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Original Article

Knowledge, Attitude, and Practice of Health Care Workers Regarding Needle Sticks and Sharp Injuries in Ranya Health Care Facilities

Blend Barzan Ameen; *Department of Family and Community Health Nursing, College of Nursing, University of Raparin, Ranyah, Sulaymaniyah, Kurdistan Region, Iraq* (Correspondence: blend.ameen@uor.edu.krd)
Ramand Muhammad Haji; *Department of Nursing, College of Health & Medical Technology, Sulaimani Polytechnic University, Sulaymaniyah, Kurdistan Region, Iraq*
Sharif Hama Babakr; *Department of Nursing, College of Nursing, University of Raparin, Ranyah, Sulaymaniyah, Kurdistan Region, Iraq*

ABSTRACT

Background and objective: Needlestick and sharps injuries are a common occupational hazard for healthcare workers, posing a significant risk of bloodborne pathogen transmission. Inadequate training and awareness exacerbate this risk. This study aimed to assess healthcare workers' knowledge, attitudes, and practices (KAP) regarding Needlestick and sharps injuries and to find out the relationship between KAP and demographic/work characteristics.

Method: A cross-sectional study was conducted in five healthcare facilities in Ranya Local Administration, Sulaimani Provenance, Iraq. 215 healthcare workers were selected by a non-probability convenience sampling method. The data were collected by a questionnaire form. The data were analysed using SPSS version 20, and the chi-square test was used to determine significant differences between categorical variables.

Result: Out of 215 respondents *%32.1* ،had a high level of knowledge, 60.9% had average knowledge, and 7% showed poor knowledge. Almost one-third of participants)37.2% (were found to have a good attitude, followed by a poor attitude)36.3%(, and 26.5% had an average attitude. While 45.6% had good safe needle stick and sharp injury practices, poor practices were shown among 44.7%. Significant statistical associations were found between demographic factors—including age, academic qualification, years of experience, and hospital type and at least one domain of knowledge, attitude, or practice ($P < 0.05$).

Conclusions: The study concludes that most healthcare workers have moderate knowledge, acceptable attitudes, and average practices. The findings highlight the need for targeted training and stricter safety protocols to enhance knowledge, attitudes, and practices regarding needlestick and sharp injuries.

Keywords: KAP study; Needlestick; Sharp Injuries; Infection prevention and control; Health Care Facilities.

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INTRODUCTION

Needle pricks and sharp injuries (NSIs) regularly injure healthcare workers (HCWs) and they facilitate the transmission of infections from one patient to another and among staff members [1]. It is estimated that two million injuries among HCWs occur annually [2]. Recent research indicates that the prevalence of Healthcare-Associated Infections (HAIs) is 6.5% in Europe [3], and 3.2% in the USA [4]. According to a systematic review study headed by the WHO, the prevalence of HAIs varies from 7.6% in high-income nations to 15.5% in low- and middle-income countries [5]. Numerous factors influence the spread of infections brought on by needlestick injuries such as administering excessive amounts of injections, not having enough disposable syringes, safer needle devices, containers for disposing of sharps, moving tools from hand to hand during procedures, and not being aware of the risks and receiving enough training [6]. Several studies show that healthcare personnel are not using preventive measures and have inadequate knowledge regarding the danger of needlestick injuries [7] and [2]. Other research showed that although most healthcare professionals were knowledgeable and had a good attitude, their infection control practices were inadequate [8]. In the Kurdistan Region (KRG), the survey conducted in Erbil city revealed that 57% of participants had moderate knowledge, 78.3% had a medium attitude, and 69.2% had a good practice [9]. In Iraq, particularly in the KRG, there is no accurate data available on needle pricks and sharp injuries. The working conditions and safety of healthcare personnel are often neglected, especially in developing countries. It is noteworthy that during their employment, more than two-thirds of healthcare workers encounter bodily fluids like blood [10].

The risk of needlesticks injuries and the underreporting of these injuries by medical personnel is high. It's possible that some healthcare professionals are unaware of the severe dangers of bloodborne illnesses, and others may not know how to report an incidence properly. Furthermore, their busy schedules frequently give them little time to finish the required paperwork. Therefore, the goal of the current study is to assess the knowledge, attitude, and practice regarding needlestick injuries among healthcare workers and their associated factors in Rania hospitals.

METHODS

A cross-sectional study design was conducted in five tertiary healthcare facilities to determine the healthcare staff's knowledge, attitude, and practice regarding needle sticks and sharp injuries in Rania City, Sulaimani governorate, Iraq, from September 2022 to March 2023. The sample size for this study was estimated using the formula for a single proportion: where is the Z-score corresponding to a 95% confidence level 1.96, is the expected prevalence of knowledge, attitude, or practice regarding needle stick injuries (assumed to be 50% to maximize variability), and is the desired margin of error 5%. This calculation yielded a minimum sample size of 385. However, because of logistical and practical constraints, the final sample size of this study consisted of 215 healthcare workers. This limitation is acknowledged, and the findings should be interpreted with consideration of the smaller sample size. All 215 healthcare staff who were directly involved in patient care, including nurses, physicians, and laboratory staff, and who faced a risk of exposure to needle pricks and sharp objects while dealing with patients. Staff whose responsibilities did not include direct contact with patients, such as administrative tasks, were excluded from this study.

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A non-probability convenience sampling method was used to select healthcare staff for participation in the study. The data were collected using a developed questionnaire form based on a literature review of similar studies [6], [9], and [11]. The questionnaire consisted of two parts. The first part focused on the demographic and work characteristics of the healthcare workers. The second part was the assessment portion, which included three sections. The first section assessed healthcare workers' knowledge of needle stick and sharp injuries through 10 questions, where correct answers were assigned 1 score and incorrect answers were given 0 scores. The second section assessed healthcare workers' attitudes using 5 attitude statements, where positive attitudes (agree) were scored as 1 point and negative attitudes (disagree) were also given 0 points. The third section evaluated healthcare workers' practices regarding needlestick and sharp injuries through 5 practice questions. For correct practices, scores were assigned as follows: “always” received 3 points, “sometimes” received 2 points, and “never” received 1 point. For incorrect practices, the scoring was reversed, where “never” received 3 points, “sometimes” received 2 points, and “always” received 1 point. After scoring, the total sum of scores was converted into percentages and categorized as follows: poor for scores below 50%, average for scores between 50–75%, and good for scores above 75%. The questionnaire was validated by seven experts, and a reliability test was performed through a pilot study conducted on 10% of the total study sample size. The pilot study aimed to identify and address any obstacles and ensure the feasibility of the research process. The Cronbach's alpha test indicated an acceptable consistency level of 0.72 for the collected data. The collected data were analyzed using SPSS software version 25.

Descriptive measures, including frequency and percentage, were generated to describe the data. The Chi-square test was used to determine significant differences between categorical variables. For data sets with fewer than 10 cases, Fisher’s exact test was used instead of the Chi-square test. A significance level of ≤ 0.05 was considered the threshold for statistical significance.

RESULTS

A total of 215 HCWs in five tertiary healthcare facilities participated in the study. The age of healthcare workers ranged from 20 years old to 55 years old with a mean ± SD (28.43 ±5.67) and the majority of participants 137 (63.7%) were aged 25–35 years old. 86 (40.8%) were male; 97 (48.7%) had diploma qualifications, and 96 (48.2%) had a bachelor's degree. Most of the participants were nurses, 143 (67.1%), followed by laboratory workers 48 (22.5%), and physicians 22 (10.3%). 108 (50.7%) on temporary contracts and 105 (49.3%) on permanent contracts. Additionally, the majority of HCWs, 70 (34.1%) worked in the ward unit, followed by the emergency department at 55 (26.8%), the laboratory at 49 (23.9%), and the operation room at 24 (11.7%). The smallest group 7 (3.4%), worked in ICU/CCU. Lastly, most healthcare workers were employed in governmental hospitals 170 (79.1%), while 10 (4.7%) worked in private hospitals, and a minority 35 (16.3%) were employed in both hospital types. Table 1.

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Table1: Socio-demographic characteristics of study samples

Socio-demographic characteristics	Categories	Frequency	Percentage
Age groups (years)	20–24	55	(25.6)
	25–35	137	(63.7)
	>35	23	(10.7)
	Mean ± SD	28.43 ± 5.67	
Gender	Male	86	(40.8)
	Female	129	(59.2)
Academic Qualification	Diploma	97	(48.7)
	Bachelor's Degree	96	(48.2)
	Others	22	(3.1)
Profession	Nurses	143	(67.1)
	Laboratory Workers	48	(22.5)
	Physicians	22	(10.3)
Employment Status	Temporary Contract	108	(50.7)
	Permanent Contract	105	(49.3)
Work Unit	Ward Unit	70	(34.1)
	Emergency Department	55	(26.8)
	Laboratory	49	(23.9)
	Operation Room	24	(11.7)
	ICU/CCU	7	(3.4)
Hospital Type	Governmental	170	(79.1)
	Private	10	(4.7)
	Both	35	(16.3)

The study observed that the assessment of the healthcare worker's knowledge ranged from 33.3 to 88.9 with a mean ±SD (66.54 ±11.94). When categorized, the majority 131 (60.9%) had average knowledge and 69 (32.1%) were categorized as having good knowledge while a small group 15 (7%) were categorized as having poor knowledge. While the study shows the assessment percentage of the healthcare worker's attitude ranged from 16.7 to 100 with mean ±SD (66.35 ±20.5). The distribution of healthcare workers' attitude levels showed that most of them 80 (37.2%) were found to have a high attitude followed by a poor attitude 78 (36.3%), while 57 (26.5%) had an average attitude. In addition, the practice assessment of healthcare workers ranged up to 94.4 with mean ±SD (55.27 ±15.46). The groups ranked as follows, average practices category was first 98 (45.6%) followed by poor practices 96 (44.7%) reported while only 21 (9.8%) of the participants had a good level. Table 2

Table 2: Knowledge, attitude and practice assessment of healthcare workers regarding needle stick and sharp injuries (n = 215)

KAP	Assessment	Statistics / Categories	Frequency	Percentage
Knowledge	Knowledge Score (%)	Mean ± SD	66.54 ± 11.94	
		Range (Min – Max)	33.3 ± 88.9	
	Knowledge Category	Poor (<50)	15	(7)
		Average (50–75)	131	(60.9)
		Good (>75)	69	(32.1)
	Total		215	(100)
Attitude	Attitude Score (%)	Mean ± SD	66.35 ± 20.50	-
		Range (Min – Max)	16.7 - 100	-
	Attitude Level	Poor (<50)	78	(36.3)
		Average (50–75)	57	(26.5)
		Good (>75)	80	(37.2)
	Total		215	(100)
Practice	Practice Score (%)	Mean ± SD	55.27 ± 15.46	-
		Range (Min – Max)	22.2 - 94.4	-
	Practice Level	Poor (<50)	96	(44.7)
		Average (50–75)	98	(45.6)
		Good (>75)	21	(9.8)
	Total		215	(100)

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Table 3. shows the association between knowledge categories and demographic/ work characteristics. For the healthcare workers' different age groups, the data showed that the workers between 25-35 years had the highest percentages of knowledge for both the average level 72 (55%) and good level 55 (79.7%) while the workers over 35 years had the lowest percentage in the poor level 1 (6.7%) with the highly statistically significant association (P-value 0.005). Regarding sex effect, females slightly outperformed males in the good level 40 (58%) and had a lower proportion in the poor level 9 (60%) but with non-statistically significant differences at (P-value 0.966).In relation to the worker's academic qualifications' effects on knowledge, the workers with a bachelor's degree had the highest percentage in the good knowledge level 45 (66.2%), while those with a diploma had the highest percentage rate at the poor level 8 (72.7%). The difference in knowledge scores across healthcare workers' academic qualification levels was statistically highly significant (P-value 0.004). Among healthcare workers' different titles, nurses showed the highest percentage in the good knowledge level 47 (68.1%) and a relatively low percentage rate in the poor level 9 (60%), but the P-value of 0.645 did not show a statistically significant association. Regarding the effect of workers' experience, the data showed that the workers with the least experiences (<5 years) showed the highest percentage of the average level 54 (47.4%) and good level 32 (53.3%) knowledge with the statistically significant difference (P-value 0.031). For the worker's contract type, permanent staff had a higher percentage of good knowledge level 37 (53.6%), while temporary staff were more prevalent at the poor level 11 (73.3%). However, this difference was not statistically significant (P-value 0.166).About hospital working departments, the ward had the highest percentage in the average level 37 (29.8%) and good knowledge level 29 (42.6%), with a non-statistically significant association at (P-value 0.862). Finally, governmental hospital employees were dominant across all categories, particularly in the good knowledge level 50 (72.5%) and this association was statistically significant (P-value 0.045). Regarding the distribution of the worker's attitude percentage score with the healthcare demographic and hospital characteristics groups, it showed that the healthcare workers aged between 25 and 35 years had the highest percentages for both the average level 43 (75.4%) and good level 45 (56.3%) attitude categories, while the >35 years' group had the lowest percentage in the poor category 5 (6.4%). These associations were statistically significant with a P-value of 0.027. Regarding sex differences, females had slightly higher percentage scores in the good attitude category 46 (59.7%) compared to males 31 (40.3%). These differences between the worker's sex and the attitude percentage scores were not statistically significant (P-value 0.774).For the effect of the worker's academic qualifications, those with a bachelor's degree had the highest percentage in the good attitude level 44 (58.7%), while those with a diploma dominated the poor attitude category 46 (64.8%). This difference in the various workers' academic qualifications on the worker's attitude category level was highly statistically significant at (P-value 0.003). Among different work titles, nurses showed the highest good attitude level 53 (67.1%) and were also more prevalent in the poor category 55 (71.4%). However, the associations were not statistically significant (P-value 0.077).Regarding the effect of the worker's experience, workers with the lowest

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experience (<5 years) had the highest score in the good attitude percentage 40 (59.7%), while those with the most experience years (>15) had the lowest percentage rate in the poor category 4 (5.8%). However, it was not statistically significant (P-value 0.213).

For the workers' contract types, permanent staff had a slightly higher good attitude percentage of 42 (53.2%) compared to temporary staff 37 (46.8%), but this was not statistically significant (P-value 0.3).

Table 3: Association between knowledge categories and demographic/work characteristics

		Knowledge categories						
		Poor		Average		Good		P-value
Variables		Frequency	(%)	Frequency	(%)	Frequency	(%)	
Age groups	< 25	4	(26.7)	39	(29.8)	12	(17.4)	
	25-35	10	(66.7)	72	(55)	55	(79.7)	0.005*
	> 35	1	(6.7)	20	(15.3)	2	(2.9)	
Sex	Male	6	(40)	51	(40.2)	29	(42)	0.966
	Female	9	(60)	76	(59.8)	40	(58)	
Academic qualification	Preparatory	0	(0)	2	(1.7)	0	(0)	
	Diploma	8	(72.7)	68	(56.7)	21	(30.9)	0.004*
	Bachelor's	3	(27.3)	48	(40)	45	(66.2)	
	Post-graduate	0	(0)	2	(1.7)	2	(2.9)	
Work title	Physician	3	(20)	11	(8.5)	8	(11.6)	
	Nurse	9	(60)	87	(67.4)	47	(68.1)	0.645
	Laboratory worker	3	(20)	31	(24)	14	(20.3)	
Experience groups (year)	< 5	9	(75)	54	(47.4)	32	(53.3)	
	5-15	3	(25)	44	(38.6)	27	(45)	0.031*
	>15	0	(0)	16	(14)	1	(1.7)	
Working Contract Type	Permanent	4	(26.7)	64	(49.6)	37	(53.6)	0.166
	Temporary	11	(73.3)	65	(50.4)	32	(46.4)	
Hospital working unit	Ward	4	(30.8)	37	(29.8)	29	(42.6)	
	Laboratory	3	(23.1)	31	(25)	15	(22.1)	
	Emergency	4	(30.8)	36	(29)	15	(22.1)	0.862
	Operation room	2	(15.4)	15	(12.1)	7	(10.3)	
	ICU/ CCU	0	(0)	5	(4)	2	(2.9)	
Type of hospital	Governmental	14	(93.3)	106	(80.9)	50	(72.5)	
	Private	0	(0)	9	(6.9)	1	(1.4)	0.045*
	Both	1	(6.7)	16	(12.2)	18	(26.1)	

* Significant differences

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For the hospital working units, the emergency department workers had the highest percentage of good attitude levels 29 (37.2%), while the ICU/CCU had the lowest percentage rate in the poor category 1 (1.4%). However, there was no statistical association at (P-value 0.097).

Finally, governmental hospital employees dominated all categories, particularly the good attitude levels while employees working in private hospitals had the lowest percentage at the poor level 4 (5.1%). Therefore, there was no statistical significance with a P-value of 0.459 (Table 4).

Table 4: Association between attitude categories and demographic/work characteristics

Variables		Attitude categories						P-value
		Poor		Average		Good		
		Frequency	(%)	Frequency	(%)	Frequency	(%)	
Age groups	> 25	24	(30.8)	6	(10.5)	25	(31.3)	
	35-25	49	(62.8)	43	(75.4)	45	(56.3)	*0.027
	< 35	5	(6.4)	8	(14)	10	(12.5)	
Sex	Male	34	(43.6)	21	(37.5)	31	(40.3)	0.774
	Female	44	(56.4)	35	(62.5)	46	(59.7)	
Academic qualification	Preparatory	2	(2.8)	0	(0)	0	(0)	
	Diploma	46	(64.8)	22	(41.5)	29	(38.7)	*0.003
	Bachelor's	22	(31)	30	(56.6)	44	(58.7)	
	Post-graduate	1	(1.4)	1	(1.9)	2	(2.7)	
Work title	Physician	5	(6.5)	4	(7)	13	(16.5)	
	Nurse	55	(71.4)	35	(61.4)	53	(67.1)	0.077
	Laboratory worker	17	(22.1)	18	(31.6)	13	(16.5)	
Experience groups	> 5	33	(47.8)	22	(44)	40	(59.7)	
(year)	15-5	32	(46.4)	22	(44)	20	(29.9)	0.213
	<15	4	(5.8)	6	(12)	7	(10.4)	
Working Contract Type	Permanent	33	(42.3)	30	(53.6)	42	(53.2)	0.30
	Temporary	45	(57.7)	26	(46.4)	37	(46.8)	
Hospital working unit	Ward	32	(43.8)	18	(33.3)	20	(25.6)	
	Laboratory	18	(24.7)	17	(31.5)	14	(17.9)	
	Emergency	15	(20.5)	11	(20.4)	29	(37.2)	0.097
	Operation room	7	(9.6)	6	(11.1)	11	(14.1)	
	ICU/ CCU	1	(1.4)	2	(3.7)	4	(5.1)	
Type of hospital	Governmental	66	(84.6)	44	(77.2)	60	(75)	
	Private	4	(5.1)	2	(3.5)	4	(5)	0.459
	Both	8	(10.3)	11	(19.3)	16	(20)	

*Significant differences

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Regarding practical percentage scores, Table 5 shows that healthcare workers aged 25–35 years had the highest percentages in both the average [59 (60.2%)] and good [18 (85.7%)] practice categories, whereas the oldest age group (>35 years) had the lowest percentage in the poor practice category [10 (10.4%)]. However, there was an association at (P-value 0.310). Regarding the sex differences, females had slightly higher percentages in the average 60 (62.5%) and good 12 (57.1%) practice categories compared to males, who had lower percentages in the poor category 41 (43.6%). Also, the sex or practice scores were not statistically significant (P-value 0.678).For the effect of the worker's academic qualifications, those with a bachelor's degree had the highest score percentage rate in the good practice level 14 (70%), while those with a diploma degree dominated the poor category 51 (57.3%) with a statistically significant at (P-value 0.037). Among different work titles, nurses dominated all three levels: good 11 (52.4%), average 63 (64.3%) and poor 69 (73.4%) while the physician had the lowest percentage in the poor level 8 (8.5%). However, the differences among different work titles were not Statistically significant (P-value 0.136) Regarding the effect of worker experience, workers with the lowest experience (<5 years) had the highest good practice 12 (63.2%) and average 12 (63.2%) levels while the most experienced workers (>15 years) had the lowest percentage in the poor level 9 (10.3%). However, these associations between healthcare workers' experience groups were not statistically significant (P-value 0.498). For contract type, both permanent and temporary staff showed very similar distributions in all practice categories, with no statistically significant association (P-value 0.977). For hospital working units, the ward workers had the highest practice percentage in the good 7 (33.3%) and average 30 (32.3%) categories while the ICU/CCU workers had the lowest percentages across all categories. However, the association between workers' departments was not statistically significant (P-value 0.48). Finally, governmental hospital employees dominated all practice categories while private hospital employees had the lowest percentage in all categories with statistically significant association at (P-value 0.017). Table 3.

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Table 5: Association between practice categories and demographic/work characteristics

Variables		Practice categories						P-value
		Poor		Average		Good		
		Frequency	(%)	Frequency	(%)	Frequency	(%)	
Age groups	> 25	26	(27.1)	27	(27.6)	2	(9.5)	
	35-25	60	(62.5)	59	(60.2)	18	(85.7)	0.310
	< 35	10	(10.4)	12	(12.2)	1	(4.8)	
Sex	Male	41	(43.6)	36	(37.5)	9	(42.9)	0.678
	Female	53	(56.4)	60	(62.5)	12	(57.1)	
Academic qualification	Preparatory	2	(2.2)	0	(0)	0	(0)	
	Diploma	51	(57.3)	41	(45.6)	5	(25)	*0.037
	Bachelor's	35	(39.3)	47	(52.2)	14	(70)	
	Post-graduate	1	(1.1)	2	(2.2)	1	(5)	
Work title	Physician	8	(8.5)	9	(9.2)	5	(23.8)	
	Nurse	69	(73.4)	63	(64.3)	11	(52.4)	0.136
	Laboratory worker	17	(18.1)	26	(26.5)	5	(23.8)	
Experience groups	> 5	40	(46.0)	43	(53.8)	12	(63.2)	
(year)	15-5	38	(43.7)	29	(36.3)	7	(36.8)	0.498
	<15	9	(10.3)	8	(10)	0	(0)	
Working Contract Type	Permanent	47	(49)	48	(50)	10	(47.6)	0.977
	Temporary	49	(51)	48	(50)	11	(52.4)	
Hospital working unit	Ward	33	(36.3)	30	(32.3)	7	(33.3)	
	Laboratory	17	(18.7)	26	(28)	6	(28.6)	
	Emergency	30	(33)	21	(22.6)	4	(19)	0.48
	Operation room	7	(7.7)	14	(15.1)	3	(14.3)	
	ICU/ CCU	4	(4.4)	2	(2.2)	1	(4.8)	
Type of hospital	Governmental	83	(86.5)	74	(75.5)	13	(61.9)	
	Private	5	(5.2)	3	(3.1)	2	(9.5)	*0.017
	Both	8	(8.3)	21	(21.4)	6	(28.6)	

*Significant differences

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DISCUSSION

Healthcare workers are known to be at risk for occupational exposure to bloodborne viruses, including HIV, hepatitis B, and hepatitis C, and other pathogenic exposures connected to hospitals. Additionally, the KAP of healthcare workers is essential in limiting exposure to bloodborne viruses at work and stopping the spread of infections between them and hospital patients. The result of this study found that most HCWs 60.9% had moderate knowledge; 32.1% had good knowledge while only 7% of them were categorised as having poor knowledge. This is back to the fact that the majority of HCWs had high academic qualifications 99% from diploma and above. Further, this result is supported by (8), which found that in general, among 385 participant HCWs, 232 (81.4%) had good knowledge, 47 (16.5%) had moderate knowledge, and 6 (2.1%) had poor knowledge about infection prevention. The study revealed an association between age, academic qualification, years of experience, and type of hospital while no association was found with sex, work title, type of working contract, and unit of work with knowledge of infection prevention among healthcare workers at P-value = 0.005. The age group 25–35 showed the highest percentage of knowledge more than half the percentage. Regarding academic qualifications, healthcare workers holding bachelor's degrees showed the highest percentage of good knowledge, and a significant association was observed among those with less than five years of work experience. In addition, workers in governmental hospitals were more likely to fall into poor knowledge compared to those working in both hospitals. This may be because private sector workers constantly need to increase their health information to maintain their jobs, and also because most private hospitals have restrictive rules regarding health workers' adherence to occupational safety rules. A study on knowledge of standard precautions among healthcare professionals in Saudi Arabia found no significant difference in knowledge between male and female groups [12]. Additionally, [3] indicated no association between knowledge of Infection prevention among healthcare professionals and age, sex, marital status, religion or duration of work for the respondents. Concerning attitude of healthcare workers. The study illustrated that less than forty percent (37.2%) were found to have a positive attitude, nearly the same percentage had a poor attitude 36.3%, and slightly more than a quarter had an average attitude 26.5%. Which is considerably the same with studies conducted in Iran [14] and Jordon [5]. The way that HCWs see risk varies. While some individuals may be more prone to underestimating risks, others may exhibit greater risk aversion. Attitudes toward needlestick injuries (NSIs) can also be influenced by personal perceptions of responsibility, safety, and adherence to protocols. Healthcare professionals may be more or less likely to estimate the hazards of NSIs depending on other criteria, such as age, academic qualification and years of experience. Table 3 indicated the positive association between HCWs' attitude and their age, academic qualification, worker title, years of experience and unit of working. With regard to the HCWs' practice, the study found that 45.6% of HCWs had a good practice and 44.7% of them had poor practices additionally, less than 10% of the participants had a good level. (figure 1). And overall, more than half of the study sample have good practice, while [16] found that 73.3% of HCWs had a good practice, and another study in India by [17] reported good practice among 91% of nurses in India. Compared with the

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other studies, findings conducted in Singapore66.3% [18], Ethiopia (60.2%) [19], Northern Cyprus 30.9% [20], and Vietnam (46.1%) [21] were almost identical. Several variables at work affect whether each person works correctly or not, such as certain healthcare personnel not being adequately instructed during their initial education or working at the hospital on safe injection techniques, appropriate disposal of sharps, and post-exposure measures; Time limitations and workloads may cause shortcuts and safety protocol violations. Additionally, some healthcare workers may develop routines and habits that are hard to break, even if they are risky; Insufficient resources, such as inadequate sharps containers or personal protective equipment (PPE), can make it difficult to follow safe procedures. Lastly, the study also showed that there is a significant association between the HCWs' practice regarding needle prick injury and the type of hospital. Healthcare professionals working in government hospitals were more likely to report poor practices 86.5% compared to those working in both types of hospitals, 28.6% (P-value = 0.017) and a weak association with HCWs' qualifications. The highest percentage of good practices was 70% among healthcare personnel with bachelor's degrees, compared to 25% among those with diplomas (P-value = 0.037) while no association was found with age, sex, work title, experience groups (year), and unit of working. The result is inconsistent with AlKhaldi et al.'s study, which found that years of experience and training in infection control were strongly linked to good practice. This result is inconsistent with [22], which found that years of experience and training in infection control were strongly linked to good practice. Same as [23], found that sex, age, work experience, and training programs are all strongly correlated with practice.

CONCLUSION

The study concludes that most of the healthcare workers in Rania hospitals have moderate knowledge, with good knowledge linked to younger age, higher academic qualifications, and less work experience. Attitudes varied among healthcare workers; while most achieved acceptable scores, the percentage falling into the poor category remained notably high and the positive attitude was influenced by factors such as age, qualifications, and job roles. Overall, practices were generally average, with poor practices more prevalent in government hospitals and associated with healthcare workers' academic background and hospital type.
RECOMMENDATION Based on the findings, it is recommended to implement targeted training programs focusing on needlestick and sharp injury prevention for all HCWs, especially those with lower academic qualifications and those working in governmental hospitals. Training should emphasize the importance of safe practices and address attitude gaps. Regular workshops and refresher courses can help reinforce positive attitudes and improve overall safety protocols. Additionally, hospitals should consider stricter enforcement of safety guidelines and provide ongoing support to ensure sustained improvement in knowledge, attitudes, and practices among healthcare workers. ETHICAL CONSIDERATIONS Ethical approval for the study was obtained from the University of Raparin/ College of Nursing and the Ranya General Directorate of Health (Ref. No: 410/29/7, dated August 7, 2022). Additionally, oral consent was obtained from all participants. Participants were assured that their data would remain anonymous and be used solely for research purposes.

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CONFLICT OF INTEREST

The authors report no conflict of interest.

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