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## Assessment of Practice of Injection Safety among Nurses in a Tertiary Hospital in Osun State, Nigeria

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### Abstract

The objective of this study was to assess the practice of injection safety among nurses in Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife, Osun State, Nigeria. A cross sectional descriptive design was adopted for the study. A self-administered questionnaire was used to obtain information. A total of 271 nurses were selected from various wards of the hospital using stratified sampling technique. The data were collected, assembled and analyzed by using SPSS version 20.0 at  $p < 0.05$  significance level. Findings showed that 60% of the respondents demonstrated good practice of injection safety. However, the major barriers to the practice of injection safety were availability of good disposable injection equipment ( $p = 0.040$ ), non-display of injection safety guidelines ( $p = 0.010$ ) and nurses' lack of adequate knowledge ( $p = 0.003$ ). Training and retraining of nurses should be embarked upon in order to improve nurses' knowledge of injection safety and enhance good practice. The institution should demonstrate willingness to safety injection practices by providing adequate resources for its implementation.

**Keywords:** injection safety, barriers to injection practice, nurses, tertiary hospital, Nigeria

### INTRODUCTION

Injection is a very important aspect of nursing practice and a vital means of administering medications all over the world. It is estimated that about 20 billion injections are administered every year across the globe, and more than 90% of them are for curative purpose (Kulkarni et al., 2016). Injections are usually administered intravenously, intramuscularly, intradermally, and subcutaneously, but care must be taken when carrying this procedure because of the potential risk it portends if all precautionary measures are not followed. A safe injection is defined as the injection that does no harm to the recipient, does not expose the health worker to any risk and does not result in waste that is dangerous for the community (Peethala & Garapati, 2017). Injection safety is an integral component in the prevention and transmission of infection from one patient to another and is key to reducing hospital stay and its financial implications, whereas unsafe injection practices do not only harm patients but also carry risks to the health care workers through needle stick injuries

(Gyawali et al., 2013). Unsafe injection practices involve reusing syringe or needle, reusing the syringe even after changing the needle, use of injections against safer alternatives, touching the needle, leaving a needle in the vial to withdraw additional doses, recapping needles, improper disposal of used syringes, exposing used needle to the public (Rehan et al., 2021). It was reported that unsafe injection accounted for 32% of hepatitis B (HBV), 40% of hepatitis C (HCV) and 5% of human Immuno-deficiency virus (HIV) infections each year worldwide (Rehan et al., 2021). Developing countries often witnessed overbearing and unnecessary use of injections for both major and minor health related matters, and are mostly used unsafely (Gyawali et al., 2013). In Nigeria, National policy of injection safety and healthcare waste management was introduced by the Federal Ministry of Health, where training was organized for healthcare workers in major public health facilities at the inception (Gadzama et al., 2014).

Implementation and sustainability of policies is a herculean task in most developing countries, even as Gyawali, *et al.* (2013), reported that most injection providers had not been trained on safe injection practices in the previous years, with lack of guidelines for safety practice and medical waste management, hence the need for this study

The objective of this study was to assess the practice of injection safety among nurses in Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife, Osun State, Nigeria

## **MATERIALS AND METHODS**

A cross sectional hospital-based study was conducted among nurses in Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun State, Nigeria.

Taro Yamane formula was used to estimate the sample size  $n = N / [ 1 + N(e^2)$ . Where,  $n$  = desired sample size;  $N$  = population size (839);  $e$  = limit of sampling error set at 5%. Computing with the above formula gave a sample size of 270.9. Hence, a sample size of 271 was used for the study.

Stratified sampling technique was adopted to recruit consenting nurses until the required sample size was reached. As at the time of data collection, there were 839 clinical nurses employed in the institution who were working in 6 different units of the hospital. The study sample were proportionally selected from the 6 units as follows; 40 nurses were recruited from Unit I (Phase I), 57 nurses were recruited from Unit II (Phase II), 64 nurses from Unit III (Phase IVA) and 34 nurses were recruited from Unit IV (Phase IVB), 75 nurses were recruited from Unit V (Wesley Guild Hospital unit), while 1 nurse was recruited from Unit VI (Dental unit). The participants were selected following their willingness to participate and on first come, first recruited method.

A questionnaire was developed and validated for this study to obtain data from nurses on their practices of injection safety. The questionnaire comprised of 3 subsections and a total of 28 items. Section A consists of 7 items which assessed the socio-demographic characteristics of the respondents. Section B consists of 14 items which assessed the practice of injection safety and Section C consist of 7 items which assessed barriers to implementation of injection safety practices. The piloting of the developed tool was performed on a sample of 20 nurses who were selected based on similarity to the study sample. The questionnaire was modified as

appropriate before administration on the sample population.

### **Ethical approval**

Ethical approval was obtained from the Research and Ethics Committee of Obafemi Awolowo University Teaching Hospitals, Ile-Ife with the approval number ERC/2020/06/07. Permission was sought from the Head of Clinical Nursing Department. The description of the study was provided to the nurses, and emphasis was made that participation was voluntary. The nurses were informed that they have the right to withdraw at any stage of the study.

### **Data analysis**

The data obtained were cleaned to ensure that it is free from all possible errors such as omissions and incompleteness. The cleaned data were then entered directly into Statistical Package for Social Sciences (SPSS) by IBM SPSS Inc. of Chicago, Illinois, USA Version 20 for statistical package analysis to generate descriptive statistics. The relationship between variables was determined using chi-square test with statistical significance set at  $p$ -value < 0.05.

## **RESULTS**

As reflected in table 1, majority (91.1%) of the participants in the study are females. More than half (55.4%) of them were aged 31-40 years. Majority (81.5%) of the respondents are married. Concerning religious practices, majority (93.4%) were Christians. Almost half (48.7%) of the respondents were holder of Bachelor of Nursing Science. Majority (88.6%) of the respondents were from the Yoruba tribe. More than three quarter (76%) of the participants were senior nursing staffs and more than a third (37.3%) have over 9 years of working experience.

Table 2 shows that majority (76.8%) of the respondents always prepare injection in a visibly clean, dedicated table or tray; 93.3% occasionally clean their hands using clean water and soap before and after injection; 94.5% occasionally protect themselves against the blood and body fluids of all patients regardless of diagnosis. Also, about 95.5% of the respondents occasionally make use of antiseptic solution to clean patient's skin before injection occasionally, and where 74.2% opined that needle stick injury occasionally occurs during improper handling; and 94.1% occasionally disposed their sharps and infectious waste in an appropriate container immediately. Figure 1 showed that the practice of injection safety was good among 60% of the respondents.

The distribution of perceived barrier to the practice of injection safety was presented in table 3. The table revealed that availability of good disposable injection equipment (p= 0.040), non-display of injection safety guidelines (p= 0.010) and lack of knowledge of nurses (p= 0.003) have a significant influence on the practice of injection safety.

**Table 1: Socio-demographical Characteristics of the Respondents**

Item description	Options	Frequency (n = 271)	Percentage (100%)
Gender	Male	24	8.9
	Female	247	91.1
Age (years)	21-30	60	22.1
	31-40	150	55.4
	> 41	61	22.5
Marital Status	Single	47	17.3
	Married	221	81.5
	Divorced	3	1.1
Religion	Christianity	253	93.4
	Islam	14	5.2
	Traditional	1	1.4
Highest academic qualification	RN/RM	120	44.3
	BNSc	132	48.7
	Postgraduate	19	7.0
Tribe	Yoruba	240	88.6
	Igbo	24	8.9
	Hausa	7	2.6
Year of experience at work	< 3 years	64	23.2
	3-6 years	55	19.2
	6-9 years	54	19.9
	> 9 years	101	37.3

**Table 2: Distribution of the Level of Practice of Injection Safety**

Item description	Options	Frequency (n = 271)	Percentage (100%)	Mean ± SD
<b>Preparation of Injection Procedure</b>				
I prepare injection in a visibly clean, dedicated table or tray	Never	2	0.7	2.59± 0.77
	Sometimes	42	15.5	
	Occasionally	20	8.1	
	Always	205	75.6	
Disposable syringe is taken from a sterile unopened packet	Never	9	3.3	2.77 ± 0.72
	Sometimes	18	6.6	
	Occasionally	244	90.0	
	Always	0	0	
I clean my hands using clean water and soap before and after injection	Never	1	0.4	2.86± 0.53
	Sometimes	18	6.6	
	Occasionally	251	92.6	
	Always	1	0.4	
I use a new pair of gloves before giving injection	Never	10	3.7	2.63± 0.85
	Sometimes	35	12.9	
	Occasionally	226	83.4	
	Always	0	0	
I cover my broken skin before coming to work	Never	1	0.4	2.94 ± 0.38
	Sometimes	7	2.2	
	Occasionally	261	97.4	
	Always	2	0.7	

Table 2 Continue

Item description	Options	Frequency (n = 271)	Percentage (100%)	Mean ± SD
I protect myself against the blood and body fluids of all patients regardless of diagnosis	Never	0	0	2.89 ± 0.46
	Sometimes	15	5.6	
	Occasionally	256	94.5	
	Always	0	0	
I do use medications packaged for single use for more than one patient	Never	169	62.4	0.99 ± 1.36
	Sometimes	20	7.4	
	Occasionally	81	29.9	
	Always	1	0.4	
I take extra care while using scalpels, razors, needles and syringes	Never	4	1.5	2.89 ± 0.51
	Sometimes	9	3.3	
	Occasionally	257	94.8	
	Always	1	0.4	
<b>Injection Administration</b>				
I do antiseptic cleaning of patient's skin before injection	Never	2	0.7	2.89 ± 0.47
	Sometimes	11	4.1	
	Occasionally	258	95.2	
	Always	0	0	
There is appropriate securing of patient and intended puncture site	Never	0	0	2.94 ± 0.32
	Sometimes	7	2.6	
	Occasionally	264	97.4	
	Always	0	0	
Needle stick injury occurs during improper handling	Never	8	3.3	2.45 ± 0.95
	Sometimes	61	22.5	
	Occasionally	201	74.2	
	Always	0	0	
<b>Waste Management Activities</b>				
There is immediate disposal of sharps and infectious waste in an appropriate container	Never	1	0.4	2.88 ± 0.49
	Sometimes	15	5.5	
	Occasionally	255	94.1	
	Always	0	0	
I do recap used needle with two hands	Never	220	81.2	0.46 ± 1.04
	Sometimes	14	5.2	
	Occasionally	37	13.7	
	Always	0	0	
Improper disposal of sharps cause injury	Never	13	4.8	2.68 ± 0.83
	Sometimes	24	8.9	
	Occasionally	234	86.3	
	Always	0	0	

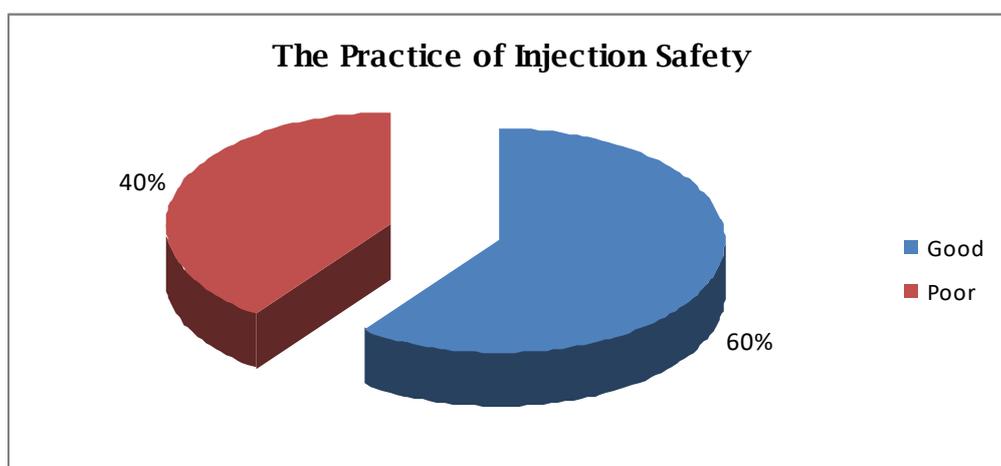


Figure 1: Overall level of practice of Injection Safety

**Table 3: Barriers facing the implementation of Injection Safety Practices**

Items	Practice of Injection safety		Chi square	P value
	Poor	Good		
<b>Availability of good disposable injection equipment:</b>				
No	2	12	4.236	0.040*
Yes	108	149		
<b>Regular running water and soap for cleansing of hands:</b>				
No			2.753	0.097
Yes	42	46		
	68	115		
<b>Non display of injection safety guidelines</b>				
No	57	58	6.673	0.010*
Yes	53	103		
<b>Lack of training and retraining:</b>				
No	26	37	0.016	0.900
Yes	84	124		
<b>Emergency nature of some cases and work pressure:</b>				
No	46	65	0.056	0.812
Yes	64	96		
<b>Shortage of nurses:</b>				
No	68	106	0.460	0.498
Yes	42	55		
<b>Nurses' lack of adequate knowledge is a major barrier:</b>				
No			11.718	0.003*
Yes	55	56		
	55	105		

p < 0.05\*

## DISCUSSION

The participants of this study were predominantly females. It is not uncommon to have female's majority on studies among nurses, as the profession have been stereotyped as a female dominated profession. Almost half (48.7%) of the respondents had Bachelor of Nursing Science while more than a third (37.3%) have over 10 years of work experience. This is similar to the report of a study among healthcare workers in Jigawa State, North-western Nigeria where majority were in their early careers whose work experience were within the range of 1 - 10years (Abubakar *et al.*, 2019).

It was found out in this study that majority (60%) had good practice while the practice of injection safety was poor among 40% of the respondents. Findings from this study was similar to the report of Ijachi *et al.*, where 79.8% of the healthcare professionals had appropriate practice of injection safety (Ijachi *et al.*, 2016). Anwar *et al.* (2019), also reported a high score (97.6% and 98%) of safe injection practices among nurses in their study, but our finding was contradicted by the report of Birhanu *et al.* (2019), where 25.5% had good practice of injection safety. Another author reported that in a study among injection services providers/phlebotomist, the respondents had good knowledge of injection Furthermore, the availability of disposable injection equipments as a barrier to practice of

safety but majority were not complying with recommended guideline of infection control and aseptic techniques (Gadzama *et al.*, 2014). The Barriers to the practice of injection safety were identified to be lack of knowledge of nurses (p= 0.003), non-display of injection safety guidelines (p= 0.010) and availability of good disposable injection equipment (p= 0.040). In this study, the lack of knowledge of nurses as reported as a barrier could be likened to the report of Birhanu *et al.* (2019), where only 28.7% of the nurses had good knowledge on injection safety. The education and knowledge that nurses garnered while in training is of essence but more important is on-the-job training on current injection policy and guidelines. This has become increasingly important as knowledge gained through basic professional training has a half-life of 2.5years, and such training is expected to expire by the fifth-year post graduation (Chong *et al.*, 2011). The need for a written guideline on injection safety which will be conspicuously placed at designated areas of the wards cannot be over-emphasized, even as the World Health Organization advised that setting up a national standard for safe and appropriate use of injections is the first step before assessment of injection practices as it will provide a target value upon which the assessment will be based (WHO, 2003). injection safety in this study is similar to the findings of Gadzama *et al.* (2014), where the

facility waste is not collected in appropriate containers and disposed of according to the standard waste management, and most of the staff handling the waste were not trained.

#### CONCLUSION

The practice of injection safety was good among nurses in Obafemi Awolowo University Teaching Hospital. Therefore, training and retraining of nurses should be embarked upon in order to improve nurses' knowledge of injection safety and enhance good practice. The institution should demonstrate willingness to safety injection practices by providing adequate resources for its implementation

#### RECOMMENDATIONS

1. Despite this level of practice, there is the need for continuing education on the practice of injection safety among nurses as some still engage in recapping of needles,

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using packaged medications more than once, and fail to make use of hand gloves.

2. Injection safety guidelines should be made available and accessible for nurses by Ministry of Health and Hospital Management.
3. There should be adequate provision of facilities for proper waste disposal by hospital management and nurses should make use of these facilities.

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