers contribute to the causes of nosocomial infections. In a study conducted by Baba & Kharbach (2023) Regarding general knowledge, more than half of the students gave a correct definition of nosocomial infections. The transmissible nature of the nosocomial infection was well known by almost all of the participants (92.5%). In this current study the student nurse had fair knowledge of nosocomial infections while the nursing students in Morocco had a very good knowledge and understanding of nosocomial inf.

Practices of Student Nurses Towards the Prevention of Nosocomial Infections

Participants in this study were asked about some of the prevention nosocomial practices and these were some their responses: 77% of the participants strongly agreed and 20.3% agreed to washing their hands after using the toilet. 60.8% of the participants strongly agreed to washing hands before and after direct contact with patients. A very good amount of the participants, 81.1% strongly agreed to using a new syringe and needle for each injection of a patient. These results from current study showed that the student nurses have good practices towards the prevention of nosocomial infections. In the study carried out by Kanyamba (2022), student nurses were also assessed with similar questions and their results: 166 (95%) wash hands before and after direct contact with patients while 6 (4%) do not wash hands. 144 (96%) do not recap needles after using and before disposal, 6 (4%) do recap needles. 96 (64%) wear masks and when performing invasive and fluid procedures while 48 (32%) do not wear and 6 (4%) are not sure. There is not much of a difference, both studies indicate good practices among the student nurses despite the difference in population of respondents.

Strengths and Limitations

The study provided valuable insight into the knowledge and practices of student nurses regarding the prevention of nosocomial infections. However, the study was limited to one campus, thus making it impossible to generalize the findings to nursing students at other campuses.

Implications for Practice: Nosocomial infections have been associated with several adverse outcomes including

extended hospitalization and elevated mortality rates. The nursing students play a vital role in the prevention and management of hospital acquired infections. Thus, it would be desirable to assess the knowledge and practice of the students to improve training and consequently reduce nosocomial infections. It is important that student nurses have the correct and adequate knowledge about nosocomial infections. This study could identify important issues pertaining to the prevention of nosocomial infections and actions that may cause their occurrence. Its only through the correct practice, student nurses can eliminate the occurrence of nosocomial infections. This study could also help the school of nursing to implement or incorporate lessons about infection control during theoretical block for the nursing students. The research findings may aid nursing teams to further educate the nurses about preventative measures on how to manage nosocomial infections.

CONCLUSIONS.

This study reveals that the knowledge on the prevention of nosocomial infections was fair among the participants. This study reveals that the knowledge on the prevention of nosocomial infections was fair among the participants in respect of the causes, complications and risk of Nosocomial Infections. Overall the participants showed good practices towards the prevention of nosocomial infections.

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