Knowledge, Attitude and Practice of Injection Safety among Benue State University Teaching Hospital Healthcare Professionals

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ABSTRACT

Background: Globally about 16 billion injections are given in a year, 40% of which involves reuse of needles and syringes without sterilization. This predisposes both the recipient and the health worker to blood borne infections like Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS), Hepatitis etc. States like Benue, which has HIV prevalence above the national average, probably have higher risk of these infections. This study assessed the knowledge, attitude and practice of injection safety among the healthcare professionals of Benue State University Teaching Hospital.

Methods: A cross-sectional descriptive study using stratified sampling technique was carried out on 141 health professionals of the institution between January to March 2014, using structuredself-administered questionnaire. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 20.0 with statistical significance set at p-value of p <0.05.

Results: The mean age of the respondents was 35.42 (SD±8.72) years. The respondents were predominantly males (56.7%) and nurses dominated the cadre. Overall, the respondents had good (70.2%)knowledge, positive (87.2%) attitude and appropriate (79.8%) practice scores respectively, but there were some misconceptions about the diseases transmissible by unsafe injection. The commonest unsafe injection practice among the respondents was recap of needles (19.1%). The relationship between the nature of injury and the cadre of health care professionals was statistically significant (P=0.004).

Conclusion: There is 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.

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INTRODUCTION

Injection safety as a concept includes all actions that are needed to ensure the administration of a safe injection. It is defined by the World Health Organization (WHO) as an injection that does no harm to the recipient, does not expose the health worker to any risk and does not result in waste that puts the community at risk.[1] This implies that injections are unsafe when given with unsterile or improper equipment or techniques. Unsafe injections can cause the transmission of blood borne infections to an entire community as well as abscesses, toxic reactions and the possibility of emergence of other diseases in the future.[2-4] Annually about 16 billion injections are administered in the developing and developed countries, 40% of which involves reuse of needles and syringes without sterilization.[5] Sometimes, nine out of ten patients presenting to a primary healthcare provider receive an injection, over 70% of which are unnecessary or could be given in an oral formulation.[1,3] This is often because patients believe that injections are stronger and faster than other routes of drug administration and in some instances, doctors in response to the patient's immediate need, over prescribe injections despite other available options.[6-7] The fact that most vaccines are administered by injections reinforces the patients belief that injections are better.[8] These predispose the recipient and those who administer the drugs using syringes to blood borne infections like Hepatitis B virus (HBV), Hepatitis C virus (HCV), Human immunodeficiency virus (HIV), hemorrhagic fevers etc.[3,6,9] The global estimated

cases of HBV infection is about 8 to 16 million annually, HCV infection and Human Immunodeficiency Virus (HIV) is about 2.4 – 4.5 million and 80,000 -160,000 respectively.[10]

In other to reduce the health issues associated with unsafe injection practices, World Health Organization (WHO) introduced the concept of injection safety worldwide.[9] Through this network, WHO provides advice and a series of policy, management and advocacy tools to help countries access safe, affordable equipment to promote the training of health staff and rational use of injections.[11] The concept emphasizes on injection procedures that are safe for the recipient, the provider and the community where the injection instruments/waste are finally disposed of.[9,11] On that note, it is therefore, mandatorily advised that safe injection practices should be routinely applied in all healthcare settings since every health provider is considered as a potential source of infection.

Health care workers in developed countries have been shown to improve their knowledge and practice of injection safety and hospital waste management over the decade[10,12] and their consistent practices of injection safety have been shown in several studies to protect the health

Workers from severe morbidity and mortality due to common occupational injuries and even effective management of their patients.[13] On the contrary, the knowledge and compliance to safe injection practices in Nigeria is still suboptimal.[14] Furthermore, the incidence of Blood borne infections is on the increase and hospital workers are in continuous contact with patients in the course of carrying out their duties.[14,15] Benue state, where this work was carried out, has HIV prevalence rate of 10% (far higher than the national average of 3.6%).[16] All these, when captured on a background of high worldwide prevalence of unsafe injections[5] is worrisome as it depicts poor knowledge and practice of injection safety. A study of this nature is therefore imperative and timely considering the fact that implementation of the recommendations will promote better healthcare service delivery in the institution and Benue State. Our study was carried out to determine the knowledge, attitude and practice of injection safety among the healthcare professionals of Benue State University Teaching Hospital.

MATERIALS AND METHODS

Study Area

Benue State University Teaching Hospital (BSUTH) is a tertiary health facility. It is the first teaching hospital of a State University in the northern part of Nigeria. It is situated in the southern part of North Central Nigeria, and far away from any Federal Government teaching hospital.[17] It lies along Makurdi-Gboko road; about 2.64 kilometers north-west of Benue Breweries. The hospital is located at latitude 7043'N and longitude 8034'E.[18] The hospital has two directorates: directorate of administration and directorate of clinical services. It has clinical staff strength of 152 doctors, 211 nurses, and 30 laboratory scientists/technologists (giving a total of 393). Patients' annual turnover is about 25000.[19]

Study population and design

A cross-sectional descriptive study was used for the study. All Healthcare professionals involved in direct handling of potentially infectious body fluids, tissues or potentially contaminated invasive devices that have worked for more than 6 months were recruited for the study. Those who were not directly involved in the handling of potentially infectious body fluids, tissues or potentially contaminated invasive devices were excluded from the study. Eligible respondents who did not consent to participate were also excluded.

Sample size estimation and sampling technique

A minimum sample size of 188 was obtained using the formula $n = (z^2 pq/d^2)$[20] based on the assumption of safe injection practice of 85.7% from a previous study,[21] and 0.5% degree of accuracy. After adjusting for infinite factor and 10% none- responsive rate, a final minimum sample size of 141 was arrived at.

Stratified sampling technique was employed to select required respondents for the study. The clinical staffs used for the study were divided into three strata (Nurses, Doctors and Laboratory scientist) and proportionate allocation was done to select the actual respondents for the study. Of the total 141 respondents selected for the study Nurses were 76, while doctors and laboratory scientist were 54 and 11 respectively.

Data collection

The respondents were interviewed using structure self-administered questionnaire between January to March 2014. Six trained research assistants were involved. Information obtained were socio-demographic characteristics, knowledge, attitude and practice of injection safety, post exposure prophylaxis and the respondents personal experience of the consequences of unsafe injection practices.

Data analysis

Data was analyzed with Statistical Package for Social Sciences (SPSS) version 20.0. Results were summarized and presented as tables and chi square (χ^2) test was used for test of association with statistical significance set at p-value of 0.05. All related questions on knowledge, attitude and practice of injection safety were awarded 1 mark for any correct answer and zero mark for all wrong answers. The total was summed up and the percentage score were graded as reported in a previous study.[21]

Ethical consideration

Ethical approval for the study was obtained from BSUTH Research Ethics Committee and BSUTH management before commencing the study. Verbal consent was also obtained from the actual respondents before the commencement of the study.

RESULTS

Socio-demographic Characteristics

All the respondents consented to the completion of self-administered questionnaire, giving a response rate of 100%. Highest proportion (47.5%) of the respondents were between 30-39 years, followed by 40-49 years (25.5%) and 20-29 years (23.4%) then finally 50-59years (3.5%). The mean age was 35.42(SD $\pm$ 7.89) years.

More than half of the respondents were males (56.7%), while females were 43.3%; (m:f = 1.3: 1). Nurses predominates the Cadre (53.9%), followed by doctors (38.3%) and laboratory scientists (7.8%)

Table I: Socio-demographic characteristics of Respondents (N=141)

Socio-demographic characteristics	Frequency	Percent
Age (in Years)		
20 - 29	33	23.4
30 - 39	67	47.5
40 - 49	36	25.5
50 - 59	5	3.5
Sex		
Male	80	56.7
Female	60	43.3
Cadre		
Nurse	76	53.9
Doctor	54	38.3
Laboratory Scientist	11	7.8

The mean age = 35.42(SD ± 7.89) years.

Knowledge of Injection Safety

All the respondents (100%) were aware of injection safety. Most of them attributed the cause of unsafe injection to negligence (45.4%), followed by improper disposal (21.3%), ignorance (19.1%) and inadequate syringes (12.8%). Lack of skill constituted the least (1.4%). Almost all the respondents (98.6%) knew that HIV/AIDS was transmissible via unsafe injection while very few (1.4%) did not. Other diseases the respondents knew that it was transmissible via unsafe injection practices were Hepatitis B (87.9%), Hepatitis C (71.6%) and Lassa fever (50.4%). Almost all (99.3%) respondents had misconception of Parkinson's disease as a disease transmissible via unsafe injection. All the respondents (100.0%) knew that cholera, sickle cell disorder and kwashiorkor are not transmissible via unsafe injection. The overall knowledge score of the respondents concerning

diseases transmissible via unsafe injection was good (70.2%).

Table II: Respondents' Knowledge of the Causes of Unsafe Injection (N=141)

Causes	Frequency	Percent
Negligence	64	45.4
Improper Disposal	30	21.3
Ignorance	27	19.1
Inadequate Syringes	18	12.8
Lack of Skill	2	1.4

Table III: Respondents' Knowledge of the Diseases Transmitted Via Unsafe Injections (N=141)

Diseases	Transmissible		Not transmissible	
	Frequency	Percent	Frequency	Percent
HIV/AIDS	139	98.6	2	1.4
Hepatitis B	124	87.9	17	12.1
Hepatitis C	101	71.6	40	28.4
Lassa fever	71	50.4	70	49.6
Parkinson's Disease	1	0.7	140	99.3
Cholera	0	0	141	100
Sickle Cell Disorder	0	0	141	100
Kwashiorkor	0	0	141	100

Attitude towards Injection Safety

All the respondents (100%) strongly agreed that injection safety was important. Majority of the respondents (92.9%) strongly agreed that adequate measures had been taken to ensure injection safety, while 7.1% disagreed. More than two-thirds of the respondents (78.7%) agreed that it was important to use disposable gloves always, while others agreed it should be used often, sometimes or rarely (21.3%). More than two-thirds of the respondents (77.3%) agreed it was important to use safety boxes always, but those who agreed that it should be used often, sometimes or rarely constitutes 22.7%. The overall attitudinal score of the respondents was positive (87.2%).

Practice of Injection Safety

Almost half of the respondents (46.8%) practice hand washing while slightly above one-fifth (22%)

Table IV: Respondents' Attitude towards Injection Safety (N=141)

Variable	Frequency	Percent
Injection Safety is important		
Strongly agreed	141	100.0
Adequate Measures has been taken to Ensure Injection Safety		
Strongly agreed	131	92 .9
Disagreed	10	7.1
Agreed to Use Of Disposable Gloves		
Rarely	2	1.4
Sometimes	10	7.1
Often	18	12.8
Always	111	78.7
Agreed to Use of Safety Boxes		
Rarely	1	0.7
Sometimes	10	7.1
Often	21	14.9
Always	109	77.3

Table V : Practice of injection safety by respondents (N=141)

Practices	Frequency	Percent
Hand washing		
Rarely	10	7.1
Sometimes	34	24.1
Often	31	22.0
Always	66	46.8
Usage of Disposable Gloves and Safety Boxes by respondents		
Yes	132	93.6
No	9	6.4
Use of Single Dose Vials for More than One Patient		
Yes	3	2.1
No	138	97.9
Recapping of Needles		
Yes	27	19.1
No	114	80.9

Table VI : Prevalence of Needle stick Injury 12 Months before Survey by Cadre of Respondent (N=141)

Cadre	Needle stick Injury		Total
	No n (%)	Yes n (%)	
Nurse	64(84.2)	12(15.8)	76
Doctor	45(83.3)	9(16.7)	54
Lab. Scientist	5(45.5)	6(54.5)	11
Total	114(80.9)	27(19.1)	141

χ^2 =9.671, df =2, P=0.004.).

do so often, and 24.1% do sometimes, while 7.1% do so rarely. Majority of the respondents (93.6%) make use of disposable gloves and safety boxes while a few (6.4%) do not. Most of the respondents

(97.9%) do not use single dose vials for more than one patient, while very few do (2.1%). Slightly below one-fifth of the respondents (19.1%) recap needles while slightly above four-fifth (80.9%) do not. The overall practice scores were appropriate (79.8%).

Prevalence of Needle sticks Injury by Cadre of respondents

Table VI is a summary of the relationship between needle stick injury and the cadre of respondents. Of the seventy sixty nurses who participated in the study, 12(15.8%) had experienced needle stick injury. On the other hand, amongst 54 doctors 9(16.8%) had experienced needle stick injuries, while slightly above half of the laboratory scientists (54.5%) had experienced needle stick injuries. The relationship between the cadre of workers and the prevalence of needle stick injury is statistically significant (χ^2=9.671, df =2, P=0.004.).

DISCUSSION

The response rate among the total 141 interviewed in our study was 100%. That may demonstrate the willingness of health workers towards research. The age and the other socio-demographic characteristics in this study are consistent with the age of health workers in a similar work carried out in a health facility in Nigeria.[14] There are more nurses as compared to other cadres. This is probably due to the fact that the work of nurses requires higher number as compared to the other cadres especially when it comes to inpatient care or services. Also in the demographic variable, there is significant proportion of female health workers. This is in line with the expected increase in female labour force reported by International labour Organization (ILO) in 2010.[22] By implication, since tertiary health facilities are the apex of referral system where advance cases may be presented, having a high proportion of nurses is an added advantage for maximal efficiency since counselling will be required by most patients.

In our study the awareness of injection safety among health professionals of BSUTH was 100% Also in this present study, the overall knowledge score key concepts of injection safety among the health professionals was good. However, there were some misconceptions in certain areas. For instance, 0.7% of health professionals have misconception of Parkinson's disease as a disease transmissible via unsafe injection (Table III). These findings are at variant to reports of similar study carried out in Benin City where only about a third were aware[22] and the report by Ernest where tuberculosis, malnutrition and cholera were reported as misconceptions[23]. The gap between the awareness (100.0%) and the misconception is our study an indication for extensive training on injection safety.

The present study has demonstrated positive attitude towards injection safety (Table IV).

The findings are in keeping with a study carried out in University College Hospital, Ibadan[24] and in Uyo, Akwa Ibom State.[25] However; it is in contrasts with a study carried out in Pakistan.[26] The different percentages of how often the safety box should be used as demonstrated by workers in this study is similar to the study carried out in Benin City,[27] Kwara state[28] but differs from a findings of the report of across sectional survey conducted in 80 health facilities in Nigeria in 2004.[29]

The concept of injection safety by WHO is on mandatory injection safety practices by health workers at all levels of health care delivery.[9,11] In this study the overall practice scores among the workers were appropriate (79.8%). However, there is low level of compliance in some identified areas of the components of injection safety prescribed in the WHO documents. For instance, in this study less than half of the of the workers practice hand washing always (46.8%) while only about one-fifth do so often (22%). Some of the workers rarely do routine hand washing while carrying out their duties. The overall practice score in this study is consistent with the practice in a Mission hospital in

Benin City, Edo state where 78.7% were reported to wash their hands regularly[28]. Majority of the workers actually use disposable gloves and safety boxes (93.6%) while few do not (6.4%) and 97.9% of them do not use single dose vials for more than one patient. Furthermore, a significant proportion of the workers (19.1%) in this study recap needles. This is higher than 75.5% reported in a study conducted on primary health care workers in Ilorin, Kwara state, Nigeria.[29]

According to WHO, adherence to injection safety practices prevent harm to the recipient, the health worker and the communities were the waste are disposed off.[1,9,11]. However, the adherence to personal protective measures in this study is comparatively lower than 86.2% reported by Audu et al in 2013.[14] The immediate consequence as demonstrated in this study is the prevalence of needle stick injury. There is significant relationship between the cadre of the respondents and the nature of injury in this study. Laboratory scientists who have experienced needle stick injury in the past 12 months before the survey constitute 54.5% of their cadre while doctors and nurses who have experienced same constitute 16.7% and 15.8% of their cadres respectively. This finding is dissimilar to a study in New Delhi, India[30] where nurses had the highest percentage of needle stick injury in their cadre. Also, nurses are the most affected by needle stick injury probably because of the frequent use of injections in the course of carrying out their duties. But this contrasts with a study conducted in Karachi, Pakistan where junior doctors were the most affected.[31] By implication, if the health workers despite their good knowledge, positive attitude and appropriate practice can still experience occupational hazards of injection safety, the recipients and the communities are equally at risk if adequate measures are not put in place.

CONCLUSION

Healthcare professionals of BSUTH have good knowledge, positive attitude and appropriate practice of injection safety. However, they have some misconceptions on the cause and they still experience needle stick injuries in the course of their professional activities, probably due to negligence.

RECOMMENDATIONS

There is a need to bridge the knowledge/attitude-practice gap, in order to prevent harm to the health care providers and their recipient and community. We recommend that the teaching hospital management:

1) Embark on the organization of seminars to consolidate good injection safety practices.

2) Strengthen Departmental Continuing Medical Education (CME).

3) Ensure provision of safety gadgets.

REFERENCES

1. Federal Ministry of Health, Making medical injection safer in Nigeria. Injection safety in the context of infection prevention and control trainer's Guide. Do no harm Facilitator's guide. John Snow Inc, 2006; 2-103.

2. Michael S. Opening Speech at the Initial Meeting Report of Safe Injection Global Network (SIGN), World Health Organisation, Health Technology and Pharmaceuticals, Blood Safety and Clinical Technology, Geneva, Switzerland, October, 1999.

3. Hauri AM, Armstrong GL, Hutin YJF. Contaminated Injections in Health Care Setting, Comparative Qualification of Health Risks; Global and Regional burdens of disease attributable to selected major risk factors. World Health Organization. Geneva 2003; 22; 1804-1849.

4. Miller MA, Pisani E. The cost of unsafe injection. Bulletin of the world health organization 1999; 77 (10); 808-811.

5. World Health Organization. Misuse and Overuse of Injection Worldwide. WHO, 2006. (Retrieved at www.who.int/mediacentre/factsheets/fs231/en/index.html on 21 June 2013).

6. Reeler AV. Injections: A fatal attraction. Social science and medicine 1990; 31: 119-1129.

7. Reeler AV. Anthropological perspectives on injections: a review. Bulletin of the World Health Organization, 2000; 78(1); 135-43.

8. Musa IO. Injection Safety Practice among Health Workers in Static Immunization Centres in an Urban Community of Nigeria. Niger Postgrad Med J. 2005; 12(3):162-7.

9. World Health Organization. Unsafe Injection Practices: A Plague of Many Health Systems. WHO, 2006. (Retrieved at www.who.int/mediacentre/factsheets/fs231/en/index.html on 21 June 2013).

10. Centers for Disease Control and Prevention. Universal precaution for prevention of human immunodeficiency virus and other blood borne infections, www.cdc.gov/ncidod/dhap/bg (accessed on 6th April, 2014).

11. World Health Organization (Safe Injection Global Network-SIGN). Injection Safety In Light Of Primary Health Care Reforms, 2009. SIGN at 10: Report on 10 Years Recommendations To The SIGN Secretariat; Annual Meeting Of The Safe Injection Global Network, 2009; 6-7

12. [9] Centers for Disease Control. Recommendations for the prevention of HIV transmission in health care settings. Morbidity and Mortality Weekly report 1987; 36.

13. World Health Organization. Injection safety. WHO. Fact sheet N°231, Revised October 2006.

14. Audu Onyemocho, Joshua Istifanus Anekoson, Enokela Onum Pius.Knowledge and Practice of Injection Safety among Workers of Nigerian Prison Service Health Facilities in Kaduna State, Nigeria *American Journal of Public Health Research, 2013, Vol. 1, No. 7, 171-176. (Accessed at* http://pubs.sciepub.com/ajphr/1/7/5 on 6th April, 2014).

15. Federal Ministry of Health Nigeria (FMOH). Introduction. The Problem of Injection Safety. Injection Safety Assessment in Nigeria; John Snow Incorporation 2004; 8.

16. United Nations Population Fund (UNFPA). Situation Analysis. (Retrieved at http://nigeria.unfpa.org/hivaids.html on 16 July 2013).

17. Benue State University Teaching Hospital. Chief Medical Director's Welcome Address. (Retrieved at www.bsuth.org.ng/cmd_welcome_address.html on 12 July 2013).

18. Wikipaedia. Benue State University Teaching Hospital, Makurdi, Google Maps. (Retrieved at map.google.com on 12 July 2013).

19. Benue State University Teaching Hospital, Health Records Department. Statistical Report From BSUTH: Out patients and In-patients from January to December 2013.

20. Araoye MO. Research Methodology with Statistics for Health and Social Sciences, 1st edition. Nathadex Publishers, 2004; 39-120

21. Audu Onyemocho, Ogboi Sonny Johnbull, Sabitu Kabir, Abah Emmanuel Raphael,

Abdullahi Abdujalil Umar, Anejo-Okopi Joseph Ajef. Effect of Health Education Intervention on Knowledge of HIV/AIDS and Risky Sexual Behaviours amongst Prison Inmates in Kaduna State, Nigeria. *International Journal of Sciences: Basic and Applied Research (IJSBAR) (2014) Volume 11, No 1, pp 181-192.*

22. Ofili AN, Asuzu MC, Okojie. Knowledge and Practice of Universal Precautions among Doctors and Laboratory Workers in Central Hospital, Benin City, Nigeria. Jnl Med. and Biomed Res.: 1(2) 2002: 34 – 41.

23. Ernest KS. Injection Safety: Knowledge and practice Among Health Workers, West African Journal of Medicine, 2002; Vol 21(1): 70-73.

24. Kolude OO, Owoaje ET, Omokhodion O. Knowledge and Compliance with Universal Precaution among Doctors in a Tertiary Hospital. Int Conf AIDS, 2002 Jul 7-12; 14

25. Johnson OE, Asuzu MC, Adebiyi AO. Knowledge and Practice of Universal Precautions among Professionals in Public and Private Health Facilities in Uyo, Southern Nigeria-A Comparative Study. Ibom Medical Journal, Feb 2012 Vol.5 No.1

26. Janjua NZ, Razaq M, Chandir S, Rozi S, Mahmood B. Poor Knowledge Predictor of Nonadherence to Universal Precautions for Blood Borne Pathogens at First Level Care Facilities in Pakistan BMC Infect Dis. 2007; 7: 81.

27. Vincent EO, Vivian OO, Alphonsus RI. Injection safety practices among nursing staff of mission hospitals in Benin City, Nigeria. Annals of African Medicine, 2012; Vol 11, No 1: 36-41

28. Oladimeji AB, Adekunle GS, Sunday AA, Omotoso IM, Tanimola MA, James OB. Injection Safety Practices Among Primary Healthcare Workers In Ilorin, Kwara State Of Nigeria, Health Science Journal, Sept 2012;Vol 6, Issue 3: 502.

29. Federal Ministry of Health National Injection Safety Forum: Standards for universal precaution and health care waste management practices, Abuja, 2005

30. Muralidir S, Singh PK, Jain RK, Malhotra M, Bala M. Needlestick injuries among health care workers in a tertiary care hospital of India. Indian J Med Res 2010; 131:405-410.

31. Zafar A, Habib F, Hadwani R, Ejaz M, Khowaja K, Khowaja R, *et al.* Impact of infection control activities on the rate of needle stick injuries at a tertiary care hospital of Pakistan over a period of six years: an observational study. BMC Infect Dis 2009; 9:78.