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Occupational Exposure to Sharp Object Injuries Among Healthcare Workers in Dammam and Jeddah Hospitals, Saudi Arabia

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Objective: This study identify the prevalence of sharp object injuries (SOIs) among healthcare workers (HCWs) in Dammam and Jeddah, Saudi Arabia.

Methods: Quantitative methodology using a cross-sectional design was applied. Chi-square testing was employed for comparative analyses, and logistic regression encompassing univariate and multivariate models was implemented to ascertain the predictors of SOIs.

Results: Prevalence rate of SOIs among hospital HCWs in Dammam and Jeddah cities was 8.40%. Non-Saudi nationals had a rate of 11.9%, while participants who had more than 15 years of experience had a lower rate (9.9%). Gender was identified as a significant predictor of SOIs, with males being two times more likely to experience SOIs than females. The highest rates of injuries were observed among laboratory personnel (29.2%; odds ratios of 8.6 and 7.2 in univariate and multivariate models, respectively).

Conclusion: These findings show that HCWs in Dammam have a marginally higher risk of SOIs (prevalence rate 9%) than their counterparts in Jeddah (prevalence rate 7.8%). Further investigations are needed to tailor specific training programs to increase HCWs' awareness, safety knowledge, and practices to reduce SOIs.

Keywords: sharp object injuries, bloodborne pathogens, laboratory personnel, hospitals

Introduction

The health and safety of healthcare workers (HCWs) are critical to maintaining high standards of patient care and working conditions in healthcare settings. Given their frequent exposure to body fluids, HCWs are among those most at risk for occupational infection with biological agents. Nowadays, bloodborne pathogens such as hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV), are the most transmitted agents among HCWs through SOIs.[1–5] In regular interactions with patients, a tiny error or momentary negligence could endanger their health or even be deadly.[1] Thus, health and safety of HCWs are at risk of various infections, with sharp object injuries (SOIs) being a leading cause. The US Centers for Disease Control and Prevention (CDC) defines a sharp object injury (SOI) as an incident where a medical item, such as a needle or scalpel, pierces the skin, potentially exposing the individual to bloodborne pathogens. Any wound caused by a needle, scalpel, or other sharp object that exposes the individual to blood or bodily fluids qualifies as an SOI.[2] Due to the distinct and critical situations of patients, various stressors and collaborative activities may enhance the risk of accidents and the likelihood of individuals being cut by sharp items in operating rooms, intensive care units (ICUs), and emergency departments (EDs).[6] For instance, surgical teams are very susceptible to needlestick injuries (NSIs).[7,8] Moreover, the aftermath of NSIs entails substantially burdensome costs that are likely to escalate over time.[9]

The occupational exposure of HCWs to SOIs has increased over the past few decades. Based on a recent report issued by WHO, that was conducted to estimate the global burden of SOIs among HCWs, the incidence of SOIs

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remarkably increased from 6.5% in 2002 to 43% in 2020.[10] Overall, approximately 32.4–44.5% of HCWs sustain at least one accidental SOI event each year.[4,9] Unfortunately, 59.9% of NSIs go unreported annually. Nurses, who constitute approximately 63.9% of HCWs globally, are particularly vulnerable to SOIs due to their frontline roles and frequent patient interactions.[11–13] The World Health Organization (WHO) estimates that of 35 million HCWs worldwide, approximately 3 million suffer NSIs or SOIs annually, with over 0.8 and 1 million such events occurring in the United States and Europe, respectively; therefore, this problem should be promptly tackled.[9,14] Among these injuries, 2 million result in HBV infection, 0.9 million in HCV infection, and 170,000 in HIV infection. Over 90% of these infections occur in developing nations.[8,9,15,16] The national rate of NSIs in Saudi Arabia was 3.2 per 100 beds in 2012 across 52 hospitals.[17] However, data provided by King Saud Medical City in the Riyadh region reveal a high rate of 13.8 NSIs per 100 hospital beds occupied in 2009.[18]

The leading causative factors of NSIs include high workload, mental stress, fatigue due to prolonged work hours, lack of supervision, and a casual attitude of senior staff.[19,20] Moreover, the suboptimal quality of NSI prevention training programs and inadequate service provision to staff after they suffer NSIs were significant implementation gaps, despite clear hospital guidelines/policies on NSI prevention.[21] Hence, healthcare hospitals and institutions must intervene and take preventive measures to safely manage the risk of SOIs through applying universal precautions regarding proper disposal of sharp objects and using engineered safety devices to control NSIs.[22–27] Furthermore, HCWs require training sessions to raise their awareness regarding the importance of early reporting and practicing post-exposure prophylaxis to reduce the risk of bloodborne infections.[28]

The main aim of the current study was to explore the frequency of SOIs among HCWs in various settings within the cities of Dammam and Jeddah in Saudi Arabia, using a cross-sectional survey methodology. The major causes of SOIs and their predictors were closely investigated among different HCW groups in both cities, with an emphasis on safety measures, awareness, and training of HCWs to control SOIs.

Materials and Methods

Study Design and Setting

This cross-sectional study was conducted among HCWs in four hospitals over four months (March-June 2023) in two major cities of SA, Dammam and Jeddah. The city of Dammam is located in the Eastern Province of SA, the capital of the province and it hosts most of the regional administrative institutions, housing roughly more than 1.5 million residents. Jeddah is the second largest city in SA, located on the west coast. It has a population of approximately 3.7 million residents.

HCWs in 10 randomly selected hospitals in the cities of Dammam and Jeddah were invited to participate in the study. Only four general hospitals that are run by the Ministry of Health have agreed to participate (two hospitals from each city) in the study.

Population and Sampling Strategy

The targeted HCWs to be recruited in this study included physicians, nurses, technicians, and housekeeping staff. Pharmacists and office employees were excluded from the study. The required sample size for the study was calculated to be 264 participants using the sample size formula for proportion estimation in health studies:[29]

$$n = \frac{Z_1 - \frac{\alpha}{2}\, 2p(1-p)}{d^2}$$

Where:

n = Sample size

p = Expected prevalence of SOI in the study population (22%).[30]

d = Absolute error or precision (5%).

$Z_{1-\alpha/2}$ = Standard normal variate for significance (1.96 if type I error is limited to 5%)

Survey Development

The data were collected using a survey questionnaire that was constructed based on previous studies.[30–34] The questionnaire included three sections. The first section contained 11 questions to gather demographic characteristics

(job title, age group, gender, nationality, and years of experience). The second section described the common causes of SOIs and comprises 10 questions that target workplace characteristics. The third section discussed safety measures and awareness and contained 7 questions.

Data Collection

The questionnaire was translated from English into Arabic, after which it was tested using a face validity form by public health experts to measure the reliability and validity of the questions before data collection. Cronbach's alpha test, which was used to ensure the reliability of the questionnaire, yielded $\alpha = 0.71$, which was acceptable.[35] The questionnaire was distributed electronically in Arabic and English (using Google Forms) to make it understandable to all participants. To reach as many participants as possible, the questionnaire link was distributed by Email and WhatsApp texts through the public relations department at each hospital that has the contact information of the employees. Individuals unwilling to participate had the right to discontinue their participation in the survey at any time.

Data Analysis

Data processing and statistical evaluations were conducted using SPSS software, version 25. Categorical variables were articulated as counts (N) and corresponding frequencies (%). A chi-square test was employed for comparative analyses. Bivariate and multivariate logistic regression was implemented to ascertain the predictors of injuries resulting from SOIs. The analysis was grounded on a 95% confidence interval (CI), and a p-value of less than 0.05 was deemed statistically significant. The logistic regression model was evaluated to determine its effectiveness in predicting the occurrence of sharp object injuries, an outcome experienced by 42 participants in the study. The Hosmer-Lemeshow test was employed to evaluate the model's goodness-of-fit, resulting in a chi-square value of 7.88 and a p-value of 0.445. The model's adequate fit to the data is indicated by the non-significant p-value, which indicates that there are no significant differences between the predicted and observed frequencies of sharp object injuries ($p > 0.05$).

Ethical Considerations

The current study adheres to the Declaration of Helsinki. An ethical approval was obtained from the Institutional Review Board (IRB), Imam Abdulrahman Bin Faisal University (IRB No: PGS-2023-03-038) to facilitate data collection. An explanatory message was written at the beginning of the questionnaire to explain the study's aim and the participants' rights. The participants were aware of their right to withdraw while responding and that they incurred no potential risk by providing their consent. The author considered the participants' completion of all the items on the survey as consent to participate in this study.

Results

Demographic Characteristics of Participants

A total of 502 participants responded to the survey. As shown in Table 1, the study participants held various job titles, with nurses being the most represented at 42.8% (n = 215), followed by physicians at 30.5% (n = 153). Students, medical technicians, dentists, laboratory personnel, and housekeeping staff had lower representations, ranging from 4.0%–7.8%. Regarding age distribution, the majority (30.3%) fell within the 25–30 age group (n= 152), with those aged below 25 years and those over 50 years representing the least numerous (4.2% and 12.7%, respectively). The gender distribution showed a higher number of females (59.8%; n= 300) compared to males (40.2%; n= 202). Regarding nationality, non-Saudi participants slightly outnumbered their Saudi counterparts, 53.8% (n = 270) to 46.2% (n = 232). Finally, participants with more than 15 years were the most represented at 32.3% (n= 162), while those with less than five years constituted 19.5% (n= 98) of all participants.

Participants' Workplace Characteristics and Sharp Injuries Prevalence Rate

Table 2 delineates the characteristics of the participants' workplaces. The majority of the participants were working in Jeddah (51.4%), with the rest working in Dammam (48.6%). When asked about working with sharp objects, 44.4%

Table 1 Demographic Data of HCWs Participants in the Study

Variable	Frequency (n)	Percent (%)
Job title		
Physician	153	30.5
Nurse	215	42.8
Student	21	4.2
Medical technician	30	6.0
Dentist	20	4.0
Laboratory personnel	24	4.8
Housekeeping staff	39	7.8
Age groups		
<25	21	4.2
26–29	152	30.3
30–34	94	18.7
35–39	80	15.9
40–44	52	10.4
45–50	39	7.8
>50	64	12.7
Gender		
Female	300	59.8
Male	202	40.2
Nationality		
Saudi	232	46.2
Non-Saudi	270	53.8
Years of experience		
<5	98	19.5
6–9	122	24.3
10–15	120	23.9
>15	162	32.3

Table 2 Characteristics of Participants' Working Place

Variable	Frequency (n)	Percent (%)
Hospital location		
Jeddah	258	51.4
Dammam	244	48.6
Are you working with sharp objects at work?		
Yes	223	44.4
Sometimes	200	39.8
No	79	15.7
Have you been injured with a sharp object during the last 12 months?		
No	460	91.6
Yes	42	8.4

(*Continued*)

Table 2 (Continued).

Variable	Frequency (n)	Percent (%)
Are you aware of the sharp injury safety policy in your healthcare facility?		
Yes, and completely aware	399	79.5
Yes, I know, but not completely aware	101	20.1
Not sure about the presence of the sharp injuries safety policy	2	0.4
Have you received safety training on dealing with sharp objects and their disposal?		
Yes, and certified	224	44.6
Yes, but not certified	271	54.0
No, not at all	5	1.0
Do not remember	2	0.4
Are there special containers for the disposal of sharp objects in your department?		
No	46	9.2
Yes	456	90.8
Is needle injection among your job descriptions?		
No	72	14.3
Yes	430	85.7
Do you always disinfect your hands before preparing an injection?		
No	13	2.6
Yes	441	87.8
NA	48	9.6
Do you always use a new pair of gloves every time you administer an injection?		
No	99	19.7
Yes	344	68.5
NA	59	11.8

confirmed they work with them regularly, 39.8% only sometimes, and 15.7% stated they do not. In the past 12 months, 8.4% of the participants reported SOIs, with the overwhelming majority (91.6%) having not experienced such injuries.

Nurses (n = 215, 42.8%) were the largest group of participants in this study, while physicians were the second largest (n = 153, 30.5%). The findings indicate that 42 (8%) had been infected through an SOI over the last 12 months. A significant portion of the participants (79.5%) expressed being fully aware of the SOI safety policy at their facility, with 20.1% having partial awareness and a mere 0.4% unsure of its existence. Concerning safety training, 44.6% were certified, 54% had received training but were not certified, 1% had not received any training, and 0.4% could not recall being trained on SOIs. Most participants (90.8%) indicated that their departments had special containers for sharp object disposal. Administering needle injections was a work task for 85.7% of the participants. The vast majority (87.8%) reported always disinfecting their hands before preparing an injection, and 68.5% affirmed consistently using a new pair of gloves for each injection. The overall prevalence rate of SOIs among HCWs workers in Dammam and Jeddah cities is 8.40% (95% CI, 5.9–10.8%).

Prevalence of Sharp Objects Injuries Among Healthcare Workers

As shown in Table 3, when the data were analyzed based on job titles, the highest prevalence rates of SOIs were observed among laboratory personnel at 29.2% (95% CI, 9.6–48.8%), followed by students at 19.0% (95% CI, 0.7–37.4%), and housekeeping staff at 15.4% (95% CI, 3.5–27.2%). Medical technicians and physicians showed prevalence rates of 13.3% and 4.6%, respectively (Figure 1). Regarding other demographic factors, the prevalence rates increased with age, with HCWs over 50 years of age having a rate of 14.1% (95% CI, 5.3–22.8%). Moreover, males experienced a higher injury rate of 11.9% (95% CI, 7.4–16.4%) compared to females at 6% (95% CI, 3.3–8.7%). Non-Saudi nationals had an injury rate of 11.9% compared to Saudis at 7.3%. Lastly, in terms of years of experience, those over 15 years had a prevalence rate of 9.9% (95% CI, 5.2–14.5%).

Table 3 Prevalence of SOIs Among HCWs in the Study (Self-Reported During the Previous 12 Months)

Variables	Prevalence (12 Months)*
	Percent (95% CI)
Total	8.40 (5.9–10.8)
Job title	
Physician	4.6 (1.2–7.9)
Nurse	6.0 (2.8–9.3)
Student	19.0 (0.7–37.4)
Medical technician	13.3 (0.4–26.2)
Dentist	5.0 (−5.5–15.5)
Laboratory personnel	29.2 (9.6–48.8)
Housekeeping staff	15.4 (3.5–27.2)
Age groups	
<25	4.8 (−5.2–14.7)
26–29	5.3 (1.7–8.9)
30–34	8.5 (2.8–14.3)
35–39	8.8 (2.4–15.1)
40–44	9.6 (1.3–17.9)
45–50	10.3 (0.3–20.2)
>50	14.1 (5.3–22.8)
Gender	
Female	6 (3.3–8.7)
Male	11.9 (7.4–16.4)
Nationality	
Saudi	7.3 (3.9–10.7)
Non-Saudi	11.9 (5.8–12.7)
Years of experience	
<5	7.1 (2.0–12.3)
6–9	6.6 (2.1–11.0)
10–15	9.2 (3.9–14.4)
>15	9.9 (5.2–14.5)

Notes: *One-year prevalence of SOIs among HCWs in this study (self-reported).

There were variations in the prevalence rates of SOIs among hospital HCWs in the two cities examined. In Jeddah, the prevalence rate was 7.8%, with a 95% confidence interval of 2.0–12.3%, whereas in Dammam, the rate was slightly higher (9.0%), with a tighter confidence interval ranging from 5.4–12.6%. This suggests that the participating HCWs in Dammam experienced a marginally higher risk of SOIs than their counterparts in Jeddah (Figure 2).

Risk Factors of Sharp Objects Injuries Among Healthcare Workers

Table 4 presents a logistic regression model predicting the factors contributing to SOIs among hospital HCWs. In the bivariate model that considered job titles, physicians served as the reference group. Students had a crude odds ratio (COR) of 4.9, indicating that they were nearly five times more likely to sustain an SOI compared to physicians (p = 0.019). This risk further increased in the multivariate model, with an adjusted odds ratio (AOR) of 6.7 (p = 0.009). laboratory personnel. Other job titles did not show statistically significant differences in risk when compared to physicians.

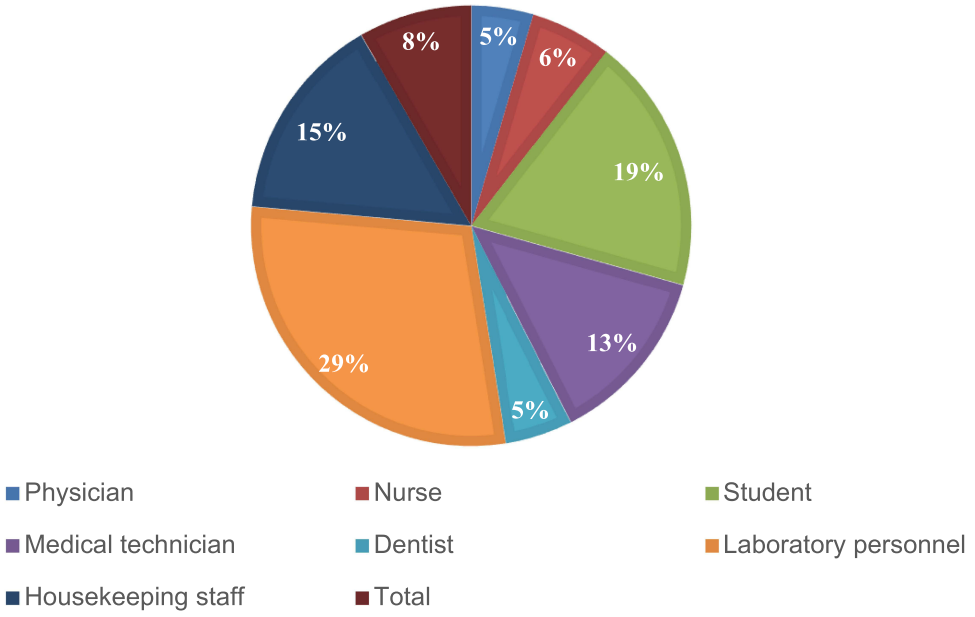

Figure 1 Prevalence rate of SOIs among HCWs based on job titles.

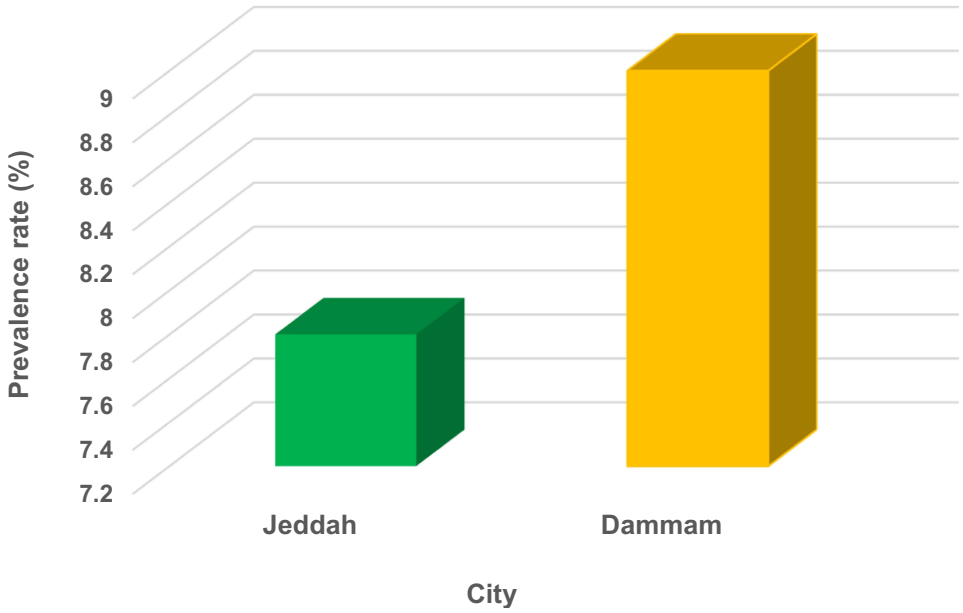

Figure 2 Prevalence rate of SOIs among hospital HCWs in Dammam and Jeddah cities.

When analyzing the age factor, individuals younger than 25 years served as the reference group. Those aged 30–35 years had statistically significantly decreased odds of SOIs in the bivariate model (COR = 0.3, p = 0.035), but this significance did not persist in the multivariate model. Other age groups did not present a significant variation in the risk of SOIs when compared to the reference group. Gender appeared to be a significant predictor, with males having a COR of 2.1 (p = 0.022) and an AOR of 2.5 (p = 0.009), indicating that they were more than two times more likely to experience SOIs than females.

However, nationality did not significantly influence the odds of SOIs, with non-Saudis showing no significant difference from the Saudis in either model. Years of experience, categorized into four groups, did not show any

Table 4 Bivariate and Multivariate Logistic Regression Analysis of Factors Associated with SOIs Among HCWs in Saudi Arabia

Predictors	Bivariate Model		Multivariate Model	
	COR[a] (95% CI)	P-value	AOR[b] (95% CI)	P-value
Job title				
Physician	**Ref.**	0.002*	**Ref.**	0.006*
Nurse	1.3 (0.5–3.4)	0.541	1.3 (0.5–3.5)	0.575
Student	4.9 (1.3–18.5)	0.019*	6.8 (1.6–28.1)	0.009*
Medical technician	3.2 (0.9–11.7)	0.078	3.2 (0.8–12.6)	0.089
Dentist	1.1 (0.1–9.4)	0.932	0.9 (0.1–8.0)	0.899
Laboratory personnel	8.6 (2.7–27.4)	0.000*	7.2 (2.1–24.7)	0.002*
Housekeeping staff	3.8 (1.2–12.0)	0.024*	3.5 (1.0–11.9)	0.043*
Age				
<25	**Ref.**	0.539	**Ref.**	0.778
26–29	0.3 (0.0–2.6)	0.275	1.4 (0.1–13.9)	0.760
30–34	0.3 (0.1–0.9)	0.035	2.5 (0.2–25.9)	0.438
35–39	0.6 (0.2–1.6)	0.273	2.6 (0.2–27.2)	0.432
40–44	0.6 (0.2–1.7)	0.317	2.9 (0.3–31.1)	0.371
45–50	0.7 (0.2–2.1)	0.467	2.8 (0.2–32.5)	0.401
>50	0.7 (0.2–2.4)	0.574	3.4 (0.3–35.2)	0.312
Gender				
Female	Ref.		Ref.	
male	2.1 (1.1–4.0)	0.022*	2.5 (1.3–5.0)	0.009*
Nationality				
Saudi	Ref.		Ref.	
Non-Saudi	1.3 (0.7–2.5)	0.437	1.2 (0.6–2.4)	0.615
Years of experience				
<5	Ref.	0.734	Ref.	0.632
6–10	0.9 (0.3–2.6)	0.864	1.5 (0.5–4.6)	0.508
10–15	1.3 (0.5–3.5)	0.590	1.7 (0.6–5.0)	0.343
>15	1.4 (0.6–3.6)	0.454	2.0 (0.7–5.5)	0.198
Working with sharp objects at work				
Yes	Ref.	0.786	Ref.	0.642
Sometimes	1.1 (0.6–2.3)	0.741	1.1 (0.5–2.3)	0.903
No	1.4 (0.6–3.3)	0.489	1.6 (0.6–4.0)	0.360
Received safety training in dealing with sharp objects				
Yes, and certified	Ref.	0.228	Ref.	0.357
Yes, but not certified	1.7 (0.8–3.2)	0.139	1.7 (0.8–3.5)	0.164
No, not at all	3.8 (0.4–35.8)	0.251	2.2 (0.2–26.1)	0.531

Notes: *Statistically significant (p-value >0.05); [a]Unadjusted or Crude odd ratio (COR); [b]Adjusted odd ratio (AOR).

significant predictive power over the odds of SOIs in either model. Regarding exposure to sharp objects at work, those who responded "Yes" were taken as the reference. Neither those who answered "Sometimes" nor those who indicated "No" showed a significant difference in their odds of sustaining injuries in either model. Furthermore, in analyses that considered safety training in handling sharp objects, certified participants were used as the reference in the model. Those

who were trained but not certified showed an elevated OR, although it was not statistically significant. The group with no training at all had a higher COR, but this was not statistically significant. The findings underline the importance of safety training, although certification did not appear to significantly reduce the risk of SOIs (Table 4).

Discussion

A total of 502 participants responded to the survey, of which (30%) were aged 25–30, representing a significant proportion of young participants, which is similar to previous studies.[31,36] More than half of the participants were female; similarly, 25.2% were male and 74.8% were female in a study by Fadil et al,[37] who investigated the burden and risk factors of SOIs among HCWs in the city of Taif, SA. The current study indicated that 42 participants (8%) had suffered an SOI during the last 12 months, with nurses reporting the highest rates of SOIs. Previous studies[31,34] have also found that nurses were more likely to experience stick injuries than physicians or other HCWs. In Ethiopia, it was discovered that nurses at Tikur Anbessa Specialized Hospital exhibited an NSI rate of 36.2%.[34] In a study conducted at King Abdulaziz University Hospital in SA, nurses were again found to have the most dominant history of SOIs.[38] Moreover, nurses have been identified as the group most susceptible to SOIs in healthcare facilities in various countries.[3,39,40]

The overall prevalence rate of SOIs among HCWs in the current study was 8.4%. It is noteworthy that our results align with the reported prevalence rates of SOIs among HCWs in various countries, such as the United States,[41] France,[42] Iran,[43] Australia,[44] and China[45] which ranged from 6.3%–9.5%. On the other hand, our value is lower than what has been reported in many studies on the incidence rates of SOIs among HCWs in SA (eg, 13.8% and 22.2% for Memish et al[18] and Abalkhail et al,[30] respectively). The students in the present study had a COR of 4.9, indicating that they were nearly five times more likely to sustain an SOI compared to physicians ($p = 0.019$). This risk further increased in the multivariate model (AOR = 6.7, $p = 0.009$). Similarly, previous studies have revealed that undergraduate students are the group most vulnerable to NSIs.[46–49] In this study, laboratory personnel showed a notably high risk as well, with a COR of 8.6 ($p < 0.001$) and AOR of 7.2 ($p = 0.002$), respectively. Similarly, a Greek study found that laboratory personnel are among the groups at the highest risk of SOIs, with an OR of 1.3, when compared with physicians in that country.[50] Furthermore, an investigation of the risk of occupational infection among 234 clinical laboratory workers in two hospitals in Al-Madinah, SA, determined that approximately 24% had experienced NSIs.[51] This provides further evidence that laboratory personnel are a group at high occupational risk for NSIs in SA. Similarly, Al Eryani et al[52] reported that 59% of occupational injuries among laboratory personnel in the healthcare sector in Sana'a, Yemen, were caused by SOIs. Housekeeping staff also exhibited an elevated risk in the current study, although it was less pronounced than for students or laboratory personnel. Likewise, housekeeping was one of the most affected HCW categories in a previous study (13.7%).[37]

In the present study, gender appeared to be a significant predictor, with males having a COR of 2.1 ($p = 0.022$) and AOR of 2.5 ($p = 0.009$), indicating that they are over two times more likely to experience SOIs than females. This is in accordance with the findings of Assen et al,[15] who found that 74.2% of SOIs were reported by males and the rest by females. Moreover, Dilie et al[1] recorded that males were approximately 10 times more likely to be exposed to NSIs. By contrast, Fadil et al found that 98 out of 131 (74.8%) females but only 33 out of 131 (25.2%) males suffered SOIs.[37]

In the present study, nationality did not significantly influence the odds of SOIs, with non-Saudis showing no significant difference from the Saudi reference group in either model. A previous study in the city of Taif, SA, found a high incidence of NSIs among non-Saudi HCWs (76.3%) in comparison to Saudi HCWs (23.7%).[37] As revealed in the current study, the prevalence rate for SOIs in Dammam was 9.0%; this result accords with the 8% found by Alfulayw et al,[36] who also found that the rate of SOI incidence recorded among participants with under five years of experience was approximately 22%.

The current study recorded a prevalence rate among HCWs in Jeddah of 7.9%, which was approximately 2.5-fold less than in previous research (incidence rates of 19.7 and 19.9% for Alharazi et al[53] and Alameer et al,[54] respectively). Interestingly, Aldakhil et al[55] found that 29.8% of dental assistants employed in private dental clinics in Jeddah had at least one NSI occurrence since beginning their careers, whereas in Dammam, the rate was slightly higher at 9.0%, with a tighter confidence interval ranging from 5.4%–12.6%. This may suggest that HCWs in Dammam experience

a marginally higher risk of such injuries than their counterparts in Jeddah. Also, it was clear from the study that outpatient clinics and emergency departments were the areas most likely to lead to infection among HCWs by sharp objects, which might be due to the high density of patients typically present there. In addition, the current study underlines the importance of safety training (although it should be said that certification did not appear to reduce the risk of SOIs significantly). Therefore, it is expected that intervention through training programs, regular awareness among target groups of HCWs, and adherence to universal precautions should have a highly significant impact on the reduction of SOI incidence.[51,52]

One of the major findings of this study is that HCWs in Saudi hospitals, especially nurses and doctors, are most vulnerable to getting injured by sharp objects. Moreover, most HCWs in Dammam experienced a marginally higher risk of SOIs than their counterparts in Jeddah. Also, highlighting as well as avoiding the major causes of SOIs reported in the current study can help healthcare facilities to establish optimal practices to protect HCWs.

Nevertheless, there are some limitations of the study that should be considered when interpreting the results. First, the lack of data on HCWs' physical visits to healthcare facilities to ensure the up-to-date preparedness towards sharp objects makes it difficult to interpret the results. Second, relying on online surveys in this study could have increased the likelihood of participation bias. Third, the lack of data regarding the number of patient beds served by HCWs, which is a crucial factor that contributes to the prevalence rate, makes it difficult to generalize the results. Fourth, although the results of the current study captured sharp injuries among HCWs in the two major cities—Dammam and Jeddah—still, they cannot be generalized to the national level. However, the major outcomes of the current study can help inform targeted training programs for each of the specific categories of HCWs. Furthermore, the study provides a basis for deriving optimal guidelines to improve HCWs' knowledge and practices towards reducing the occurrence of SOIs.

Conclusion

Globally, HCWs are frequently exposed to accidental SOIs. Their prevalence calls for an efficient strategy to mitigate the associated risks. This study highlights the prevalence of SOIs among HCWs in two major cities in SA: Dammam and Jeddah and nurses being the most represented group, followed by physicians. The results revealed that HCWs in Dammam experienced a marginally higher risk of SOIs than their counterparts in Jeddah. Avoiding the common causes of SOIs described in this study can help healthcare facilities establish optimal practices to protect HCWs. The findings of this study also provide insights that can be used to create tailored safety training programs to prevent SOIs, targeting specific workers such as housekeepers and lab technicians. Implementing these programs will enhance the knowledge and practices of these workers regarding sharp objects, ultimately reducing the incidence of SOIs.

Disclosure

The authors declare no conflict of interest.

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