Determination of Nurses' Attitudes Towards Safe Use of Cutting Tools

Hemşirelerin Kesici-Delici Aletleri Güvenli Kullanımına Yönelik Tutumlarının Belirlenmesi

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Abstract

This study was conducted as a descriptive and cross-sectional study to determine nurses' attitudes toward the safe use of sharp and cutting medical instruments. The population of the study consisted of all nurses (N = 438) working in the intensive care units, clinics, operating rooms, and emergency department of Çukurova University Faculty of Medicine Balcalı Hospital, and no sampling was performed. Data were collected using a "Personal Information Form" and the "Attitude Scale for Safe Use of Sharp Medical Instruments among Healthcare Workers". The survey forms were distributed and collected by the researcher between December 2018 and March 2019. Statistical analyses were performed using the SPSS. As a result of the study, the mean total score of nurses regarding the safe use of sharp and cutting medical instruments was found to be 111.34 ± 10.77. The high mean scores obtained by the nurses indicate the importance they attribute to the safe use of sharp medical instruments.

Keywords: *Infection, Nurse, Needlestick Injuries*

Öz

Bu araştırma, hemşirelerin kesici-delici aletleri güvenli kullanımına yönelik tutumlarını belirlemek amacıyla tanımlayıcı ve kesitsel olarak yapılmıştır. Araştırmanın evrenini Çukurova Üniversitesi Tıp Fakültesi Balcalı Hastanesinin yoğun bakım üniteleri, klinikleri, ameliyathanesi ve acil servisinde görev yapan tüm hemşireler (N: 438) oluşturmuş ve örneklem seçimine gidilmemiştir. Verilerin toplanmasında "Kişisel Bilgi Formu" ve "Sağlık Çalışanlarında Kesici-Delici Tıbbi Aletlerin Güvenli Kullanımına Yönelik Tutum Ölçeği" kullanılmıştır. Anket formları Aralık 2018- Mart 2019 tarihleri arasında araştırmacı tarafından dağıtılmış ve toplanmıştır. Verilerin istatistiksel analizinde SPSS kullanılmıştır. Araştırma sonucunda, hemşirelerin kesici-delici aletlerin güvenli kullanımına ilişkin toplam puan ortalamasının 111,34±10,77 olduğu saptanmıştır. Hemşirelerin aldıkları yüksek puan ortalamaları kesici-delici tıbbi aletleri güvenli kullanmaya yönelik verilen önemi göstermektedir.

Anahtar Kelimeler: *Enfeksiyon, Hemşire, Kesici- delici alet yaralanmaları*

1. Introduction

Nursing is a profession in which sharp and penetrating medical instruments are frequently used, making it a high-risk field for occupational exposure to infections. During clinical practice-such as performing venipuncture, administering injections, establishing intravenous access, and assisting with surgical procedures nurses may experience sharps-related injuries and be exposed to bloodborne pathogens through contact with blood and bodily fluids (Ağçay & Ünsar, 2024; Bozdemir & Bahar, 2023; Ceylan & Çelik, 2022; Elarslan, Özaydın, Güdük & Sertbaş, 2022; Özberk & Kutlu, 2021; Yun, Umemoto, Wang & Vyas, 2023). The literature indicates that healthcare workers are at risk of transmission of nearly twenty pathogenic agents as a result of sharps injuries. Since the invention of the syringe in 1845, injuries caused by sharp instruments have posed a significant occupational threat to healthcare personnel. Despite adherence to standard precautions and the increasing use of safety-engineered medical devices, percutaneous injuries continue to occur among healthcare workers. Avoiding contact with blood and bodily fluids remains the most essential preventive measure against the transmission of various infections, particularly Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus (HIV), within healthcare settings (Akça & Aydın, 2016; Bozkurt et al., 2013; Özyiğit et al., 2014; Yıldız, 2011).

Nurses, while fulfilling their professional duties, encounter various risks and hazards. Among these, infections and sharps-related injuries represent the most prominent occupational risks. The most frequent injuries to which nurses are exposed include percutaneous injuries and splashes that result in the transmission of bloodborne pathogens. Nurses may also transmit pathogenic microorganisms present in their work environment to patients and fellow healthcare providers. According to the Centers for Disease Control and Prevention (CDC, 2008) report, nurses accounted for the largest proportion (44%) of healthcare personnel exposed to blood and body fluids as a result of percutaneous injuries. In Turkey, it has been documented that nurses acquired HBV due to exposure to infected or carrier individuals during the provision of healthcare services (Akkaya, Şengöz, Pehlivanoğlu, Güngör-Özdemir, & Akkaya-Tek, 2014; Demir, & Karadeniz, 2021; Doğan & Sözen, 2016; Foda, Elshaer, & Sultan, 2018; Özyiğit, Küçük, Altuntaş, Arıkan, Kumbasar, & Fener, 2014; Pervaiz, Gilbert, & Ali, 2018; Apaydın, Sharew, Mulu, Habtewold, & Gizachew, 2017; Sözeri-Öztürk, 2019; Turan & Togan, 2013; Vural Doğru & Akyol, 2018).

Determining nurses' attitudes toward the safe use of sharp and penetrating medical instruments is critically important for reducing these occupational risks. Attitudes constitute fundamental psychosocial determinants that directly influence nurses' safety behaviors in clinical practice. Positive safety attitudes enhance adherence to standard precautions, support the correct use of safety-engineered devices, promote avoidance of risky behaviors, and increase the likelihood of reporting injuries. In contrast, negative or insufficient attitudes may lead to poor compliance with protective measures, diminished risk perception, and ultimately higher rates of sharps-related injuries. Therefore, identifying nurses' attitude levels provides essential guidance for determining training needs, developing behavior-change interventions, improving clinical protocols, and strengthening institutional safety policies. In this context, assessing nurses' attitudes is not only essential for preventing injuries but also constitutes a scientific necessity that contributes to enhancing patient safety, protecting employee health, improving institutional risk management, and enabling the development of targeted training programs.

2. Materials and Methods

2.1. Aim and Type of the Study

This study was conducted in a descriptive and cross-sectional design to determine nurses' attitudes toward the safe use of sharp and piercing instruments.

2.2. Population and Sample of the Study

The study population consisted of all nurses (N = 438) working in the intensive care units, clinics, operating rooms, and emergency department of Çukurova University Faculty of Medicine Balcalı Hospital, and no sampling method was applied.

2.3. Data Collection

Data were collected between December 2018 and March 2019 from nurses working in the intensive care units, clinics, operating rooms, and emergency department of Çukurova University Balcalı Hospital. Before participation, each nurse was individually briefed on the study's objectives, the data collection instruments, and instructions for completing the forms. A total of 438 nurses who consented to participate completed the forms, which required approximately 15 minutes to fill out. Nurses who were unable to complete the forms immediately were given a one-week period to do so, and the researcher's contact information was provided for any questions. The completed forms were subsequently collected after one week.

2.4. Data Collection Tools

Data were collected using two instruments: (1) the "Personal Information Form," which included questions regarding nurses' sociodemographic characteristics and experiences with sharp and piercing instrument injuries, and (2) the "Attitude Scale for the Safe Use of Sharp and Piercing Medical Instruments among Healthcare Workers," developed to assess nurses' attitudes toward the safe use of these instruments.

2.4.1. Personal Information Form (Appendix-1)

The Personal Information Form, was developedbased on a review of the literature (6, 7, 84–86), consists of 14 items addressing nurses' sociodemographic characteristics, work-related information, and features related to the use of sharp and piercing medical instruments.

2.4.2. Attitude Scale for the Safe Use of Sharp and Piercing Medical Instruments among Healthcare Workers (Appendix-2)

In this study, the Attitude Scale for the Safe Use of Sharp and Piercing Medical Instruments among Healthcare Workers, developed by Nilüfer Uzunbayır and Aynur Esen (2009), was used to assess healthcare workers' attitudes toward the safe use of sharp and piercing medical instruments. The scale was developed to evaluate attitudes and behaviors across three dimensions-cognitive, affective, and behavioral**.** It consists of a total of 25 items, structured to comprehensively capture the multidimensional nature of attitudes.

The cognitive subscale consists of 12 items (Items 1, 4, 8, 11, 13, 16, 18, 19, 20, 23, 24, and 25) that assess knowledge and awareness regarding the safe use of sharp and piercing medical instruments. Scores obtained from this subscale range from 12 to 60**.** The affective subscale includes 6 items (Items 2, 7, 9, 10, 14, and 22) that evaluate individuals' feelings and attitudes toward the subject, with possible scores ranging from 6 to 30**.** The behavioral subscale comprises 7 items (Items 3, 5, 6, 12, 15, 17, and 21) that measure practice-oriented behaviors related to the use of sharp and piercing medical instruments, and scores for this subscale range from 7 to 35**.**

The items in the scale are rated using a five-point Likert-type response format**.** Positively worded items (Items 1, 2, 4, 5, 6, 8, 9, 11, 14, 15, 19, 20, 22, 24, and 25) are scored from *Strongly agree* (5 points) to *Strongly disagree* (1 point). Negatively worded items (Items 3, 7, 10, 12, 13, 16, 17, 18, 21, and 23) are reverse-scored, such that *Strongly agree* receives 1 point and *Strongly disagree* receives 5 points. The total score obtainable from the scale ranges from 25 to 125, with higher scores indicating a positive attitude toward the safe and appropriate use of sharp and piercing medical instruments, and lower scores indicating unsafe use.

Regarding the psychometric properties of the scale, the Pearson correlation coefficient was found to be 0.96 ($p < 0.001$). In the split-half reliability analysis, the Cronbach's alpha coefficient was 0.72 for the first half of the scale and 0.66 for the second half. The Spearman–Brown prophecy coefficient, used to assess internal

consistency, was 0.74. The Cronbach's alpha coefficient for the entire scale was calculated as 0.80. These findings indicate that the scale is a valid and reliable measurement tool for assessing healthcare workers' attitudes toward the safe use of sharp and piercing medical instruments.

2.5. Ethical Considerations

Ethical approval for this study was obtained from the Non-Interventional Clinical Research Ethics Committee of Çukurova University Faculty of Medicine on 02 November 2018, with decision number 82-9. In addition, institutional permission was obtained from Çukurova University Faculty of Medicine Balcalı Hospital. Participation in the study was entirely voluntary, and both verbal and written informed consent were obtained from all nurses through an Informed Consent Form. Furthermore, written permission was obtained via email for the use of the Attitude Scale for the Safe Use of Sharp and Piercing Medical Instruments among Healthcare Workers, developed by Specialist Nurse Nilüfer Uzunbayır.

2.6. Data Analysis

Data analysis was performed using IBM SPSS Statistics version 24. The descriptive characteristics of the nurses were presented as frequencies and percentages. Following the assessment of data distribution, it was determined that the data did not conform to a normal distribution; therefore, non-parametric statistical methods were employed. Comparisons between two independent groups were conducted using the Mann–Whitney U test (Z-table value), while comparisons among three or more independent groups were performed using the Kruskal–Wallis H test (χ^2-table value). In cases where significant differences were identified among three or more groups, Bonferroni correction was applied for pairwise comparisons. Additionally, Spearman's correlation coefficient was used to examine relationships between non-normally distributed variables.

3. Results

3.1. Findings Related to Nurses' Descriptive Characteristics

The descriptive characteristics of the nurses are presented in Table 1. The mean age of the nurses was 32.23 ± 8.36 years, with 42.9% (n=188) in the 20–29 age group. It was determined that 84.5% (n=370) were female, 60.0% (n=263) were married, and 56.4% (n=247) were graduates with a bachelor's degree. In addition, 95.9% (n=420) were residing in the city, 78.1% (n=342) had been working for more than five years, and 34.7% (n=152) were employed in internal medicine clinics.

Furthermore, 88.6% (n=388) of the nurses had received the HBV vaccine, 94.7% (n=415) had undergone training on the safe use of sharp/piercing instruments, and 46.5% (n=193) reported receiving this training as in-service education. It was also found that 52.7% (n=231) of the nurses had a history of injury, 49.8% (n=115) had been injured two to three times, and among those injured, 58.9% (n=136) did not report the risky incident using a formal notification form (Table 1).

Table 1. Findings Related to Nurses' Descriptive Characteristics

Characteristics (N=438)	Frequency (n)	Percentage (%)
Age groups [Mean ± SD → 32.23 ± 8.36 (years)]		
20–29	188	42.9
30–39	149	34.0
40 and above	101	23.1
Gender		
Male	68	15. 5
Female	370	84.5
Marital Status		
Single	175	40.0
Married	263	60.0
Education Level		
Vocational Health High School	125	28.5
Associate Degree	48	11.0
Bachelor's Degree	247	56.4
Postgraduate (Master's/Doctorate)	18	4.1
Region of Residence		
District	18	4.1
Province (City Center)	420	95.9
Duration of Employment		
Less than 1 year	13	3.0
1–5 years	83	18.9
More than 5 years	342	78.1
Clinic of Employment		
Emergency Department	31	7.1
Operating Room	42	9.6
Intensive Care Unit	115	26.3
Internal Medicine Clinic	152	34.7
Surgical Clinic	98	22.3
HBV Vaccination Status		
Yes	388	88.6
No	50	11.4
Training on the Safe Use of Sharp/Piercing Instruments		
Yes	415	94.7
No	23	5.3
Source of Training		
In-service Training	193	46.5
Infection Control Committee	181	43.6
School	12	2.9
Occupational Health and Safety Unit	29	7.0
History of Needlestick/Sharp Injuries		
Yes	231	52.7
No	207	47.3
Number of Injuries		
Once	55	23.8
2–3 times	115	49.8
4–5 times	44	19.0
More than 5 times	17	7.4
Reporting the Injury Incident with a Form		
Yes	95	41.1
No	136	58.9

3.2. Findings Regarding the Mean Scores of Nurses on the Scale for Safe Use of Sharp and Piercing Medical Instruments

When examining the mean scores of nurses regarding the safe use of sharp and piercing instruments, the overall mean score was found to be 111.34 ± 10.77; the mean score of the cognitive sub-dimension was 53.61 ± 5.33; the mean score of the affective sub-dimension was 26.46 ± 2.98; and the mean score of the behavioral sub-dimension was 31.27 ± 3.79 (Table 2).

As a result of the study, when the attitudes of all nurses toward the safe use of sharp and piercing medical instruments were examined, it was determined that both the overall scale scores and the sub-dimension scores were high.

Table 2. Mean Scores of Nurses on the Scale of Attitudes Toward the Safe Use of Sharp and Penetrating Medical Instruments

Subdimensions		Mean ± SD	Min. ± Max.
Scale of Attitudes Toward the Safe Use of Sharp and Penetrating Medical Instruments	**Cognitive**	53.61 ± 5.33	31.0-60.0
	Affective	26.46 ± 2.98	16.0-30.0
	Behavioral	31.27 ± 3.79	16.0-35.0
	Total Score	111.34 ± 10.77	70.0-125.0

3.3. Findings Regarding the Mean Scores of Nurses on the Scale of Attitudes Toward the Safe Use of Sharp and Penetrating Medical Instruments According to Their Descriptive Characteristics

The cognitive subdimension scores of nurses showed statistically significant differences according to age, clinical department, HBV vaccination status, training on the safe use of sharp and piercing instruments, and history of injury (Table 3). Accordingly, nurses aged 20–29 years had significantly higher cognitive subdimension scores compared to those aged ≥40 years (χ^2 = 8.477; p = 0.014) (Table 3)**.** With respect to clinical departments, nurses working in intensive care units, internal medicine, and surgical clinics demonstrated significantly higher cognitive subdimension scores than those working in operating rooms (χ^2 = 14.102; p = 0.007) (Table 3)**.** Analysis based on HBV vaccination status revealed that unvaccinated nurses had significantly higher cognitive subdimension scores than vaccinated nurses (Z = −2.886; p = 0.004) (Table 3). Similarly, nurses who had not received training on the safe use of sharp and piercing instruments (Z = −2.625; p = 0.009) and those without a history of injury (Z = −2.302; p = 0.021) scored significantly higher in the cognitive subdimension compared to their respective counterparts (Table 3)**.** These findings indicate that cognitive awareness regarding the safe use of sharp and piercing medical instruments may vary depending on individual and professional characteristics.

The behavioral subdimension scores of nurses also differed significantly according to gender, marital status, educational level, clinical department, HBV vaccination status, and history of injury (Table 3). In this context, female nurses (Z = −2.355; p = 0.019), married nurses (Z = −2.119; p = 0.034), those holding bachelor's or graduate degrees (χ^2 = 15.927; p = 0.001), and nurses working in intensive care units, internal medicine, and surgical clinics had significantly higher behavioral subdimension scores (χ^2 = 13.713; p = 0.008) (Table 3). In addition, unvaccinated nurses (Z =−2.272; p = 0.023) and nurses without a history of injury (Z=−3.686; p

<0.001) also demonstrated significantly higher behavioral subdimension scores compared to their respective comparison groups (Table 3). These results suggest that safe behavioral practices related to the use of sharp and piercing medical instruments are influenced not only by demographic and professional characteristics but also by health-related individual experiences.

Similarly, statistically significant differences were observed in the affective subdimension (χ^2=13.358; p = 0.010) and total scale scores (χ^2 = 15.640; p = 0.004), particularly with respect to clinical department, HBV vaccination status, training status, and history of injury (Table 3). Nurses working in intensive care units, internal medicine, and surgical clinics, those who were unvaccinated, those who had not received training, and those without a history of injury obtained significantly higher scores (Table 3). Overall, these findings demonstrate that nurses' attitudes toward the safe use of sharp and piercing medical instruments are influenced by multiple factors across the cognitive, affective, and behavioral domains.

Table 3. Mean Scores of Nurses on the Scale of Attitudes Toward the Safe Use of Sharp and Penetrating Medical Instruments According to Their Descriptive Characteristics

Variable (N = 438)	**n**	**Scale of Attitudes Toward the Safe Use of Sharp and Penetrating Medical Instruments**			
		Cognitive Median [Min–Max]	**Affective Median [Min–Max]**	**Behavioral Median [Min–Max]**	**Total Median [Min–Max]**
AgeGroups					
(1)20–29	188	55.5 [31.0-60.0]	27.0 [17.0-30.0]	31.5 [17.0-35.0]	114.5 [71.0-125.0]
(2)30–39	149	55.0 [37.0-60.0]	27.0 [16.0-30.0]	33.0 [17.0-35.0]	115.0 [70.0-125.0]
(3)40 and above	101	53.0 [38.0-60.0]	27.0 [18.0-30.0]	32.0 [16.0-35.0]	112.0 [77.0-125.0]
Statistical Analysis*		χ^2=8.477	χ^2=1.446	χ^2=1.448	χ^2=2.843
Significance		**p=0.014**	**p=0.485**	**p=0.485**	**p=0.241**
Difference		**[1-3]**			
Gender					
Male	68	54.0 [37.0-60.0]	26.0 [16.0-30.0]	31.0 [17.0-35.0]	110.0 [70.0-125.0]
Female	370	55.0 [31.0-60.0]	27.0 [17.0-30.0]	32.0 [16.0-35.0]	114.5 [71.0-125.0]
Statistical Analysis		Z=-0.877	Z=-1.712	Z=-2.355	Z=-1.682
Significance		**p=0.381**	**p=0.087**	**p=0.019**	**p=0.093**
Marital Status					
Single	175	55.0 [31.0-60.0]	27.0 [17.0-30.0]	31.0 [17.0-35.0]	112.0 [71.0-125.0]
Married	263	55.0 [37.0-60.0]	27.0 [16.0-30.0]	33.0 [16.0-35.0]	115.0 [70.0-125.0]
Statistical Analysis		Z=-0.292	Z=-0.341	Z=-2.119	Z=-0.867
Significance		**p=0.770**	**p=0.733**	**p=0.034**	**p=0.386**
Educational Level					
(1)Vocational Health High School					
(2)Associate Degree	125	55.0 [35.0-60.0]	27.0 [18.0-30.0]	31.0 [20.0-35.0]	112.0 [74.0-125.0]
(3)Bachelor's Degree	48	55.0 [31.0-60.0]	27.0 [20.0-30.0]	31.5 [19.0-35.0]	114.0 [71.0-125.0]
(4)Postgraduate Degree	247	55.0 [36.0-60.0]	27.0 [16.0-30.0]	33.0 [16.0-35.0]	114.0 [70.0-125.0]
	18	55.5 [46.0-60.0]	28.5 [23.0-30.0]	34.0 [28.0-35.0]	117.0 [103.0-125.0]
Statistical Analysis*		χ^2=0.655	χ^2=2.892	χ^2=15.927	χ^2=4.486
Significance		**p=0.884**	**p=0.409**	**p=0.001**	**p=0.214**
Difference				**[1-3,4] [2-4]**	

*For data not following a normal distribution, the "Mann–Whitney U" test (Z-table value) was used to compare the measurement values of two independent groups, while the "Kruskal–Wallis H" test (χ^2-table value) was employed to compare the measurement values of three or more independent groups.

Table 3 (continued). Mean Scores of Nurses on the Scale of Attitudes Toward the Safe Use of Sharp and Penetrating Medical Instruments According to Their Descriptive Characteristics

Variable (N = 438)	n	Scale of Attitudes Toward the Safe Use of Sharp and Penetrating Medical Instruments			
		Cognitive Median [Min–Max]	Affective Median [Min–Max]	Behavioral Median [Min–Max]	Total Median [Min–Max]
Region of Residence					
District	18	55.0 [41.0-60.0]	27.5 [19.0-30.0]	31.0 [23.0-35.0]	112.5 [88.0-125.0]
Province	420	55.0 [31.0-60.0]	27.0 [16.0-30.0]	32.0 [16.0-35.0]	114.0 [70.0-125.0]
Statistical Analysis		Z=-0.145	Z=-0.368	Z=-0.392	Z=-0.118
Significance		**p=0.885**	**p=0.713**	**p=0.695**	**p=0.906**
Duration of Employment					
Less than 1 year	13	54.0 [40.0-60.0]	25.0 [20.0-30.0]	32.0 [17.0-35.0]	111.0 [77.0-125.0]
1–5 years	83	56.0 [31.0-60.0]	27.0 [17.0-30.0]	31.0 [18.0-35.0]	115.0 [71.0-125.0]
More than 5 years	342	54.0 [370-60.0]	27.0 [16.0-30.0]	32.0 [16.0-35.0]	113.0 [70.0-125.0]
Statistical Analysis		χ^2=4.085	χ^2=1.579	χ^2=0.119	χ^2=1.607
Significance		**p=0.130**	**p=0.454**	**p=0.942**	**p=0.448**
Clinical Department					
(1) Emergency	31	54.0 [35.0-60.0]	26.0 [17.0-30.0]	31.0 [17.0-35.0]	110.0 [71.0-125.0]
(2) Operating Room	42.	52.5 [37.0-60.0]	25.0 [16.0-30.0]	30.0 [16.0-35.0]	109.0 [70.0-123.0]
(3) Intensive Care Unit	115	55.0 [46.0-60.0]	27.0 [18.0-30.0]	32.0 [22.0-35.0]	114.0 [95.0-125.0]
(4) Internal Medicine Clinic	152	55.0 [31.0-60.0]	27.0 [18.0-30.0]	32.0 [20.0-35.0]	115.0 [71.0-125.0]
(5) Surgical Clinic	98	55.0 [41.0-60.0]	27.0 [17.0-30.0]	33.0 [19.0-35.0]	115.0 [83.0-125.0]
Statistical Analysis*		χ^2=14.102	χ^2=13.358	χ^2=13.713	χ^2=15.640
Significance		**p=0.007**	**p=0.010**	**p=0.008**	**p=0.004**
Difference		**[2-3,4,5]**	**[2-3,4,5]**	**[2-3,4,5]**	**[2-3,4,5]**
HBV Vaccination					
Yes	388	54.0 [31.0-60.0]	27.0 [16.0-30.0]	31.0 [16.0-35.0]	113.0 [70.0-125.0]
No	50	56.5 [39.0-60.0]	28,0 [19.0-30.0]	33.0 [20.0-35.0]	117.5 [78.0-125.0]
Statistical Analysis		Z=-2.886	Z=-1.719	Z=-2.272	Z=-2.856
Significance		**p=0.004**	**p=0.086**	**p=0.023**	**p=0.004**
Training on the Use of Sharp Instruments					
Yes	415	55.0 [31.0-60.0]	27.0 [16.0-30.0]	32.0 [16.0-35.0]	113.0 [70.0-125.0]
No	23	59.0 [50.0-60.0]	28.0 [20.0-30.0]	33.0 [27.0-35.0]	119.0 [104.0-125.0]
Statistical Analysis		Z=-2.625	Z=-1.069	Z=-1.343	Z=-2.153
Significance		**p=0.009**	**p=0.285**	**p=0.179**	**p=0.031**
Place of Training					
In-Service Training	193	55.0 [31.0-60.0]	27.0 [17.0-30.0]	32.0 [16.0-35.0]	115.0 [71.0-125.0]
Infection Control	181	55.0 [37.0-60.0]	27.0 [16.0-30.0]	32.0 [17.0-35.0]	112.5 [70.0-125.0]
School	12	55.5 [48.0-60.0]	27.5 [22.0-30.0]	31.0 [22.0-35.0]	113.0 [94.0-125.0]
Occupational Health and Safety	29	53.0 [38.0-60.0]	26.0 [18.0-30.0]	31.0 [23.0-35.0]	114.0 [80.0-125.0]
Statistical Analysis		χ^2=1.488	χ^2=2.912	χ^2=0.218	χ^2=1.306
Significance		**p=0.685**	**p=0.405**	**p=0.975**	**p=0.728**
History of Injury					
Yes	231	54.0 [36.0-60.0]	26.0 [17.0-30.0]	31.0 [17.0-35.0]	111.0 [71.0-125.0]
No	207	55.0 [31.0-60.0]	27.0 [16.0-30.0]	33.0 [16.0-35.0]	115.5 [70.0-125.0]
Statistical Analysis		Z=-2.302	Z=-2.436	Z=-3.686	Z=-3.138
Significance		**p=0.021**	**p=0.015**	**p=0,000**	**p=0.002**
Number of Injuries					
Once	55	55,0 [36.0-60.0]	26,0 [17.0-30.0]	31,0 [18.0-35.0]	115.0 [71.0-125.0]
2–3 times	115	53,0 [40.0-60.0]	26,0 [18.0-30.0]	31,0 [17,0-35.0]	109.0 [77.0-125.0]
4–5 times	44	55,0 [39.0-60.0]	27,0 [22.0-30.0]	31,0 [23.0-35.0]	114.0 [84.0-125.0]
More than 5 times	17	54,0 [38.0-60.0]	28,0 [18.0-30.0]	33,0 [24.0-35.0]	113.0 [80.0-124.0]
Statistical Analysis		χ^2=5.072	χ^2=7.083	χ^2=3.563	χ^2=5.202
Significance		**p=0.167**	**p=0.069**	**p=0.313**	**p=0.158**
Injury Reporting					
Yes	95	53.0 [39.0-60.0]	26.0 [19.0-30.0]	31.0 [21.0-35.0]	111..0 [86.0-125.0]
No	136	54.0 [36.0-60.0]	27.0 [17.0-30.0]	31.0 [17.0-35.0]	112.0 [71.0-125.0]
Statistical Analysis		Z=-0.640	Z=-0.872	Z=-1.722	Z=-0.014
Significance		**p=0.522**	**p=0.383**	**p=0.085**	**p=0.989**

*For data not following a normal distribution, the "Mann–Whitney U" test (Z-table value) was used to compare the measurement values of two independent groups, while the "Kruskal–Wallis H" test (χ^2-table value) was employed to compare the measurement values of three or more independent groups.

4. Discussion

Despite the implementation of standard precautions and the use of new techniques and devices in clinical practice, needlestick and sharps injuries, along with infection transmission, continue to occur among healthcare workers. Nurses have been reported to experience sharps injuries more frequently than other occupational groups, which may be attributed to factors such as high patient-to-nurse ratios, long and demanding working hours, extensive responsibilities including patient care and invasive procedures, and inadequacies in institutional regulations (Akça & Aydın, 2016; Bozkurt et al., 2013; Can & Sezen, 2017;Elarslan et al., 2022; Triassi & Pennino, 2018; Turkish Hospital Infections and Control Association, 2006).

The literature indicates that the majority of studies on sharps injuries primarily focus on the frequency of incidents, the circumstances under which they occur, and the professional groups affected, while fewer studies address healthcare workers' attitudes and behaviors toward the safe use of sharp and piercing medical instruments (Bozdemir & Bahar, 2023; Can & Sezen, 2017; Dizili Yelgin et al., 2018; Doğan & Sözen, 2016; Foda et al., 2018; Pervaiz et al., 2018).

The findings indicate that nurses generally demonstrate positive attitudes toward safe practices; however, some subdimensions—particularly during periods of high workload or emergency intervention may require improvement. Differences observed in the cognitive, affective, and behavioral subdimensions point to potential gaps in training and institutional support.

These results highlight the importance of continuous education programs, strict institutional policies, and strategies to reduce occupational risks, especially for early-career nurses and those working in high-intensity clinical settings. Furthermore, regular monitoring of nurses' attitudes and identification of potential risk factors can contribute to the development of preventive measures and the establishment of safer working environments.

4.1. Discussion of the Findings on Nurses' Mean Scores in the Scale for Attitudes Toward the Safe Use of Sharp and Cutting Medical Instruments

The nurses' total scale scores were found to be above the mean, indicating that their attitudes toward safe practices were generally positive. Likewise, the scores obtained from the cognitive, affective, and behavioral subscales were also above the mean, demonstrating that nurses' awareness, attitudes, and behaviors regarding the safe use of sharp and cutting medical instruments were overall favorable.

The total and subscale mean scores of nurses in previous studies are consistent with the findings of the present study (Akça & Aydın, 2016 Harland, 2024; Özenir, 2017; Özyiğit, Küçük, Altuntaş, Arıkan, Kumbasar, & Fener, 2014). These findings indicate that nurses' attitudes toward the safe use of sharp and cutting medical instruments are generally positive.

4.2. Discussion of the Findings on Nurses' Mean Scores in the Scale for Attitudes Toward the Safe Use of Sharp and Cutting Medical Instruments According to Their Descriptive Characteristics

When the nurses were compared in terms of age, younger nurses (20–29 years) obtained higher cognitive subscale scores than those aged 40 and above, indicating greater cognitive awareness regarding the safe use of sharp and cutting instruments. However, previous studies did not report statistically significant differences in cognitive, affective, or behavioral subscales, or total scale scores across age groups (Özenir, 2017; Harland, 2024).

Regarding gender and marital status, female and married nurses demonstrated significantly higher behavioral subscale scores than male and unmarried nurses, respectively. These findings suggest that both gender and

marital responsibilities may influence behavioral attitudes toward sharp and cutting instruments, although prior research has not consistently identified such associations (Özenir, 2017; Harland, 2024).

Educational level was significantly associated with behavioral subscale scores, with nurses holding undergraduate and postgraduate degrees scoring higher than vocational high school or associate degree graduates. This indicates that higher educational attainment corresponds with more positive behavioral attitudes toward sharp and cutting instruments (Akça & Aydın, 2016; Yıldız, 2011).

Comparisons across clinical departments revealed that nurses working in intensive care, internal medicine, and surgical units had significantly higher cognitive, affective, behavioral, and total scale scores compared to those in operating rooms. This may be related to differences in patient acuity, workload, and exposure to critical care settings (Akça & Aydın, 2016; Özyiğit et al., 2014).

Unexpectedly, HBV vaccination status and prior training on the safe use of sharp instruments were associated with cognitive, behavioral, and total scale scores in a counterintuitive manner, with unvaccinated and untrained nurses scoring higher. This could reflect a more cautious or vigilant approach among these groups, possibly due to perceived risk or uncertainty. Previous studies have reported inconsistent findings regarding these variables (Akça & Aydın, 2016; Yıldız, 2011).

Finally, nurses without a history of sharps injuries demonstrated significantly higher scores across all subscales and the total scale compared to those with prior injuries, suggesting that absence of prior injury may be linked to more positive attitudes toward instrument handling (Bozdemir & Bahar, 2023; Ceylan & Çelik, 2022; Elarslan, Özaydın, Güdük & Sertbaş, 2022; Özberk & Kutlu, 2021; Yun, Umemoto, Wang & Vyas, 2023).

5. Conclusion and Recommendations

The nurses' attitude scores regarding the safe use of sharp and cutting medical instruments were found to be above the mean. The findings obtained from the scale indicate that nurses' attitudes toward the safe use of these instruments are generally positive.

Based on the evaluation of the study data, the following recommendations can be made:

- It is recommended that all nurses be vaccinated against HBV and that their antibody levels be monitored and evaluated. For the procedures to be followed after risky injuries with sharp and penetrating medical instruments in hospitals (such as reporting the injury, documentation, implementation of post-exposure prophylaxis, and initiation of treatment processes) to be effectively adopted in practice, the effectiveness of the training provided to nurses should be evaluated.
- Nurses should receive training on CDC's universal precautions, the safe use of sharp and penetrating medical instruments, and protection from infections that may be transmitted through blood and body fluids, and the effectiveness of this training should be assessed.
- To establish sufficient and necessary awareness about infections transmitted through blood and body fluids, training should be delivered using different methods and repeated at regular intervals.
- Support should be provided for the use of safe medical devices in healthcare services in order to prevent and reduce nurses' occupational exposures.

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