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Evaluation of Nurses' Needlestick and Sharps Injury Status, Reporting Frequency and Post-Injury Practices

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ABSTRACT

Objective: The aim of this study is to identify the causes and frequency of needlestick and sharp injuries among nurses and to examine their knowledge and practices following these injuries.
Methods: The population of the study consisted of 1,550 nurses working at a state and a university hospital located in a city center. The sample included 478 nurses, aged between 18 and 60, who were actively working and volunteered to participate in the study between September 1, 2019, and December 31, 2019. A survey assessing sociodemographic characteristics, the frequency of needlestick and sharp injuries, and post-injury practices was administered to the voluntarily participating nurses. The data were analyzed using the SPSS 25 software program.
Results: It was determined that 45.6% of the nurses experienced sharps ınjury 2-5 times in their working life, and 67.8% of them had sharps injury in the last year. It was determined that 71.3% of these injuries were caused by injector needles, and 50.8% of them were caused by fast movement. It was determined that 58.8% of the nurses washed the injured area with soap and water as an intervention after a sharp object injury.
Conclusion: A high rate of needlestick and sharp injuries was found among nurses, and it was determined that the reporting rates of these injuries were low.
Keywords: Employee safety, needlestick and sharps device injury, nursing.

Declaration (This article was presented as a thesis at Atatürk University Health Sciences Institute, Fundamentals of Nursing Department.)

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Introduction

Hospitals are institutions that fall into the high-risk category in terms of working conditions (Gürer, 2018). Healthcare professionals, who are dedicated to providing health services to society, are at the center of these hazardous work environments and constitute one of the groups most at risk of occupational accidents. When healthcare workers experience occupational accidents due to potential risks and hazards in hospital work environments, it leads to significant issues such as loss of health, disability from a human, social, and psychological perspective, and income loss from an economic standpoint (Dikmen et al., 2014). Healthcare workers face numerous risks in their work environments, with the most common occupational accidents being sharps injuries (Yazar et al., 2016). Needlestick and Sharps injuries (NSI) are among the most significant occupational risks for healthcare workers and cannot be overlooked (Omaç et al., 2010). Among healthcare workers, nurses are particularly at higher risk of encountering health hazards due to spending more time with patients and providing direct care (Parlar, 2008). Nurses, being the occupational group most exposed to these risks, frequently experience needlestick and sharps injuries. This is extremely important, especially because nurses are at high risk of exposure to infections transmitted through blood and body fluids as a result of NSI (Olgun et al., 2014). Nurses are at high risk of exposure to blood and bodily fluids and are vulnerable to approximately 20 pathogens, including Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus (HIV), which can be transmitted through contact with contaminated sharps injuries (Coppola et al., 2016).

According to data from the Centers for Disease Control and Prevention (CDC), exposure to blood and bodily fluids due to injuries is most commonly reported among nurses (53%), with the most frequent causes of injury being disposable syringes (27%) and suture needles (25%) (CDC, 2016). In terms of materials causing injuries, hospitals have numerous instruments and procedures that can lead to needlestick and sharps injuries. These procedures include blood collection, IV catheter insertion, and the use of scalpels during dressings, with the most common injuries occurring during the recapping of syringe needles (Okutan et al., 2018; Samancıoğlu et al., 2013). Other studies have found that needlestick and sharps injuries most frequently result from needle sticks (40-70%), followed by ampoule cuts (Menteşe & Karaca, 2021; Oluwatosin et al., 2016; Omaç et al., 2010; Yelgin et al., 2018; Yoldaş et al., 2014; Zhang et al., 2018).

The frequency of needlestick and sharps injuries among nurses is attributed to their excessive workload, the rapid pace of patient turnover leading to hasty movements, and the long hours of shifts causing attention lapses. Despite the high frequency of needlestick and sharps injuries among nurses, literature indicates that reporting rates for such injuries remain low (Kurttekin et al., 2020). In this context, considering that Turkiye has ten times more HBV carriers than the United States, it is not difficult to estimate the magnitude of the danger for healthcare professionals in our country (Omaç et al., 2010).

Occupational accidents resulting from deficiencies in occupational health and safety in the healthcare sector are a significant health problem that requires study and planning, given the health, social, and economic losses they cause (Dikmen et al., 2014). Nurses face serious dangers and risks in their work environments, including needlestick and sharps injuries and infectious diseases. To ensure the delivery of safe and quality-standard services to patients, healthcare professionals must also be healthy and have their occupational safety ensured. In this regard, the health and safety of healthcare professionals is a critical issue that requires careful attention (Solmaz et al., 2017; Menteşe & Karaca, 2021; Zhang et al., 2017). In light of this information, this study was conducted to examine the causes and frequency of needlestick and sharp injuries among nurses, their reporting status, the practices they perform after such injuries, and to compare the data obtained in the study with hospital records through a retrospective evaluation.

Research Questions

1. What is the frequency of needlestick and sharps injuries among nurses?
2. What are the causes of needlestick and sharps injuries among nurses?
3. What are the practices followed by nurses after experiencing a needlestick and sharps injury?
4. What is the reporting status of needlestick and sharps injuries among nurses?
5. What are the reasons for nurses not reporting needlestick and sharps injuries?

Methods

Research Design

This study consists of two phases. The first phase was descriptive, while the second phase was conducted retrospectively.

Study Setting

This study was conducted between September 1, 2019, and December 31, 2019, at various healthcare institutions located in a city center, including a University Health

Research and Practice Center, a Training and Research Hospital, State Hospitals, and a Maternity and Women's Hospital.

Study Population and Sample

The study population comprised a total of 1,550 nurses working in the following institutions: 562 nurses at the University Health Application and Research Center, 129 nurses at the State Hospital, 701 nurses at the Training and Research Hospital, 52 nurses at the Maternity Hospital, and 106 nurses at another State Hospital. The study sample consisted of 478 nurses aged 18–60 who were actively working in the specified hospitals and agreed to participate in the study between September 1, 2019, and December 31, 2019. The inclusion criteria were being aged 18–60, voluntary participation, and active employment.

Data Collection Tools

Sociodemographic Form

Developed by the researchers, this form includes questions about the nurses' age, gender, education level, workplace, years of experience, etc.

Needlestick and Sharps Injuries Survey Form

Developed based on the literature (Dişbudak, 2013; Kaya et al., 2012; Musa et al., 2014; Okutan et al., 2018; Olgun et al., 2014), this form consists of 26 questions assessing the frequency of needlestick and sharps injuries among nurses and their post-injury practices.

Annual Needlestick and Sharps Injuries Data Reporting Form

Also developed based on the literature (Dişbudak, 2013; Kaya et al., 2012; Musa et al., 2014; Okutan et al., 2018; Olgun et al., 2014), this form records needlestick and sharps injury reports in hospitals, including the instruments causing the injuries, the nature of the incidents, and the number of injuries.

Data Collection

The research data were collected in two phases.

Phase 1 of the Research;

Nurses who voluntarily participated in the study were administered a survey assessing sociodemographic characteristics, the frequency of sharps injuries, and post-injury practices. Prior to the survey, nurses were informed about the study, and data were collected through face-to-face interviews using informed consent forms.

Phase 2 of the Research;

Annual needlestick and sharps injury reports were obtained from the hospitals involved in the study. The data were officially acquired via mail from the institutions. The information from these records was documented in the needlestick and sharps injury reporting form in accordance with permissions.

Data Analysis

The data were analyzed using SPSS 25 (IBM SPSS Corp., Armonk, NY, USA) software. Descriptive statistics, including percentages, means, standard deviations, and chi-square tests, were used to evaluate the study data.

Ethical Consideration

Ethical approval was obtained from the Non-Interventional Clinical Research Ethics Committee of Atatürk University to conduct the study (Date: 22/04/2019; Approval No: B.30.2.ATA.0.01.00/184). Institutional permissions were also secured from the hospitals involved. Participants were assured that their data would be protected and used solely for the purposes of this study. Data obtained from hospital records were analyzed without disclosing hospital names, and ethical principles were strictly adhered to. All steps of the study were carried out in accordance with the Declaration of Helsinki.

Results

The findings obtained within the scope of the research are presented with tables.

The findings obtained within the scope of the research are presented alongside tables. When examining the distribution of the descriptive characteristics of the nurses included in the study (Table 1), it was found that the majority of the nurses (46.2%) were in the age range of 25-29 years, 61.7% were graduates of a bachelor's degree program, 39.8% were employed at a training and research hospital, 68% worked in shifts, 63.4% were aware of the existence and activities of the infection control committee at their institution, and 83.1% had received training regarding needlestick and sharp injuries. The average age of the nurses included in the study was determined to be 27.62±5.62 years, while the average years of employment was 5.69±5.24 years.

When examining the distribution needlestick of sharp object injury incidents among nurses (Table 2), it was found that 45.6% of the nurses had experienced sharp object injuries 2-5 times during their professional careers, and 67.8% had encountered such incidents within the past year. Among these nurses, 32.4% reported having sustained an injury once in the past year, with 71.3% of these injuries occurring due to a syringe needle. Additionally, 64.9% of the injuries happened while preparing the patient for a procedure, and 50.8% were attributed to the nurses moving quickly.

Table 1.
Distrubution of Nurses' Demographic Characteristics

Characteristics	n	%
Age		
20-24	133	27.8
25-29	221	46.2
30-34	66	13.8
35 and above	58	12.2
Gender		
Female	386	80.8
Male	92	19.2
Education		
Health Vocational High School	88	18.4
Associate Degree	74	15.5
Bachelor's Degree	295	61.7
Master's Degree and Above	21	4.4
Institution Worked		
University Hospital	123	25.7
Training and Research Hospital	190	39.8
State Hospital	165	34.5
Years of Work Experience		
1-5 years	306	64.0
6-10 years	109	22.8
11-15 years	35	7.3
16 years and above	28	5.9
Work Type		
Continuous Day Shift	113	23.6
Continuous Night Shift	40	8.4
Shift Work	325	68
Awareness of Infection Control Committee in the Institution		
None	3	0.6
Unknown	25	5.2
Exists (those unaware of its work)	147	30.8
Exists (those aware of its work)	303	63.4
Training on Needlestick and Sharp Object Injuries		
No	81	16.9
Yes	397	83.1

Furthermore, it was determined that 44.1% of the nurses included in the study had sustained injuries from contaminated sharp objects with patient body materials within the past year, and 79% collected information about the patient following the injury.

Notably, 99% of the nurses reported that they had not contracted an infectious disease as a result of needlestick sharp object injuries, while 58.8% indicated that they washed the injured area with soap and water as a post-injury intervention.

Table 2.
Distribution of Needlestick and Sharps Injury Incidents Among Nurses

Needlestick and Sharp Injury Incidents	n	%
Number of Needlestick and Sharp Injuries in Professional Life		
Never exposed	72	15.1
Once	72	15.1
2-5 times	218	45.6
6-10 times	78	16.3
11-20 times	22	4.6
21 times and above	16	3.3
Needlestick and Sharps Injury Experience in the Last Year		
No	154	32.2
Yes	324	67.8
Number of Needlestick and Sharp Injuries in the Last Year (n=324)		
1	105	32.4
2	94	29.0
3	54	16.7
4	22	6.8
5 or more	49	15.1
Devices Causing Needlestick and Sharp Injuries in the Last Year (n=324)		
Injector needle	231	71.3
Suture needle	12	3.7
İV catheter	12	3.7
Ampoule	57	17.6
Other (Lancet, scalpel, etc.)	12	3.7
Situations Where Needlestick and Sharp Injuries Occurred Most Frequently in the Last Year (n=324)		
Preparing for a procedure on the patient	210	64.9
During the procedure on the patient	52	16.0
After the procedure on the patient	62	19.1
Reasons for Needlestick and Sharp Object Injuries in the Last Year (n=324)		
Carelessness	114	35.3
Quick movement	164	50.8
Fatigue	26	8.0
Material structure	13	4.0
Excessive workload	6	1.9
Exposure to Contaminated Needlestick and Sharp Objects with Patient Body Fluids in the Last Year		
No	181	55.9
Yes	143	44.1
Information Gathering About the Patient After Exposure to Contaminated Needlestick and Sharp Objects (n=143)		
No	30	21.00
Yes	113	79.0
Infection Due to Needlestick and Sharp Object Injury		
No	401	99.0
Yes (Hepatitis B)	4	1.0
***Actions Taken After Exposure to Needlestick and Sharps Injury in the Last Year (n=324)**		
Did nothing	24	7.3
Bleeding the injured area	54	16.4
Washing the wound area with soap and water	194	58.8
Cleaning the wound area with antiseptic	38	11.4
Applying pressure to stop the bleeding	20	6.1

Table 3.
Distribution of Nurses' Reporting of Needlestick and Sharp Injuries

Reporting Status	n	%
Written Reporting of Needlestick and Sharps Injury Exposure (n=324)		
No	188	58
Yes	78	24.1
Sometimes	58	17.9
Reporting Contaminated Needlestick and Sharp Object Injuries with Patient Body Fluids in the Last Year		
No	100	69.9
Yes	43	30.1
***Reasons for Not Reporting Contaminated Needlestick and Sharp Object Injuries (n=100)**		
Unawareness of reporting necessity	33	23.1
Time constraints	44	30.8
Indifference	37	25.9
Vaccination	29	20.3

*More than one option can be selected.

The distribution of nurses' reporting of needlestick and sharp object injuries is presented in Table 3. It was found that 58% of the nurses did not submit a written report when experiencing a needlestick and sharp object injury. Furthermore, 69.9% did not report exposures to contaminated needlestick and sharp objects with patient body materials within the past year, with the primary reason for not reporting being time constraints (30.8%).

When examining the distribution of needlestick and sharp object injury incidents among nurses based on units, hours, and materials (Table 4), it was found that 25.9% of the nurses experienced injuries while working in internal medicine units, and 50.6% reported injuries during the 08:00-16:00 shift.

Additionally, 66.9% of the nurses indicated that they were most frequently injured by syringe needles during their work, while 51.9% reported that they sustained injuries primarily while breaking ampoules in the past year. Notably, 88.1% of the nurses had not experienced injuries from contaminated needlestick and sharp objects with body fluids from patients with HIV, Hepatitis B, or Hepatitis C within the past year.

The distribution of personal protective equipment (PPE) usage among nurses is presented in Table 5. It was found that 93.7% of the nurses used PPE during needlestick and sharp object injuries, with 93% specifically using gloves as protective equipment during these incidents.

Table 4.
Distribution of Units, Hours, and Materials Where Nurses Experienced Needlestick and Sharp Injuries

Unit, Hour, and Material	n	%
Unit Where Needlestick and Sharp Injuries Occurred in the Last Year (n=324)		
Emergency Department	58	17.9
Surgical Unit	68	21.0
Internal Medicine Unit	84	25.9
Intensive Care Unit	75	23.1
Operating Room	27	8.3
Blood Collection	12	3.7
Working Hours When Needlestick and Sharp Injuries Occurred (n=324)		
08:00-16:00	164	50.6
16:00-24:00	133	41.1
00:00-08:00	27	8.3
***Devices Most Frequently Causing Needlestick and Sharp Injuries During Work**		
Injector needle	320	66.9
Suture needle	19	4
Ampoule	129	27
Lancet, scalpel	10	2.1
Procedures Causing Needlestick and Sharp Injuries in the Last Year (n=324)		
While drawing blood	49	15.1
While breaking an ampoule	168	51.9
While inserting an IV catheter	14	4.3
While putting the injector cap	37	11.4
While disposing of sharp objects in waste bins	12	3.7
While administering injections	6	1.9
During surgical procedures	26	8.0
Other (While collecting medical waste, while transferring blood from the syringe to tubes etc.)	12	3.7
Exposure to Contaminated Needlestick and Sharp Objects with Body Fluids of HIV, Hepatitis B, C Patients in the Last Year		
No	126	88.1
Yes	17	11.9

*More than one option can be selected.

Additionally, 69.7% reported that they always used PPE during invasive procedures, while 53.1% indicated that they were unable to use PPE due to a high workload and time constraints.

Annual Official Reporting Numbers of Needlestick and Sharp Injuries Reported by Nurses Working in State and University Hospitals in a City Center: 18 reports (36%) from Hospital A, 11 reports (22%) from Hospital B, 2 reports (4%) from Hospital C, 5 reports (10%) from Hospital D, and 14 reports (28%) from Hospital E, totaling 50 reports in one year.

Table 5.
Distribution of Nurses' Use of Personal Protective Equipment

Use of Protective Equipment	n	%
Use of Personal Protective Equipment During Needlestick and Sharp Injuries (n=143)		
No	9	6.3
Yes	134	93.7
Personal Protective Equipment Used During Needlestick and Sharp Injuries (n=143)		
Gloves	133	93.0
Double gloves	10	7.0
Frequency of Using Personal Protective Equipment During Invasive Procedures		
Always	333	69.7
Sometimes	134	28.0
Never	11	2.3
Factors Preventing the Use of Personal Protective Equipment		
Intense workload and lack of time	254	53.1
Insufficient tools and equipment	48	10.0
Belief that it hinders comfortable work	85	17.8
Not seeing the need due to vaccination	20	4.2
Lack of attention, forgetfulness	26	5.4
Allergy to the materials used	18	3.8
Knowing that the patient does not have an infectious disease	20	4.2
Other	7	1.5

*More than one option can be selected.

Discussion

Occupational accidents arising from deficiencies in occupational health and safety in every healthcare institution remain a global issue that needs attention due to the health, social, and economic losses they cause. Based on this, this research aims to identify the causes and frequency of sharp object injuries, examine the information and practices following the injuries, and retrospectively evaluate these notifications through hospital records for comparison with the relevant literature.

In this study, a significant majority of nurses (84.9%) reported having experienced at least one sharp object injury during their working life. In the study by Olgun et al. (2014), 75.2% of nurses stated that they had experienced at least one sharp object injury in the last three months, while in the study by Omaç et al. (2010), this figure was 62.7%. In the study by Benli et al. (2016), it was noted that sharp object injuries constituted 68.8% of occupational accidents experienced by hospital staff. The high rates of sharp object injuries among nurses pose a risk of transmission for many pathogens, primarily hepatitis and HIV, which are transmitted through blood and body fluids (Abebe et al., 2018). In this study, the sharp object causing injuries was identified as the syringe needle in the first place, followed by the ampoule (Table 2). In the literature, studies involving healthcare workers and nurses also indicate that injuries from syringe needles rank first (Güney et al., 2017; Olgun et al., 2014; Oluwatosin et al., 2016; Omaç et al., 2010; Samancıoğlu et al., 2013; Yazar et al., 2016; Yoldaş et al., 2014), and injuries from ampoules rank second (Güney et al., 2017; Olgun et al., 2014; Oluwatosin et al., 2016; Omaç et al., 2010). In the study by Satılmış and Şahin (2019), the instruments causing injury were found to be insulin needles in the first place and suture needles in the second place, with nurses being the most affected profession. In this study and the literature, needle-stick injuries are highlighted as a significant cause of sharp object injuries (Kepenek et al., 2017; Özer et al., 2020; Satılmış et al., 2019; Yelgin et al., 2018), drawing attention to the importance of this issue. The high incidence of injuries from syringe needles can be attributed to the frequent use of these tools by nurses during procedures such as injections, medication preparation, and blood draws, as well as their behavior when collecting waste after procedures.

When examining the circumstances under which injuries occurred, it was found that the majority of injuries among nurses occurred while preparing for procedures on patients; the leading causes of injury were identified as rapid movement and carelessness (Table 2). In two different studies, nurses indicated that the primary cause of their injuries was rapid movement (Mangırlı & Özşaker, 2014; Zahrah et al., 2012). One study found that injuries predominantly occurred while removing instruments from the environment and during the procedure (Özer et al., 2020), while another study indicated that injuries occurred first during the use of sterile instruments before treatment (Doğru et al., 2018), and yet another study noted that injuries were a result of carelessness during operations (Satılmış et al., 2019). It can be inferred that the prevalence of injuries among nurses due to workload and rapid movement is associated with the low number of nurses and the high number of patients per nurse. Injuries occurring before procedures may be perceived as low-risk by nurses due to the lack of contamination of materials; however, these injuries can still pose a risk for serious physical damage and the transmission of diseases due to the compromise of skin integrity, highlighting the importance of preventing all sharp object injuries.

In this study, nearly half of the injured nurses (44.1%) reported having sustained injuries with contaminated sharp objects involving patient body materials within the last year, with 79% of those who experienced contaminated injuries collecting information about the patient afterward.

Additionally, 99% of nurses indicated that they had not contracted an infectious disease as a result of sharp object injuries throughout their working lives (Table 2). When reviewing the literature, Omaç et al. (2010) reported that 24.6% of nurses who experienced sharp object injuries had contact with the patient's blood or body fluids, while Samancıoğlu et al. (2013) indicated that 21.2% of nurses injured by sharp objects had been injured by contaminated instruments. In a study involving 634 nurses from 13 Western European countries and Russia, it was reported that the source was known in 80% of cases, and nearly half (43%) indicated that the sharp object was contaminated (Costigliola et al., 2012). In the study by Guliyeva et al. (2016), it was found that 86% of healthcare personnel were aware of the source of the instrument causing injury. The high rate of data collection about patients after contaminated injuries in this study is a positive aspect in terms of the precautions to be taken after such injuries.

When examining post-injury practices in this study, it was found that nurses primarily reported washing the injured area with soap and water (58.8%), while 16.4% reported bleeding the injured area. The use of antiseptic solutions was found to be quite low (Table 2). In the study by Güney et al. (2017), the most commonly used practice post-injury was cleaning with povidone-iodine, followed by cleaning with liquid soap. In the studies conducted by Goel et al. (2017) in Northern India, healthcare workers were found to frequently clean the injured area with soap and water. The study by Dişbudak (2013) also revealed that nurses most commonly used antiseptics for washing after injuries, followed by washing with soap. When a sharp object injury occurs, the wound should be thoroughly washed with soap and water, and then an antiseptic solution should be applied. It is essential to avoid actions such as squeezing or bleeding the wound to prevent further trauma. Afterward, an occupational accident entry should be made in the emergency department, necessary examinations should be conducted, and the case should be referred to the occupational health unit and the infection control unit (Girgin et al., 2009; Official Gazette, 2012). Based on this, it can be inferred that nurses continue to engage in inappropriate practices post-injury, possibly due to hasty behavior, underestimating the injury, a lack of knowledge, or an inability to translate knowledge into action.

When examining the distribution of reporting sharp object injuries, it was found that more than half of the nurses (58%) did not submit a written report when experiencing an injury, and even among those who experienced contaminated sharp object injuries, only 30.1% reported the incident in the last year. The primary reason for not reporting contaminated sharp object injuries was identified as time constraints. Other reasons for not reporting included underestimating the injury, not knowing the necessity to report, and the presence of vaccination (Table 3). In the literature, Okutan and Sarıtaş (2018) reported that 59.6% of nurses did not report the injury, and 44.3% indicated that they did not report it because the instrument was not contaminated. Güney et al. (2017) found that 58.8% of emergency service workers did not report their injuries, with the reasons for not reporting being primarily due to the material not being infected, lack of time/concern, and unawareness of the need to report. In the study by Altıok et al. (2009), 87.3% of participants did not report sharp object injuries, stating that they were unaware of the necessity to report, did not feel concerned, and were unfamiliar with the process. Akkaya et al. (2014) indicated that 68% of injuries were not reported, and nearly half of the affected personnel reported that they did nothing after the injury. When asked about the reasons for not reporting, the most frequent response was "I considered it insignificant." Many studies have reported low reporting rates. In contrast, the study by Karacaer et al. (2018) found that the reporting rate to the Infection Control Committee was 68%, which stands out as a remarkably high reporting rate. The International Safety Center (EPINet-CDC, 2016) report states that percutaneous injuries are not reported adequately. Despite the high rates of injuries, the reporting rates remain low, with reasons for not reporting including lack of concern, time constraints, and unawareness of the need to report. A significant barrier to the success of prevention programs is the low reporting rates of reported sharp object injuries. Particularly, nurses who do not report after experiencing sharp object injuries represent a significant risk group for both individual and societal infection chains.

In this study, when examining the units where nurses experienced sharp object injuries in the last year, it was found that the most frequent injuries occurred in internal medicine units, intensive care, and surgical units, with injury rates being quite similar (Table 4). In the study by Özer et al. (2020), the most common units where healthcare workers were injured were identified as internal medicine, surgical units, and intensive care units. The study by Karabay et al. (2014) also found that the highest injuries occurred in intensive care and operating rooms. Comparing this research with similar studies, it can be observed that the units where sharp object injuries most frequently occur show both similarities and differences, and these rates may vary depending on the working conditions of these units, patient factors, working conditions, and various other variables.

When examining the time intervals during which nurses experienced sharp object injuries in the last year, it was determined that half of the nurses experienced injuries

during the 08:00-16:00 shift, while nearly half (41.1%) experienced injuries during the 16:00-24:00 shift (Table 4). Many studies have reported that sharp object injuries most frequently occur during the 08:00-16:00 working hours (Karakoç et al., 2018; Olgun et al., 2014; Özer et al., 2020; Yelgin et al., 2018). Similar studies have found that injuries most frequently occur on weekdays, during working hours, particularly in the morning. In a public and a private tertiary hospital in Lahore, Pakistan, the shift during which the most injuries occurred was reported to be the morning shift in both hospitals (Hassnain et al., 2017). In this study and many similar studies, a significant proportion of sharp object injuries occurred during daytime working hours. The higher incidence of injuries during daytime hours can be explained by the greater workload associated with procedures performed in hospitals during the day, as well as higher patient circulation and procedural activities, intense human traffic (visits, doctor rounds), and the operation of complex cases during daytime hours (Akyıldız, 2022; Omaç et al., 2010; Souza et al., 2014). The increased patient circulation and hospital admissions on weekdays due to outpatient services, surgeries, etc., can be related to the higher workload and the increased number of nursing interventions, including invasive procedures.

In this study, it was determined that the devices most frequently causing sharp object injuries among nurses during their working hours were syringe needles (66.9%) and ampoules (27%). Additionally, the most frequently reported procedure resulting in sharp object injuries in the last year was "breaking an ampoule" (Table 4). Other studies have indicated that the most common cause of injury was "closing the needle cap" (Akkaya et al., 2014; Kaya et al., 2012; Kepenek et al., 2017; Olgun et al., 2014; Yazar et al., 2016). Nurses play an indispensable role in all hospital units, performing care and treatment procedures due to the wide range of their job responsibilities. Since ampoules and syringe tips are among the most frequently used instruments by nurses, the high rates of injury can be attributed to workload, noncompliance with precautions, rapid movement, carelessness, and the lack of a culture of safe instrument usage.

In this study, when examining the use of personal protective equipment among nurses, it was found that nearly all nurses (93.7%) used personal protective equipment in the event of sharp object injuries, and virtually all injured nurses reported using gloves during the injury (Table 5). In various studies, it has been reported that a majority of nurses (80.2%) take precautions by wearing disposable/single-use gloves when caring for patients with blood-borne infections (Olgun et al., 2014). Similarly, Güney et al. (2017) found that among emergency service workers, gloves (59.0%) were the most commonly used protective measure in the past year. In many studies, the rates of the most frequently used personal protective equipment have been found to range between 55% and 93%, with gloves being the most common (Akkaya et al., 2014; Kaya et al., 2012; Kepenek et al., 2017). Additionally, it was determined that 12.6% of nurses did not take precautions for sharp object injuries due to carelessness, forgetfulness, or lack of concern (Okutan et al., 2018). In cases of injuries occurring through gloves, the risk of microorganism transmission is low, as gloves provide a good barrier, and the likelihood of infection following a sharp object injury through gloves is also reduced (Friedman et al., 2014). The high rate of glove usage among nurses is encouraging.

In the hospitals where this study was conducted, retrospective data on nurses' sharp object injury reports from the past year were requested, and it was determined that only 50 official reports were made in one year across all hospitals. However, nurses self-reported having experienced 324 injuries in the past year (Table 2). Based on this comparison, it is evident that the official reporting rates of sharp object injuries among nurses are quite low, with only about 1/6 of incidents being officially reported. In summary, nurses do not even report contaminated sharp object injuries, and even when they have sufficient knowledge, reasons such as lack of time and perceiving it as a waste of time are cited, indicating a tendency to avoid reporting, particularly for contaminated injuries. Furthermore, it is suggested that nurses do not regard these injuries as significant and avoid procedural requirements.

Limitations of the Study

In this study, an attempt was made to reach the entire population; however, conducting the study in different hospitals and the unwillingness of nurses to participate in the survey posed challenges. Additionally, the limitation of this study is that only the annual reporting numbers of injuries could be obtained from hospital records.

Conclusion and Recommendations

In this study, conducted to determine the causes and frequency of needlestick and sharp injuries among nurses, examine their post-injury information and practices, and retrospectively evaluate these notifications through hospital records, the following results were found;

- The frequency of needlestick and sharp injuries among nurses is high.

- The devices most frequently causing needlestick and sharp injuries among nurses are syringe needles and ampoules,
- Needlestick and sharp injuries among nurses are most often due to rapid movement and carelessness,
- Sharp object injuries among nurses predominantly occur during the 08:00-16:00 working hours,
- The rate of receiving training on needlestick and sharp injuries is high among nurses; however, incorrect practices such as squeezing and bleeding the injured area continue,
- The rate of using personal protective equipment during needlestick and sharp object injuries is high among nurses, with gloves being the most commonly used equipment,
- The reporting rates for needlestick and sharp injuries among nurses are low, with time constraints and lack of concern identified as the primary reasons for not reporting,
- It was concluded that the reporting rates for needlestick and sharp injuries among nurses in hospital records are very low.

The following recommendations are made in the study;

- In addition to general training on needlestick and sharp object injuries, new training strategies should be developed that are specific to each unit and aimed at transforming knowledge into behavior.
- Since a significant portion of injuries is caused by syringe needles and ampoules, institutions should procure safer medical supplies such as safety syringes and ampoule breakers and promote their use.
- The causes of injuries during the working hours when injuries are most frequently experienced should be investigated, and necessary precautions should be taken.
- Employee safety units, infection control units, and training nurses should work more actively to increase the rates of using protective equipment and reporting after injuries.
- Injury reports should not only be maintained for record-keeping; these records and studies should be reviewed to work on reducing injuries.
- Emphasis should be placed on sharp object injury topics in both undergraduate education and in-service training.
- Awareness of needlestick and sharp injuries among nurses should be increased, and reporting of such injuries should be encouraged.

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