

KNOWLEDGE OF SAFE INJECTION PRACTICES, PREVENTION OF SHARP INJURIES, AND MEDICAL WASTE MANAGEMENT IN NURSING STUDENTS OF THE UNIVERSITY OF MEDICINE AND PHARMACY AT HO CHI MINH CITY

ABSTRACT

Objective: To describe the knowledge regarding safe injection practices, prevention of sharp injuries and medical waste management in Nursing students of the University of Medicine and Pharmacy at Ho Chi Minh City.

Method: A cross-sectional study conducted in 264 Nursing students, during the academic year 2022-2023. A pre-designed questionnaire was used to survey knowledge regarding standard precautions.

Results: The study found that 51% of nursing students possessed accurate knowledge regarding safe injection practices and the prevention of injuries from sharp objects. Notably, the aspect concerning contact precautions for managing wounds in HIV/AIDS patients had the highest correct response rate at 92.1%. Additionally, 73% of nursing students demonstrated correct knowledge about medical waste management, with the highest accuracy (93.2%) in the area of waste segregation at the point of generation.

Conclusion: Overall, more than half of the students have correct knowledge about safe injection practices, prevention of sharp injuries, and medical waste management in standard precautions (all above 50%).

Keywords: *safe injection practices, standard precautions, nursing students*

I. INTRODUCTION

Currently, bloodborne infections pose a significant concern in the medical field, particularly for the nursing sector, which is directly involved in procedures that may expose them to blood and body fluids. Non-compliance or poor compliance with standard precautions can make them vulnerable to occupational exposure risks during patient care [1]. Nurses exposed to bloodborne

pathogens, bodily fluids, or airborne pathogens are at risk of contracting occupational infections such as HIV/AIDS, hepatitis B, hepatitis C, tuberculosis, and other infectious diseases [2]. Moreover, nursing students frequently participate in clinical practice, putting them at high risk of exposure to infection-causing factors. However, nursing students have less practical experience compared to healthcare professionals. Therefore, providing standard precaution knowledge to nursing students is essential, as it can help achieve outcomes such as reducing nosocomial infection rates, minimizing healthcare risks for both healthcare workers and the students involved in clinical practice [3,4]. Based on this reality, we aim to conduct the study: "Knowledge of Standard Precautions among Nursing Students at the University of Medicine and Pharmacy at Ho Chi Minh City".

II. SUBJECT AND METHODS

2.1. Subjects, locations, and study period

Inclusion Criteria: Nursing students in their third or fourth year at the University of Medicine and Pharmacy, Ho Chi Minh City, who agree to participate in the study.

Exclusion Criteria: Students who have deferred their studies or those who did not fully complete the survey questionnaire.

Time and location

Time Period: From August 2022 to June 2023.

Location: Faculty of Nursing and Medical Technology, University of Medicine and Pharmacy at Ho Chi Minh City.

2.2. Method

Study Design: a cross-sectional descriptive study

Sample Size: the sample size was calculated using the formula

$$n \geq \frac{Z_{1-\alpha/2}^2(1-p)p}{d^2}$$

α : significance level ($\alpha = 0.05$)

Z: standard normal distribution value at 95% confidence level

P: estimated proportion, $p = 0.787$ (According to the findings of Vo Van Tan et al regarding

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Received date: 23/10/2024

Revised date: 21/12/2024

Accepted date: 25/12/2024

the percentage of nursing students possessing knowledge of standard prevention measures [5]

d : maximum allowable error of the estimate ($d = 0.05$)

Substituting these values into the formula, the calculated sample size is $n = 264$.

Sampling Method: stratified random sampling method was applied based on the academic years (third and fourth year) of the students. The number of samples required from each stratum (class) was calculated using the formula:

$$n_i = \frac{nN_i}{N}$$

n is the sample size in the study

n_i is the total number of samples needed from each class

N_i is the current number of students in each class

N is the total number of students in the 2019-2023 and 2020-2024 cohorts of the Nursing program. The number of students included in the sample is: 140 third-year students and 124 fourth-year students

2.3. Data Collection Tool

The data collection tool is a standardized prevention knowledge questionnaire for students by author Lê Thị Nga (2016) in the study "Knowledge and Attitudes about Standard

Preventive Measures of Students at Hanoi Medical University." The questionnaire was evaluated for reliability with a Cronbach's alpha of 0.88. The content of the questionnaire includes 71 questions divided into 10 sections (one section on students' personal information and nine sections on standard preventive measures). Each correct answer is awarded 1 point, and incorrect answers receive 0 points. Students' knowledge is considered adequate if they correctly answer more than 70% of the total questions on standard preventive measures [6]. The overall accuracy rate for each section is determined by calculating the mean correct answer rate across all questions within that section.

Data Processing and Analysis: Data entry was performed using Epidata Entry Client software. Data analysis was conducted using STATA 17.0 software. Frequencies and percentages were used to describe qualitative variables.

Ethical issues: The study was approved by the Ethics Committee in Biomedical Research at the University of Medicine and Pharmacy at Ho Chi Minh City, under the approval number 1055/HĐĐĐ-ĐHYD dated December 9, 2022.

Funding: The study was conducted with financial support from the University of Medicine and Pharmacy at Ho Chi Minh City.

III. RESULTS

Table 1. Individual characteristics of students

Factors		Quantity	Ratio (%)
Gender	Male	29	10.98
	Female	235	89.02
Academic year	Third-year students	140	53.03
	Fourth-year students	124	46.97

Research Results: The study results show that among the total number of nursing students participating in the research, the number of fourth-year students was 1.74 times higher than the number of third-year students (63.26% compared to 36.74%). Additionally, the findings indicated that the majority of students participating in the study were female (89.02%), a figure 8.1 times higher than that of male participants.

Table 2. Knowledge about safe injection practices and prevention of injuries from sharp objects

Contents	Correct Answer	
	Quantity	Ratio (%)
Injuries from sharp objects should be self-treated and do not need to be reported (False)	239	90.5
Used syringes should be bent to avoid injury (False)	230	87.1
Dirty sharp objects should be crushed before disposal (True).	94	35.6
Used syringes should be recapped to avoid injury (False)	100	37.9
Needlestick injuries are the most common in clinical settings (False).	33	12.5
Exposure prophylaxis is used to manage wounds in patients with HIV/AIDS (True)	243	92.1

The results in the table above show that the knowledge of students participating in the study about safe injection practices and prevention of injuries from sharp objects is uneven. The content with the highest correct response rate is the use of exposure prophylaxis to manage wounds in patients with HIV/AIDS (92.1%). Additionally, most students also correctly answered the question about reporting after being injured by sharp objects (90.5%). However, the correct response rates for handling dirty sharp objects and not recapping used syringes were much lower, at 37.9% and 35.6%, respectively.

Table 3. Knowledge about medical waste management

Contents	Correct answer	
	Quantity	Ratio (%)
Waste must be sorted at the source of generation (True).	246	93.2
Waste storage areas must be at least 1000 meters away from dining areas, patient rooms, public walkways, and crowded areas (False).	39	14.7
Hazardous medical waste and general waste must be stored separately (True).	244	92.4
Initial treatment of highly infectious waste: by chemicals or moist heat (True).	229	86.7
Disposal of general waste: landfill or recycling (True).	200	75.8

The results in the table show that for the two contents of sorting waste at the source of generation and separately storing hazardous medical waste and general waste, the percentage of students who answered correctly was the highest and nearly equal at 93.2% and 92.4%, respectively. Conversely, only 14.7% of students correctly identified the minimum distance from waste storage areas to dining areas, patient rooms, public walkways, and crowded areas. For the remaining contents on the initial treatment of highly infectious waste and the disposal methods for general waste, the correct response rates were also relatively high (both over 75%)

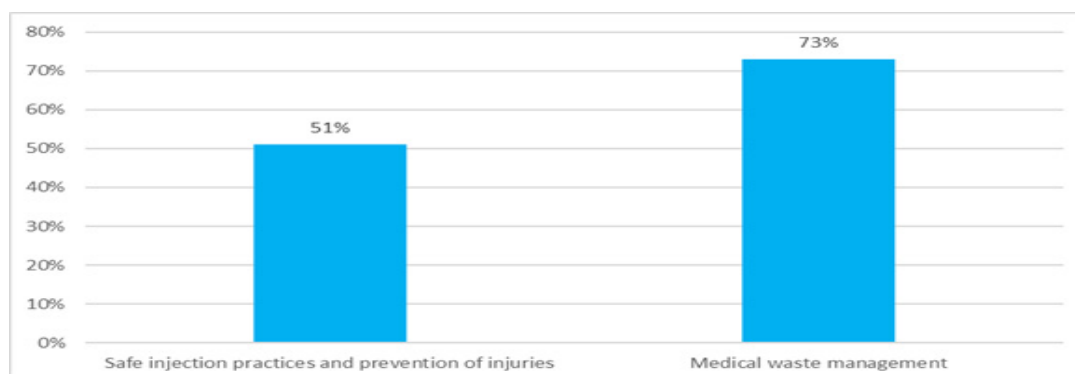


Figure 1. Correct response rate for knowledge content of the questions

Overall, the percentage of students who correctly answered questions about standard preventive knowledge, including safe injection practices, prevention of injuries from sharp objects, and medical waste management, was over 50% of the students participating in the study. Among these, knowledge about medical waste management had a relatively high percentage (73%). The contents on safe injection practices and prevention of injuries from sharp objects had lower correct response rates than the above content but still accounted for more than half of the students participating in the study (over 50%).

IV. CONCLUSION

The research results show that most students correctly answered questions on safe injection practices and prevention of injuries from sharp objects. Aspects such as reporting injuries from

sharp objects, not bending used syringes, and using exposure prophylaxis for wounds in patients with HIV/AIDS had the highest correct response rates. These results are significantly higher compared to

the studies by Lê Thị Nga in 2016 and Mn. Huson Amin Ghalya, Prof. Yousseya Ibrahim, with rates of over 60% and over 45%, respectively [6], [7]. Most students answered incorrectly to the question "Needlestick injuries are the most common in clinical settings," resulting in the lowest correct response rate among all six questions (12.5%). Similarly, in the study by Lê Thị Nga in 2016, this question also had the lowest correct response rate (11.9%) [6]. However, in the study by Mn. Huson Amin Ghalya and Prof. Yousseya Ibrahim, this rate reached an impressive 76.0% [7]. Although aware of the dangers of exposure to blood and bodily fluids during their studies and clinical practice, most students are not well-versed in standard preventive techniques. Specifically, their knowledge of safe injection practices and prevention of injuries from sharp objects is not high. This issue should be addressed because administering injections and infusions are common procedures performed by students. If their knowledge of prevention and management of injuries is inadequate, students are at high risk of exposure to sharp objects during injections and infusions, and potentially contracting HBV, HCV, and HIV through these sharp objects [3][4]. Therefore, it is imperative that students are comprehensively equipped with knowledge in this area prior to transitioning into fully qualified healthcare professionals.

The research results indicate that 73% of nursing students possess accurate knowledge regarding medical waste management. When compared to other studies involving nursing and medical students, this percentage shows a significant difference. In Vietnam, a study conducted at Hanoi Medical College (2016-2017) revealed that the percentage of nursing students with correct knowledge about medical waste classification was 71.6% before intervention and increased to 93.2% after intervention [8]. Meanwhile, a study conducted at Hanoi Medical University in 2021 on medical students revealed that only 45.8% of students correctly answered the definition of medical waste, and 49.2% accurately identified the types of hazardous infectious waste [9].

Globally, a study conducted in India in 2021 revealed that 95.1% of nursing students had poor

knowledge regarding medical waste management, despite their attitudes and practices being relatively good [10]. A study conducted in Turkey in 2019 showed that 89.1% of nursing students had received training in medical waste management, yet there were still significant shortcomings in self-protection and the classification of recyclable waste [11]. Compared to studies conducted in Zambia, your rate of 73% is higher, indicating that nursing students in Vietnam have better knowledge of medical waste management [12]. However, compared to developed countries, the management and disposal of medical waste in Vietnam still face many challenges. The research results contribute to clarifying the overall picture of nursing students' knowledge of medical waste management, while also emphasizing the necessity of training and raising awareness among students.

V. CONCLUSION

Overall, more than half of the students possess accurate knowledge regarding safe injection practices, prevention of injuries from sharp objects, and medical waste management in standard precautions (all above 50%). The percentage of students with correct knowledge about safe injection practices and prevention of injuries from sharp objects is 51%. The percentage of students with correct knowledge about medical waste management is 73%.

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