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Original Research

Knowledge and Practice of Injection Safety among Staff in Medical Tobruk Center and Blood Bank in Tobruk City

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ABSTRACT:

Unsafe injection practices put patients and healthcare providers at risk of infectious and non-infectious adverse events, sound knowledge and skillful practices of work staff are vital to breaks the chain of blood borne diseases transmission caused by unsafe injection practices. Objectives: To assess the knowledge and practices amongst work staff regarding injection safety in Tobruk medical center and blood bank, Tobruk city , Libya. Methods: A cross-sectional study was carried out amongst 72 work staff in Tobruk medical center and blood bank, during the period of December 2023to january2024. A pre-designed questionnaire which assessed knowledge and practices regarding injection safety tool was used to collect data. In this study A good amount of information was obtained a total 72 0f workers The

present study concluded that there was findings of the study revealed that knowledge and practice of injection safety among work staff in TMC and blood bank , was good. Implying that the work staffs are willing to adhere to safety practices, However the percentage of those with fair and poor knowledge calls for concern.

KEYWORDS : Work Staff, Injection, Safety , Knowledge, Practices, Tobruk.

INTRODUCTION

The risk of occupational transmission of blood-borne pathogens via sharp devices remains a significant hazard to both healthcare and ancillary workers. Previously, education, training, and universal precautions have been implemented in an attempt to reduce the risk. However, the most recent preventive strategy is needle-protective devices. These have been developed from conventional products but incorporate a safety mechanism that, when activated, covers the needle tip and thus assists in the prevention of needlestick injuries and potential seroconversion to blood-borne pathogens. To date, a number of studies have been undertaken to evaluate these products, the majority of which show these devices to be safe and reliable in addition to potentially reducing associated needlestick injuries. However, to encourage the introduction of these devices in the UK, further studies are needed to either support or refute initial findings and to encourage the evaluation and subsequent implementation of needle-protective devices. (Joanna C, 2004)

Needle stick injuries are a serious concern for nurses and other healthcare workers. One of the main clinical risks from needle stick injury is the possible infection by blood-borne diseases, such as hepatitis and HIV. A number of different measures have been introduced to minimize the risk and impact of needle stick injuries, including the use of fixed-needle safety syringes. However, some healthcare workers refuse to use such devices, for reasons that include the perceived need to change syringe needles between drawing up a medicine and its administration to a patient. (Ray Higginson ,*et al* 2013)

The different technologies available in safe injection practices can be categorized as: (1) Auto disable syringes for immunization. (2) Prefilled devices. (3) Reuse prevention syringes for curative injections. (4) New safety devices which include safe blood draw and NSI prevention devices. Auto disable syringes are preferred over normal disposable syringes because of its safety and can be used with minimal amount of training. These syringes improved vaccination coverage rates and are being currently introduced in country EPI. Un inject prefill injection device ensures safety by various ways. There are also reuse prevention syringes for curative injections. (Saurabh Sharma, 2005)

Injection as a form of drug administration is universal practiced and in very many cases unavoidable if effective therapeutic dose of such drugs must be given. Unsafe injection is any form of injection practice that poses any health risk to the recipient. The practices

include multiple needle users without adequate sterilization between worker and unsatisfactory disposal of needles that may encourage needle stick injury in others. This will encourage the transmission of infectious diseases. After the eradication of small pox, it became erroneously believed by several that parental route of drug administration was the most active in all cases so most people sought tor injections as treatment for medical problems (Sudesh Gyawali, *et al* 2013)

Exposure to blood borne viruses, by healthcare workers is on the increase between worker specially nurses being the most affected (Yang, Wu, Wang, 2013) These viruses include hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) etc. These exposures are reported to constitute serious problem in the health care setting as they are common causes of illness and mortality among health care workers in general including hospitalized patients. The practice of standard precautions has been shown to reduce the risk of exposure to blood and body fluids. (Riaz, H, Kamal, *et al* 2012.)

One of the continuous routes of these exposures is from percutaneous (needle stick or other sharps) injuries. It is estimated that 50% of nurses will experience at least one needle stick injury in their job (Rhode, Dupler, Posta, Sanders, 2013).

The WHO estimates that 501,000 deaths have occurred because of unsafe injection practices (WHO (2004). . These deaths could have been prevented by injection safety practices which include reduction of injections, ensuring safe injection practices using the "nine rights," availability of appropriate injection devices and proper disposal of sharps and other healthcare wastes. The "nine rights" of injection safety ensures that the right patient is given the right drug in the right dosage and right formulation using the right injection equipment at the right time and right route with right storage and the right method of disposal safe injection practices are expensive than unsafe injection practices, but it will actually reduce a great burden on health system by breaking the chain of transmitting blood borne diseases and their consequences . When providing health services, it is important to prevent the transmission of diseases every time at all levels. .(FMOH2007) Hence the present study was carried out to assess the knowledge and practices amongst doctor and nurse and lab technician regarding injection safety in tobruk medical center and blood bank in tobruk city,Libya.

Omorogbe, Omuuemu, and Isara (2012) documented that the burden of unsafe injection practices is borne by health care providers especially nurses and doctors, the patients and the community at large Also the global burden of diseases due to unsafe injection use, estimated by the World Health Organization (WHO) by probability model for the year 2008 was 340,000 Human Immunodeficiency Virus (HIV) infections, 15 million Hepatitis B Virus (HBV) infections, 1 million Hepatitis C Virus (HCV) infections, 3 million bacterial infections and 850,000 injection site infections. This accounted for 14% of HIV, 25% HBV, 8% HCV and 5% of bacterial infections worldwide (Sudesh, Devendra, *et al* 2013).

According to the WHO's Safe Injection Global Network (SIGN), a safe injection is one that does not harm the recipient, does not

expose the provider (HCWs) to any avoidable risks and does not result in waste that is dangerous to the community. Hence, safe injection practice involves the administration of rational injection by a qualified and well-trained person using a sterile device, right technique, proper disposal and management of the wastes generated. The SIGN was launched by the WHO as an alliance of global stakeholders to support and ensure the safe, logical and proper use of injections worldwide. (WHO, 2002)

One of the strategies to achieve the goal of this coalition as highlighted by SIGN is the behaviour change of healthcare workers. Healthcare workers are those individuals who deliver health services such as injection to the sick either directly as nurses and physicians or indirectly as environmental health, laboratory and other supportive staff including waste handlers (Joseph B, Joseph M, 2016). It is believed that behaviour change among the injection providers will improve the healthcare workers' and patient safety by preventing the reuse of injection equipment, reducing unnecessary injections, prevention of needlestick injuries and enhancement of community safety via safe sharps and other waste management. (Gyawali S, *et al*. 2013)

MATERIALS AND METHODS

A cross-sectional study was carried out amongst 100 from work staff in tobruk medical center and blood bank ,during the period of December 2023to january2024. The informed consent was obtained from each participants, and anonymity of the participants was maintained throughout the study. Ethical approval was obtained from the institutional ethics committee prior to the study. The data were collected on a predesigned, pre-structured questionnaire distributed among these staff, and they were asked to fill the questionnaire. The questionnaire comprised questions on knowledge and practices related to the injection safety. The language of the questionnaire was English. All the questions were objective and multiple-choice type. Demographic details such as age, sex, qualification, years on of service, training on injection safety while in service, immunization status against hepatitis B and accidental needle stick injury. Results were analyzed in the form of frequency, mean, percentage whenever appropriate.

Statistical Analysis

Data was fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp). Qualitative data were described using number and percentage.

The Kolmogorov-Smirnov test was used to verify the normality of distribution. Quantitative data were described using range (minimum and maximum), mean, standard deviation and median. Significance of the obtained results was judged at the 5% level. The used tests included:

1- Student t-test

For normally distributed quantitative variables, to compare between two studied categories

2 - F-test (ANOVA)

For normally distributed quantitative variables, to compare between more than two categories.

RESULTS AND DISCUSSION

A good amount of information was obtained a total 72 0f workers . Majority of the respondents 37 (52.9%) were within the age range of 25-35 years followed by 13 (18.6%) who were within the age group of less than 25 years and the 20 (28.6%) were more than 35 years old. Forty eight (68.6%) were female , 22 (31.4%)were male . over half of the respondents 29 (41.4%) were doctors, followed by the nurse 25 (35.7%)and lab technician formed only 16 (22.9%) of the study population. Forty eight (68.6%) The majority of participants are from TMC . while 22 (31.4%) were from blood bank. Details of the respondent's demographic characteristics are shown in (table1) . 33 (47.1%)of the respondents had 0-4years' clinical experience, 19 (27.1%) had 5- 10 years, 18 (25.7%)had over 10 years' experience. About 36 (51.4%) of the respondents reported not attending any formal training on injection safety. And 39 (55.7%) have been immunized , 31 (44.3%) not immunized against HBV . Details of the respondent's demographic characteristics are shown in (table 1)

Reply of work staff regarding their knowledge towards injection safety is tabulated in Table 2. Majority of 87.1%of respondents of the respondents were aware of disease that transmission through unsafe injection and 75.7%) of respondents were aware of possible s Possible causes of Needle Stick Injury , , and about (60%)were recapping needles, (24.3%) of them reported their NSI,...

In table 4: The majority 64.3% of the work staff who had not needle stick injuries reported their injuries and (10%) of those who reported the accidental exposures were advised on blood tests and post exposure prophylaxis (PEP), while 25.7% Exposure to needle Stick injury for one time.

In table 4 Exposure to Needle Stick Injury reported that 64.3 % not at all 25.7% one time and more than tow time 10%, as shown in (Table 4) Exposure to Needle Stick Injury.

According to (table 5)our study showed that recapping of needles after uses and Lack of precaution was the most common cause for NSI for more than half work staff (61.4%) followed by hasty work with percent (58.6%) and Lack of precaution in drawing(blood4%) , were applied immediate preventive measures (48.6%) ,and reported to NSI in hospital with (40%) only Regarding knowledge, total score for awareness between work place there is in blood bank 7.77 ± 1.82 while in MTC 7.33 ± 2.18 see (table 6) work exper with total score for awareness and practice reported that works had experience at 0-4 years is 8 ± 2.05 it is more Awareness from other while the works 5-10 years had less Awareness 6.74 ± 2.35 respectively as the (table 7).

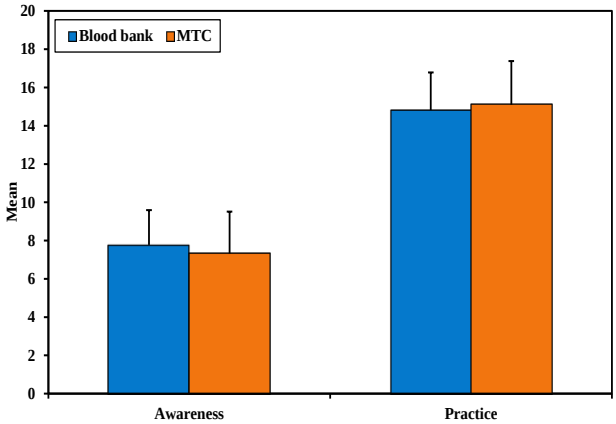

Figure: (1). Relation between Workplace with Total Score for Awareness and Practice**.**

Table (1): Distribution of the studied cases according to demographic data (n = 70)

Demographic data	No. (%)
Age	
<25	13 (18.6%)
25 – 35	37 (52.9%)
>35	20 (28.6%)
Mean ± SD.	31.6 ± 8.25
Median (Min. – Max.)	30 (18 – 54)
Gender	
Male	22 (31.4%)
Female	48 (68.6%)
Qualification	
Doctor	29 (41.4%)
Nurse	25 (35.7%)
Lab tech	16 (22.9%)
Workplace	
Blood bank	22 (31.4%)
MTC	48 (68.6%)
Work Exper (Years)	
0 – 4	33 (47.1%)
5 – 10	19 (27.1%)
> 10	18 (25.7%)
Trainig	
Received	34 (48.6%)
Not Received	36 (51.4%)
Immunization HBV	
Immunized	39 (55.7%)
At Immunized	31 (44.3%)

Table (2): Distribution of the studied cases according to awareness on injection safety items (n = 70)

Awareness on injection Safety	No No. (%)	Yes No. (%)
Diseases transmitted by Needle Stick Injury	9 (12.9%)	61 (87.1%)
Possible causes of Needle Stick Injury	17 (24.3%)	53 (75.7%)
Measures to be taken after NSI	26 (37.1%)	44 (62.9%)
No recapping of needles after use	28 (40%)	42 (60%)
Hand washing proceeding injection	15 (21.4%)	55 (78.6%)
Use of gloves proceeding injection	13 (18.6%)	57 (81.4%)
Appropriate disposal after use	13 (18.6%)	57 (81.4%)
Appropriate use of safety boxes	19 (27.1%)	51 (72.9%)
No reuse of used syringes or needle	15 (21.4%)	55 (78.6%)

Table (3): Descriptive analysis of the studied cases according to score for awareness on injection safety (n = 70)

	Mean ± SD.	Median (Min. – Max.)
Total score (0 – 10)	7.47 ± 2.07	8 (1 – 10)
Average score (0 – 1)	0.75 ± 0.21	0.80 (0.10 – 1)

Table (4): Distribution of the studied cases according to Exposure to needie Stick injury (n = 70)

Exposure to needle Stick injury	**No. (%)**
Not at all	45 (64.3%)
Al least one time	18 (25.7%)
Two – Five times	7 (10%)

Table (5): Distribution of the studied cases according to cause for NSI (n = 70)

Cause for NSI	No. (%)
Recapping needles	
No	27 (38.6%)

Yes	43 (61.4%)
Lack of precaution in IV inserting	
No	27 (38.6%)
Yes	43 (61.4%)
Hasty works	
No	21 (30%)
Yes	49 (70%)
Lack of precaution in drawing blood	
No	29 (41.4%)
Yes	41 (58.6%)
Applied preventive measures	
Applied	34 (48.6%)
Not applied	36 (51.4%)

Table (6): Relation between Workplace with total score for awareness and practice

	Workplace		
	Blood bank (n = 22)	MTC (n = 48)	p
Awareness	7.77 ± 1.82	7.33 ± 2.18	0.413
Practice	14.82 ± 1.97	15.1 ± 2.28	0.588

Table (7): Relation between work exper with total score for awareness and practice

	Work Exper (Years)			
	0 – 4 (n = 33)	5 – 10 (n = 19)	> 10 (n = 18)	p
Awareness	8 ± 2.05	6.74 ± 2.35	7.28 ± 1.56	0.094
Practice	15.48 ± 2.05	14.63 ± 2.54	14.61 ± 1.94	0.258

Table (8): Relation between Workplace with total score for awareness and practice

	Workplace		
	Blood bank (n = 22)	MTC (n = 48)	p
Awareness	7.77 ± 1.82	7.33 ± 2.18	0.413
Practice	14.82 ± 1.97	15.1 ± 2.28	0.588

This study shows an overall good knowledge level of health care workers regarding the transmission of important diseases through NSI. On average 87% of work staff were aware that HBV can be transmitted through NSIs, 94.1% aware of HCV and 94.9% aware of HIV can be transmitted through NSIs. This was higher than the study done in India in which only 50.2% of HCWs gave correct answers regarding disease transmission through NSIs. This is most probably a result of awareness programs conducted in our hospitals. Holla R, et al. 2014

There was high knowledge regarding the "need to wear double gloves during phlebotomy procedure" statement which goes with Mast et al. study Mast ST, Woolwine JD. 2013

However, our study shows that there is a highly significant association between wearing double gloves with not injured HCWs, also a highly significant association found between recap needle and injured respondents. No significant association was found between the use of safety boxes or wearing gloves in any other procedures with needle stick injury. While in other study find that only 18% of them don't use hand gloves regularly when administering injections. This finding is consistent with study done by Omorogbe et al 2012 , where only 4 (3.3%) of participants use gloves regularly. In study by Onyemocho et al. 2013, showed that only 7.2% respondents wear single use glove before administering injection.

In the current study, only (24.3%) of HCWs were aware full that post exposure NSI. This finding similar to the Berthelot P study, which found that 33.2% of HCWs were aware of Hep C seroconversion, 64.2% of the subjects knew

that post-exposure prophylaxis of HIV should be taken within 72 h, and 77.7% knew that post-exposure prophylaxis of Hep B should be taken within 24 h, which agrees with other studies, which found that two-thirds of the subjects were unaware of post exposure prophylaxis of Hep B . Kathleen E Corey, (MD, 2009)

The awareness regarding recapping needles after usage. The results showed that 42 (60%) of HCWs supposed that needles should be recapped after usage. In our study the results of Mendelson study, in which 72% of healthcare workers reported that needles should be recapped after use. In this study, (64.3%) of participants agree that post exposure prophylaxis measures are important to minimize the risk of diseases transmission. This is in agreement with a study which was carried out in Gondar university hospital (92.8%) done by Gholami et al 2015Regarding practice, the works 0-4 year scored better than others followed by more than 10 year with mean practice scores of (15.48 ± 2.05and 14.63 ± 2.54 respectively). There was a highly significant association between knowledge scores and practice scores ($p < 0.001$); moreover, a highly significant association was found between practice and aware.

CONCLUSION

The findings of the study revealed that knowledge and practice of injection safety among work staff in TMC and blood bank, was good. Implying that the work staffs are willing to adhere to safety practices, However the percentage of those with fair and poor knowledge calls for concern. This implies that some work staffs are still unaware that practicing injection safety helps to prevent occupational hazard and the spread of infectious diseases such as HIV/AIDS. Hepatitis B, C and other blood born infections, which can be transmitted through unsafe injection. The good practice of injection safety was as a result of good knowledge and perhaps positive work attitude of some work staffs which is also highly commendable.

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ETHICS

We have ethical approval from the research studies office of Tobruk University.

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الملخص

تُعرّض ممارسات الحقن غير الآمنة المرضى ومقدمي الرعاية الصحية لخطر الإصابة بأمراض معدية وغير معدية. لذا، تُعدّ المعرفة الجيدة والممارسات الماهرة للعاملين ضرورية لكسر سلسلة انتقال الأمراض المنقولة بالدم الناتجة عن ممارسات الحقن غير الآمنة. الأهداف: تقييم المعرفة والممارسات المتعلقة بسلامة الحقن لدى العاملين في المركز الطبي وبنك الدم بمدينة طبرق، ليبيا. المنهجية: أُجريت دراسة مقطعية شملت 72 عاملاً في المركز الطبي وبنك الدم بمدينة طبرق، ليبيا، خلال الفترة من ديسمبر 2023 إلى يناير 2024. استُخدم استبيان مُصمّم مسبقًا لتقييم المعرفة والممارسات المتعلقة بسلامة الحقن لجمع البيانات. في هذه الدراسة، تم الحصول على قدر جيد من المعلومات من 72 عاملاً. خلصت الدراسة إلى أن معرفة وممارسة سلامة الحقن لدى العاملين في المركز الطبي وبنك الدم جيدة، مما يعني أن العاملين على استعداد للالتزام بممارسات السلامة. ومع ذلك، فإن نسبة من لديهم معرفة متوسطة أو ضعيفة تستدعي القلق.

الكلمات المفتاحية: طاقم العمل، الحقن، السلامة، المعرفة، الممارسات، طبرق.