Nursing Students' Knowledge of Al-Bayan University Regarding Infection Control Strategies at Intensive Care Units

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Abstract

Introduction: One of the most significant causes of medical, social, and economic issues in both developed and developing nations is nosocomial infection (NI). The clear duty of nurses and nursing students is to implement preventative measures and lower the risk of infections (future nurses), this study concern to identify students" knowledge and the association of their socio-demographic data. It is necessary to emphasize and focus on infection prevention and control since education has played a significant role in expanding the knowledge of infection control among healthcare personnel. There have been few studies examining this issue in relation to pre-graduation nursing students at Al-Bayan University.

Methodology: A descriptive (cross-sectional) design was aim to identify the students' knowledge regarding infection control strategies at intensive care unit in Al- Bayan University through the application of an online questionnaire. The study started on 13th, January 2021 to the 5th, June 2021. The study was carried out through an online questionnaire to the three educational levels (sophomore, junior and senior) in Al- Bayan University- College of Nursing. A simple random (probability) sample was used to select (227) participants. Electronic (virtual) classrooms were used to share the link of an online questionnaire; one month period was allotted to gather the maximum number of participants.

Results: The study demonstrates that the majority of the subject (62%) were females and the remaining (38%) were males. It also shows that the study subject mostly lived in urban areas, that the third stage of the subject's college career recorded the highest percentage (97%) of the subject's college stages, and that the subject's distribution by marital status shows that the single and married take the highest percentages (75.4% and 19.7%, respectively), The majority (63.9%) of the study's sample demonstrates that students generally have little knowledge of emergency stroke management, that there are no statistically significant differences between genders in this area, that there is no relationship between marital status and knowledge, and that location has no bearing on students' knowledge.

Conclusions: Senior, junior, and sophomore record the highest percentage respectively in the college stages of the study subject, most of the students' (74%) were single. The majority of the students' records moderate to good knowledge regarding infection III control, in addition, the college stages and residence record high statistically significant association (p≥ 0.001).

Keywords: Infection control, Nursing student knowledge.

Introduction:

The formative stage and ideal time for obtaining the requisite knowledge and abilities is during the undergraduate nursing education. In addition to having early patient interaction during clinical training, nursing students who work in critical care units after graduation also have early patient contact. One of the most crucial factors that taxed hospitals and health care organizations was infection prevention and control. The purpose of this study is to assess students' knowledge of infection control measures. It is necessary to address the fact that most nursing undergraduate courses

do not explicitly train students in infection control. Therefore, it is necessary to evaluate the teaching and training needs of undergraduate nursing students with relation to these practices.

Healthcare-related infections reduce a person's quality of life by increasing pain and death, deteriorating health, dysfunction, impairing cognitive function, and costing the health care system money owing to prolonged hospital stays and delayed recovery (1). The pooled rate of central line-associated blood stream infections in intensive care units in Latin America, Asia, Africa, and Europe was 4.9 per 1,000 central line days, according to the International Nosocomial Infection Control Consortium. This rate is nearly five times higher than that reported from comparable US intensive care units. (2). A study was carried out in Iraq (Merdaw, 2007) to determine the prevalence of bacteria in samples taken from surgical wounds and to assess selected isolates' resistance to antimicrobials. Swabs from wounds were evaluated between June 2010 and January 2011. The Kirby-Bauer disc diffusion method was used to test the antimicrobial susceptibility of the samples. 102 wound swabs in total were evaluated. 80 (78.43%) of the swabs tested positive for bacteria whereas 22 (21.56%) were sterile (3). In acute care hospitals, at least 5% to 10% of patients develop an infection. According to estimates, one in every 20 hospitalized patients will develop an HCAI. Not only are patients at significant risk, but so are healthcare professionals (HCWs), especially medical students. 7–9 Therefore, it is crucial that medical students have sufficient knowledge of infection prevention and control (IPC) techniques and that these practices be included into their professional training. Standard precautions and hand hygiene compliance on the part of HCWs, especially medical students, has been acknowledged as an effective method to prevent and control HCAIs. 10 Such precautions safeguard not only the patient and family but also the environment, health care workers, and students (4).

Nowadays, health care-associated infections, also known as nosocomial infections or hospital-acquired infections are by far the most frequent problems affecting hospitalized patients. Nosocomial infections are in fact seen to be the biggest threat to patient safety in the hospital setting, and during a national staphylococcal infection pandemic, they suddenly became under the purview of public health officials. (Burke, 2003) (5).

Objectives:
The study aims to assess the nursing students' knowledge regarding Infection Control Strategies in intensive care unit (ICU) and find out the association between nursing students' knowledge and sociodemographic characteristics.

Research question:
Nursing Students' Knowledge of Al-Bayan University Regarding Infection Control Strategies at Intensive Care Units

Methodology:
Study design:
A descriptive (cross-sectional) design was used for the period from 13th, January 2021 to the 5 th , June 2021

Setting and Sample of the Study:
The study was carried out through online questionnaire to the three educational stages (second, third and fourth) in Al- Bayan University, College of Nursing. A simple random (probability) sample was used to select (227) participants. Electronic (virtual) classrooms were used to share the link of an online questionnaire; one month period was allotted to gather the maximum number of participants.

Data analysis:
Data are analyzed through the use of the SPSS (Statistical Package for Social Sciences) version (24) application Statistical analysis system. The researcher used multiple tests to analyze the data: frequency and percentage, mean, and Alpha Cronbach (α), t-test, Spearman correlation coefficient.

Power analysis (Study size):
The minimal necessary sample size would be 227 with an expected effect size of 0.15, a planned statistical power of 0.95, predictors, and a probability level of 0.05. It would be 45 if a 20% attrition rate were used. Hence, a sample size of 272 would be advised. The total number of samples is 227.

Study instrument:
Study instrument was developed through reviewing of available literatures and the researchers constructed an online questionnaire that consisted of forty items divided into six domains (General Concepts, Hand Hygiene, Sharps management, Personal Protective equipment (PPE), Waste disposal, and Occupational infection and Environmental Sanitation) in addition to socio-demographic data and informed consent that ask the participants if they agree or disagree to participate in the research. All the questions rated and score as (correct answer = 1, incorrect answer = 0). The questionnaire composed of MCQ with 4 choices in addition to true and false questions. Less than 50 % = Low level of students' knowledge, 50 - 59 = Accepted level of students' knowledge, 60 – 69 = Moderate level of students' knowledge ,70 – 79 = good level of students' knowledge ,80 – 89 = very good level of students' knowledge, the scale has demonstrated excellent internal consistency and reliability.

Part I: Socio- Demographic Information Sheet
It consists of (4) items which include: gender, stage of college, residency, and marital status.
Part II: Knowledge about Infection Control Strategies
Consists of two domains as the following:
1- General Concepts: consists of (5) items.
2- Hand Hygiene: consists of (11) items.
3- Sharps management: consists of (8) items
4- Personal Protective equipment (PPE): consists of (8) items
5- Waste disposal (4) items
6- Occupational infection and Environmental Sanitation: consist of (4) items.

Ethical considerations:
The sample was gathered online through correspondence between official groups and online classes of students using an electronic questionnaire that was appropriate for the study's needs and contained study instruments. Participants were informed of the study and given the option to participate or decline.
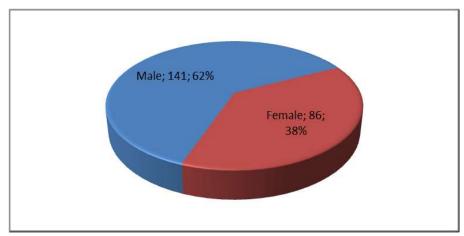
Results:

Figure (1): Distribution of subject according to their gender (N=227)

This figure demonstrates that the majority (62%) of the subject was females and (38%) was males.
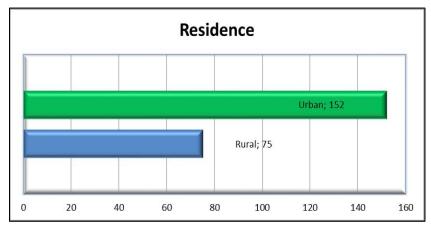
Figure (2): Distribution of subject according to their residence (N=227)

This figure show that the urban records the highest percentage of residence in the study subject.
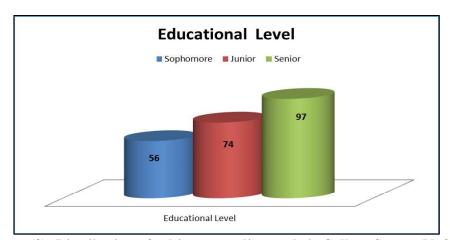

Figure (3): Distribution of subject according to their College Stages (N=227)

Senior, junior, and sophomore record the highest percentage respectively in the college stages of the study subject.
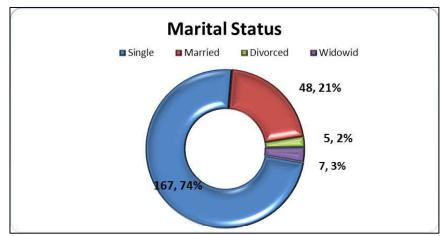

Figure (4): Distribution of subject according to their marital status (N=227)

Distribution of the subject by their marital status demonstrates that single and married takes the highest percentage (74% and 21%) respectively.
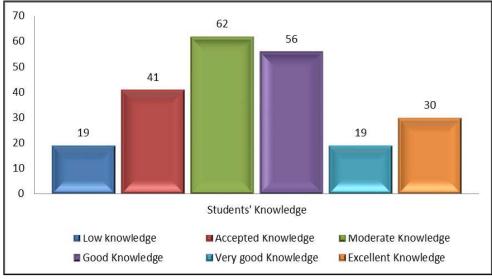
Figure (5): Distribution of Students' Knowledge (N=227)

This figure reveals that most students' (F=62) record a moderate level of knowledge concerning infection control followed by (F=56) good level of knowledge.

Table 1: Comparison of knowledge differences by their gender.

Independent Samples Test						
Levene's Test for Equality of Variances			**t-test for Equality of Means**			
Students' knowledge	**F**	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**
Equal variances assumed	12.1	.001	-.214	225	.831	-.184
Equal variances not assumed			-.233	221.2	.816	-.184

S: significant, df: degree of freedom

This table demonstrates that high statistically significant differences were found between males and females according to their knowledge about infection control.

Table 2: Association between Marital Status and Students' Knowledge

ANOVA					
Marital status					
Students' Knowledge	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	154.208	3	51.403	1.306	.273
Within Groups	8776.294	223	39.356		
Total	8930.502	226			

This table shows that no statistical association between marital status and students' knowledge.

Table 3: Association between College Stages and Students' Knowledge.

Students' Knowledge	Sum of Squares	df	Mean Square	F	Sig.
ANOVA					
College Stages					
Between Groups	781.289	2	390.644		
Within Groups	8149.213	224	36.380	10.738	**.000**
Total	8930.502	226			

High statistical associations were recorded between college stages and students' knowledge (p ≤ 0.001).

Table 4: Comparison of knowledge differences by their Residence

Students' knowledge	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Independent Samples Test						
Levene's Test for Equality of Variances			**t-test for Equality of Means**			
Equal variances assumed	.182	.670	2.405	225	**.017**	2.11114
Equal variances not assumed			2.401	146.7	.018	2.11114

This table reveals that students' knowledge toward infection control was different according to their residence, so high statistical differences were recorded (p ≤ 0.001).

Discussion:

The main findings of this study are as follows:

Part one: Discussion of Students' knowledge regarding infection control (figure 5):

Nursing students' have early direct contact with the patient in the clinical training in addition after graduation when working in critical care units. Infection prevention and control are one of the most important aspects that exhausted the health care agencies and hospitals. In this study, the researchers try to evaluate the students' knowledge about infection control strategies. The study demonstrates that most of the students' have a moderate level (60-69%) of knowledge about infection control. Three college stages. The study by Park (2007), which employed a descriptive survey approach to assess student nurses' knowledge, attitudes, and self-confidence about the prevention of nosocomial infections and to gather data for the creation of an efficient policy and education program, lends credence to these findings. Data were gathered from 520 student nurses using a questionnaire that had 15 knowledge-related items, 81 attitude-related items, and 81 self-confidence-related items. Knowledge received an average score of 0.63. According to the study, these research findings could help advance ongoing and recurrent instructional programs on nosocomial infection for nursing students (6). At the University of Birmingham Medical School in the UK, Mann and Wood (2006) conducted a second study to assess third-year medical students' comprehension of infection control policies and procedures. Medical students received a semi-structured questionnaire. 156 of the 322 students that took the survey completed it (48%). Findings revealed that 50% of medical students were unaware of the exclusion period following an episode of diarrhea and vomiting, 35% were unaware of the proper use of gloves, and 58% were unaware of the proper indications for using

alcoholic hand gel. Among medical students, 64% reported receiving formal education in hand hygiene, 12% reported receiving informal instruction, 19% reported receiving both types of instruction, and 5% reported receiving no hand hygiene instruction at all. Forty-nine (49) percent of medical students felt that their course did not place enough focus on infection management. These findings raised questions regarding the pupils' understanding of infection control. The university is currently examining whether a more structured approach to infection control instruction and evaluation is necessary (7).

Part two: Association between Students' knowledge and their sociodemographic data:
In relation to gender, the results showed that gender had no statistically significant association with the students' knowledge toward infection control. Among medical students, 64% reported receiving formal education in hand hygiene, 12% reported receiving informal instruction, 19% reported receiving both types of instruction, and 5% reported receiving no hand hygiene instruction at all. A self-administered questionnaire was utilized to assess usual precautions, particularly hand cleanliness. Participating in this study were 162 students, 114 nursing students, 31 medical students, and 17 students studying radiography. students in radiology (61%), and nursing (66%), both had moderate scores. Regarding knowledge and attitudes of infection prevention and control, there was no discernible difference between the sexes in scores. (8). Concerning the residence (figure 2), the study reveals high statistical differences in students' knowledge, the students' who live in urban records better knowledge than who lived in rural area, no available studies supporting this result. The obvious reason for this finding is that students who live in rural areas have greater difficulty traveling to their universities due to vast distances and traffic jams, which may have an impact on their ability to study compared to those who live in metropolitan areas. Contrary to college stages, married status (figure 3,4) does not correlate with students' knowledge of either topic. Throughout June and August 2018, a cross-sectional study by Elgazzar and Qalawa (2020) was conducted at the Port Said main hospital. Data were gathered for 140 operating room nurses, who made up a purposive sample. The tool used to gather study data includes sociodemographic information about nurses as well as their understanding of asepsis and infection control principles. A strong association between nurses' sociodemographic characteristics and their knowledge of the principles of sterilization and infection control, particularly in areas relevant to educational level, provides support for the study's conclusions (9).

Conclusion:
From the present study findings, the researcher has got the following conclusions:
Students' knowledge records a moderate to good knowledge regarding infection control strategies in intensive care units at Al-Bayan University, and the residence and college stages record high statistically significant association with students' knowledge.

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