Quynh ATT & Einhellig K. Belitung Nursing Journal. 2017 June;3(3):183-190.
Accepted: 1 June 2017
http://belitungraya.org/BRP/index.php/bnj/

ORIGINAL RESEARCH **ISSN: 2477-4073**

PRACTICES FOR PREVENTION NEEDLESTICK AND SHARPS INJURIES AMONG NURSING STUDENTS

Anh Tran Thi Quynh[1*], Katrina Einhellig[2]

[1]TienGiang Medical Collge, Viet Nam
[2]University of Northern Colorado, United States

*Correspondence:
Anh Tran Thi Quynh, MSN, RN
Academics & Research Affairs, TienGiang Medical Collge. 83 Thai Sanh Hanh Street, Ward 9, My Tho City, Tien Giang, VietNam.
Tel (+84) 984492550
Email: quynhanhcdyttg@gmail.com

ABSTRACT

Background: Needlestick and sharp injuries are a serious hazard in any health care setting for health care workers and students during clinical practice. Thus, the efforts to prevent the needlestick and sharps injuries are needed and considered a part of the routine practice.

Objective: This study aimed to investigate the frequency of nursing students in doing the correct practice in prevention needlestick and sharps injuries.

Methods: This cross- sectional study was conducted between 2013 and 2014 in nursing students of Tien Giang Medical College who participated in clinical practice. There were 360 students participated in the study using simple random sampling. Data were collected using the practical assessment checklist and demographic characteristics questionnaire. Data were processed using STATA 12.0, and analyzed using Chi-square and Fisher test.

Results: The students who did general practice correctly accounted for 52.50%, and those who did practice incorrectly was 47.5%. The students who used gauze or wool wrap in inhaler were 59.7%, wearing gloves in practice (39.2%), do not disassemble needles from syringes after injection 50%, and removing needles into barrel after injection (65.6%). There was statistically significant relationship between time of participation in clinical practice and correct practice with p-value 0.04 (<0.05)

Conclusion: The correct practice of nursing students related to the prevention of needlestick and sharps injuries remains low. There was a significant relationship between time of participation in clinical practice and correct nursing practice. It is suggested that students must be taught about the risk of infection at the beginning of clinical practice, and constantly reminded throughout the learning process, especially for injection safety awareness, knowledge and techniques about the risk of transmission of HBV, HCV and HIV by sharp objects in the healthcare facility.

Key words: Needlestick injuries, sharp injuries, nursing students, prevention, practice

INTRODUCTION

Exposure to blood and body fluids from patients while performing daily professional work is a serious problem in health workers, especially in nursing staff.[1] However, it is is also a threat to the health of nursing students during clinical practice. According to the World Health Organization, of the 35 million HCWs in the world, annually, there are 3 million people exposed to blood borne pathogens, including HBV 37.6%, HCV 39% and 4.4% infection with HIV/AIDS.[2] In Vietnam, according to a recent survey by the Institute of Occupational Health and Environmental Sanitation at 3 hospitals in Hanoi, showed that sharps injuries in healthcare workers accounted for a very high rate: Thanh Nhan hospital (68.7%); Dong Anh Medical Center (85.2%), and Trang An hospital (50%). According to the Department of Preventive Medicine and HIV/AIDS on 45 of 64 provinces and cities, there was a total of 343 cases of occupational injury risk of exposure to HIV/AIDS care workers health, which the highest percentage was in nursing (45.2% of cases), physicians (29.7%), and technicians (9.6%).

Exposure to pathogens through blood every day is a serious problem for students. The possibility of infection with HBV, HCV, and HIV is significant. Furthermore, HIV chemoprophylaxis regimen after exposure (occupation) is not applicable in the current situation in Vietnam, and there is no known preventive measures against HCV. Therefore, students aware of the risk and how to backup while practicing is needed. This study aimed to investigate the practice for prevention of needle stick injuries and sharps in nursing students. The benefits of this study are to set out plans to protect, prevent, ensure the safety of students in clinical practice.

METHODS

Design and Sample

This cross- sectional study was conducted between 2013 and 2014 in nursing students of Tien Giang Medical College who participated in clinical practice at Tien Giang General Hospital. There were 360 students participated in the study using simple random sampling. The inclusion criteria of the samples were: the students who were studying nursing, had to have clinical practice at the hospital for at least 12 months.

Measures

Data were collected using the practical assessment checklist and demographic characteristics questionnaire. There were 12 items of questions in the checklist. Each practice performed by the student was counted as 1 point, and those who did not practice or incorrect practice was counted as 0 point. The 70% cut-off point (70% assessment level practice) was used to determine proper nursing practice related to prevention needlestick injury sharp. It means that 70% or more indicated a proper practice, while below 70% indicated improper practice.

Data collection

To evaluate the practice of preventing needlestick injuries and sharps, researchers directly observed nursing students perform injection techniques. The students were randomly selected to perform the practices. Single blind was performed which the students did not know that they were in the research study.

Data analysis

Data were processed using STATA 12.0, and analyzed using Chi-square and Fisher test with significant value 0.05.

Ethical consideration

The ethical approval in this study was obtained from Tien Giang Medical College. All participants in this study have

obtained the appropriate informed consent. The objective and procedures of the study were explained, and all informations provided were kept confidentially. Finally, all students were asked to sign the written informed consent.

RESULTS

As shown in the Table 1, there was a total of 360 students participated in the study, which consisted of 22.8% male and 77.2% female. The majority of the samples was in the age 20-24 years old group (82.8%), learning for 3-6 months before practice, and reported that they had a guideline from curriculum (65.3%) and laboratorium (34.2%). However, 3.3% of students reported that they had received no guidance related to occupational exposure in their training program. The area of clinical practice varied, which majority was in surgical nursing (26.7%).

Table 1: General characteristics of the study sample

Characteristics	Frequency	Percentage (%)
Sex		
Male	82	22.8
Female	278	77.2
Age group		
< 20 years old	41	11.4
20-24 years old	298	82.8
≥ 25 years old	21	5.8
Area of clinical nursing practice		
Basic Nursing	44	12.2
Internal medicine Nursing	74	20.6
Surgical Nursing	96	26.7
Pediatric Nursing	19	5.3
Infectious Nursing	67	18.6
Other nursing specialties	60	16.7
Learning/reading time before practice		
3 -6 months	132	36.7
6 -12 months	110	30.6
>12 months	84	23.3
No learn	34	9.4
Prevention guideline related to occupational exposure		
Lessons in curriculum	235	65.3
Skills lab	123	34.2
Clinical practice	173	48.1
No guidance	12	3.3

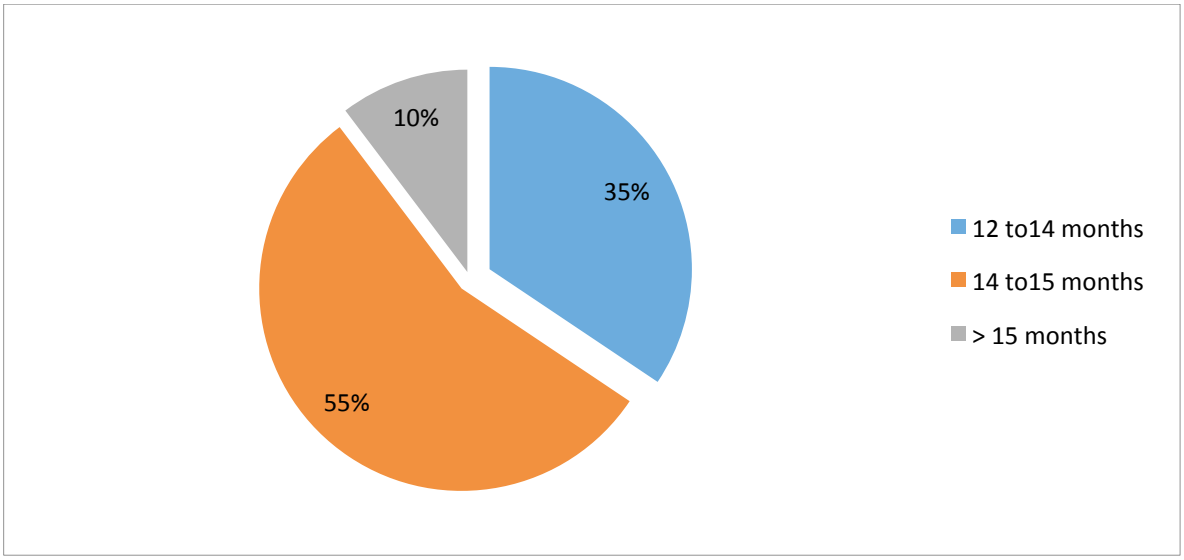

Figure.1. *Time to participate in clinical practice (n=360)*

Figure 1 shows that the time of participation of the students in clinical practice was also evaluated, which indicated that 14 to15 months of clinical practice was the highest proportion of students at 55.28% in this study.

Table 2: Percentage of general practice

No	Practice	Frequency	Percentage (%)
1	Preparing box/container of needle and sharp	298	82.8
2	Using gauze/wool wrap in inhaler, distilling sterile water before break	215	59.7
3	Keeping work area tidily	325	90.3
4	Do not recap the needle with both hands before injection	284	78.9
5	Wearing gloves to perform	141	39.2
6	Focusing on injection for patient	302	83.4
7	Do not touch the needle when it is inserted or drawn	278	77.2
8	Technique of recapping the needle after injection	255	70.8
9	Do not disassemble needles from syringes after injection	180	50
10	Do not bend needle after injection	353	98.1
11	Removing needles into barrel/container immediately after injection	236	65.6
12	filling container *no* more than ¾ full	169	46.9
Correct general practice (practice correctly ≥ 9 content)		189	52.5

Table 2 shows that the percentage of students preparing barrel/container sharp and needle was 82.8%, while unprepared students accounted for 17.2%. Most of the students who did practice correctly up to 70% are in the practice of: Keeping work

area tidily (90.3%), Do not recap the needle with both hands before injection (78.9%), Focusing on injection for patient (83.4%), Do not touch the needle when it is inserted or drawn (77.2%), Recapping technique of the needle after injection (70.8%), and Do not bend needle after injection (98.1%). While the practice criteria that are below 70% include: Using gauze/wool wrap (59.7%), Wearing gloves (39.2%), Do not disassemble needles from syringes after injection (50%), Removing needles into barrel after injection (65.6%), and filling container *no* more than ¾ full (46.9%).

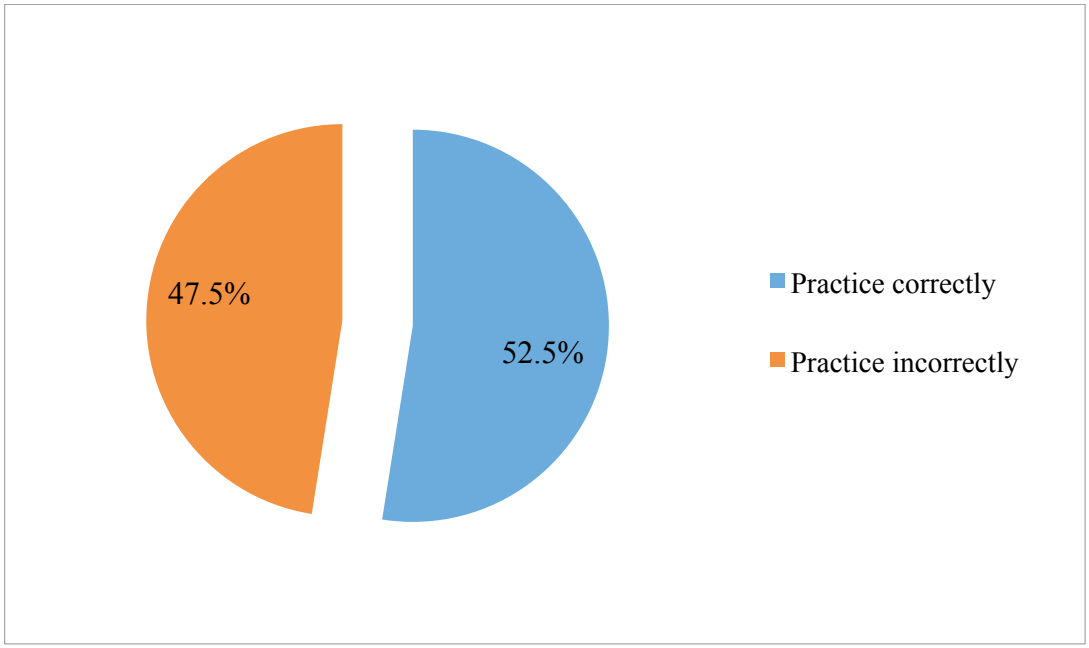

Figure 2. Percentage of general practice

As shown in Figure 2, the percentage of the students who did general practice correctly (≥ 9 score) accounted for 52.50%, and those who did practice incorrectly was 47.5%.

Table 3: The relationship between demographic characteristics and practice

Characteristics	Practice		p	PR (CI 95%)
	Correct n (%)	Incorrect n (%)		
Gender				
Male	40 (48.8)	42 (51.2)	0.44	1.09 (0.86-1.41)
Female	149 (53.6)	129 (46.4)		
Age group				
<20 yrs	24 (58.5)	17 (41.5)	0.41	1.0
20-24 yrs	157 (52.6)	141 (47.4)		0.90 (0.68 -1.19)
≥ 25 yrs	8 (38.1)	13 (61.9)		0.65 (0.35-1.19)

Table 3 shows that there was statistically no significant relatiosnhip between gender and practice with p-value 0.44 (>0.05), and no significant relationship between age and practice with p-value 0.41 (<0.05).

Table 4: The relationship between time to clinical practice and content learned

Characteristics	Practice		p	PR (CI 95%)
	Correct n (%)	Incorrect n (%)		
Time to participate in clinical practice				
12 to 13 months	60 (48.4)	64 (51.6)	0.04*	1
14 to15 months	107 (53.7)	92 (46.3)		1.21 (0.97-1.53)
>15 months	22 (59.5)	15 (40.5)		1.46 (0.94-2.34)
Learning /reading time before practice				
None	13(38.2)	21 (61.8)	0.24	1
3 -6 months	89 (67.4)	43 (39.1)		1.76 (1.13-2.74)
6 -12 months	46 (41.8)	64 (58.2)		1.09 (0.67-1.77)
>12 months	41 (48.8)	43 (51.2)		1.27 (0.79-2.06)

*Significant level <0.05

Table 4 shows that the students who participated in clinical practice for 12 to 13 months has no much difference in doing practice correctly (48.4%), while those who practice for 14-15 months has 1.21 times higher in practice correctly than those who just participated in clinical practice for 12-13 months. And those who had clinical practice for > 15 months performed correct practice 59.5% and incorrect practice 40.5%. The p-value was 0.04, which indicated that there was statistically significant relationship between time of participation in clinical practice and correct nursing practice. On the other hand, the students who did not learn before clinical practice had lower score in practice correctly (38.2%). The best time to learn is 3-6 months that showed the higher correct practice (67.4%), and it is 1.76 higher than those who did not learn. However, this study revealed that the students who learned for 6-12 months or > 12 months had lower score in correct practice. The p-value showed 0.24 (>0.05), which indicated that there was no significant relationship between learning time and proper clinical practice.

DISCUSSION

Findings of this study showed that the score of practice of preparing barrels/container of sharps that causes a majority of injuries was 82.8%. This score remains higher compared with the score of health workers in Van Khanh Duong hospital which was 97.9%. However, it may be influenced by the work environment of the hospital.[3]

Currently, hospital overcrowding is a prominent issue, possibly due to the number of patients admitted and the increasing use of standard container sharp, which does not not fully meet.[4] According to the standard for the prevention of medical facility of the Ministry of Health in 2012 (Issued together with Decision No. 3671/QD - MOH September 27/ 2012 of Ministry of Health) for waste management, sharp object is defined as Any object which could readily puncture or cut the skin of an individual when encountered; or risking unexpected injury.[5] So this is an issue of nursing education and hospital management concern.

The percentage of students who were correctly using gauze/wool wrap in

early inhaler, and distilled water before break was only 59.8%. Based on the students subjectivity, it is indicated that they can feel safe when breaking ampules and distilled water without the use of wool or gauze to protect their hands. According to the study of Talas[6],Shiao[7], Smith and Leggat[8], the rate of student injuries related to the breaking of ampules and distilled water are mostly caused by subjectivity and do not use wool or gauze to protect the hand. In this regard, teachers need to regularly do monitoring and education for students to prevent this risk.

Finding of this study also revealed that the students who did practice correctly were 52.5%, which is higher than the study of Nguyen Do Nguyen that 49.7%,[9] and the study of Logan (49.51%). However, it remains low standard compared to the other studies, such as Askarian study of needle injury rate in student medical, dental, nursing and midwifery at the teaching hospital of University of Shiraz, Iran showed that the proportion of students practice that have higher standard of preventive measures accounted for 87.8%,[10] and study of Norsayani about the rate of injury from needles and other factors related to this problem among medical students showed that 86% students practice with possible prevention.[11] This indicated that the ratio of clinical practice in prevention needle and sharps injuries in Vietnamese students is lower than the International students according to the literature. It might be due to the practice of the Vietnamese students is limited, and they are not yet fully aware of the risk, or due to the variations of skill required in many areas of clinical nursing practice. Therefore, the nurse educators need to strengthen education, as well as close monitoring and reminding the students to practice regularly to reduce the risk of injury mechanism that may occur.

CONCLUSION

In conclusion, the correct practice of nursing students related to the prevention of needlestick and sharps injuries remains low (52.50%). There was a significant relationship between time of participation in clinical practice and correct nursing practice. It is suggested that: 1) Students must be taught about the risk of infection at the beginning of clinical practice, and constantly reminded throughout the learning process, especially for injection safety awareness, knowledge and techniques about the risk of transmission of HBV, HCV and HIV by sharp objects in the healthcare facility, and apply effective measures to prevent hospital-acquired infections and prevention of risk; 2) Prevent injury through skin, improve procedures and training for students to know safe practices when working; and 3) Should provide full sharps container safety standards.

ACKNOWLEDGEMENTS

This paper is the result of a thesis in general medicine. The authors appreciate the efforts and support of Tien Giang Medical College and all the people who helped us in this study.

REFERENCES

1. Wilburn SQ, Eijkemans G. Preventing needlestick injuries among healthcare workers: a WHO-ICN collaboration. *International journal of occupational and environmental health.* 2004;10(4):451-456.
2. Swe KMM, Zin T, Bhardwaj A, Abas ABL, Barua A. The Prevalence of Needle Sticks Injury among Medical Students in Melaka, Malaysia, A Cross Sectional Study. *Eur J Sci Res.* 2012;71(2):214-220.
3. DuongKhanhVan. Occupational injuries by sharps among health

care workers in regional hospitals in Hanoi. *Vietnam Journal of preventive Medicine.* 2012;8(116):120-127.
4. MinistryofHealth, DepartmentofTherapy. *Report on the implementation of the APW of a pilot survey on unsafe injection practice in Vietnam.* . Hanoi, Vietnam2003.
5. MinistryofHealthVietnam. *Practical Guidelines for standard prevention in Health Care Facilities*2012.
6. Talas MS. Occupational exposure to blood and body fluids among Turkish nursing students during clinical practice training: frequency of needlestick/sharp injuries and hepatitis B immunisation. *Journal of clinical nursing.* 2009;18(10):1394-1403.
7. Shiao JS-C, Mclaws M-L, Huang K-Y, Guo YL. Student nurses in Taiwan at high risk for needlestick injuries. *Annals of epidemiology.* 2002;12(3):197-201.
8. Smith DR, Leggat PA. Needlestick and sharps injuries among nursing students. *Journal of Advanced Nursing.* 2005;51(5):449-455.
9. Nguyen ND, Vinh PT, Anh PHD, Thuy MTT. Blood exposed due to injuries acquired during clinical practice among medical students at Ho Chi Minh City university of medicine and pharmacy. *Y Hoc TP. Ho Chi Minh.* 2004;8(1):20-25.
10. Askarian Mehrdad; Malekmakan L L. The prevalence of needle stick injuries in medical, duental, nursing and midwifery students at the university teaching hospitals of Shiraz, Iran. *Indian Journal of Medical Sciences.* 2006;60(6):221-232.
11. MY NIH. Study on inciduence of needle stick injury and factors associated with this problem among medical students. *Journal of occupational health,.* 2003;45(2):172-178.

Cite this article as: Quynh ATT, Einhellig K. Practice for Prevention Needlestick and Sharps Injuries among Nursing Students. Belitung Nursing Journal 2017;3(3):183-190.