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Magnitude of Needle Stick and Sharp Injury with Associated Factors Among Hospital Health Care Workers in Tikrit City

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ABSTRACT

Background: Health care workers are at risk of acquiring blood borne pathogen infections through exposure to blood or infectious body fluids mainly through exposure for needle stick or sharp injury.
Objectives: To assess the problem of needle stick and sharps injuries among health care workers at Tikrit city hospitals.
The Aim: For prevention and control of needle stick injury to keep health care workers safe from blood borne diseases.
Material and Methods: A cross-sectional study performed on a sample composed of 280 health care workers (HCWs) in Saladin and Tikrit Emergency hospitals during the period from March to December 2021. Well-structured questionnaire.
Results: The study revealed that the health care workers were at high risk of needle stick injury by (70.4%) with the highest percentage were at age more than 40 years.
Conclusion: There is a very high rate of accidental needle stick injury among health care workers by hollow bore needle was common procedure especially during recapping of needles.

Keywords- needle stick injury, blood born infection, post exposure prophylaxis, Health worker, syringe needle.

I. INTRODUCTION

An impairment brought on by a needle stick, a broken ampoule, a cannula, a surgical blade, or other sharp objects contaminated with bodily fluids is referred to as a sharp injury[(1)].

NSIs account for about one third of all occupational accidents encountered by HCWs in a health care setting[(2)]. The majority of NSI infections occur in developing countries[(3)].

Many factors can leading/predisposing to NSIs, the most common cause is recapping of needles and one of the main risk factors is failure to observe safety precautions.

All HCWs may be exposed to work-related risks that include infections from biological samples and contaminated equipment[(4)] but Clinical laboratory employees have been demonstrated to have a high rate of bacterial occupational infection [(5-7)]. These injuries are still underreported [(8)], particularly those that take place in developing nations[(9)].

NSIs may lead to psychological distress, fear, tension, anxiety in health care workers [(10)], depression, and post-traumatic stress disorder[(11)].

II. MATERIAL AND METHODS

The study was conducted at the general hospitals (Saladin hospital and Tikrit emergency hospital) in Tikrit City, From30/March-30/December 2021.

The health care workers (resident doctors, nurses, laboratory workers, skilled midwives, and others) of any age and either gender who were in contact with the patients and their blood and body fluids, were involved in the study. They were enrolled from different departments of the hospitals including all branches of surgery,

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gynecological and obstetrical department, branches of medical department, emergency departments, pediatrics, in addition to laboratory and blood bank unit and other units. Used a questionnaire which was adopted from related study–occupational.

III. RESULTS

1- The Distribution of Occurrence of NSIs in the Sampled HCWs.

The results revealed the frequency of NSIs among the HCWs was197 (70.4%) out of 280. (Figure 1).

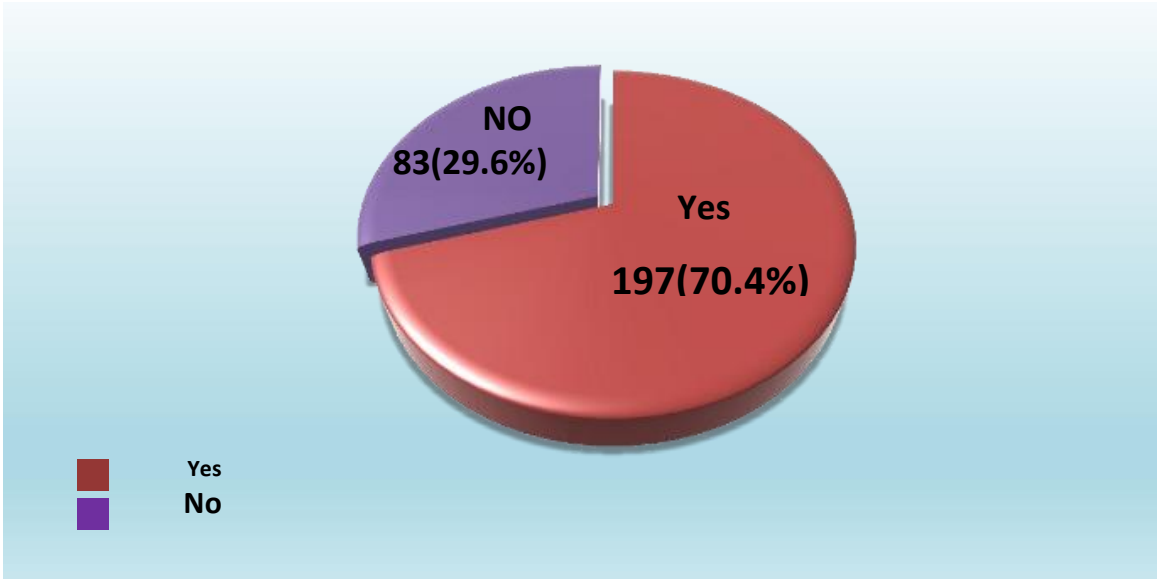

Figure1: The Distribution of Occurrence of NSIs in the Sampled HCWs.

2-Distribution of NSI with Socio-Demographic Characteristic

The peak of HCWs aged > 40 were exposing for NSIs by 23 (100%), there is a statistical significant association of age and NSI (c^2=28.7,d.f.=3,P=0.001) (table1). NSI was prominently among male. The sex were significantly associated with NSI (c^2=8.9, d.f.=1, P=0.003).

NSI higher among gynecology and obstetrics 26 (78.8%), and emergency HCWs 56 (76.7 %).

NSI with ≥ 4years work were with significant higher NSI (c^2=29.3, d.f.=1, P=0.001) and prone higher among those with two shifts (c^2=37.7,d.f.=1, p=0.001).

Table1: Distribution of NSI with Socio-Demographic Characteristic

Socio-Demographic Characteristic. (n=280)		Accidental NSI				P. value
		Yes		No		
		No.	%	No.	%	
Age(years)	20---	118	60.8	76	39.2	0.0001
	30---	56	88.9	7	11.1	
	40---	13	100	-	-	
	50---59	10	100	-	-	
Sex	Male	84	80.8	20	19.2	0.003
	Female	113	64.2	63	35.8	
Professions	Physician	80	87.9	11	12.1	0.0001
	Paramedical HCWs	117	61.9	72	38.1	
Department	Medicine	26	74.3	9	25.7	0.5
	Surgery	42	61.8	26	38.2	
	Gynecology& Obstetric	26	78.8	7	21.2	

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	Pediatrics	22	73.3	8	26.7	
	Emergency	56	76.7	17	23.3	
	Laboratory	21	58.3	15	41.7	
	Others	4	80.0	1	20.0	
Working Years	≤4year	122	61	78	39	0.0001
	>4years	75	93.8	5	6.2	
Duties	One shift	80	54.4	67	45.6	0.0001
	Two shifts	117	95.9	2	4.1	

3-Distribution of Participants According to the Number of NSI and Demographic Characteristics.

HCWs were exposed for NSI directly proportion with the ages > 50 years were exposing higher for > 5 times and a statistical significant association of age and sex with number of NSI (c^2=24.4, d.f.=3, p=0.0001), and (c^2=5.1, d.f.=1, p=0.05) respectively and also with working years (c^2=19.9, d.f.=1, p=0.001), and duties (c^2=5,d.f.=1,p=0.05)

Table2: Distribution of Participants According to the Number of NSI and Demographic Characteristics.

Socio-Demographic Characteristic. (n=197)		Number of NSI				c^2,d.f.,Pvalue
		≤5times		>5times		
		No.	%	No.	%	
Age(years)	20---	88	74.5	30	25.5	24.4, 3,P=0.0001
	30---	33	58.9	23	41.1	
	40---	5	38.5	8	61.5	
	50---59	-	-	10	100	
Sex	Male	44	52.4	40	47.6	5.1,1,P=0.05
	Female	41	36.3	72	63.7	
Professions	Physician	53	66.3	27	33.7	0.3,1,P=0.5
	Paramedical HCW	73	62.4	44	37.6	
Department	Medicine	17	65.4	9	34.6	10.2,6,P=0.5
	Surgery	24	57.1	18	42.9	
	Gynecology& Obstet.	11	42.3	15	57.7	
	Pediatrics	16	72.7	6	27.3	
	Emergency	41	73.2	15	26.8	
	Laboratory	16	76.2	5	23.8	
	Others	3	75.0	1	25.0	
Working Years	≤4year	93	76.2	29	23.8	19.9,1,P=0.001
	>4years	34	45.3	41	54.7	
Duties	One shift	52	65.0	28	35.0	5,1,P=0.05
	Two shifts	57	48.7	60	51.3	

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4-The Distribution of Participants According to Type of NSIs

It showed that 135 (68.5%) of HCWs had their injuries while using syringe hollow bore needle and the rest were by surgical suture needle.

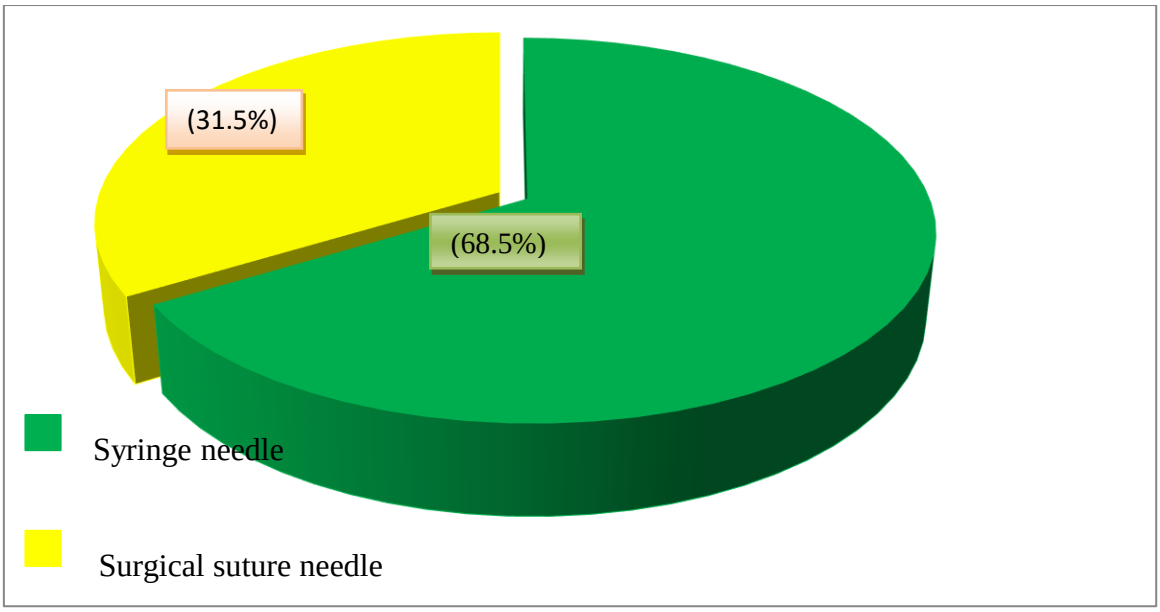

Figure (2): The Distribution According to the Type of NSIs

5- Distribution of Participants According to Stage of NSIs.

As in the line of literature, recapping needle was the commonest stage of blood and needle handling that may led to NSI and represented by (63.7%),(table 3).

Table3: Distribution of Participants According to Procedure of NSIs

NSI procedure (n=135)	no.	%
Removing needle cap	21	15.6
Recapping needle	86	63.7
Inserting needle into vein	13	9.6
Removing needle	13	9.6
Throwing needle	2	1.5

6- Distribution of Participants According to Post-exposure Prophylaxis Measure after NSI

Action taken after NSI used disinfectants were174 (88.3%), the majority was wearing single glove 122 (61.9%).

Table (4): Distribution of Participants According to NSIs Post-exposure Prophylaxis Measure.

Post-exposure Prophylaxis Measure.		No.	%
Action taken after NSI(n =197)	Washing the injured site	21	10.7
	Sterilizing the injured site	174	88.3
	Others	2	1.0
Wearing gloves	Wearing single glove	122	61.9
	Wearing double gloves	23	11.7
	Not	52	26.4
Rationalization for not wearing gloves (n =52)	Allergy to gloves	15	28.8
	Feeling of discomfort	17	32.7
	Restriction of work	17	32.7
	Not available most of the time	2	3.8
	Not need them at all	1	1.9

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7-Distribution of Participants According to Reporting of NSI

This study showed only 33 (11.8%) were reported, and most cases were not reported 247 (88.2%). The majority were doing not know whom to report NSI by143 (57.9%) or it is not that of importance event 56 (22.7%).

Table (5): Distribution of Participants According to Reporting of NSI

	Number	%
Reporting of NSI when occur Yes	33	11.8
No	247	88.2
Justification of not reporting (n=247)		
Source of injection thought not to be infectious	4	1.6
Event was not that important	56	22.7
Worried about future consequences	2	0.8
Did not know whom to report	143	57.9
Did not know that injuries are reportable	42	17.0

IV. DISCUSSION

The frequency of NSI among HCWs was 70.4%. It is much higher than that reported in Diyala (23.7%)[13] and lower than that in Baghdad (86.6%)[14].This difference might be attributed to differences in sampling and instruments.

The observed figure is higher than that in Iran (42.5%)[15], the difference might reflect the fact that the deference in exposure and conflict and It is lower than that reported in Syria (76.6%)[16].This deference might be explained by the ongoing conflict and wars in Syria.

It is higher than that in Poland (28%)[17], Germany (22%)[18], lower than that in Ethiopia (76%)[19] and in India(80.5%)[20].This differences might be due to the difference in sample size and culture.

NSIs with socio demographic characteristics

-Profession:

This study showed that physician was complaint of NSIs significantly higher than that paramedical staff 87.9%, 61.9% respectively. This phenomenon might be explained by the fact of absence of exact job description of HCWs. These findings agree with that in Baquba[13].NSIs was prominent among nurses in Baghdad, Syria, Egypt, Iran, India and Uganda[14,21-23].

-Age:

HCWs aged > 40 years were more exposing for NSI. This might be explained to many factors such as more years of working, working time, working hours, and might working in departments that deal with serious conditions needs heavy work, so had more chances to exposed, this result agree with study in Baghdad[14].

-Sex:

In the current study NSI was prominently among male. It is agreeing with that study in Iran/Shiraz[12] but it is disagreeing with the study done in Baghdad[14], in Qatar[24], and in India [25].This finding might be attributed the effect of tribal culture.

-Department:

The NSI were highly prominent among workers in gynecology and obstetrics and emergency departments. This finding might be explained by the fact the gynecology and obstetrics and emergency are the busiest departments over the day. This finding consistent that reported in Baghdad[14]. In Malaysia the highest incidence of episodes of NSI occurred in obstetrics and gynecology followed by medicine and surgery[26].Iran were HCWs in medical and emergency department had higher exposure rate to NSI (23%) and (21%) respectively[12].In India most of the NSIs took place in medical and surgical departments (75%) followed by the emergency department (9%)[27]. These differences might be due to cultural differences.

-Working shifts and working years:

Those work two shifts show significantly higher NSI than those with one shift (p=0.0001).This might be due to high work load has an effect on the performance and safety, long working hours, may lead to fatigue and mental with physical stress, which could increase the chance of human error and the risk of NSIs. It is disagreeing with that in Iran[12], and in India [27]. This difference might be explained by differences in health systems.

The finding that HCWs with long working years showing high rate of NSI. This finding might attributed to the fact that those tolerated high risk cases, which in turn neglect the control.

-Times of NSIs:

A significant association of number of NSIs with age, gender, years and duties shifts. > 5 times NSIs were fined more among female, with working years more than 4 years and with 2 working shifts.

This study revealed that NSI was negatively rated with age. It is line of literature[13,14].

-The type and procedure of NSI:

The syringe hollow-bore needles reported the highest proportion of sharp object injuries in the current study (58.5%). This finding were higher than that in study done in Baghdad (52.5%)[14], in Baquba (46%)[13], but lower than that reported in India (75%)[27].

Although it has been prohibited, recapping needles reported to be still high in most studies. The result is corresponding with that was reported in Baghdad[63], and in Saudi Arabia[28], Egypt[22,29]), Japan [30].

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-Post-exposure prophylaxis measure:

Regarding to the Post-exposure prophylaxis measure, in the current study the majority of HCWs who had NSI used disinfectant material after injury (88.3%) in addition to washing of injured area (10.7%), This result is agree with study in Baghdad[14], but unlike that reported in Egypt where hand washing was the common post-exposure prophylaxis measure (63.4%)[31], and in Iran 70.2%[12], also in India washed the site of injury with water and soap (60.9%)[27].

For the protection of HCWs from contamination with infected material, they wear single glove at time of work (61.9%). This finding corresponding to that reported by the study in Baghdad reports 76%, 14% respectively [14]. In Iran 61% had used gloves at the time of exposure[32], In India (65%)[27].All HCWs need to be take care when exposed to blood or body fluid[33].

-Reporting:

Immediate reporting of NSIs plays an essential role in post exposure prophylaxis and treatment of the injury[31].

In current study, the majority of the HCWs did not report it to hospital administration (88%). This finding agree with that in the study of Baghdad[14], in Baquba76.3% [13], in Iran 60-82% of NSI were not reported[12,23].Other studies as inThailand76.2%[34]and in Pakistan 99.3%[35].

The prevalence of reported and non-reported NSIs remains uncertain, and the size of the problem cannot be accurately determined till acknowledge of the HCWs about the importance of reporting be improved.

The study shows that the commonest reason cited for not reporting the accident was, they did not know where and whom to report (57.9%). This finding agree with that in Baghdad (49.2%)[14], and this finding demonstrates that there aren't any clear rules about how to report these incidents or who they should be reported to, in addition to a lack of universal precaution training.

Reporting HCW injuries permits counseling regarding exposure risk and secondary transmission avoidance, including potential patient transmission, and even may lessen anxiety that is present [19,33].

Due to wars and conflicts, Iraq's health system has deteriorated, and the low reporting rate of these occurrences may be a result of the administration's reluctance to record such accidents.

V. CONCLUSIONS

1. The accidental NSIs are very high.
2. Demographic, professional, specialty and working years were factors affecting the rate of NSI.
3. Hollow bore needle was common procedure especially during recapping of needles.
4. There is a deficiency in training courses about universal
5. The rate of underreporting after accidental NSI was very high among health care workers.

RECOMMENDATIONS

1. There is a need to pay attention for this phenomena by enhancing training, health promotion for the health care workers, monitoring and supervision for the work.
2. All HCWs for each hospital are in need to attending adequate training courses in infection control to enhance their awareness and decreases the risk of NSIs.
3. Enhancing a reporting system that should be available through 24 hours for all NSIs registering which can be simplify the management and steps of preventive measure in future.
4. Carrying out future studies on this phenomenon to find the obstacles.

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