

Knowledge and Practice of Injection Safety among Workers of Nigerian Prison Service Health Facilities in Kaduna State

Audu Onyemocho^{1*}, Joshua Istifanus Anekoson², Enokela Onum Pius³

¹Department of Epidemiology and Community Health, College of Health Sciences, Benue State University, Makurdi, Nigeria

²Department of Community Medicine, Kaduna State University, Kaduna, Nigeria

³Department of Pharmacology, College of Health Sciences, Benue State University, Makurdi, Nigeria

*Corresponding author: audeeony@yahoo.com

Received June 22, 2013; Revised July 13, 2013; Accepted July 17, 2013

Abstract Injection safety practice is an important component of basic infection control but in low income settings like the prisons where the seroprevalence of blood borne infections are significantly higher. These remains neglected under the pressure of overwhelming social, economic and political challenges and put the patients and healthcare providers at risk of infectious and non-infectious adverse events. This study assessed the level of knowledge and practice of injection safety among health care workers of Nigerian prison service health facilities in Kaduna State, Command. A cross sectional descriptive study using multistage sampling technique was employed by means of structured interviewer administered questionnaire to 138 prison health workers carried out in January 2012. Data analysis was by use of Statistical Package for Social Sciences (SPSS version 17), with statistical significance set at p-value of 0.05. The findings showed that 54.3% of Health workers had good knowledge score of key injection safety issues, while 16.7% and 29.0% had had fair and poor general knowledge scores respectively. About half (50.4%) had fair practice of injection safety. There was statistical significance between knowledge and practice of injection safety in relation to cadre of staff (p value 0.000), staff that had training on injection safety (p value 0.003) and years of experience of the staff (p value 0.032) respectively. There was good knowledge score and fair practice of injection safety among health workers. The determinant factors were the cadre, training and years of experience of the workers. Therefore, it was concluded that regular and on the job training programs on core aspect of injection safety among health workers should be conducted by the health departments of Nigerian prison service on regular basis.

Keywords: *knowledge, practice, injection safety, prison, health workers*

Cite This Article: Audu Onyemocho, Joshua Istifanus Anekoson, and Enokela Onum Pius, "Knowledge and Practice of Injection Safety among Workers of Nigerian Prison Service Health Facilities In Kaduna State." *American Journal of Public Health Research* 1, no. 7 (2013): 171-176. doi: 10.12691/ajphr-1-7-5.

1. Introduction

Injectable medicines are commonly used in healthcare settings for the prevention, diagnosis, and treatment of various illnesses [1]. In developing countries an estimated 16 billion people have been reported to receive injections for several reasons each year [2] and the materials used for these important medical procedures poses a lot of hazard to the recipient, the healthcare providers or the public living in the environment where the wastes are finally disposed. Majority of the health care personnel sustained injuries from unexpected patient movement, handling or disposal of used needles, reuse, recapping, accidental needle stick injury by colleagues and needle disassembly and quite a number of them are unaware of [1,2,3]. Globally, unsafe injections account for more than 25 million preventable new cases of blood borne infections like Hepatitis B virus, Hepatitis C or Human immunodeficiency virus (HIV). There are an estimated

250,000 new cases of HIV infections per year as a result of the reuse of needles and syringes. In Africa, 250 to 500 people are newly infected with HIV each day as a result of unsafe blood transfusions and unsafe injection practice [4,5].

To reduce the hazardous effects of unsafe injection practices on the populace, the World Health Organization (WHO) introduced the concept of injection safety which does not harm the recipient, does not expose the provider to any avoidable risks and does not result in waste that is dangerous for other people in the community [6]. Issues generally addressed in injection safety practice includes hand hygiene; use of gloves where appropriate; single-use personal protective equipment; skin preparation and disinfection and proper waste management [4,6]. It is therefore, mandatorily advised that safe injection practices should be routinely applied in all healthcare settings since every person in health settings is considered a potential source of infection [6,7,8].

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 [8,9]. Consistent practices of injection safety amongst them 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. For instance, recapping the needles and disposing them safely into puncture resistance containers alone has been shown to reduce hospital acquired infections by almost 70% [4,6,8,9,10,11,12]. On the contrary, the knowledge and compliance to safe injection practices in developing countries is still suboptimal [1,5,7,13,14,15,16]. Despite that, uses of injections have completely overtaken the real need; reaching proportions no longer based on rational medical practice, making the widespread incidences of unsafe injections an important public health problem [17,18,19,20].

Physical and mental health of prisoners is the most vital as well as the most vulnerable aspect of life in prison. In the United Nations standard Minimum Rules (SMR) for the treatment of Prisoners, mandatory provisions of primary health care services are made in every prison institution; and that warrants the employment of different cadres of health personnel in all prison formations. The employees in the health directorate are professionals like nurses, doctors and laboratory scientist, and non-professionals like cleaners and waste collectors [21,22]. Health workers of the prison services in the course of carrying out their duties are repeatedly exposed to these endogenous hazards thus could be considered a potential source of infection to their co- health care providers, their patients and the public. However, the implementation of national injection safety practice in prison settings remain neglected under the pressure of overwhelming social, economic and political challenge among others [23,24]. The peculiar natures of the prison environment make it a breeding site for most infections. The sero-prevalence of the blood born infections like Human Immunodeficiency virus (HIV), Hepatitis B virus (HBV), HCV, Cytomegalovirus and Protozoa; and other body fluids origin within the prison population worldwide is considerably higher than in general population [23-28]. This study assessed the level of knowledge and practice of injection safety among Primary health Care workers of Nigerian prison health facility in Kaduna State Command.

2. Materials and Methods

2.1. Study Area

The command comprised of 15 prison settings of different capacities and total health workers strength of about 370 spread proportionally across the facilities in the command. All the prisons have a primary health care facility where they attend to health needs of the inmates. In addition, Kaduna convict prison which is the largest and oldest of all the prisons in the command; has 20 bed equipped hospital which acted as a secondary referral facility for the rest 14 primary health facilities in the command [29]. All the health workers in the 15 prison settings in the command that are involved in both

preventive and curative primary health care services were included in the study and those workers whose jobs are not directly related to health care delivery services and handling of injections were excluded.

2.2. Study Design

A cross-sectional descriptive study was conducted in January 2012 investigating 138 health care workers of Nigerian prison service health facilities in Kaduna State command.

2.3. Sample Estimation and Sampling Technique

A minimum sample size of 188 was obtained using the formula Z^2pq/d^2 [30] based on the assumption of safe injection practice rate of 85.7% from a previous study [31] and 0.5% degree of precision. After adjusting for infinite factor and 10% nonresponsive rate a final minimum sample size of 138 was arrived at. Multi stage sampling technique was employed. Five facilities were selected out of the 15 by toss of coin and the required numbers of workers from each of the facilities were proportional allocated by their cadre and the staff strength and the actual respondents who participated in the study were finally selected using a simple random sampling technique.

2.4. Data Collection Tools

The respondents were assessed using a structured interviewer administered questionnaire which was pretested in Kuje convict prison, about 170 km away from Kaduna convict prison.

2.5. Inclusion and Exclusion Criteria

All the health workers in the 15 prison settings in the command that are involved in both preventive and curative primary health care services were included in the study and those workers whose jobs are not directly related to health care delivery services and handling of injections were excluded. Participation in the study was voluntary.

2.6. Data Analysis

Results were summarized and presented as contingency tables and chi square (χ^2) test was used for test of association with statistical significance set at p-value of 0.05.

2.7. Ethical Consideration

Ethical approval was obtained from the Kaduna State Controller of prison after which an advocacy visits were paid to all the superintendent officers in charge of the selected prison and verbal consent was obtained from all the respondents who consented to participate.

3. Results

3.1. Socio-demographic Characteristics

All the respondents consented to the interviewer-administered questionnaire, giving a response rate of

100%. The mean age of the respondents was 36.2 ± 8.6 years with age range of 20-54 years. The respondents were predominantly female (66.7%). Forty one (29.7%) of them were Community health extension workers, 21.7% were auxiliary medical staffs, 25.4% were nurses, while

doctors constitutes the least (2.9%) professional workforces. More than one third of the respondents (36.2%) had over 10 years of work experience while less than one fourth (8.7%) had less than a year experience (Table 1).

Table 1. Socio-demographic characteristics of respondents (n=138)

Variable	Frequency	Percentage
Age (in years)		
20-24	6	4.3
25-29	38	27.5
30-34	28	20.3
35-39	14	10.1
40-44	20	14.5
45-49	20	14.5
50-54	12	8.7
Sex		
Male	46	33.3
Female	92	66.7
Cadre of staff		
Doctors	4	2.9
Nurses	35	25.4
Community Health Extension Workers (CHEW)	41	29.7
Environmental Health Officers (EHO)	20	14.5
Laboratory Staff	8	5.8
Auxiliary Medical Staff	30	21.7
Work Experience (in years)		
<1	12	8.7
1-5	28	20.3
6- 10	48	34.8
>10	50	36.2

Mean age= 36.2 ± 8.6 years, age range = 20- 54 years

3.2. Knowledge of Injection Safety

Ninety (65.2%) of the respondents knew the correct WHO definition of safe injection as injection which does not harm the recipient, does not expose the provider to any avoidable risks and does not result in waste that is dangerous for other people in the community, while 34.8% did not know the correction meaning of safe injection. Most of the respondents (65.9 %,) knew that HIV, HCV and HBV could be transmitted by unsafe injection practices, while 27(19.6%) had poor knowledge of the diseases that could be transmitted via unsafe injection practices. Among those with poor knowledge, some had misconceptions of breast cancer (0.7%) and tuberculosis (2.2%). One hundred and four (75.4%) knew that both patients, health care providers and the public are all at risk of unsafe injection. Ninety one (65.9%) had good knowledge of the method of final disposal of injection material. The overall knowledge score of the respondents on the entire issues of definition of injection safety, hand hygiene; use of gloves where appropriate; single-use personal protective equipment; skin preparation and disinfection and proper injection material waste management was predominantly good (54.3%). Twenty three (16.7%) and 29.0% had had fair and poor general knowledge scores respectively (Table 2).

Table 2. Respondents' knowledge of safe injection practices (n=138)

Variable	Frequency	Percentage
WHO definition of safe injection		
Correct	90	65.2
Incorrect	48	34.8
Diseases caused by unsafe injection practices		
Good	91	65.9
Fair	20	14.5
Poor	27	19.6
People at risk of unsafe injection		
Good	104	75.4
Fair	19	13.8
Poor	15	10.9
Method of final syringe disposal		
Good	91	65.9
Fair	32	23.2
Poor	15	10.9
Overall knowledge score		
Good	75	54.3
Fair	23	16.7
Poor	40	29.0

One hundred and eighteen (85.5%) of the respondents never had any training on injection safety through out their work experience, while twenty (14.5%) had training at work place.

3.3. Practice of Injection Safety

On injection safety method(s) practiced by the respondents three months prior to the survey, 138 (100.0%) discard used injection materials immediately after single use but none of them use retractable needle syringes. More than half (69.6%) do not recap needles after use, 92.8% segregate sharp wastes and 86.2% wear gloves while handling wastes. Greater than two third of the respondents do not wash their hands before (79.7%) and after (86.2%) administering injections, One hundred and nineteen (86.2%) of the respondents wear gloves when handling hospital wastes, but only 7.2% of them wear single use

gloves before administering injections. Seventy eight (56.5%) of the respondents take post exposure prophylaxis immediately after sharp object injuries.

Table 4 shows the relationship between the socio-demographic characteristics of the respondents and their knowledge and practice of injection safety. There was a statistically significant relationship between the cadre of staff and the knowledge and practice of injection safety ($p=0.000$). Years of experience and training of workers on injection safety protocols were also significantly related to knowledge and practice of injection safety ($p=0.032$ and 0.003 respectively).

Table 3. Summary of safety injection methods practiced by Respondents 3 months before Survey (n=138)

Injection method(s)	Yes	No
	Frequency (%)	Frequency (%)
Discard used syringe in a single unit	138 (100.0)	0 (0.0)
Used retractable needle syringes	0 (0.0)	138 (100.0)
Recapping of needles	42 (30.4)	96 (69.6)
Segregated sharps waste	128 (92.8)	10 (7.2)
Hand wash before administering injection	28 (20.3)	110 (79.7)
Hand wash after administering injection	19 (13.7)	119 (86.2)
Wearing of single use gloves before administering injection	10 (7.2)	128 (92.8)
Wearing gloves when handling hospital waste	119 (86.2)	19 (13.8)
Skin preparation with alcohol- based solution before injection	133 (96.4)	5 (3.6)
Takepost exposure prophylaxis (PEP) after injury	78 (56.5)	60 (43.5)

Table 4. Factors affecting Respondents knowledge and practice of injection safety

Variable	Knowledge and practice of injection safety		Total	Statistics
	Yes (%)	No (%)		
Cadre of staff				
Doctors	3 (75.0)	2 (25.0)	4	$X^2 = 24.350$ df=5 p value= 0.000
Reg. Nurses and Midwives	28 (80.0)	5 (20.0)	35	
Community Health Extension Workers (CHEW)	23 (56.1)	18 (43.9)	41	
Environmental Health Officers (EHO)	11 (55.0)	8 (45.0)	20	
Lab. Staff	4 (50.0)	4 (50.0)	8	
Auxiliary Medical Staff	6 (20.0)	24 (40.6)	30	
Work Experience (in years)				
<1	9 (75.0)	3 (25.0)	12	$X^2 = 8.810$ df=3 p value= 0.032
1-5	22 (78.6)	6 (21.4)	28	
6- 10	28 (58.3)	20 (41.7)	48	
>10	42 (84.0)	8 (16.0)	50	
Training on injection safety while in service				
Yes	17 (85.0)	3 (15.0)	20	$X^2 = 8.857$ df= 1 p value= 0.003
No	58 (49.2)	60 (50.8)	118	

4. Discussion

The socio-demographic characteristic of the workers in this study demonstrates some issues of the recruitment policy of the Nigeria and the nature of the health facilities, as well as the efficiency and effectiveness of the health sector in Nigerian prison service. The workers age range of 20 - 54 years in this study, conforms to the Nigerian civil service rule of minimum of 18 years eligible age for recruitment and 60 years retirement age [32,33]. However, the mean age of the 36.2 ± 8.6 years shows that majority of the health workers in Kaduna prison command are young adults as against older age groups reported in a study in Nepal [34] and Ilorin [20]. There are more female health workers (66.7%) in this study as compared to the

males (33.3%). This is consistent with the expected increase in female labour force participation from 50.2 to 51.7 percent reported by International Labour Organization (ILO) in 2010 [35]. Community Health Extension Workers (CHEW) formed the bulk of the worker force (29.7%), followed by auxiliary medical staff (21.7%) and amongst the professionals the nurses predominates (25.4%). This is consistent with the actual situations of most Primary health care facilities in Nigeria where nursing professions, Community Health Officers (CHO) and community extension health workers predominate, since they are the cadre of health workers that are required for effective PHC deliveries in Nigeria [13]. In a settings like the prison institution where counseling of the offenders is very important in terms of their reformation and reintegration into the society for

maximal efficiency, the females may be more needed and in view of the fact that there is only one secondary health facility it also explains the need for few skilled professionals (Table 1).

At present, injection service is a major method to administer drugs to the patients and training provides a good platform for better understanding and practice of injection safety. However, in this study, there is discrepancy between years at work place and the training of prison health workers on injection safety. Quite a large proportion of the workers had 6 years of work experience and above (Table 1), but only 14.5% had attended training on safe injection. Despite the inadequate training of the workers, the overall knowledge score on key issues of injection safety was good (54.3%) (Table 2). This is consistent with similar study carried out by Medubi et al in a tertiary health institution in Ilorin [27] and in a study conducted by Ofilia et al in Benin City [17]. This is probably due to higher proportion of nurses as main professional workforce since their training curriculum would have taught topics on injection administration, infection control and universal precautions. Notably, the study also revealed that PHCWs that had less than a year working experience had poor knowledge of injection safety and those with over 5 years of working experience had fair knowledge compared to those between 1 to 5 years of working experience where many (85.7%) of them had good knowledge of injection safety.

In this study, there are some preliminary driving factors of injuries as regards to unsafe injection practices. All the cadre of health workers in Nigerian prison discards injection materials immediately after single use. In all the facilities there were no retractable needle syringes and 69.6% of the workers who uses non retractable syringes do not recap needles after use, while 30.4% recap needles after use. This is far higher than study at Ilorin where only 21.5% of primary health workers do not recap syringes after use [36]. But consistent with reports of other studies where needle recapping in addition to other factors like unexpected movement of patients were reported as the major circumstances surrounding occurrence of injuries among health workers [12,13].

The study also showed that respondents always comply with universal precaution protocols and adhere to personal protective measures against injury as 86.2% of the workers wear gloves when handling hospital wastes and 56.5% of them took post exposure prophylaxis against HIV infection immediately after sharp object injuries (Table 3). In the United States, a study conducted in two privately owned community hospitals in Minneapolis reported that gloves were observed to be used where appropriate 67.2% of the time, followed by goggles (50.7%), masks (16.0%) and gowns (15.3%). Needles were recapped in 34.4% of cases [23]. 63.85% was reported in similar studies [24].

Many of the workers do not have training but they might have read about it and put it to practice probably for their own safety in order to prevent infection of blood borne pathogens like HIV and Hepatitis B and C viruses.

Theoretically, knowledge level with respect to safe injections is in direct proportion to the professional title of health workers [8,9]. This study was able to demonstrate a statistically significant relationship between the cadre of health worker, their years of experience, their training and

practice of injection safety protocols. These relationships could serve as a good background that could be built upon for the prevention and control of blood borne pathogens amongst health workers.

5. Conclusion

The study revealed that knowledge of injection safety among prison health staff was above average but there is a significant gap on their unsafe injection practices. In our conviction, the cadre and years of experience of workers with their training on safe injection protocols are the main determinants of Knowledge and practice of injection safety.

Recommendations

We recommend that the knowledge gap on in-depth knowledge of injection safety among the prison health staff should be bridged through regular and on the job training, supported by Information Education and Communication (IEC) programs by the Health Departments of Nigerian prison service. There is need for periodic injection safety assessment (auditing) in all the Nigerian prison health facilities by the relevant stake holders.

References

- [1] Centers for Disease Control and Prevention: injection safety: www.cdc.gov/ncidod/dhapp/bg (accessed on 23rd October, 2011).
- [2] 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 risks factors. World Health Organization. Geneva 2003; 22: 1804-1849.
- [3] Bolarinwa OA, SalaudeenAG Aderibigbe SA. Musa OI, AkandeTM. Knowledge and attitude of primary health care workers in a north central state of Nigeria toward safe injection. International Journal of Academic Research 2011; 3 (3): 209-214.
- [4] UNICEF. Injection safety efforts eliminate immunization-related infections in sub-Saharan Africa. UNICEF Joint news note and press release 1 July 2011: (Accessed at www.gavialliance.org on 27th September, 2011).
- [5] Neelam D. Coordinator, Blood Transfusion Safety World Health Organization. Making Safe Blood Available in Africa. Committee on International Relations Subcommittee on Africa, Global Human Rights and International Operations U.S. House of Representatives 27 June 2006.
- [6] World Health Organization (WHO): WHO best practice for injections and related procedures toolkit. March 2010.
- [7] Savanna, R.R. Injection drug use, unsafe medical injections, and HIV in Africa: a systematic Review. Harm reduction Journal. 2009: <http://www.harmreductionjournal.com/content/6/1/24> (Accessed on 28 OctOber, 2011).
- [8] Centers for Disease Control and Prevention. Universal precaution for prevention of human immunodeficiency virus and other blood borne infections, www.cdc.gov/ncidod/dhapp/bg (accessed on 3rd Dec. 2011).
- [9] Centers for Disease Control. Recommendations for the prevention of HIV transmission in health care settings. Morbidity and Mortality Weekly report 1987; 36.
- [10] Miller MA, Pisani E. The cost of unsafe injections. Bulletin of the World Health Organization, Vol. 77, no 10, 808-811.
- [11] World Health Organization. Injection safety. WHO. Fact sheet N°231, Revised October 2006.

- [12] Hutin Y, Hauri A, Chiarello L, Catlin M, Stilwell B, Ghebrehiwet T, Garner J. Best infection control practices for intradermal, subcutaneous, and intramuscular needle injections. *Bull World Health Organ* 2003; 81(7):491-500.
- [13] Mahfouz AA, Abdulmoneim I, Khan MY, Daffalla AA, Diab MM, Shaban H, Al Amri HS. Injection safety at Primary health care level in south – western Saudi Arabia. *Eastern Mediterranean Health Journal* 2009; 15(2): 443-450.
- [14] Michelle K. Unsafe injections in low-income country health settings: need for injection safety promotion to prevent the spread of blood-borne viruses. *Health Promotion International*; Vol. 19. No.1: 95-103.
- [15] Musa IO. Injection Safety Practice among Health Workers in Static Immunisation Centres in an Urban Community of Nigeria. *Nigeria Postgraduate Medical Journal* 2005; 12(3): 162-167.
- [16] Obionu CN. Primary Health Care for developing countries. 2nd Edition. Enugu. Ezu books publisher, 2007; pp 1-24.
- [17] Ofilia AN, Asuzu MC, Okojie OH. Incidence of blood related work accidents among health workers in government hospital in Benin City Nigeria. *JMBR*.2004; 3(1): 59-66.
- [18] Khurram S, Shirin M, Syeda FT, Idress A, Asif ZM. Knowledge, Attitude and Practices regarding needle stick injuries amongst health care providers. *Pakistan Journal of Surgery* 2008; 24(4): 243-248.
- [19] Shaheen S, Nighat N, Majid HQ. Knowledge regarding Hepatitis B among EPI vaccinators working in district south Karachi. *Pak J Med Sci*. 2007; 23(4): 538-541.
- [20] Medubi SA, Akande TM, Osagbemi GK. Awareness and pattern of needle stick injury among health workers at university teaching hospital Ilorin, Nigeria. *AJCEM*. 2006; 7(3):183-188.
- [21] Penal Reform International: Making the standards work, an international handbook of prison practice second edition Penal Reform International Netherland, 2001: 69-98.
- [22] A WHO guide to the essentials in prison health: Health in prisons, WHO Regional Office for Europe Scherfigsvej 8 DK-2100 Copenhagen Ø, Denmark Edited by: Lars Møller, HeinoStöver, Ralf Jürgens, Alex Gatherer and HaikNikogosian 2007.
- [23] Harm reduction international. The Global State of Harm Reduction, 2012: harm-reduction and Prison Needle Exchange: Lessons from a Comprehensive Review of international Evidence and Experience, 2006(accessed at www.ihra.net/global-state on 10th October, 2012).
- [24] The Federal Ministry of Internal Affairs. HIV/AIDS Knowledge, Attitudes, Practices and Seroprevalence among Staff of the Paramilitary Services (Nigerian Prisons and Immigration) and Prison inmates: A Rapid Assessment Report (draft). 2002.
- [25] Chima C, Labo HS, Adebayo S, Anyanti J, Nwosu AN, Okekearu I, Mohammed H. High HIV sero-prevalence rates in prisons in Nigeria: a case of double sentencing for prison inmates. The society for family health rapid assessment report, 2009.
- [26] Oloyde G, Agomoh U. A baseline assessment of the substance abuse and HIV & AIDS situation in selected prison institutions in Nigeria. United Nations office on Drug and Crime; 1999.
- [27] Fajnzylber P. Inequality and violent crime. *Journal of law and Economics* 2002; 45(1):1-40.
- [28] Goyer KC. HIV/AIDS in Prisons: Problems, Policies, and Potentials. Paper presented at the Institute for Security Studies, 18th Feb.2003.
- [29] Labo HS. The Nigerian Prison System: Present Situation and prospect for reform. First edition, National Institute press publishers, Bukuru. 2004.
- [30] Araoye MO. Research Methodology with Statistics for Health and Social Sciences, first edition. Nathadex publishers Ilorin, 2004:25-120.
- [31] Bolarinwa OA, Salaudeen AG, Aderibigbe SA, Musa OI, Akande TM. Knowledge and attitude of primary health care workers in a north central state of Nigeria toward safe injection. *International Journal of Academic Research* 2011, 3(3) :209-214.
- [32] Kabir M, Iliyasu Z, Abubakar IS, Kabir ZS, Farinyaro AU. Knowledge, Attitude and Beliefs about Epilepsy Among Adults in A Northern Nigerian Urban Community. *Annals of African Medicine*, 2005. Vol. 4, No. 3: 107 – 112.
- [33] Federal Republic of Nigeria. Extraordinary Public service Rules (2008 Edition) with Federal official Gazette. Federal Government printer/publisher, Abuja, 2009. No 57, Vol.96: 10-57.
- [34] Daniel I, Emma O. (November 16, 2010 · in NEWS). "Jonathan appoints Afolabi Head of Service as Oronsaye retires". *Vanguard* (Nigeria). Retrieved 2011-06-01.
- [35] Bhattarai MD, Adhikari IP, Kane A, Uprety T, Wittet S. Rapid assessment of perception, knowledge and practices related to immunization injection safety in Nepal. Joint report of Health Nepal, UNICEF and USAID Nepal office. 2001:1-35.
- [36] International labour Office (ILO), Geneva: Women in labour markets: Measuring progress and identifying challenges, 2010. Accessed at <http://www.ifro.org> (accessed on 25th May 2011).
- [37] Bolarinwa OA, AsowandeA, Akintimi CI. Needle Stick Injury Pattern Among Health Workers In Primary Health Care Facilities In Ilorin, Nigeria. *Academic Research International* 2011, 1 (3): 419-429.