



## Evaluation of Attitudes Towards Safe Use of Needle-Stick and Sharp Medical Instruments of Healthcare Workers in a Public Hospital

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### Abstract

**Objective:** This cross-sectional and descriptive study was conducted to evaluate the attitudes of healthcare workers towards the safe use of needle-stick and sharp medical instruments.

**Methods:** The study was conducted cross-sectionally on 248 healthcare workers. Data were collected face-to-face using the "Healthcare Worker Identification Form" and the "Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments".

**Results:** The total score and cognitive and affective subscale mean scores of the Attitudes Toward Safe Use of Needle-Stick and Sharp Medical Instruments Scale were statistically significantly higher in women than in men ( $p<0.05$ ). The mean scores of healthcare workers who were having night shift were lower than those who were not having night shift ( $p<0.05$ ). According to the results of linear regression analysis, gender, educational status, occupation, and exposure to injury were determined as factors independently affecting attitudes towards safe use of needle-stick and sharp medical instruments ( $p<0.05$ ).

**Conclusion:** In this study, it was found that the attitudes of male healthcare workers, those who were having night shift, those who experienced sharps injuries, midwives and health officers towards safe use of needle-stick and sharp medical instruments were low. In line with these results, it is recommended to organize in-service training programs for the prevention of sharps injuries, to pay attention to standard prevention practices and to actively use the reporting system, taking into account the personal (gender) and professional characteristics of healthcare workers (occupation, having a needle-stick and sharp injury, postgraduate education status, having night shift, etc.).

**Keywords:** Attitudes, Healthcare Workers, Needle-Stick and Sharp Medical Instruments, Scale, Regression

Received: 18.09.2023  
Accepted: 13.05.2024  
Available Online: 19.08.2024

### 1. Introduction

Healthcare workers are exposed to many infections that can be transmitted from patients in the environment where they work. The most important risks are needle-stick as well as injuries and infections caused by sharp medical instruments (1,2). At least 20 different infectious agents may be transmitted to healthcare workers through direct contact with blood and bloody body fluids or through needle-stick and sharp medical instruments such as needles. Viruses take the first place when discussing these agents and the most common viruses are hepatitis B virus (HBV), hepatitis C virus (HCV) and "human immunodeficiency virus" (HIV) (3). Unlike the members of other professions, healthcare workers are more likely to face occupational risks due to the fact that they have to come into contact with sick and healthy individuals or the tissues/organs/extracts etc. of these individuals as well as the characteristics of the environment in which they work (4). Despite the studies conducted on this subject

**Cite as:** Çakmak Ağçay E., Ünsar S. Evaluation of Attitudes Towards Safe Use of Needle-Stick and Sharp Medical Instruments of Healthcare Workers in a Public Hospital. *Sakarya Üniversitesi Holistik Sağlık Dergisi*. 2024;7(2): 81-93. <https://doi.org/10.54803/sauhsd.1362407>



and precautions taken in this regard, the risk of transmission of infections through occupational contact still prevails (3).

The first data on injuries to healthcare workers caused by needle-stick and sharp medical instruments began to be collected by Mc Cormick and Maki in 1981 and injuries caused by needle sticks were first reported and recorded in 1986. In the study conducted by Mc Cormick and Maki, the incidence of sharp instrument injuries (including needle-stick injury) during medical interventions was found to be 69.6%. Authors recommend several protection strategies to prevent sharp instrument injuries (including needle-stick injury). These recommendations include training programs addressing healthcare personnel, avoiding the act of reattaching the needle cap after removal and improved and accessible waste management (5). Pursuant to the estimates of the American Center for Disease Control and Prevention (CDC), annually 385,000 personnel providing healthcare services in healthcare institutions are exposed to sharp instrument injuries (including needle-stick injury) and an average of 1000 needle-stick and sharp medical instrument injuries are reported everyday. In 1987, CDC delivered certain suggestions for preventing sharp instrument injuries (including needle-stick injury) to be implemented throughout the country. These suggestions include carefully handling and using needles and sharp medical instruments and the management of the wastes thereof (6,7).

Altıok et al. (8) reported that 79.1% of healthcare workers were injured with a needle-stick and sharp medical instrument at least once during their professional lives and 60.9% of these injuries were caused by medical instruments contaminated with blood. It was further reported that injuries caused by the syringe needle are frequently experienced while caring for the patient, trying to place the cap on the needle, withdrawing the needle from the syringe and disposing the needles into the waste bin. They also reported that the incidence of sharp instrument injuries is higher among nurses and midwives (83%), the majority of healthcare providers have been vaccinated against hepatitis B (79.5%), and only 12.7% of those who suffered an injury reported this injury. Özberk and Kutlu reported that the rate of exposure of healthcare workers to sharp instrument injuries (including needle-stick injury) over the last year was 15.5%. In the same study it was concluded that mean scores of physicians, nurses and healthcare officials in the Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments were significantly higher compared to the hospital cleaning staff (9).

Among all healthcare professionals, nurses have been reported to be the group most likely to encounter infections that cause blood-borne diseases. Following the nurses, the groups with the highest rate of encountering infections are listed as physicians, dentists, auxiliary health care personnel and hospital cleaning staff. For the purpose of their study reviewing the sharp instrument injuries (including needle-stick injury) faced by healthcare workers working in a tertiary healthcare institution, Suntur and Uğurbekler (10) concluded that the occupational group most frequently exposed to such injuries is nurses with 35.6%, and the most important factor causing such injuries is the disposal of the needle tip following the invasive procedure. It was also reported that injuries mostly likely occur in clinics, intensive care units and operating rooms, respectively. There are studies in the literature examining the effects of some characteristics of nurses on the sharp instrument injuries whereby it was reported that nurses' characteristics such as age, gender, educational status, department/clinic they work in and their working experience affect their cognitive, affective and behavioral attitudes (11, 12, 21).

Minimizing the risks through precautions taken against sharp instrument injuries will enable healthcare personnel to perform their services in safe working conditions. Sharp instrument injuries and infections that may occur in the post-injury period can only be prevented by taking effective security policies and protective measures. Trainings to be provided on the subject should aim to raise awareness of all healthcare professionals and managers (3,13).

Healthcare workers are increasingly exposed to sharp instrument injuries (including needle-stick injury) in the institutions they serve and their risk of exposure to sharp instrument injuries is increasing everyday. In consideration of these data, this study was conducted to evaluate the attitudes of healthcare workers (physicians, nurses, midwives and health officers) towards the safe use of needles and sharp medical instruments as well as to determine the influencing factors.

## **1.2. Study questions**

1. Is there a significant difference between the attitudes of healthcare workers towards the safe use of needles and medical instruments and the independent variables (age, gender, exposure to sharp instrument injuries etc.)?
2. Which factors affect healthcare professionals' attitudes towards the safe use of needles and sharp medical instruments?
3. What are the attitudes of healthcare professionals towards the safe use of needles and sharp medical instruments?

## **2. Method**

### **2.1. Study design**

The study was conducted cross-sectionally on 248 healthcare workers who worked in a public hospital in Silivri between January-March 2018 based on the permission provided by the Ethics Committee of a university hospital dated 16.08.2017 and issue no: 2017/205. The Principles of the Declaration of Helsinki and Publication Ethics was ensured for research purposes. Verbal consent was obtained from healthcare professionals who agreed to participate in the study. Healthcare professionals who agreed to participate in the study were informed that they had the right to withdraw from the study whenever they liked.

### **2.2. Population and sample of the study**

The population of the study consisted of physicians, nurses, midwives and health officers working in a public hospital in Silivri. The forms/questionnaire used for the purpose of the study were filled out by volunteers in appropriate environments (outpatient clinic room, nurses' room etc.) in the departments/clinics where healthcare professionals were assigned. Data collection tools were generally administered to physicians between 15:00 and 17:00 hours on outpatient clinic days when the patient intensity was low. Forms were administered to nurses, midwives and healthcare officers during working hours and shifts when treatment and patient care were less intense. Data were filled in and questionnaires were collected within an average of 20 minutes.

No sampling method was applied in the study and physicians, nurses, midwives and health care officials who worked in the public hospital in Silivri throughout the dates when the study is conducted and who volunteered to participate in the study were included therein. 258 healthcare professionals working in the healthcare institution, including 64 attending physicians, 152 nurses, healthcare officers and 42 midwives, were included in the study and constituted the sample of the study. 248 (96%) healthcare professionals assigned in the hospital were reached within the scope of the study.

### **2.3. Data collection tools**

The "Healthcare Worker Identification Form" was developed following the literature review. "Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments" was used to determine the attitudes of healthcare workers towards the safe use of needles and sharp medical instruments.

**Healthcare Worker Identification Form:** Healthcare Worker Identification Form, developed by the authors in line with the literature research, includes 17 questions with sub-questions addressing the sociodemographic characteristics (age, gender, education status, occupation, working experience, the department being worked for, number of shifts, monthly working hours, daily sleep hours, injury caused by needles and sharp medical instruments, referral to the relevant department after injury, the reason of not referring to the relevant unit and status of having received training on injuries caused by needles and sharp medical instruments) of physicians, nurses, midwives and health officers who volunteered to participate in the study (8,13,14,15,16).

**Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments:** The items of the scale developed to measure the attitudes of healthcare professionals towards the safe use of needles and sharp medical instruments have taken into account standard precautions and common injuries regarding the use of sharp medical instruments and was developed in line with these data. The 5-point Likert type scale, consisting of 25 items, was developed aiming to determine the Cognitive, Behavioral and Affective attitudes. Lower scores in the Attitude Scale indicate that the healthcare worker fails to use the needles and sharp medical instruments safely whereas higher scores indicate that the healthcare worker uses the needles and sharp medical instruments safely. The lowest and the highest total score that can be obtained from the attitude scale is 25 and 125, respectively. Scores of the sub-dimensions of the attitude scale can also be calculated. The highest score that can be obtained from the cognitive attitudes sub-dimension is 60 whereas the lowest score is 12. The highest score that can be obtained from the behavioral attitudes sub-dimension is 35 whereas the lowest score is 7. The highest score that can be obtained from the affective attitudes sub-dimension is 30 whereas the lowest score is 6. The validity and reliability of the scale was confirmed by Uzunbayır (14) in 2009. The Cronbach's alpha value of the original scale is 0.80. The Cronbach alpha value of the scale used in our study is 0.89.

## 2.4. Evaluation of data

NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) (License No: 1675948377483; Serial No: N7H5-J8E5-D4G2-H5L6-W2R7) program was used for the statistical analysis of the data collected in the study. Study data were analyzed using descriptive statistical methods (mean, standard deviation, median, frequency, percentage, minimum and maximum). Whether the quantitative data were normally distributed or not was tested with the Shapiro-Wilk test and graphical analysis. Mann Whitney U test was used for pairwise group comparisons of quantitative variables that did not show normal distribution. Kruskal Wallis test was used for comparisons of three or more groups that did not show normal distribution and Bonferroni-Dunn Test was used for pairwise comparisons. The variables of gender, education, occupation, the department being worked for, having night shifts and exposure to sharp instrument injuries (including needle-stick injury), which are considered among the factors that have a significant or nearly significant effect on the attitudes towards the safe use of needles and sharp medical instruments were further analyzed by Enter and Backward Stepwise Regression analysis. In all analyses,  $p < 0.05$  was considered as statistically significant.

## 3. Results

Mean age of the participating healthcare workers was found to be  $34.90 \pm 8.99$ , their mean working experience was  $12.15 \pm 8.90$  years, average number of night shifts per month was calculated as  $6.92 \pm 3.2$ , and average daily sleep was found as  $6.94 \pm 1.40$  hours. 70.6% of the participants were female, 41.5% of those had bachelor's degrees, 55.2% were nurses, 40.3% worked in internal medicine and 71.8% had night shifts (Table 1).

**Table 1.** Sociodemographic and Occupational Characteristics (n=248)

<b>Sociodemographic Characteristics</b>		<b>n (%) or Mean±SD</b>
<b>Age (yrs)</b>	Min-Max (Median)	20-65 (35)
	Mean±SD	34.90±8.99
<b>Gender</b>	Female	175 (70.6)
	Male	73 (29.4)
<b>Education</b>	Vocational High School Of Health Services	17 (6.9)
	Associate Degree	59 (23.8)
	Bachelor's Degree	103 (41.5)
	Post Graduate Degree	69 (27.8)
<b>Occupational Characteristics</b>		
<b>Occupation</b>	Physician	59 (23.8)
	Nurse	137 (55.2)
	Midwife	28 (11.3)
	Healthcare Officer	24 (9.7)
<b>Working Experience (yrs)</b>	Min-Max (Median)	0.1-39 (10)
	Mean±SD	12.15±8.90
<b>Working Experience in the Healthcare Institution (yrs)</b>	Min-Max (Median)	0.1-30 (4)
	Mean±SD	5.09±4.89
<b>Department being worked for</b>	Emergency Room	59 (23.8)
	Internal Medicine	100 (40.3)
	Surgery	35 (14.1)
	Operating Room	23 (9.3)
	Intensive Care	31 (12.5)
<b>Having Night Shifts</b>	Yes	178 (71.8)
	No	70 (28.2)
<b>Number/Frequency of Night Shifts per month (n=178)</b>	Min-Max (Median)	1-13 (8)
	Mean±SD	6.92±3.20
<b>Working hours per month (n=233)</b>	Min-Max (Median)	100-288 (176)
	Mean±SD	180.77±24.24
<b>Sleeping Hours (hours)</b>	Min-Max (Median)	2-15 (7)
	Mean±SD	6.94±1.40

It was determined that 55.6% of healthcare workers had never been injured by a needle-stick and sharp medical instrument whereas 44.4% had been exposed to an injury caused by a needle-stick and sharp medical instrument. It was further determined that 73.6% of the injured healthcare workers referred to the relevant departments, 51.7% of healthcare workers who were injured by a needle-stick and sharp medical instrument however did not refer to the relevant departments complained that they did not have enough time, the rate of healthcare workers trained on injuries caused by a needle-stick and sharp medical instrument were 86.3% and 50.5% of them evaluated the training they received as sufficient (Table 2).

**Table 2.** Exposure to Sharp Instrument Injuries and Training Received on this Issue (n=248)

<b>Sharp Instrument Injuries</b>	<b>Category</b>	<b>n (%)</b>
<b>Sharp Instrument Injuries</b>	Yes	110 (44.4)
	No	138 (55.6)
<b>Referral to Relevant Departments in case of Injury</b>	Yes	81 (73.6)
	No	29 (26.4)
<b>Reasons for Not Referring to Relevant Departments in case of Injury (n=29)</b>	Unaware of the	4 (13.8)
	Procedure/Protocol	
	Lack of time	15 (51.7)
<b>Received Training on Sharp Instrument Injuries</b>	Finding it useless/unnecessary	10 (34.5)
	Yes	214 (86.3)
	No	34 (13.7)



<b>Efficiency of the Training Received (n=214)</b>	Quite Efficient	25 (11.7)
	Efficient	108 (50.5)
	Moderate	69 (32.2)
	Not Efficient	12 (5.6)

Although not presented in the table below, mean score of the “Cognitive Attitude” sub-dimension of the Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments was  $55.08 \pm 4.53$ , mean score of the “Affective Attitude” sub-dimension was  $27.10 \pm 2.76$ , the “Behavioral Attitude” sub-dimension was  $31.71 \pm 3.50$  and the mean Total Score was  $11.89 \pm 9.52$ .

No statistically significant difference was found in terms of the frequency of having night shifts when compared based on the occupation ( $p > 0.05$ ). A statistically significant difference was found in terms of the frequency of being exposed to sharp instrument injuries when compared based on the occupation ( $p = 0.007$ ). It was determined that midwives had the highest frequency of being exposed to injuries. The frequency of physicians being exposed to injuries were found to be lower compared to nurses and midwives. A statistically significant difference was found in terms of referral to the relevant departments after being exposed to an injury caused by needle-stick and sharp medical instruments when compared based on the occupation ( $p = 0.033$ ). It was determined that midwives had the highest frequency of referring to the relevant departments. The frequency of physicians referring to the relevant department were found to be lower compared to nurses and midwives. No statistically significant difference was found in terms of reasons for not referring to the relevant departments after being exposed to an injury caused by needle-stick and sharp medical instruments when compared based on the occupation ( $p > 0.05$ ). A statistically significant difference was found in terms of the trainings received on the sharp instrument injuries when compared based on the occupation ( $p = 0.001$ ). The frequency of nurses, midwives and health officers receiving trainings were found to be higher compared to the physicians. The highest frequency of receiving trainings pertained to the nurses whereas the lowest frequency of receiving trainings pertained to the physicians (Table 3).

**Table 3.** Evaluation of Having Night Shifts and Characteristics of the Sharp Instrument Injuries Based on Occupations (n=248)

Characteristics		Occupation				p
		Physician (n=59)	Nurse (n=137)	Midwife (n=28)	Healthcare Officer (n=24)	
<b>Having Night Shifts</b>	Yes	41 (69.5)	100 (73.0)	17 (60.7)	20 (83.3)	<sup>A</sup> 0.317
	No	18 (30.5)	37 (27.0)	11 (39.3)	4 (16.7)	
<b>Sharp Instrument Injuries</b>	Yes	16 (27.1)	68 (49.6)	17 (60.7)	9 (37.5)	<sup>A</sup> 0.007**
	No	43 (72.9)	69 (50.4)	11 (39.3)	15 (62.5)	
<b>Referral to Relevant Departments in case of Injury (n=110)</b>	Yes	8 (50.0)	51 (75.0)	16 (94.1)	6 (66.7)	<sup>B</sup> 0.033*
	No	8 (50.0)	17 (25.0)	1 (5.9)	3 (33.3)	
<b>Reasons for Not Referring to Relevant Departments in case of Injury (n=29)</b>	Unaware of the Procedure/Protocol	1 (12.5)	2 (11.8)	0 (0)	1 (33.3)	<sup>B</sup> 0.965
	Lack of time	4 (50.0)	9 (52.9)	1 (100)	1 (33.3)	
	Finding it useless/unnecessary	3 (37.5)	6 (35.3)	0 (0)	1 (33.3)	
<b>Receiving training on injuries</b>	Yes	36 (61.0)	130 (94.9)	26 (92.9)	22 (91.7)	<sup>B</sup> 0.001**
	No	23 (39.0)	7 (5.1)	2 (7.1)	2 (8.3)	
<b>Efficiency of the Training Received (n=214)</b>	Quite Efficient	8 (22.2)	13 (10.0)	2 (7.7)	2 (9.1)	<sup>B</sup> 0.409
	Adequate	16 (44.4)	65 (50.0)	16 (61.5)	11 (50.0)	
	Moderate	11 (30.6)	46 (35.4)	6 (23.1)	6 (27.3)	
	Not Efficient	1 (2.8)	6 (4.6)	2 (7.7)	3 (13.6)	

Female participants' mean scores in the cognitive and affective attitudes sub-dimensions of the scale and mean total scores were found to be statistically higher compared to males ( $p < 0.05$ ). No significant

difference was found between the mean scores of the participants in the behavioral attitudes sub-dimension of the scale when compared based on gender ( $p>0.05$ ). No significant difference was found between the mean total scores of the participants in the Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments and its sub-dimensions when compared based on the age and education of the healthcare workers ( $p>0.05$ ) (Table 4).

**Table 4.** Comparison of Healthcare Workers' Mean Total Scores in the Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments and its Sub-Dimensions based on Sociodemographic Characteristics

Characteristics		Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments				
		n	Cognitive Attitudes Mean±SD (Median)	Affective Attitudes Mean±SD (Median)	Behavioral Attitudes Mean±SD (Median)	Total Mean±SD (Median)
Age (yrs)	≤25 yrs	49	54.78±5.07 (56)	27.20±2.89 (28)	31.41±3.73 (32)	113.39±10.65 (117)
	26-35 years	80	55.59±4.03 (56)	27.51±2.32 (28)	31.85±3.11 (33)	114.95±8.05 (116)
	36-45 years	92	55.25±4.49 (57)	27.03±2.90 (28)	32.02±3.47 (34)	114.30±9.48 (117)
	≥46 yrs	27	53.56±4.89 (54)	25.93±3.09 (26)	30.74±4.24 (31)	110.22±11.06 (112)
	<sup>d</sup> p		0.287	0.109	0.373	0.248
Gender	Female	175	55.55±4.03 (56)	27.49±2.40 (28)	32.03±3.13 (33)	115.07±8.34 (117)
	Male	73	53.95±5.41 (55)	26.18±3.32 (27)	30.92±4.19 (32)	111.04±11.47 (113)
	<sup>c</sup> p		0.048*	0.006**	0.102	0.012*
Education	Voc. High School of Health Sci.	17	53.12±5.68 (54)	26.94±2.88 (28)	31.00±4.00 (31)	111.06±11.03 (113)
	Associate Degree	59	54.93±5.15 (57)	26.56±3.20 (27)	31.64±3.96 (33)	113.14±11.59 (118)
	Bachelor's Degree	103	54.78±4.42 (55)	27.12±2.65 (28)	31.26±3.55 (31)	113.16±9.33 (115)
	Post Graduate Degree	69	56.14±3.55 (57)	27.58±2.45 (28)	32.59±2.70 (34)	116.32±6.81 (118)
	<sup>d</sup> p		0.135	0.406	0.100	0.137

Mean: Mean, Standard Deviation

The variables of gender, education, occupation, the department being worked for, having night shifts and exposure to sharp instrument injuries (including needle-stick injury), which are considered among the factors that have a significant effect on the attitudes towards the safe use of needles and sharp medical instruments were further analyzed by Enter and Backward Stepwise Regression analysis. As a result of Enter regression analysis, independent factors affecting the attitudes were determined as gender and exposure to injury ( $p<0.01$ ). As a result of Backward Stepwise regression analysis, independent factors affecting the attitudes were determined as gender, post graduate degree, occupation and exposure to injury ( $p<0.01$ ). Attitudes of male healthcare workers towards the safe use of medical instruments were found to be lower (4.13 times) than women. Attitudes of healthcare workers with post graduate degrees towards the safe use of medical instruments were found to be higher (3.58 times) compared to others. The attitude levels of those who were healthcare officials were found to be lower (4.28 times) compared to those who were not healthcare officials ( $p<0.05$ ). The

attitudes of those who were exposed to sharp instrument injuries towards the safe use of medical instruments were found to be lower (3.26 times) compared to those who have no such experience ( $p<0.01$  (Table 5)).

**Table 5.** Linear Regression Analysis of Factors Affecting Healthcare Workers' Attitudes Towards Safe Use of Needles and Sharp Medical Instruments

Model	Enter Method				Backward Stepwise Method			
	B	95.0% CI		P	B	95.0% CI		p
<b>Gender (0:F; 1:M)</b>	-4.136	-7.126	-1.146	<b>0,007**</b>	-4.543	-7.237	-1.849	<b>0.001**</b>
<b>Education (Associate Degree)</b>								
Voc. High School	-1.506	-6.608	3.596	0.561				
Bachelor's Degree	-0.974	-3.994	2.047	0.526				
Post Graduate Degree	2.717	-1.587	7.022	0.215	3.575	0.921	6.229	<b>0.008**</b>
<b>Occupation (Nurse)</b>								
Healthcare Officer	-4.456	-8.961	0.048	0.052	-4.285	-8.456	-0.114	<b>0.044*</b>
Midwife	-0.731	-4.583	3.120	0.709				
Physician	0.137	-4.111	4.386	0.949				
<b>Department being worked for (Internal Medicine)</b>								
Surgery	-1.866	-5.607	1.875	0.327				
Operating Room	0.093	-4.218	4.404	0.966				
Emergency Room	0.519	-2.662	3.701	0.748				
Intensive Care	2.832	-1.122	6.786	0.160				
Having Night Shifts	-1.805	-4.560	0.950	0.198				
Exposure to injuries	-3.260	-5.698	-0.822	<b>0.009**</b>	-3.294	-5.590	-0.997	<b>0.005**</b>
Constant	117.838	114.361	121.316	0.000**	116.088	114.199	117.977	<b>0.000**</b>
Adjusted R <sup>2</sup>	0.104			0.107				

Voc. High School Vocational High School Of Health Services, ICU: Intensive Care Unit

#### 4. Discussion

Exposure to blood and body fluids as well as sharp instrument injuries (including needle-stick injury) are serious hazards faced by health care workers (HCWs) in healthcare institutions. Nurses and midwives, who have direct contact and are in constant communication with patients, are more likely to be exposed to these injuries due to frequent contact with sharp medical instruments (including needles) and in this context they are considered to be in the occupational risk group (12,14,16).

Mean total score of the health care workers who participated in our study in the Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments Attitude Scale Towards the Safe Use of Sharp Medical Instruments was found to be  $113.89 \pm 9.52$ . In a similar study conducted by Özberk and Kutlu (9) with healthcare workers, mean total score in the Attitude Scale was calculated as  $104.95 \pm 12.9$ . In a similar study Özyiğit et al. (13) calculated mean total score of healthcare workers in the scale as  $84.21 \pm 5.23$ . Mean total score in the scale was calculated as  $70.26 \pm 11.65$  in the study conducted by Akça and Aydın (11). Considering that the maximum total score that can be obtained from



the scale is 125, mean score calculated in our study, which is very close to the highest score, indicates majority of healthcare workers use sharp medical instruments safely. The fact that nearly half of the healthcare workers in the study group have a bachelor's degree and that majority of them received training on the safe use of sharp medical instruments is thought to have a positive impact on their attitudes.

In our research, it was determined that 44.4% of the healthcare workers were exposed to sharp instrument injuries, 73.6% referred to the relevant departments after the injury, 51.7% did not refer to the relevant department as they did not have enough time, 86.3% received training on sharp instrument injuries and 50.5% of them found the training they received sufficient. In their study examining the knowledge, attitudes and practices of healthcare workers regarding sharp instrument injuries, Alsabaani et al. (15) argued that the incidence of sharp instrument injuries over the last 12 months was 11.57%, these injuries were most frequently encountered among nurses and female healthcare workers and that 52.7% of these injuries were not reported. They further reported that the incidence of sharp instrument injuries was significantly higher in secondary healthcare institutions and surgery clinics. Altıok et al. (8) concluded that 79.1% of healthcare workers were exposed to sharp instrument injuries before, 12.7% of them referred to the relevant department following the injury, the reason of not referring to the relevant department in case of injury was stated by 48.6% that they were not unaware of the procedure/protocol however 12.9% stated that they did not have enough time and 70.1% of them told that they received training on the issue. In a similar study conducted by Yazar et al. (16), it was stated that 59.0% of healthcare workers were exposed to sharp instrument injuries before and 6% of them referred to the relevant department following the injury. Karacaer et al. (17) reported that 53.6% of healthcare workers were injured by sharp instrument injuries before, 68.0% referred to the relevant department following the injury and 78.4% received training on the issue. In a similar meta-analysis study conducted by Gheshlagh et al. (18) in Iran, it was reported that 42.5% of healthcare workers were exposed to injury. In the study conducted by Afridi, Kumar, and Sayani (19) in Pakistan, it was reported that 64% of healthcare workers were exposed to sharp instrument injuries before, 1.4% referred to the relevant department following the injury and 10.1% stated that they did not receive an efficient training regarding sharp instrument injuries. The workload and the high number of patients in the departments/clinic where they were assigned as well as the inadequacy of healthcare workers increase the risk of sharp instrument injuries. Based on this and other study results, it can be concluded that the rate of exposure to sharp instrument injuries are high however the rate of reporting such exposure is low. This result reveals that healthcare workers do not have time to refer to the relevant unit following an injury due to heavy workload and the fact that they do not know the necessary procedure/protocol. Although it was concluded that the rates of training received on sharp instrument injuries are quite high, it is thought that healthcare workers are not sensitive about referring the case to the relevant unit due to the reasons stated above.

The attitudes of female healthcare professionals participating in our study towards the safe use of sharp medical instruments were found to be higher than those of male. It was further determined in this study that the attitudes of male health care officers, who were exposed to sharp instrument injuries before, on the safe use of sharp medical instruments were found to be low while the attitudes of those with a postgraduate degree were higher. In their study examining the effects of some characteristics of nurses on the sharp instrument injuries, Bozdemir and Bahar (21) reported that nurses' characteristics such as age, gender, education, department/clinic they work in and their working experience affect their cognitive, affective and behavioral attitudes. In their study examining the relationship between gender and the knowledge, attitudes and prevalence of healthcare workers regarding sharp instrument injuries, Altaf et al. (23) found that the rate of female employees being exposed to sharp instrument injuries was higher than male employees. In their systematic review examining the healthcare workers' prevalence

of exposure to sharp instrument injuries in developing countries and related factors Mengistu and Tolera (24) found that the prevalence of sharp instrument injuries varied between 19.9% and 54% and the frequency of occurrence throughout the professional career was reported to be 64.1%. In this study, it was determined that the factors affecting sharp instrument injuries were gender, education, occupation, workload, working experience and the use of personal protective equipments (PPEs). Hassanipour et al. (25) examined the risk factors for sharp instrument injuries affecting healthcare workers and reported that these factors include being young, being female, having night shifts, lower working experience, working in surgical clinics and not receiving trainings on these injuries. There are studies in the literature reporting that gender has no effect on attitudes (11, 19) besides other studies in which the prevalence of female healthcare workers being exposed to injuries is found to be higher than that of males (18, 19, 22). Belachew et al. (26) reported that the probability of exposure to sharp instrument injuries was two times higher in male nurses compared to female nurses. Kebede and Gerensea (27) concluded that the risk of being exposed to sharp instrument injuries is approximately five times higher in nurses who do not follow infection prevention rules compared to nurses who follow them. Socio demographic and occupational characteristics found in the literature to affect sharp instrument injuries faced by healthcare workers vary. It is recommended to plan further evidence-based comparative studies involving more study groups on this subject.

## **5. Conclusion and Recommendations**

In this study, it was found that the attitudes of male healthcare workers, those who were having night shift, those who experienced sharp instrument injuries, midwives and health care officers towards safe use of sharp medical instruments were low. In line with the results obtained in the study, it was recommended to provide the necessary occupational health and safety/in-service trainings for healthcare workers on the safe use of sharp medical instruments at regular intervals, to decrease the frequency of night shifts, to operate medical waste management procedures effectively, to comply with all standard protective measures, to report near-miss incidents/occupational accidents, to encourage healthcare workers to participate in the training provided and to conduct more comparative studies on sharp instrument injuries.

## **Limitations**

The study covered the healthcare workers working in a single city hospital between the dates the study was conducted, who met the inclusion and the voluntary participation criteria, therefore the results can be generalized exclusively to the institution where the study was conducted.

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**Author(s) Notes:** Authors would like to express their sincere thanks to the editor and the anonymous reviewers for their helpful comments and suggestions.

**Author(s) Contributions:** All authors contributed equally to the writing of this paper. All authors read and approved the final manuscript.

**Conflict of Interest Disclosure:** No potential conflict of interest was declared by authors.

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**Supporting/Supporting Organizations:** No grants were received from any public, private or non-profit organizations for this research.

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