Journal of Current Medical Research and Opinion

Received 09-05-2025 | Revised 28-05-2025 | Accepted 28-06-2025
CMRO 08 (07) 4325-4332 (2025)
DOI: *https://doi.org/10.52845/CMRO/2025/8-7-5*
www.cmro.in

CMRO
ISSN (O) 2589-8779
(P) 2589-8760

Original Article

Compliance Level of Nurses Regarding Sharp Injuries Prevention Guidelines in Kirkuk Hospitals: A Cross-Sectional Study

Shaimaa Abbas Mohammed [1]*, Nazar Ahmed Mahmood [2]

[1, 2] Department of Community Health Nursing, College of Nursing, University of Kirkuk, Kirkuk City, Iraq

[*]**Corresponding author:** Department of Community Health Nursing, College of Nursing, University of Kirkuk, Kirkuk City, Iraq. **Email: nsrm23009@uokirkuk.edu.iq**

Abstract:

Background and aim: Sharp injuries occur in healthcare settings, often due to lapses in compliance with prevention guidelines. Nurses, as primary providers of direct patient care, play a crucial role in implementing these guidelines. This study aimed to assess nurses' compliance with guideline for preventing sharp injury in Kirkuk City hospitals and to identify related factors.

Methods: A descriptive cross-sectional design was conducted in four hospitals in Kirkuk City from December 20, 2024, to March 15, 2025. A purposive sampling method was used to select 200 nurses. Data were collected using structured questionnaires and observational checklists. Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 26, with results reported as frequencies and percentages. A significance level of $p<0.05$ was set for statistical analysis.

Results: Of the 200 nurses observed, 96 (48%) were male and 104 (52%) were female. Most nurses 134 (67%) demonstrated partial compliance with sharp injuries prevention guidelines, while 66 (33%) were fully compliant. The study identified a correlation between compliance level and gender ($p = 0.5$), married status ($p = 0.01$), and educational training ($p < 0.001$).

Conclusions: The compliance of nurses with sharp injuries prevention guidelines in hospitals within Kirkuk city was found to be partially compliant. This underscores the need for hospitals to establish clear policies and provide ongoing education and training focused on sharp injury prevention.

Key words: Compliance level, Nurses, Sharp Injuries, Prevention Guidelines, Kirkuk City.

Introduction:

Precautionary and safety measures are crucial in every workplace to reduce adverse situations and ensure the safety of healthcare workers. Implementing sharps injury prevention guidelines allows hospital institutions to assess and enhance their efforts to protect nursing staff. Workplace safety, especially concerning sharp injuries, is a primary concern for nurses (American Nurses Association, 2008). Thoughtfully implemented policies can provide hospitals with a framework

for change, offering an opportunity to enhance the education and training of nursing staff on the prevention, documentation, and reporting of sharps injuries (ECRI Institute, 2016).

Globally, sharps injuries are a significant safety issue within hospital setting. The World Health Organization (WHO, 2019) reports that over 35 million healthcare workers experience occupational needlestick injuries (NSIs) and sharps injuries (SIs) annually. Nurses have the highest prevalence of these injuries among healthcare workers (Abadiga, Mosisa & Abate, 2020). Roughly 385,000 occupational sharp injury cases occur annually among healthcare workers in United States hospitals (CDC, 2019), while approximately one million cases occur in Europe (European Union's Information Agency for Occupational Safety and Health, as cited by CDC, 2019). In Iraq, a cross-sectional study conducted in Sulaimani revealed an alarmingly high incidence of sharps injuries among nurses, reaching 74.3% (Haji et al., 2024).

Contamination of equipment and needles can facilitate virus transmission, even after months (HASSAN et al., 2021). NSSIs pose a risk for over 20 bloodborne infections, accounting for a significant proportion of global infections. Hepatitis B, HCV, and HIV/AIDS are the most common, accounting for 36.7%, 39%, and 4.4% respectively (Hosseinipalangi et al., 2022).

Nurses in emergency departments face an increased risk of exposure to needlestick and sharp injuries (NSSIs) due to the fast-paced, high-stress environments and unpredictable nature of their work. During emergencies, nurses may inadvertently bypass standard precautions, thereby increasing their risk of exposure to sharps. Studies indicate that emergency departments account for a disproportionate number of reported needlestick injuries, often stemming from hurried procedures, insufficient protective measures, and inadequate communication during critical moments (Alsallum et al., 2024).

This study aims to evaluate nurses' compliance with sharps injury prevention guidelines in hospitals in Kirkuk, Iraq. To our knowledge, this is the first study assessing nurses' compliance in this specific city. By focusing on the prevalence of sharp-related injuries among healthcare workers and the factors influencing nurses' adherence to these critical guidelines, this research seeks to address a significant gap in the existing literature and ultimately contribute to safer healthcare practices.

Materials and Methods:

Study Design and Setting:

A cross-sectional survey was conducted in four hospitals in Kirkuk City from December 20, 2024, to March 15, 2025, to assess nurses' compliance with sharp injuries prevention guidelines. North of Baghdad is Kirkuk, which is about 148 miles (238 kilometers) away. The population is 1,483,788 people (Abid & Mahmood, 2023).

Sample Size and Sampling:

A total of 200 nurses working in the emergency departments of the selected hospitals were included using purposive, non-probability sampling (Kumait, 2015). The sample comprised 96 males (48%) and 104 females (52%). Inclusion criteria were nurses working morning and night shifts in the emergency departments. Nurses who declined participation, were unable to provide information due to illness or leave, or worked in ECG and casting rooms were excluded

Tools and Instruments:

Data were collected using two instruments: a structured questionnaire and an observational checklist. The questionnaire consisted of two sections: sociodemographic factors (age, gender, years of employment, education, marital status) and professional background (training, education, infection control activities). The observational checklist assessed compliance with sharp injury prevention guidelines using a three-point Likert scale (always, sometimes, never), scored 3, 2, and 1, respectively. Compliance levels were defined as follows: full compliance (≥2.34), partial compliance (1.68–2.33), and non-compliance (<1.67). The questionnaire's reliability was confirmed through inter-rater reliability testing,

and content validity was established by a panel of eight experts.

Ethical Considerations:

Ethical approval was obtained from the Ethics Committee of the College of Nursing, University of Kirkuk. Official permission was secured from the Kirkuk Health Directorate. Verbal informed consent was obtained from all participants.

Statistical analysis:

Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 26. Descriptive statistics were used to characterize the sample. Categorical variables were presented as percentages, and continuous variables as mean ± standard deviation. The Chi-square or Fisher's exact test was used to analyze the impact of basic factors on compliance levels, with significance set at $p<0.05$. Effect sizes were determined using Cramer's V.

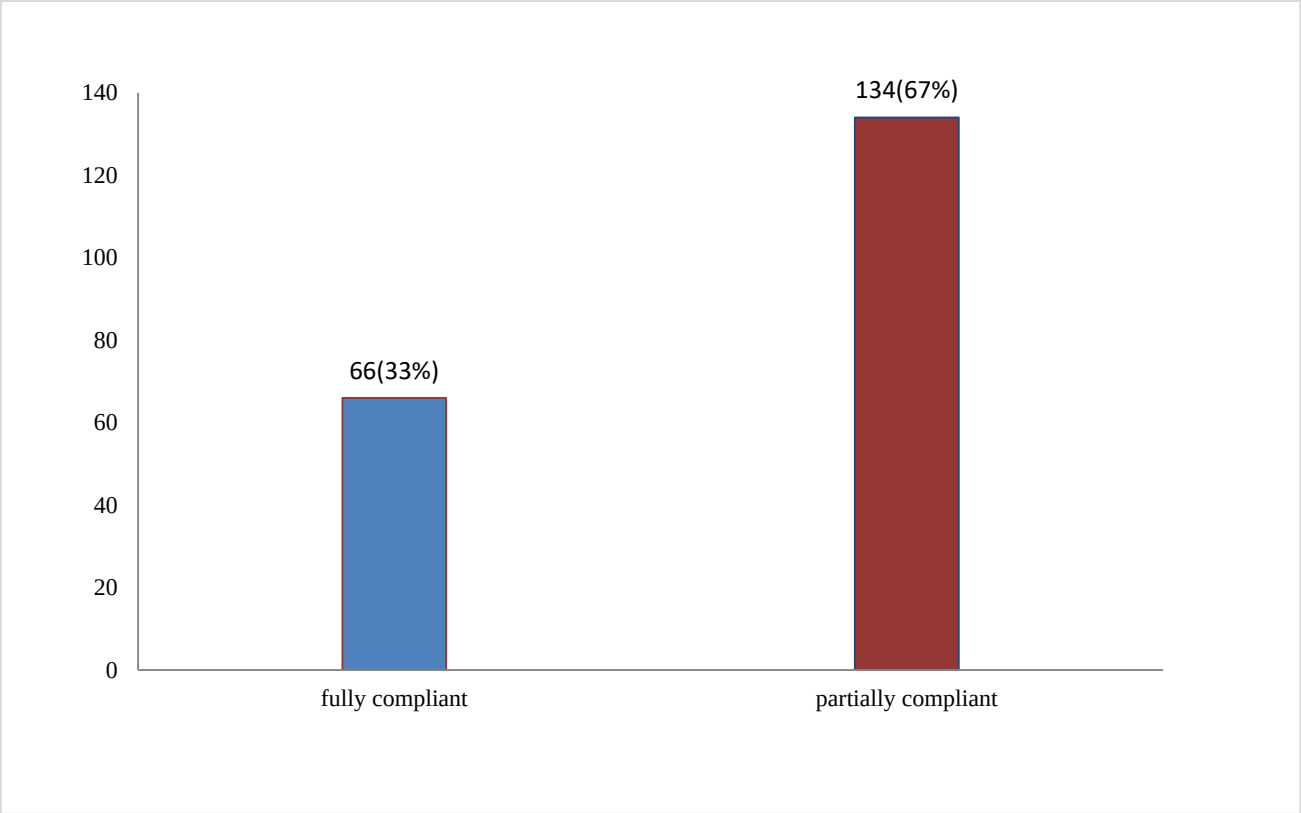

Fig 1. Distribution of the Study Sample (n=200) by Level of Compliance

Table 1. Assessment of compliance concerning certain sharp injury prevention guidelines for the study sample (n=200)

Items		Always	Sometimes	Never	Mean of Scores	Level of compliance
		No. (%)	No. (%)	No. (%)		
1.	Maintain visual contact with the procedure site	80(40)	120(60)	00	2.40	F.C
2.	Do not recap, bend, or break needles before disposal	48(24)	142(71)	10(5)	2.19	P.C
3.	Do not uncover the sharp object until it is time to use it	136(68)	64(32)	00	2.68	F.C
4.	Use the one-handed scope technique of recapping	4(2)	72(36)	124(62)	1.40	N.C
5.	Use a protective pad between fingers when breaking ampule	54(27)	58(29)	88(44)	1.83	P.C

6.	Plan safe handling and disposal before any procedure	42(21)	158(79)	00	2.21	P.C
7.	Do not hand a sharp object directly put it on a tray	118(59)	82(41)	00	2.59	F.C
8.	Use instruments rather than fingers to grasp needles	198(99)	2(1)	00	2.99	F.C
9.	Use of personal protective equipment during procedure	44(22)	82(41)	74(37)	1.85	P.C
10.	Dispose of used needles promptly in sharps disposal	38(19)	162(81)	00	2.19	P.C
11.	Avoid bringing hands close to opening of a sharp container	178(89)	22(11)	00	2.89	F.C
12.	Keep filled sharps containers awaiting in a secure area	20(10)	180(90)	00	2.10	P.C

(F.C.) fully compliant = scores (2.34-3), (P.C.) partially compliant = scores (1.68-2.33), (N.C.) non-compliant = <1.67

Table 2. Association between sociodemographic of nurses (n = 200) and compliance level

Variables	**Partially compliant**	**Fully compliant**	***P value***	**Effect size**
	n = 134 (67%)	**n= 66 (33%)**		
Age (Years)				
20-24	59 (29.5%)	36 (18%)	0.477**	0.137
25-29	51 (25.5%)	23 (11.5%)		
30-34	10 (5%)	4 (2%)		
35-39	9 (4.5%)	1 (0.5%)		
40-45	5 (2.5%)	2 (1%)		
Gender				
Male	70 (35%)	26 (13%)	0.05*	0.121
Female	64 (32%)	40 (20%)		
Years of employment				
(1-5)	104 (52%)	54 (27%)	0.636 **	0.106
(6-15)	21 (10.5%)	9 (4.5%)		
(16-25)	5 (2.5%)	3 (1.5%)		
(<25)	4 (2%)	0		
Level of Education				
Graduate of secondary nursing school	9 (4.5%)	3 (1.5%)	0.378 *	0.1
Graduate of medical institute	84 (42%)	48 (24%)		
Graduate of the college of nursing	41 (20.5%)	15 (7.55)		
Marital status				
Single	88 (44%)	32 (16%)	0.01**	0.222
Married	34 (17%)	27 (13.5%)		
Divorced	12 (6%)	5 (2.5%)		
Widowed	0	2 (1%)		
Educational training				

Yes	115 (57.5%)	43 (21.5%)	< 0.001*	0.239
No	19 (9.5%)	23 (11.5%)		

*Chi square, **Fisher's Exact

Results:

Among the 200 nurses surveyed, 96 (48%) were male and 104 (52%) were female. The majority 95 (47.5%) were aged 20–24 years, with a mean age of 25.89 ± 4.84 years.

The overall compliance with sharp injury prevention guidelines shows that two-thirds of the participants, 134 nurses (67%), were categorized as "partially compliant". In contrast, a smaller proportion, 66 nurses (33%), were classified as "fully compliant" (Figure 1).

Compliance assessment of specific sharp injury prevention guidelines revealed variability in compliance. Practices corresponding to items 1, 3, 7, 8, and 11 were categorized as fully compliant. Conversely, the guideline "Use the one-handed scoop technique of recapping" (item 4) was the only one identified as non-compliant. The remaining guidelines (items 2, 5, 6, 9, 10, and 12) are categorized as partially compliant (Table 1).

The association between various sociodemographic characteristics of nurses and their level of compliance was analyzed using Chi-square or Fisher's Exact tests. A statistically significant association was found with marital status ($p = 0.01$, effect size: 0.222). Participation in educational training also demonstrated a highly significant association with compliance ($p<0.001$, effect size:0.239). However, variables such as age ($p = 0.477$, effect size: 0.137), gender ($p = 0.05$, effect size: 0.121), years of employment ($p = 0.636$, effect size: 0.106), and level of education ($p = 0.378$, effect size 0.100) did not show statistically significant associations with nurses' compliance levels.

Discussion:

This study aimed to assess the level of compliance among staff nurses in preventing sharps injuries across four hospitals in Kirkuk City. The results indicated that most nurses were only partially compliant with injury prevention measures. This finding is consistent with a previous descriptive survey that observed staff nurses consistently maintained visual contact during procedures involving sharp instruments (Tayaben, 2015). This likely reflects nurses' awareness of the importance of avoiding, recognizing, and managing potential accidental injuries caused by sharp objects or needles. However, areas requiring improvement were also identified.

The current study found that more than half of nurses sometimes avoid recapping, bending, or breaking needles. This contrasts with another study that reported slightly less than half of nurses always recapped needles prior to disposal (Al-Mugheed et al., 2023). This disparity me be attributable to insufficient training in needlestick injury prevention within some hospital settings or the scarcity of adequate sharps disposal containers, potentially leading nurses to temporarily recap needles, which they might perceive as a "safe" interim technique until proper disposal is possible. Similarly, while the majority of nurses consistently avoid uncovering sharp objects until immediate use, aligning with CDC recommendations for preventing accidental injury, which highlight the importance of keeping sharp objects away from oneself and others at all times to prevent accidental injury (CDC, 2023). The study also revealed that more than half of participants did not employ the one-handed scoop technique for recapping. Al-Mugheed et al. (2023) observed a higher usage rate of this technique, suggesting that cultural and institutional differences in occupational safety norms may influence compliance within healthcare institutions.

Furthermore, nurses in this study were only partially compliant regarding the use of a protective pad between fingers when breaking an ampule and in planning safe handling and disposal before any procedure. These findings underscore the importance of adhering to Occupational Safety and Health Administration (OSHA)

recommendations, which advocate wrapping ampoule neck with a sterile gauze before opening and emphasize meticulous planning for safe medical procedures. Consistent with findings from another study, the current study confirmed that staff nurses typically utilize a designated neutral zone or tray for the placing and retrieving spent needles and employ instruments to grasp them (Tayaben, 2015). An optimal neutral zone device should be sufficiently large to contain sharps and prevent the transfer of contaminated sharps between individuals, thereby reducing the risk of accidental sharps injuries.

The current study found that most nurses sometimes wore personal protective equipment during procedures and promptly disposed of used needles in sharps containers. Conversely, Yusuf et al. (2023) found that the majority of nurses in Mogadishu always wore disposable gloves and promptly disposed of contaminated needles. Additionally, nurses in this study reported always avoiding bringing their hands close to the opening of sharps containers, a finding supported by Tayaben (2015). However, nurses sometimes left filled sharps containers waiting in secure areas, which Tayaben (2015) also observed.

The present study revealed that there were no significant statistical differences in compliance based on age, years of employment, and education. This result is consistent with Ayed et al. study (2015). The finding underscores the necessity of improving compliance with standard precautions and highlights the importance of ongoing specialized training programs on these measures to promote adherence to infection control protocols.

The current results indicate that respondents' compliance with guidelines was influenced by gender, with women demonstrating greater compliance than men. This finding is supported by a Turkish study (Topçu& Sert, 2023). The higher compliance observed among female respondents may be attributed to a greater tendency to follow organizational norms and regulations, as well as their increased caution regarding infection prevention. However, Cruz (2019) reported that males were more likely than females to comply. This highlights the variability of findings across different contexts.

Marital status also emerged as a significant predictor of compliance levels. Notably, a study conducted in Nepal contradicted the present findings regarding marital status (Thapa & Kaphle, 2021). Consistent with research from Ethiopia (Haile et al., 2017), the current study found that nurses who received training on standard precaution guidelines were more likely to consistently adhere to these guidelines compared to those who had not received such training. This may be explained by the fact that training enhances nurses' knowledge and skills, enabling them to understand fundamental principles and standards of practice. In contrast, an Iranian study found no correlation between training and compliance (Omer & Saleh, 2023).

It's important to note that the direct observation method used in this study has limitations. It is time-consuming, requires specialized and trained personnel, and may introduce observational bias, known as the Hawthorne effect, were individuals alter their behavior because they are being observed.

Conclusions:

Most nurses in Kirkuk hospitals partial comply with sharps injury prevention guidelines, highlighting the needs for continuous improvement programs. Hospitals must implement and enforce comprehensive policies, provide ongoing training, and supply adequate safety resources to enhance compliance and protect nurses from sharp-related injuries.

Acknowledgment:

The researchers would like to express their deep appreciation to the hospitals administrating team who helped in facilitating conduction of this study. Profound gratitude is also extended to the nursing staff who accepted to participate in the current study.

References:

1. Abadiga, M., Mosisa, G., & Abate, Y. (2020). Magnitude of needlestick and sharp injury and its associated factors among nurses working at health institutions in Western Ethiopia, 2020. *Risk Management and Healthcare Policy*, 1589-1602.
2. Abid, A. M., & Mahmood, N. A. (2023). Exploring factors behind skipping a healthy breakfast among primary school children in Kirkuk city, Iraq. *Rawal Medical Journal*, *48*(4), 846-846.
3. Al-Mugheed, K., Farghaly, S. M., Baghdadi, N. A., Oweidat, I., & Alzoubi, M. M. (2023). Incidence, knowledge, attitude and practice toward needle stick injury among nursing students in Saudi Arabia. *Frontiers in Public Health*, *11*, 1160680.
4. Alsallum, I. N. M., Lasloom, M. S. M., Al Ahmadi, M. F. S., Almurikhie, F. T., Almutairi, F. K., Daily, M. A. A., ... & Alruwaili, E. K. T. (2024). The Impact of Needlestick and Sharp Injuries on Nurses, Technicians, and Laboratory Technicians: Risk Factors, Prevention, and Management. *Journal of International Crisis and Risk Communication Research*, *7*(S12), 758.
5. American Nurses Association. (2008). *Workplace safety and needlestick injuries are top concern for nurses*. Retrieved August 10, 2010, from http://www.ana.org/
6. Ayed, A. (2015). Knowledge & compliance of nursing staff towards standard precautions in the Palestinian hospitals.
7. Centers for Disease Control and Prevention website. Sharps safety for healthcare settings. www.cdc.gov/sharpssafety/index.html. Updated February 11, 2015. Accessed October 20, 2023.
8. Cruz, J. P. (2019). Infection prevention climate and its influence on nursing students' compliance with standard precautions. *Journal of advanced nursing*, *75*(5), 1042-1052.
9. ECRI Institute. (2016). *Sharps injury prevention programs*. ECRI and the Institute for Safe Medication Practices PSO. https://www.ecri.org/Resources/AHCJ/2016_Resources/Sharps_Injury_Prevention_Programs.pdf
10. Haile, T. G., Engeda, E. H., & Abdo, A. A. (2017). Compliance with standard precautions and associated factors among healthcare workers in Gondar University Comprehensive Specialized Hospital, Northwest Ethiopia. *Journal of environmental and public health*, *2017*(1), 2050635.
11. Haji, R. M., Mohammed, S. M., Ali, S. H. R., & Mohammad, S. S. (2024). Incidence of Needle Stick Injuries and Behavior After Injuries Among Nurses in Sulaimani Hospitals. *Al-Rafidain Journal of Medical Sciences (ISSN 2789-3219)*, *6*(1), 232-238.
12. HASSAN, Z. A., ABD ALHUSIAN, S. S., & JASIM, W. M. (2021). Assessment of the Prevalence and Risk Factors of Viral Hepatitis B & C among patients attending gastrointestinal center in Kirkuk City, Iraq. *Age*, *154*(145), 51-5.

13. Hosseinipalangi, Z., Golmohammadi, Z., Ghashghaee, A., Ahmadi, N., Hosseinifard, H., Mejareh, Z. N., ... & Kan, F. P. (2022). Global, regional and national incidence and causes of needlestick injuries: a systematic review and meta-analysis. *Eastern Mediterranean Health Journal*, *28*(3).
14. Kumait, A. S. (2015). Assessment knowledge and life-style practices of patients with hypertension among their disease in rural area of Kirkuk city. *Kirkuk Journal of Science*, *10*(3).
15. Occupational Safety and Health Administration. (2016). *Controlling occupational exposure to hazardous drugs*. U.S. Department of Labor. https://www.osha.gov/hazardous-drugs/controlling-occex
16. Omer, Z. A., & Saleh, H. S. (2023). Assessment of nurses' knowledge attitude and practice regarding infection controls in intensive care unit at hospitals in Kirkuk City-Iraq. *Mosul Journal of Nursing (Print ISSN: 2311-8784 Online ISSN: 2663-0311)*, *11*(1), 113-122.
17. Tayaben, J. L. (2015). Compliance with sharps injury prevention guideline among nurses in tertiary care hospitals in the Philippines. *International Journal of Infection Control*, *11*(2).
18. Thapa, A., & Kaphle, H. P. (2021). Knowledge and Factors Associated with Compliance of Standard Precautions in Clinical Exposure among Proficiency Certificate Level Nursing Students of Pokhara, Nepal. *Journal of Health and Allied Sciences*, *11*(1), 51-58
19. Topçu, S., & Sert, Z. E. (2023). Turkish nursing students' compliance to standard precautions during the COVID-19 pandemic. *PeerJ*, *11*, e15056.
20. World Health Organization (WHO). Needlestick injuries. 2019; Available from: https://www.who.int/occupational_health/topics/needinjuries/en/
21. Yazid, J., Yaakub, R. M. R., Yusof, S., & Wilandika, A. (2023). Needle-stick incidents among nurses: knowledge, attitude, and practices in the workplace. *Asian Journal of Environment-Behaviour Studies*, *8*(25), 47-62.