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KNOWLEDGE, ATTITUDE AND PRACTICE OF INJECTION SAFETY AMONG NURSES IN PRIMARY HEALTH CARE CENTERS IN AL-AHSA CITY, SAUDI ARABIA 2018

Community Medicine

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ABSTRACT

Needlestick injury (NSI) is a commonly encountered occupational hazard which may transmit various blood-borne infections. In the Kingdom of Saudi Arabia (KSA), the main risk factor is the low awareness about injection safety measures. This study aims to assess the level of knowledge, attitude and practice of injection safety as wel as to measure the prevalence of NSI. It includes (250) nurses in Primary Health Care Centers(PHCCs) belonging to Ministry of Health in Al-Ahsa city, KSA from January 2018 to March 2018. Self-administered questionnaire was used for data collection. Overall 54.8% of the nurses had a high level knowledge. High attitude and high practice was observed among 44.8% and 68.4% respectively. The prevalence of NSI was 40% .

Knowledge of nurses working in PHCCs in Al-Ahsa regarding safe injection is quite acceptable. Despite that, the prevalence of NSI is relatively high with a low attitude towards reporting to responsible authorities.

KEYWORDS

Needlestick injury, Injection safety, Primary health care workers, Nurse.

INTRODUCTION

1.1 Background

1.1.1. Definition of injection, injection safety and needle stick injury:

"Injections are skin-piercing procedures performed with a syringe and needle to introduce a substance into the body for prophylactic, diagnostic, curative or recreational purposes" (Akeem, B. O., Abimbola, A., & Idowu, A. C., 2011). Injections could have many forms; intradermally, intramuscularly and intravenously (Akeem, et al.,2011).

The World Health Organization (WHO) defines injection safety as a procedure that does not harm the recipient or the provider and does not result in waste that is hazardous for the community (Onyemocho et al.,2013). "Needle Stick Injury (NSI) is the non-intentional puncture of the skin caused by an injection needle while sharps injury are caused by puncture of the skin by sharp objects or instruments including an injection injury" (Akeem, et al.,2011).

1.1.2. Prevalence of injection and needle stick injuries:

In developing and transitional countries, injections are given much more than really needed. It was found that about 16 billion injections are given yearly in those countries (Mahfouz et al.,2009).

Among the 35 million healthcare workers (HCWs) worldwide, 3 million had needlestick and sharps injuries (NSSIs) annually. It was observed that the level of NSSIs varied depending on the economic status of the country (Kakizaki et al.,2011; Mahfouz et al., 2009). In developed countries, because of adoption safe injection practice, this reduced the risk for NSIs. On the other hand, developing countries that are still practising unsafe injection are having a high rate of NSIs (Ismail et al.,2014).

In the Kingdom of Saudi Arabia (KSA), based on the previous studies done on Jazan 2011-2012 and Abha 2006, the prevalence of NSI in primary health care workers (PHCWs) range from 14 to 16.5% (Ismail et al.,2014; Mahfouz et al., 2009).

1.1.3. Risk factors for needle stick injuries:

Worldwide the main risk factors for NSI are; female, young, anesthesiology technicians, gynecologists and obstetricians and surgeons, high workload, working in intensive care unit, less experience, are recapping needles, are not wearing gloves, and are not trained on injection safety and infection control measures (Ismail et al.,2014).

In KSA, the main risk factor is the low awareness about injection safety measures (Ismail et al.,2014; Mahfouz et al., 2009).

1.1.4. Consequences of needlestick injuries:

A NSI is a commonly encountered occupational hazard which may transmit various blood-borne. The most well-documented infections are hepatitis B virus (HBV), hepatitis C virus (HCV), and Human Immunodeficiency virus (HIV). It may cause adverse events such as abscesses and toxic reactions. These blood-borne infections can lead to profound consequences like long-term illness, disability and death (Akeem et al.,2011; Gyawali et al.,2016; Ismail et al.,2014).

As estimated by WHO on 2002 World Health Report, two million out of 35 million HCWs experience percutaneous exposure to infectious diseases annually. It was found that 37.6% of Hepatitis B, 39% of Hepatitis C and 4.4% of HIV in HCWs worldwide are a result of NSIs (World Health Organization, 2005).

In addition to the infectious diseases, NSIs are a financial burden for healthcare services. A lot of costs have spent for laboratory screening of HBV, HCV and HIV. In addition to post-exposure prophylaxis and treatment of those infections. The costs of the tests and treatments for NSIs are estimated to range from $6.1 million in France to $118–591 million in the United States of America annually (Motaarefi et al.,2016).

Many factors contribute to unsafe injection among nurses in primary health care centers. Some of the factors are related to the nurses and the others are structural and organizational factors (Gyawali et al.,2016; Jacob et al.,2010; Onyemocho et al.,2013). The study aims to evaluate the process of injection safety among nurses in PHCCs in Al-Ahsa city, Saudi Arabia from January 2018 to March 2018. It measures the level of knowledge, attitude and practice of injection safety and the prevalence of NSI among the nurses.

METHODOLOGY

2.1. Study area:

Al-Ahsa province comprises 68% of the eastern region and 24% of the total kingdom. The two major cities in Al-Ahsa are Mubarraz and Hofuf. The other small urban areas are Al-Oyoun, Al-Jafar, Al-Omran, and Juatha (Abdelatti, H., Elhadary, Y., & Babiker, A. A.,2017).

2.2. Study period

The fieldwork was conducted during the period from January 2018 to March 2018.

2.3. Study settings
Ministry of Health (MOH) is the main provider of healthcare in the KSA. In Al Ahsa there are 70 MOH PHCCs (Amin, T., & Al Wehedy, A. ,2009; Statistics and Information General Department in MinistryOf Health KSA.,2016). The study was conducted in the MOH PHCCs in Al-Ahsa, KSA.

2.4. Study Description:
2.4.1. Study type:
This study is a cross-sectional study.

2.4.2. Study population:
Nurses in PHCCs in Al-Ahsa, KSA, from January 2018 to March 2018.

2.4.3. Sample size
By considering the error margin of 5%, 95% confidence limit and total population under the study of 684, the sample size was 250 using (www.raosoft.com) website.

Population selection criteria
2.4.3.1 Inclusion criteria
- Nurses
- Male & female
- All nationalities

2.4.3.2. Exclusion criteria
- Nurses who were on vacation during the period of study.
- Nurses who work in administration

2.5. Sampling technique
The participants were selected randomly using systematic random sampling. A frame list of all nurses was prepared. The first one was chosen randomly by a simple random technique, and then every third nurse was chosen as the sampling fraction was almost 3.

2.6. Data collection tool
Self-administered pilot-tested and validated questionnaire was used. The questionnaire was used in research done in Nigeria (NEEDLE STICK INJURY PATTERN AMONG HEALTH WORKERS IN PRIMARY HEALTH CARE FACILITIES IN ILORIN, NIGERIA) by Dr Bolarinwa Oladimeji Akeem, Dr Asowande Abimbola and Akintimi Clement Idowu (Akeem et al.,2011). The consent was taken from the author. Some modifications were done in the questionnaire to suit the local health care system. (Almalki et al.,2012). The questionnaire translated into Arabic and was revised by two consultants. After modification, the validity and reliability of the questionnaire were retested through a pilot study.

The questionnaire will consist of Socio-demographic data and questions to assess knowledge, attitude and practice of injection safety. Data was computerized using Statistical Package for Social Science (SPSS). A total score was obtained by summation of answers variables. So, there were scores for each of them. Median was computed for each score. Values less than or equal median were classified as low whereas those more than median values were classified as high.

2.7. Data collection technique
A covering letter of the questionnaire was designed to clarify the purpose of the study, the importance and benefits of the responses. The questionnaire was distributed during the working hours; care was taken to do not disturb the nurses. The researchers were available to clarify any issues.

2.8. DATA ENTRY AND ANALYSIS
Data were collected, checked for completeness, and verified for inconsistency or outlier readings. Then the data entered by investigators into a personal computer and analyzed using the Statistical Package for the Social Sciences (SPSS) software version 21.

2.9. Ethical consideration
- Written permission from the Joint Program of Family & Community Medicine and the other from concerned authority in MOH PHC were obtained before conduction of the research.
- Individual consent was a prerequisite for data collection.
- It was written on the front page of the questionnaire that (Answering questionnaire means an agreement of participation in the study).
- All information was kept confidential and cannot be accessed except for the purpose of scientific research.

RESULTS
3.1. Socio-demographic characteristics
As shown in table 1, The study included 250 nurses. Their demographic characteristics are summarized in table1. The highest educational level of most of them (72.4%) was Diploma degree. The duration of work in the current health facility exceeded 10 years among 40.8% of the participants whereas total work experience exceeded 10 years among 52.4% of them.

Table 1: Socio-demographic characteristics of the participants (n=250)

Socio-demographic characteristics	No. (%)
Age groups in years	
21-25	11 (4.4%)
26-30	70 (28.0%)
31-35	77 (30.8%)
More than 35	92 (36.8%)
Gender	
Males	48 (19.2%)
Females	202 (80.8%)
Education level	
High school	17 (6.8%)
Diploma	181 (72.4%)
Bachelor / higher	52 (20.8%)
Duration of work in the current facility	
<1 year	36 (14.4%)
1-5 years	62 (24.8%)
6-10 years	50 (20.0%)
> 10 years	102 (40.8%)
Total work experience	
<1 year	15 (6.0%)
1-5 years	37 (14.8%)
6-10 years	67 (26.8%)
> 10 years	131(2.4%)

3.2. Knowledge of Injection safety
It was shown that slightly less than half of the nurses (46.4%) had a history of attending any update seminar/ training or workshop on injection safety. More than half of the participants (57.6%) reported a history of previous hearing of injection safety. The responses of the participated nurses with questions concerning different aspects of injection safety. Majority of them knew correctly that Usage of sterile equipment (84.4%)and Appropriate disposal f injection waste (82.0%) are amongst the known best practices in a safe injection. Also, the majority of them (95.6%) knew that diseases could be transmitted through unsafe injection and 93.6% could recognize that measles cannot be transmitted through unsafe injections. Majority of the nurses (88.4%) understood what is meant by an injection. Overall 54.8% of the nurses had a high level of injection safety.

3.3. Attitude to injection safety
Majority of the participants (98%) either agreed or strongly agreed that safe injection should be practiced by all healthcare workers, safe injection practices should be enforced in healthcare services (99.2%), and training will improve their practice of safe injection (98.4%). Most of them (80.8%) either agreed or strongly agreed that inadequate injection material is responsible for poor injection safety practices. Almost half of them (49.6%) either agreed or strongly agreed that the government is not doing enough to encourage injection safety practices. Overall, high attitude towards injection safety was observed among 44.8% of the nurses.

3.4. Injection safety-related practice
3.4.1. Availability of syringes and needles in the health facility
The disposable needle and syringe were available in almost all health facilities (98.8%). Autodestruct type of syringes and needles were available in more than half of the health facilities (56.4%).

3.4.2. Immediate collection of used needle & syringes
Majority of the participants (96%) used the safe box for immediate collection of needles and syringes.

3.4.3. Availability of safety box at the health facility
Safety boxes were available in the health facilities, according to the

majority of the participants (96.8%). Adequate supply was reported by most of them (75.6%).

3.4.4. Final disposes of used needles & syringes

Almost half of the nurses (50.4%) did not know the final dispose of off used needles & syringes whereas 34% of them reported dig, burn and burry and incineration was mentioned by 14% of nurses.

3.4.5. Recap needle

Majority of nurses (94%) reported did not recap the needle after use. Overall, high practice related to safety injection was reported by 68.4% of the participated nurses.

Table 2: Knowledge, attitude and practice of injection safety among nurses

Knowledge of injection safety	yes	No
Understanding of the definition of injection	221 (88.4%)	29(11.6%)
Hearing about safe injection practices	144(57.6%)	106(42.4%)
Attending any update seminar/ training or .workshop on injection safety	116(%46.4)	134 (53.6 %)
knew that diseases could be transmitted through unsafe injection	239(%95.6)	11(%4.4)
Is recapping of needle acceptable in injection procedure?	22(%8.8)	228(%91.2)
Are you aware of the national policy on injection practice	148(%59.2)	102%40.8)
Attitude to injection safety	yes	No
Safe injection should be practiced by all healthcare workers	245(%98)	5 (2%)
Injection practices should be enforced in healthcare services	248(%99.2)	2(0.8%)
Training will improve their practice of safe injection	246(%98.4)	4 (1.6%)
Inadequate injection material is responsible for poor injection safety practices	202(%80.8)	48 (19.2%)
Government is not doing enough to encourage injection safety practices	124 (%49.6)	126 (50.4%)
Injection safety-related practice		
What do you use for immediate collection of used needle & syringes?		
Safe box	240 (96.0%)	
Any container	9 (3.6%)	
Others	1 (0.4%)	
Is injection safety box available for use in your health facility?		
Yes	242 (96.8%)	
No	8 (3.2%)	
If yes, is the supply adequate?		
Yes	189 (75.6%)	
No	53 (21.2%)	
Not applicable	8 (3.2%)	
Do you recap needle?		
Yes	15 (6.0%)	
No	235 (94.0%)	

3.5. Prevalence of needle sticks injury

The prevalence of needle stick injury was 40% as demonstrated in the figure. It happened once among 48% and more than twice among 26% of them. The first step taken by nurses when they had NSI was pressing the wound site and washing (36.4%), followed by reporting to authorities (24.8) and reporting to colleagues (11.2%).

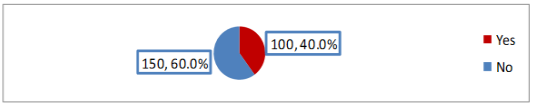

Figure 1: Prevalence of needle stick injury among the participants

4. DISCUSSION

The practice of safe injection is a procedure recommended by CDC to prevent the transmission of infection from patients to healthcare providers and vice versa in healthcare facilities. Since it is not always known if an individual has an infection or no, safety procedures should be implemented to ensure the non-transmission of infectious diseases (Centers for Disease Control and Prevention (CDC), 2011). This study was carried out to explore the knowledge, attitude and practice of safety injection among nurses working at PHCCs at Al-Ahsa, KSA.

4.1. Knowledge of safe injection

In this study, slightly less than half of the nurses (46.4%) had a history of attending any update seminar/training or workshop on injection safety and 57.6% previously heard about injection safety. In a study carried out in Jazan (KSA), 60% of healthcare professionals received continuous medical education regarding principals of infection control (Ismail et al.,2014). However, in a study conducted in Pakistan, only 21.6% of healthcare workers were aware of the universal precaution guidelines (Siddique et al.,2008).

Majority of nurses in this study knew correctly that Usage of sterile equipment (84.4%) and Appropriate disposal of injection waste (82.0%) are the known best practices in the safe injection. Also, the majority of them (95.6%) knew that diseases could be transmitted through unsafe injection and overall 54.8% of them had a high level of injection safety. In a similar study carried out among healthcare workers in Jazan (Ismail et al.,2014), also acceptable knowledge was reported as 95% of them believed that sharp objects should be kept in a puncture-proof container, kept in a closed container, or disposed of by a professional company. However, a slightly lower level of knowledge was reported in a study carried out in Abha, where the knowledge percentage ranged between 84.7% and 91.8% regarding various issues of injection safety (Kakizaki et al., 2011). Acceptable level of knowledge regarding safe injection among nurses is expected as they are more exposed to bad procedures than other categories of healthcare workers. However, transmission of this knowledge into practice is the most important.

4.2. Attitude towards safety injection

In the current study, the majority of the nurses agreed that safe injection should be practiced by all healthcare workers, safe injection practices should be enforced in healthcare services, and training will improve their practice of safe injection. Additionally, most of them agreed that inadequate injection material is responsible for poor injection safety practices. However, about half of them agreed that the government is not doing enough to encourage injection safety practices. Overall, high attitude towards injection safety was observed among 44.8% of the nurses in this study. In another study carried out in Nigeria by Adejumo and Dada (2013), more than half of nurses (59%) had a positive attitude to injection safety. Nevertheless, out of two-thirds (67%) of nurses who reported non-availability of safety injection devices in their workplace; only 8.9% and 24.9%, respectively, strongly agreed that such devices are not affordable to patients (Adejumo, P. O., & Dada, F. A. ,2013). Also, Bolarinwa et al. (2011) reported in another Nigerian study that almost three-quarters of nursed had a good attitude towards safe injection (Bolarinwa OA, Salaudeen AG Aderibigbe SA. Musa & Akande TM.,2011). Positive attitude towards safe injection was also observed among nurses working at public health facilities in Kenya (Omond OK.,2016). However, our findings contradict what has been reported in a Korean study by Smith et al. who showed a negative attitude of nurses towards injection safety (Smith et al., 2006). Also, in West Bengal, only 32% of PHC workers had good attitude towards safety injection with 54.3% agreed that training will improve safe injection, and 23% felt unsafe injection, 9.3% reported over prescription of injection in health facilities while 55.1% agreed that the practice of injections in all primary healthcare settings is safe (Chaudhuri, S. B., & Ray, K.,2016).

4.3. The practice of safety injection

In the present study, some positive issue regarding the practice of safe injection were observed as the disposable needle and syringe were available in almost all health facilities (98.8%). Autodestruct type of syringes and needles were available according to more than half of the participants (56.4%). Majority of the participants (96%) used the safe box for immediate collection of needles and syringes. All of the aforementioned findings indicated good practice regarding safe injection. In another Nigerian study (Akeem et al., 2011), stocks of needles and syringe as well as disposable gloves were not available (85% and 75%), respectively.

Safety boxes were available in the health facilities, according to the majority of the participants (96.8%). Adequate supply was reported by most of them (75.6%). Also, in Nigeria, safety boxes were highly available (93.5%) and used (95%) in primary healthcare settings(Akeem et al., 2011). The high level of availability and supply of safety box is an indication of an acceptable level of safe injection practices in the PHCCs in Al-Ahsa, KSA. Additionally, a high level of safe injection practice was reported by 68.4% of the participants, although we depended on self-reporting and not actual observation.

Almost half of the nurses (50.4%) in the current study did not know the final dispose of off used needles & syringes whereas 34% of them reported dig, burn and burry and 14% reported incineration. In a similar study carried out in primary care settings in Nigeria (Akeem et al., 2011), dig, burn and burry was reported by 61.5% of healthcare

workers and local incineration was mentioned by 32% of them. It has been reported by Yanet et al. (2006) (Youwang et al.,2006), that "dig, burn and burying" is preferred for developing countries and the use of local incineration may not be suitable because of other health hazards that might be associated with its application.

In the current study, the majority of nurses (94%) reported not recapping of the needle after use. Lower rates of needle recapping were reported from Nigeria (21.5) (Akeem et al., 2011), Swaziland (69%) (Daly et al.,2004) and Oman (72%) (Al Awaidy et al.,2006) among tertiary health workers.

We can conclude regarding the practice of safe injection that, the facilities are available, but there is a deficient in the training of nurses, which responsible for the high rate of needlestick injuries.

4.4. Needlestick injury rate

The prevalence of needle stick injury among nurses in the present study was 40%; it happened once among 48% and more than twice among 26% of them. This figure is very high if compared with those reported from different areas in the Kingdom of Saudi Arabia. Ismail et al. reported a rate of 14.8% among nurses in Jazan (Ismail et al.,2014). Mahfouz et al. reported a rate of 16.5% among nurses in Abha (Mahfouz et al.,2009). The rate was also higher than that found among Malaysian hospital nurses (28%) (Rampal et al.,2010). In India, the rate of NSIs was 11.4% among community nurses and 34.8% among nurses working at tertiary care hospitals(Salelkar et al.,2010) Also, in Nigeria, among healthcare workers in primary care settings, a rate of 32.1% has been reported (Akeem et al., 2011). In Oman (Al Awaidy et al,. 2006) and Swaziland (Daly et al.,2004), rates of 17.9% and 30% were reported, respectively. In the Dominican Republic, a rate of 23.5% has been mentioned (Moro et al.,2007).

The relatively high rate of NSIs observed in this study might be attributed to poor adherence of nurses to the infection control guidelines.

Globally, there is under-reporting of needle stick injury among healthcare workers (Akeem et al., 2011). In the present study, only 24.8% of nurses mentioned that reporting to authorities will be the first step after needle stick injury insult whereas 11.2% will report to colleagues. In Nigeria, only 19.5% of PHCWs reported the needle stick injury to the authority (Akeem et al., 2011). while in Oman, only 17.9% of health workers reported NSIs (Al Awaidy et al.,2006). This underreporting means that many cases of NSIs go on without appropriate management and documentation exposing the PHCWs to dangers consequences of unsafe injection.

In the present study, as expected more educated nurses were more knowledgeable about the safe injection. The same has been reported by others (Akeem et al., 2011; Ismail et al.,2014). However, unexpectedly, newly graduated nurses were more knowledgeable than more experienced nurses. This could reflect a good level of knowledge they obtained during their school/undergraduate period regarding safe injections.

Although this study, up to our knowledge, is the first one to explore the magnitude of the problem of NSIs among nurses in Al-Ahsa Region, KSA and identified knowledge, attitude and practice of nursing regarding safe injection , which could have a significant influence on decision-makers, this study has some limitations that should be mentioned. It included only nurses working at primary health care centers, so the results cannot be generalized over the entire population of nurses in Al-Ahsa. Its cross-sectional study proved only association and not causality between dependent and independent variables. Susceptible to confounding bias due to inability to collect information on all potential confounders. Finally, information on the practice of safe injection was collected by self-reporting and not observation, which subjected to information bias.

5.1. CONCLUSION

Knowledge of nurses working at primary health care centers in Al-Ahsa regarding safe injection is quite acceptable as more than half of them had a high level of knowledge. However, a considerable proportion of them did not attend any update seminar/training or workshop on injection safety. Newly graduated and higher educated nurses were more knowledgeable about safe injection compared to their peers. Less than half of the nurses had a high attitude towards safe injection, with no difference according to demographics or experience. Most of the nurses claimed a high level of practice-related safe injection. Females expressed a higher level of practice-related safe injections than males.

The prevalence of needle stick injuries is relatively high compared to other similar studies with a low attitude towards reporting to responsible authorities.

5.2. Recommendations

Based on the study results and discussion, the following are recommended:

1. PHCCs in AlAhsa need to organize and implement educational activities on safety injection, and attendance of nurses and other healthcare workers of such activities should be mandatory
2. Meticulous supervision concerning the proper usage of injection safety equipment should be a priority.
3. Periodic injection safety assessment and auditing for all health care staff, particularly nurses is needed
4. Further studies included nurses from different healthcare facilities as well as other healthcare workers are highly recommended.
5. Encourage nurses to report NSIs to high authorities once happened and follow proper steps to deal with the incident.
6. Disposal of biomedical waste and monitoring of the activity is required.

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