

Original Article

Investigation of the Attitudes towards Needlestick and Sharps Injury among Nursing Students

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Abstract

Aim: This research was conducted to compare the attitudes towards needle stick and sharps injury among nursing, the effects of related training and hospital practices.

Method: The study utilized a quasi-experimental design with pretest-posttest control group. It was conducted at a university between April and June, 2017. The participants were 84 students who were divided into experimental (n=42) and control (n=42) groups. Data were collected through the Demographic Characteristics Form and Attitudes Scale about Healthcare Personnel's Safe Use of Needlestick and Sharp Medical Objects.

Results: There was an increase in the experimental group students' mean scores after the training they received, this difference was not statistically significant ($p>0.05$).

Conclusion Injuries can be decreased by being careful and taking precautions about the use of needlestick and sharp medical objects. In addition, theoretical and practical trainings should be designed in order to be protected from needlestick and sharps injuries.

Key words: healthcare personnel; needlestick and sharps injuries; prevention, training

Introduction

It is common for healthcare personnel to be exposed to blood-borne pathogens in hospitals. With the treatments and care interventions they apply, healthcare personnel forms an important risk group especially in terms of some blood-borne infectious diseases. (Dulon et al., 2017). According to needlestick and sharps injuries reports, this proportion ranges between 1.4 and 9.5 for 100 healthcare personnel yearly (Elseviers et al., 2014).

Healthcare personnel can be contaminated with the effects of infections while providing health services. Although the rate of percutaneous injuries decreases significantly due to such factors as using disposable medical materials, bloodletting through vacuum tubes, and throwing needlestick and sharps to impenetrable infected sharps bin, the ratio is still high and maintains its importance (Ayranci and Kosgeroglu, 2007; Dulon et al., 2017; Ozlu et al., 2016).

A study conducted in Turkey reported that 46.1% of nurses get injured 1 to 5 times in a year, 40,6 % have needlestick injuries, and 32,5% get injured due to broken ampule pieces (Ozlu et al., 2016). A study conducted with 526 African nurses and midwives indicated that the most important risks with needlestick and sharps are lack of training, long working hours exceeding 40 hours, closing needle covers after use, and holding needles without gloves (Hamlyn and Easterbrook, 2007).

Some studies on needlestick injuries report that among the healthcare personnel, nurses are the most vulnerable ones to injuries (Manzoor et al., 2010; Motaarefi et al., 2016). Injuries related to blood and body fluid contagion or to materials contacted them are a source of serious health problems in health institutions (Clarke, Schubert and Körner, 2007). Important diseases that have potential contagion in needlestick and sharps injuries include HIV, HBV and HCV (Koc, 2013; Ulutasdemir et al., 2015;). HIV transmission risk due to needlestick-sharps is less

than HBV. HIV transmission risk due to needlestick is 0.3%, and HBV transmission risk is 30% (Koc, 2013; Smith et al., 2006). Nurses encounter several occupational risks that include fewer number of workers available, start to work at early ages, long and busy working hours, and needlestick and sharps injuries caused by medicine implementations (Kevitt and Hayes, 2015; Parsa-Pili, Izadi, Golbabaei, 2015). Therefore, it is considered that nurses' knowledge about needlestick and sharps injuries and ways of protection could be increased specifically when they are students so that their awareness could be raised before they start working.

This study aims to compare the attitudes towards needle stick and sharps injury among nursing students who were given a specific training and who were not. The study also seeks answers to the question "Is the specific training on blood and blood-borne diseases, needlestick and sharps injuries, and waste management of sharp objects as effective as curriculum-based information and practice at hospital".

Methods

Design and Sample Size

This study, which utilized quasi-experimental design with pretest-posttest groups, aims to compare students' needlestick and sharps injury attitudes before and after the training they were provided. The study was conducted at a University Health High School between April and June, 2017.

Target population of the study was 123 students who were enrolled in the Nursing Department of a University Health High School. The sample was 84 students who were divided into experimental (n=42) and control (n=42) groups.

No randomization was performed for the identification of the experimental and control groups. The experimental group was composed of first year students who had practice experience at hospital and who did not receive any specific training on sharps injuries and waste management of sharps.

The control group involved students who received curriculum-based information about the aforementioned topics, who had practice experience in hospitals for a period between 65 and 115 days, and who did not receive any specific training about blood-borne diseases,

needlestick and sharps injuries, and waste management of needlestick and sharps.

Procedure

Pre-test data were collected by the researchers through face to face interviews administered in a classroom environment. A three-hour special training on blood-borne diseases, needlestick and sharps injuries, and waste management of needlestick and sharps was given to the experimental group by one of the researchers. The training, which was face to face and interactive, was administered in a classroom environment.

The section about waste management was given practically. Posttest data were collected from the students in the experimental group after they received a three-hour training on the issue and had practice at hospital for two weeks-24 hours in total. Posttest data were collected in classroom environment through face to face interviews, using the same data collection tools. The control group was administered the posttest data collection tools simultaneously.

Participants and ethical consideration

The students who participated in the study were informed about the study, and written and verbal consent was obtained from those volunteered to participate in the study. Ethical committee approval was obtained from the institution where the study was conducted.

Instruments

Demographic Characteristics Form

The 9-item Demographic Characteristics Form was developed by the researchers in line with the related literature (Uzunbayir and Esen, 2011; Hambridge, Nichols, and Endacott, 2016).

Attitudes Scale about Healthcare Personnel's Safe Use of Needlestick and Sharp Medical Objects

The questionnaire was developed by Uzunbayir and Esen (2011) and its reliability and validity was performed (Cronbach's alpha=0.80). Cronbach's alpha value was found 0.81 in this study. The scale has 25 items and three subscales that identify cognitive, affective and behavioural attitudes. It is rated on a 5 point Likert scale, and the scores range between 25 and 125. Besides, Items 3,7,10,12,13,16,17,18,21, and 23 are negative statements. "Totally agree" option takes the lowest score in these items. There is no cut-

off point for the scale, higher scores indicate safer use of needlestick and sharps (Uzunbayir and Esen, 2011).

Data analysis

Data were analysed in SPSS statistical package programming, using numbers, percentages, chi-square tests, independent groups t-test, and paired samples t-test.

Results

Control variables of the study are age, gender, type of high school students graduated from, needlestick and sharps injuries, type of injury, blood and blood-borne diseases, previous curriculum-based education about blood and blood-borne diseases, needlestick and sharps injuries, and waste management (Table 1).

Table 1. Control Variables of the Study

		Experimental Group		Control Group		x ²	P
		N	%	N	%		
Gender	Female	21	50	24	53.6	.431	>0.05
	Male	21	50	18	42.9		
Type of High School	Vocational School of Health	3	7.1	2	4.8	.213	>0.05
	Other	39	92.9	40	95.2		
Previous curriculum-based education about blood and blood-borne diseases	Yes	14	33.3	31	73.8	13.832	<0.05
	No	28	66.7	11	26.2		
Previous curriculum-based education about needlestick and sharps injuries	Yes	9	21.4	26	61.9	14.155	<0.05
	No	33	78.6	16	38.1		
Previous curriculum-based education about waste management of needlestick and sharps	Yes	9	21.4	31	73.8	23.100	<0.05
	No	33	78.6	11	26.2		
Getting needlestick and sharps injuries	Yes	7	16.7	24	57.1	14.775	<0.05
	No	35	83.3	18	42.9		
Reason for injury	Needlestick	4	57.2	9	37.5	4.878	>0.05
	Breaking the ampule	3	42.8	12	50.0		
	Other	-	-	3	12.5		
		$\bar{X} \pm SD$		$\bar{X} \pm SD$		t:- 3.915	<0.05
Age		19.95±1.79		21.31±1.35			

Table 2. Students' awareness of their own case about Hepatitis B

		Experimental Group		Control Group	
Case about Hepatitis B	Natural immunity	1	2.4	21	50.0
	Vaccinated	6	14.3	14	33.3
	Do not know	35	83.3	7	16.7

Table 3. Comparison of the Scale Mean Scores Before and After the training

	Experimental Group				Control Group			
	Pretest $\bar{X} \pm SD$	Posttest $\bar{X} \pm SD$	t	p	Pretest $\bar{X} \pm SD$	Posttest $\bar{X} \pm SD$	t	p
Attitudes Scale about Safe use of Needlestick and Sharp Medical Objects	111 ± 8.53	112 ± 9.25	-.729	.470	112 ± 7.87	112 ± 7.27	-.683	.498

Table 4. Comparison of Pretest-Posttest Scale Mean Scores of the Experimental and Control Groups

Attitudes Scale about Safe use of Needlestick and Sharp Medical Objects	Experimental Group	Control Group	t	P
	X±SD	X±SD		
Pretest	111 ± 8.53	112 ± 7.87	-.452	>0.05
Posttest	112 ± 9.25	112 ± 7.27	-.262	>0.05

It was found that 83.3% of the students in the experimental group and 16.7% of the students in the control group did not know their own case about Hepatitis B (Table 2).

Mean scores that experimental group students got from the attitudes scale about safe use of needlestick and sharps injury were 111 ± 8.53 in the pretest and 112 ± 9.25 in the posttest. There was an increase in the experimental group students' scale mean scores after the training they received, but this difference was not statistically significant. Mean scores for safe use

of needlestick and sharps injury attitudes of the students in the control group were found 112 ± 7.87 in the pretest and 112 ± 7.27 in the posttest. No significant differences were detected between the pretest and posttest mean scores of the control group students ($p > 0.05$; Table 3).

Pretest data show that the scale mean score was 112 ± 7.87 in the control group, which was higher than the experimental group. However, this difference was not statistically significant ($p > 0.05$). Posttest results indicated no statistically significant differences between the

experimental and control groups ($p > 0.05$; Table 4).

Discussion

Review of the studies at national and international level indicates large proportions of needlestick and sharps injuries among nurses and nursing students (Costigliola, 2012; Hambridge, 2011; Hambridge, Nichols, and Endacott, 2016; Lukianskyte, Gataeva, and Radziunaite, 2011; Ozer and Bektas, 2012).

A study reports that 51% of the nurses got injured while they were closing the needle cover, and 49% got injured while breaking the ampule. Besides, it was highlighted in the same study that carelessness, haste, and work overload were the factors that caused needlestick and sharps injuries (Lukianskyte, Gataeva, & Radziunaite, 2011).

Another study indicates that 30 % of nursing students got needlestick and sharps injuries at least once (Karatat, Celik and Koc, 2016). In line with these results, 57.1% of the nursing students in the control group were found to be exposed to needlestick and sharps injuries. This finding is considered to result from the fact that the students in the control group had longer hospital practice experience and more practice opportunities in comparison to experimental group students.

Studies show that majority of percutaneous injuries were experienced while closing the needle cover after the treatment or while taking the needle from the injector (Kaweti, and Abegaz, 2016; Costigliola et al., 2012; Dulon et al., 2017). Irmak and Baybuga (2011) report that the most common injuries were caused by needlesticks (54.0%), and mainly during IV/IM injection interventions (60%).

Celik, Akduman and Kıran (2010) point that majority of students got injured while they were taking the medicine from ampule/bottle to the injector (81.2%) and while closing the needle cover after injection (19.1%).

Another study reports that 47.3 % of nursing students got injured from needlestick, and 37.8 % got injured from ampule breaks while they were preparing the medicine (Unver, Tastan, and Coskun, 2012). The present study also found that the students got injured mostly when they were breaking the ampule, which is considered to result from students' using a wrong technique

while breaking the ampule and failing to take protective measures.

In their study conducted with students from different health departments, Askarian and Malekmakan (2006) found that 13.8% of the participants was not vaccinated against Hepatitis B. Besides, Talas (2009) found that 32.3% of the nursing students was not vaccinated against Hepatitis. This study also revealed that 83.3% of the nursing students especially in the experimental group did not know their case about Hepatitis B. This finding indicates that the students are under great risk in terms of catching Hepatitis B, which could be due to the fact that they were freshmen students.

The reasons for the fact that there are no differences between the mean scores of the experimental and control groups in terms of the scores they obtained from attitudes scale about safe use of needlestick and sharps are varied. These include the facts that the training was verbal and semi-practical; it was given just once; and the students did not have sufficient clinical experience as they were freshmen students. Safe use of needlesticks and sharps could be enhanced by increasing the frequency of the trainings, observing students individually during the trainings, and equipping them with sufficient clinical skills.

Particularly the healthcare personnel, due to the nature of the work they do, will maintain to be under serious risk (Pathak et al., 2012). Institutions should have policies that will decrease this risk to minimum, provide the required instruments, take the necessary precautions, and check these precautions (Ilhan et al., 2006; Motaarefi et al., 2016; Ulutasdemir et al., 2015; Wicker et al., 2008).

Before they start practice at hospitals, students who receive health education should be given trainings on hospital infections, universal precautions, blood-borne infections, reporting injuries, and prophylaxis issues after contagion. In addition to these, students' knowledge should be assessed before and during clinical practices, and the trainings should be revised accordingly (Ozlu et al., 2016; Zhang et al., 2015).

Limitations

Limitation of this study is that the groups are similar in terms of age, needlestick or sharps injuries, blood and blood-borne diseases, and previous curriculum-based education about

needlestick and sharps and their waste management. Besides, another limitation is that the specific training given to the group was semi-practical and given only once.

Conclusions and Implications for Nursing Education

This study found that nursing students did not use needlestick and sharp medical objects safely at a desired level. As a result, the training given to the students was found to have no effects on the attitudes towards safe use of needlestick and sharps. This case might have resulted from the facts that the duration allocated to this topic in the training was quite short, the topics were not revised, and thus they were forgotten. Given the importance of this issue, students' knowledge should be consolidated and reviewed through audio-visual materials. It has been determined that only training or practice is not effective in this matter. It is recommended that studies conducted together with training and implementation are carried out. Besides, nursing students should be observed well during clinical practices and provided with feedback about their correct or incorrect practices.

Nursing students form a high risk group in terms of needlestick and sharps injuries. Hence, it is very important for them to be trained about needlestick and sharps injuries. Only this way can they protect themselves and take precautions. Nursing curriculum should include information about occupational accidents and risks in needlestick and sharps injuries, curriculum should be designed for protection from occupational accidents, risks and their legal aspects; and the efficiency of the training should be monitored at frequent intervals. Besides, clinical nurses have important roles in forming a role model about these issues.

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