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Determinants of Injection Safety Practice Among Health Care Workers in Selected Primary Health Care Centres, Abeokuta, Ogun State

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Abstract:

Injections are one of the most common health care procedures and have been used effectively for many years in preventive and curative healthcare. Safe injection practice is one of the standard precautions that help in maintaining basic levels of patient safety and provider protections but with the increase in the rate of infections associated with unsafe injection practices, there is a need to assess the determinants of injection safety practices among health care workers in primary health care centres in Abeokuta Ogun State. Nigeria. This study was conducted in selected primary health care centres in the two Local Government Areas of Abeokuta South and North. A total of one hundred and eighty-two (182) health workers were randomly selected from the total of two hundred and eighty (280) health care workers in the two local government areas. A well-structured questionnaire to assess the determinants of safe injection practice was developed and administered. The data from the survey was entered and analyzed using Statistical Package for Social Scientists (SPSS) version 23. Descriptive analysis involving frequency counts and percentages was done and the hypotheses tested using regression analysis model. The level of significance was set at 95% confidence interval.

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The result from this study shows that there was a relatively high number (55.5%) of health workers that carry out safe injection practices, 44.5% of the respondents still carried out inadequate safe injection practices. In conclusion, large number of the health care workers are willing to carry out good injection practices, but many are still engaged in unsafe practice which is a source of concern. Hence, continuous training and awareness creation on injection safety practice should be the norm at primary health care facilities.

Keywords: Injection Safety, Knowledge, Practices, Health Care Workers,

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Introduction

Injections have been used efficiently for several years in precautionary and curative of different health ailment by the healthcare providers. Also, injections are one of the most common health care measures that is been carried out on a daily basis by the Doctors, Nurses, community health Extension Workers, laboratory officers among others because it ensures the introduction of medication into the body system for healing or drawing samples for diagnosis purposes. Injection practices worldwide and especially in low- and middle-income countries, including Africa has witness unsafe practices that ultimately lead to the large-scale transmission of blood borne viruses among patients, health care providers and the community at large. Unsafe injection practice seems to be very high in some countries, with a global estimated of 16.7 billion injections were received annually, and 6.6 billion were made with the reused equipment (WHO, 2018). Nevertheless, injection safety includes practices envisioned to prevent spread of infectious diseases between one patient and another, or between a patient and healthcare provider, and to prevent harms such as needle stick injuries.

WHO describes a "safe injection" as one which does not damage the recipient, does not expose the provider of the injection to any avoidable risk. Unsafe injection practices pose a risk for patients and healthcare workers. Unsafe injection practices such as the re-use of unsterile needles and syringes contribute extensively to the global burden of blood-borne pathogens (Morar et al., 2016) and (Pepin, et al, 2014). The problem of diseases arising from accidental injection needle-stick injuries as documented by WHO among healthcare workers showed that 3 million accidental needle-stick injuries lead to 37% of new hepatitis B virus (HBV) infection, 39% of new hepatitis C virus (HCV) infection and 5.5% of new human immunodeficiency virus (HIV) infection among healthcare providers.

It has been observed that health care workers are exposed to dangers of unsafe injection practices such as recapping of needles, manipulating used sharps, passing of sharps from one health care worker to another to discard, carelessly left used needles in unexpected places like dirty linen. Patients are exposed to the vulnerabilities of unsafe injection practices from extreme use of injectable medications especially when there are other appropriate alternatives, reuse of injection equipment, where hygienic technique is not observed by healthcare workers and administration of injections at incorrect mode.

In a study conducted by Desta et al., (2018), they concluded that one of the global public health agenda is infections associated with health care, as hospital related infection is becoming a momentous threat. Burnnet (2020) was of the veiw that, infection can occur when microorganisms such as viruses, bacteria, fungi among others enters human body to cause havoc. Also, World Health Organization showed that up to 1.7 million people were infected with hepatitis B virus, up to 315,000 with hepatitis C virus and as many as 33,800 with HIV through an unsafe injection (WHO, 2015). WHO also stresses the need to limit the number of unnecessary injections as a precarious way of reducing the risk.

In addition, the level of awareness of injection safety practices among health workers was reported to be high but their adherence to the practice of care was not commensurate with the awareness (Eyam at al. 2019). Also, study conducted by (Ijachi et al, 2016) at Benue State University Teaching Hospital (BSUTH) revealed that the healthcare professionals at

BSUTH have positive attitude, good knowledge and suitable practice of injection safety but have some misapprehensions on the cause and they still experience needle stick injuries during their professional activities. This agreed with another report that showed that, despite injection safety training, inadequate knowledge with poor injection practice was found among the surveyed healthcare workers at the secondary healthcare facility in Jigawa State (Salisu et al., 2019). The reuse of syringes and needles was also reported which underscores the need for adequate and safe injection commodities at all levels of healthcare delivery.

This study therefore, assessed determinants of injection safety practices among health care workers in selected primary health care centres in Abeokuta, Ogun State. This study specifically examined:

1. the background training of primary health care workers;
2. the level of knowledge on injection safety among primary health care workers;
3. the level of injection safety practices among primary health care workers;
4. the relationship between background training and injection safety practice; and
5. relationship between knowledge and injection safety practice.

Research Questions

The following research questions were raised for this study:

1. What is the background training of primary health care workers?
2. What is the level of knowledge on injection safety among primary health care workers in Abeokuta?
3. What is the level of injection safety practices among primary health care workers in Abeokuta?

Research Hypotheses

The following research hypotheses were postulated for this study:

1. There is no significant relationship between background training and injection safety practice.
2. There is no significant relationship between knowledge and injection safety practice.

Methodology

This study adopted a cross-sectional quantitative descriptive survey design which is a form of a non-experimental research type. The study was conducted in two selected Local Government area of Abeokuta Ogun State, which are, Abeokuta South Local Government comprises of 20 primary health care centres and Abeokuta North Local Government comprises of 30 primary health care centres. The study population were the health care workers in selected primary health care centres in two selected Local Government area of Abeokuta, Ogun State. The cadres of health care workers sampled were nurses, doctors, community health extensions workers and laboratory staffs. Slovin's formula (1960) was applied in getting a sample size of 182 (see table 1 and 2). Multistage sampling procedure was used in selecting the target samples.

Table 1: Staff distribution of selected health care workers in the two LGAs

SN	CADRE	ABEOKUTA SOUTH	ABEOKUTA NORTH	TOTAL
1	Nurses	33	45	**78**
2	Doctor	6	7	**13**

3	CHEW	56	68	**124**
4	Laboratory Officers	28	37	**65**
	TOTAL	**123**	**157**	**280**

Table 2: Distribution of Respondents by Cadre

SN	CADRE	ABEOKUTA SOUTH		ABEOKUTA NORTH		TOTAL	
		Total Population	Selected Sample	Total Population	Selected Sample	Total Population	Selected Sample
1	Nurses	33	$\frac{33}{123} \times 80 = 22$	45	$\frac{45}{157} \times 102 = 29$	78	51
2	Doctor	6	$\frac{6}{123} \times 80 = 4$	7	$\frac{7}{157} \times 102 = 5$	13	9
3	CHEW	56	$\frac{56}{123} \times 80 = 36$	68	$\frac{68}{157} \times 102 = 44$	124	80
4	Laboratory Officers	28	$\frac{28}{123} \times 80 = 18$	37	$\frac{37}{157} \times 102 = 24$	65	42
	TOTAL	**123**	$\frac{123}{280} \times 182 = 80$	**157**	$\frac{157}{280} \times 182 = 102$	**280**	**182**

To measure determinants of injection safety among primary health care workers in selected Local Government Area of Abeokuta, a well-structured questionnaire was designed to collect relevant data on determinant of injection safety practices among Primary Health Care workers. The validity of the research instruments was done through face and content validity techniques. For the face and content validity, the researcher sought the opinion of experts related to the field of Nursing Science and Tests & Measurement. To carry out the reliability of the instrument, 10% (18.2, approximately 18) of the health care workers were used as the sample population to conduct the study at Odeda primary health care centre, Odeda LGA, Odeda in Ogun state. The questionnaires were administered, and the Cronbach Alpha method was used in determining the reliability. The results showed that the knowledge of injection safety practices has a co-efficient of 0.72 and injection practices have a co-efficient of 0.90.

Data collected were checked for errors to ensure correctness and completeness. The data were compiled, cleaned, coded, entered and analysed using Statistical Package for the Social Sciences (SPSS) version 23. Descriptive statistics such as frequency counts, percentages, tables, mean scores, and standard deviation was used to analyse demographic data of participants and the research questions. Regression model analysis was used in analysing the hypotheses of the study and the level of significance was set at p-value of 0.05.

Results

Research Question 1: What is the background training of primary health care workers?

Table 3: Background training of primary health care workers

Have you attended any seminar/training on Injection Safety Practices?	Yes	103	56.6
	No	79	43.4
	Total	182	100.0
What was the duration of the training	Less than a week	62	34.1
	1-4 weeks	27	14.8
	1 month and above	13	7.1
	Nil	80	44.0
	Total	182	100.0
Which injection safety areas were covered?	Clinical practice only	68	37.4
	Waste management only	37	20.3
	Clinical practice and waste management	22	12.1
	Others	7	3.8
	Nil	44	26.4
	Total	182	100.0

Table 3 shows that 79 (43.4%) of the health care workers have not attended any training (seminar) on injection safety practices.

Research Question 2: What is the level of knowledge on injection safety among primary health care workers in Abeokuta?

Table 4: Knowledge level on injection safety practice **n=182**

S/N	Statement	Yes (%)	No (%)	Mean	SD
1	A safe injection poses no danger to the patient, providers and the community*	165 (90.7)	17 (9.3)	1.09	0.29
2	HIV, Hepatitis B and C are infections associated with unsafe injection*	125 (68.7)	57 (31.3)	1.31	0.47
3	Recapping the needle after injecting a patient is a safe injection practice*	104 (57.1)	78 (42.9)	1.43	0.50
4	Hepatitis B vaccine is important to injection providers*	138 (75.8)	44 (24.2)	1.24	0.43
5	Injection safety practices serves as a means of preventing infections*	159 (87.4)	23 (12.6)	1.13	0.33
6	Controlling of the reorder levels in stocks of injection supplies is important in injection safety*	141 (77.5)	41 (22.5)	1.23	0.42
7	I precede and take measures to prevent sudden patient movement during and after the injection procedure*	144 (79.1)	38 (20.9)	1.21	0.41
8	Hand washing prior to administering an injection is a safe injection practice*	147 (80.8)	35 (19.2)	1.19	0.40

9	Hand washing after administering an injection is a safe injection practice*	151 (83.0)	31 (17.0)	1.17	0.38
10	Hand washing only is required for any form of injection administration	91 (50.0)	91 (50.0)	1.50	0.50
11	Aseptic technique is required for injection safety practices that involves some medical procedure only*	145 (79.7)	37 (20.3)	1.20	0.40
12	Observation of proper storage conditions, such as temperature as per manufactures instructions is safe injection practice*	150 (82.4)	32 (17.6)	1.18	0.38
13	Use of boiling pans for sterilization of needles and other injection materials is a safety injection practices.	77 (42.3)	105 (57.7)	1.58	0.50
14	Correct injection device is necessary for the patient*	159 (87.4)	23 (12.6)	1.13	0.33
15	Post exposure Prophylaxis is recommended in the event of needle stick injuries*	157 (86.3)	25 (13.7)	1.14	0.35

*Indicates that items were reverse scored so that higher mean scores always indicate more satisfaction or agreement.

Table 4 presents the knowledge of the health workers on injection safety practices. 165 (90.7%) and 125 (68.7%) of the respondents agreed that safe injection poses no danger to the patient, providers, and the community and that HIV, Hepatitis B and C are infections associated with unsafe injection, respectively. A total of 138 (75.8%) of respondent know the importance of Hepatitis B vaccine to injection providers. Taking measures to prevent sudden movement of the patient during and after the injection procedure was seen as a good injection practice by 144 (79.1%). A total of 147 (80.8%) and 151 (83.0%) know that hand-washing prior to and after administering injection is a safe injection practice, respectively. Using aseptic techniques for injection safety practices that involves some medical procedure only was known by 145 (79.7%) of the respondents to be a good practice. More than half of the respondents 104 (57.1%) said that recapping the needle after injecting a patient is a safe injection practice and a total of 77 (42.3%) of respondents had the view of using boiling pans for sterilization of needles and other injection materials as a safe injection practice.

Table 5: The summary of the level of knowledge on injection safety practices

Knowledge level	Category of scores	Frequency	Percentages (%)
Low	0-5	19	10.4%
Moderate	6-10	46	25.3%
High	11-15	117	64.3%
Total		**182**	**100**

Table 5 shows that majority of the respondents had knowledge on injection safety practices. 117 (64.3%) had high knowledge of injection safety practices, 46 (25.3%) had

moderate knowledge on safe injection practices while 19 (10.4%) of them had a low knowledge about it.

Research Question 3: What is the level of injection safety practices among primary health care workers in Abeokuta?

Table 6: Level of injection safety practices **n=182**

	Statement	Mean	SD
1	Acceptable practices if performed with aseptic technique*	1.66	0.81
2	Injection medication in a syringe that was prepared by someone else can be administered by any health care worker	3.40	1.32
3	I often enter a single-dose/single-use vial more than once to obtain additional doses for the same patient*	3.24	1.47
4	I do often use multidose vials for more than one patient.	3.17	1.39
5	I do often use single-dose/single-use vials for more than 1 patient	3.41	1.39
6	Practices not considered appropriate or consistent with current injection guidelines	3.32	1.46
7	Always administer injection medication to more than 1 patient using the same syringe but a new sterile needle for each patient	3.52	1.29
8	I dispose injection waste into the recommended color-coded waste bins*	2.30	2.20
9	I wash hands with running water immediately on arrival to work*	2.18	1.40
10	I wash hands with running water before putting on gloves to give an injection*	2.38	1.44
11	I wash hands with running water after removing the gloves	2.65	1.48
12	I wash hands with running water after contact with any form of contamination even when gloves are worn*	2.05	1.30
13	I wash hands with running water between procedures on same patients*	2.08	1.35
14	With increased workloads, hand washing is compromised	2.58	1.54
15	Pre-drawn medications are labelled with the legible identification: medication name	2.78	1.51
16	Pre-drawn medications are labelled with the legible identification: time it was done*	1.62	0.69
17	Pre-drawn medications are labelled with the legible identification: name of the person who did it*	1.71	0.93
18	Pre-drawn medications are labelled with the legible identification: strength of the medication*	1.88	1.02
19	Pre-drawn medications are labelled with the legible identification: expiration date*	1.78	0.90
20	I use a new sterile syringe from a sealed pack for the injections*	1.66	0.93
21	I reuse disposable syringes	3.64	1.33
22	I verify the integrity of the packet of the disposable syringe before use*	1.95	1.19
23	I prepare each injection in a clean designated area*	1.69	0.96

*Indicates that items were reverse mean scored so that higher scores always indicate more satisfaction or agreement.

The table 6 showed shows the means and SD scores of the respondents' injection practices. The items with asterisks, their responses were "reverse scored" such that higher scores would indicate more favourable satisfaction or agreement. The item statements (with mean response values ± SD): Acceptable practices if performed with aseptic technique (1.66±0.81); I dispose injection waste into the recommended color-coded waste bins (2.30±2.20); I wash hands with running water immediately on arrival to work (2.18±1.40); I wash hands with running water before putting on gloves to give an injection (2.38±1.44); I wash hands with running water after contact with any form of contamination even when gloves are worn (2.05±1.30); I wash hands with running water between procedures on same patients (2.08±1.35). Injection medication in a syringe that was prepared by someone else can be administered by any health care worker (3.40±1.32); I often enter a single-dose/single-use vial more than once to obtain additional doses for the same patient (3.24±1.47); I do often use single-dose/single-use vials for more than 1 patient (3.41±1.39); Practices not considered appropriate or consistent with current injection guidelines (3.32±1.46); Always administer injection medication to more than 1 patient using the same syringe but a new sterile needle for each patient (3.52±1.29); With increased workloads, hand washing is compromised (2.58±1.54) and I reuse disposable syringes (3.64±1.33) were agreed to be bad practices by the respondents as they had high mean scores.

Table 7: The level of injection safety

Practice level	Category of scores	Frequency	Percentages (%)
Poor	0-8	21	11.5%
Fair	9-16	60	33.0%
Adequate	17-24	101	55.5%
Total		**182**	**100**

Table 7 shows that majority of the respondents had a good practice of safe injection. 101 (55.5%) had adequate safe injection practices, 60 (33.0%) of them had a fair injection safety practice level while 21 (11.5%) of them had a poor practice of safe injection.

Test of Hypotheses

Hypothesis 1: There is no significant relationship between background training and injection safety practice.

Table 8: Relationship between background training of the health care workers and their practice of injection safety

	Unstandardized Coefficients		Standardized Coefficients		
Model	**B**	**Std. Error**	**Beta**	**T**	**Sig.**
(Constant)	2.748	0.472		5.827	0.000
Highest level of training	-0.043	0.073	-0.045	-0.590	0.556

Duration of experience in the PHC facilities (in years)	0.037	0.068	0.043	0.552	0.582
Are you equipped on the guidelines/regulations on injection storage and management?	0.077	0.139	0.046	0.557	0.578
Have you attended any seminar/training on Injection Safety Practices?	-0.242	0.241	-0.173	-1.001	0.318
Duration of training	0.005	0.009	0.097	0.543	0.588
Which injection safety areas were covered?	-0.007	0.005	-0.118	-1.232	0.219
R= 0.227, R^2 = 0.052					

Table 8 presents the regression analysis of the relationship between training and background of health care workers and their level of injection safety practices. The table 4.7 revealed that the training and the background of health care workers analysed had no significant relationship on their injection safety practices as the p-values recorded were greater than 0.05. Also, the coefficient of multiple regressions R = 0.227 and R^2 = 0.052 was recorded. This shows that the practices of safe injection of the participants are influenced by 5.2% of the training and background of health care workers.

Hypothesis 2: There is no significant relationship between knowledge and injection safety practice.

Table 9: Relationship between level of knowledge of health care workers on practice of injection safety

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	2.368	0.122		19.336	0.000
Knowledge of injection safety practices	0.049	0.076	0.048	0.644	0.520
R= 0.048, R^2 = 0.002					

Results in table 9 revealed that there was no significant relationship on their practices of injection safety as the p-value of 0.520 was recorded which is greater than 0.05. Hence, the earlier set null hypothesis (H_0) is accepted, and the alternate hypothesis (H_1) is rejected. Also, the coefficient of multiple regressions R = 0.048 and R^2 = 0.002 was recorded. This shows that the practice of injection safety of the participants is influenced by 0.2% of the knowledge of the respondents on injection safety practices.

Discussion

The findings of this study showed that doctorate degree was the highest level of education and diploma was most educational attainment among the respondents. 56.6% of the respondents have attended training or seminar on injection safety practices and 57.1% of them have 1-10 years of experience working at primary health centres. This report reflects existing outcome from the study conducted by Salisu et al. (2019) on the knowledge and practice of injection safety among healthcare workers in a secondary healthcare facility in Jigawa state, north-western Nigeria that reported 87.5% of respondents with 1-10 years of experience.

The outcome of this study revealed that (64.3%) had adequate knowledge of injection safety practices, 46 (25.3%) had moderate knowledge on safe injection practices while 19 (10.4%) of them had a fair knowledge of it. The fact that as high as 57.1% and 42.3% of respondents still have the view of recapping the needle after injecting a patient and use of boiling pans for sterilization of needles and other injection materials, respectively as a safe injection practice and 44% of respondents did not see taken Hepatitis B vaccine as important to injection providers in this study underscore the importance of adequate knowledge on the injection safety practices. This aligns with the finding of Ijachi et al. (2016) conducted on the knowledge, attitude, and practice of injection safety among Benue State University Teaching Hospital healthcare professionals where it was concluded that there is a disproportionate gap between the level of knowledge and the practice of injection safety, hence continuing medical education among health professionals is recommended to reduce the rate of needle stick injuries was recommended.

The outcome of this study showed that only 55.5% of the respondents carrying out adequate safe injection practices. The general practice of the healthcare workers in this study was good and this agreed with outcome of study conducted by Ijachi et al. (2016). On the other hand, the fact that this study revealed that as high as 44.5% still carried out inadequate safe injection practices should be a thing of concern. This agrees with the previous study conducted by Olajide et al. (2020) who reported that there were poor practices (15.2 %) of infection prevention among the healthcare workers sampled in the study conducted to understand factors that are influencing the utilization of infection prevention and control measures among nurses in some selected state hospitals in Lagos State, Nigeria. Kolude et al. (2020) also revealed poor practices in some areas among the different cadres of health workers in Ekiti state, Nigeria.

Conclusion

In conclusion, the study achieved the objective of assessing the determinants of injection safety practices among health care workers in selected primary health care centres in Abeokuta, Ogun State. It is concluded that majority of the health care workers had adequate knowledge of injection safety practices while some still have some misconceptions about it. A total of 101 (55.5%) respondents are carrying out adequate safe injection practices while as high as 44.5% still involve in inadequate safe injection practices.

Recommendations

Based on the result of the findings, the following recommendations were made;

1. Adequate training, workshops, and awareness creation on injection safety practice for health care workers should be the norm in the primary health care facilities.
2. The health care workers involved with injection practice should be encouraged to take vaccination against Hepatitis B and C and HIV infections.
3. The health care centres should ensure that the guidelines and regulations on injection safety practices are available.
4. Adequate logistics and support supervision should be put in place to ensure that health workers adhere to standard guidelines and practices.

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