

# Knowledge and Practice of WASH among Health workers in Private Hospitals within Calabar Metropolis, Cross River State, Nigeria

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## Abstract:-

### Background

Essential components for rendering healthcare services are the provision of adequate clean Water, Sanitation and Hygiene (WASH) and its practices. The presence of Water, Sanitation and Hygiene facilities within healthcare settings helps to minimize the risk of contacting hospital acquired infections and its spread. It also preserves the dignity of vulnerable populations such as pregnant women, children under -5 and the elderly.

### Objective

To determine the knowledge and practice of water, sanitation and hygiene (WASH) among health workers in private hospitals within Calabar Metropolis, Cross River State.

### Methodology

A descriptive cross sectional design was used to assess the WASH practices among health workers in the study area. Ninety-six health workers were drawn from 17 health facilities. A pre-tested, structured questionnaire was used to obtain information from health workers that gave their consent. Data was analysed using IBM SPSS version 20.0.

### Results

Majority of the health workers 33(34.4%) were aged 18-29years, 65(67.7%) were females and 37(38.5%) had a B.Sc degree out of which 32(33.3%) were nurses. A high proportion of health workers 81(84.4%) had good knowledge of WASH in healthcare settings while religion of respondents was significantly associated with a good knowledge of WASH ( $P=0.026$ ). 82% of the workers had good practice of WASH with religion and work experience of 1-6 years showing statistically significant association with a good practice of WASH among the health workers ( $P=0.026$  &  $P=0.042$ ). 52.5% reported inadequate water supply in the health facilities as the major factor hindering WASH practices in health facilities.

## Conclusion

High proportions of the health workers in this study had a high level of knowledge of WASH and an equally high level of practice of it. However, continuous health education programmes on WASH and its provision, practice and maintenance in healthcare settings should be encouraged.

**Keywords:-** Knowledge, Practice, WASH, Health Workers, Calabar Metropolis.

## I. INTRODUCTION

Essential components for rendering healthcare services are the provision of adequate clean Water, Sanitation and Hygiene (WASH) and its practices. The presence of Water, Sanitation and Hygiene facilities within healthcare settings helps to minimize the risk of contacting hospital acquired infections and its spread, helps in protecting the health workers and also preserves the dignity of the vulnerable populations like the pregnant women and the disabled. WHO/UNICEF 2015 reported that “many health care facilities in low resource settings lack basic WASH services, which compromises the ability to provide safe care and presents serious health risks to those seeking treatment”. Inability to access water and sanitation facilities in healthcare settings might discourage pregnant women from delivering in healthcare settings or causes them to delay their visit to healthcare facilities (WHO/UNICEF, 2015). The issue of inadequate supply of WASH in healthcare facilities is very important because the vulnerable populations are highly represented in these healthcare settings and the rate of morbidity and mortality could rise as a result of the inadequate supply of Water, Sanitation and Hygiene in these settings (Bouزيد, Cumming and Hunter, 2018).

A 2030 target proposed by coverage of WASH globally in healthcare settings has been encouraged to be included in the post- 2015 global coverage of WASH target in Sustainable Development Goals. The basic universal WASH services on healthcare facilities are “Every woman every child” and “Global action plan against pneumonia

and diarrhoea” (WHO/UNICEF, 2012;WHO 2014). The World Health Organisation (WHO) director general also reported that “improving WASH in healthcare facilities is a very urgent priority” (WHO, 2013). The large amount of funds invested in the universal coverage of health creates an avenue to further explain the important function of WASH in realizing this objective (Action for Global Health and Water aid, 2014).

Nosocomial infection is becoming a challenging health issue in developing countries where it has being found to be 2-20 times higher in more developed countries (Shahida and Islam, 2016). Nosocomial infections are the most common infections contacted in healthcare facilities during a visit or admission in the health facility and are among the first ten diseases that cause death in the USA (Agency for Healthcare Research and Quality, 2012). Nosocomial infections due to poor hand hygiene are a major cause of increasing morbidity, mortality, and health care costs among hospitalized patients worldwide. The high prevalence of these infections, as high as 19%, in developing countries, poses a challenge to health care providers (Angel, 2015).

Health care workers’ hands are the most usual type of vehicle for transmission of health care associated infections. Pathogenic microorganisms can stay for 2-60 minutes on health care workers’ hands (Anderson, Warren and Perez, 2008). Hand washing is the simplest and most effective measure to prevent infections. About 50% of health care associated infections occur from the hands of health care providers (HCPs) (World Alliance for Patient safety, 2009).

A report by Water Aids revealed that of all the healthcare facilities in the sub- Saharan Africa, only 42% lack access to clean water and almost 29% of the health facilities in Nigeria lack access to safer water and another 29% of the healthcare facilities also lack functional toilets while 16% of the healthcare facilities do not have anywhere to wash hands with soap (Water aids, 2016). Overcrowding

and below standard WASH infrastructure in the healthcare settings increases the risk for nosocomial infections especially in Africa and this discourages clients from visiting the health facilities or seeking medical attention when the need arises (Nejab, 2011).

## II. METHODOLOGY

This study employed a descriptive cross sectional design. The study population comprised of ninety-six health workers conveniently selected from private health facilities within the period of this study in Calabar Metropolis. Calabar Metropolis is a city in Cross River State that comprises of Calabar South and Calabar Municipality Local Government Area which is located within the rainforest belt of Nigeria (longitude of 4<sup>0</sup>57’0’’N and latitude of 8<sup>0</sup>19’30’’E). It has an area of 406 square kilometers and a population of 371, 022 according to the 2006 National Population Census though it is expected that the population has since increased, however there are no available records/data to show that for now (National Population census, 2006).

Cross River State has 18 Local government Areas out of which simple random sampling was used to select 2 LGAs: Calabar South and Calabar Municipal Local Government Areas that made up the metropolis. From a total of 56 private health facilities within Calabar Metropolis, seventeen (17) were also randomly selected for the study. Pre-tested, structured self-administered questionnaires were used to obtain data from the health workers who met the inclusion criteria. Data collected were coded, entered into and analysed using IBM SPSS version 20.0. Descriptive statistics were presented in tables and charts, relevant means and standard deviation were calculated. Chi-square test was used to test for the association between variables. Statistical significance was set at p<0.05 at a confidence interval of 95%.

## III. RESULTS

**Table 1- Socio- Demographic Characteristics of Health Workers**

Variable	FREQUENCY (N= 96)	PERCENTAGE (%)
<b>Age group(in years)</b>		
<18	4	4.2
18-29	33	34.4
30-39	26	27.1
40-49	16	16.7
50 and above	17	17.7
<b>Gender</b>		
Male	31	32.3
Female	65	67.7
<b>Marital status</b>		
Single	38	39.6
Married	56	58.3
Widowed	2	2.1
<b>Religion</b>		
Christian	91	94.8
Islam	4	4.2

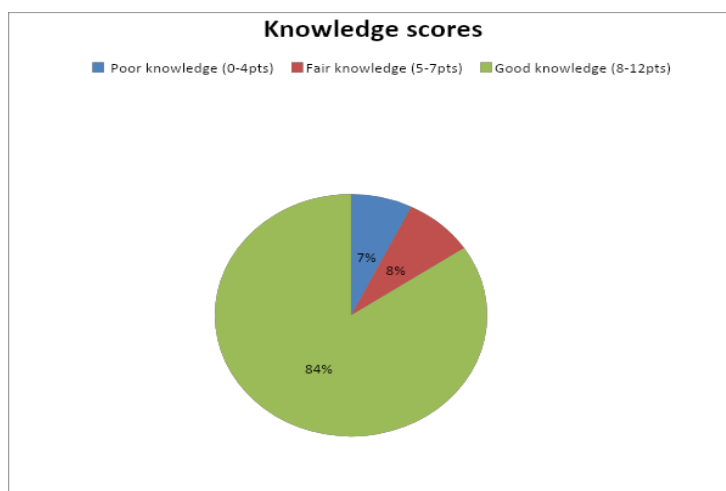
Others	1	1.0
<b>Tribe</b>		
Hausa	2	2.1
Igbo	30	31.3
Yoruba	3	3.1
Efik/Ibilio/Anang	61	63.5
<b>Professional qualification</b>		
Mbbch	17	17.7
Bsc	37	38.5
Diploma	25	26.0
SSCE	1	12.5
Others	5	5.2
<b>Job description</b>		
Medical doctor	17	17.7
Nurse	32	33.5
Lab Scientist	8	8.3
Pharmacist	9	9.4
Cleaners	4	4.2
Others	26	27.1
<b>Work experience</b>		
<1	7	7.3
1-3	32	33.3
4-6	22	22.9
7-9	9	9.4
10 & above	26	27.1

Table 1 above shows the socio- demographic characteristics of the respondents. Majority of the health workers were between 18 to 29 years of age (34.4%) of which 58.3% were married; females constituted 67.7% and 94.5% were Christians. The respondents were more from Efik/Ibibio/Annang tribes (63.5%), 38.5% had a BSc qualification followed by a Diploma (26.0%) and MBBCH (17.7%). Most of the health workers were Nurses (33.3%) while 33.3% had a work experience of 1-3 years.

**Table 2- Knowledge of WASH among Health workers**

Variables	FREQUENCY (N= 96)	PERCENTAGE (%)
<b>Heard of WASH?</b>		
Yes	85	88.5
No	11	11.5
<b>Source of information</b>		
TV	11	12.9
Radio	8	9.4
Seminar/Health Talks	55	64.7
Journals/articles	6	7.1
Friends	4	4.7
Others	1	1.2
<b>Importance of WASH</b>		
Prevention of diseases	60	62.5
Control of diseases outbreak	15	15.6
Spreading of diseases	15	15.6
No idea	6	6.3
<b>WASH can prevent nosocomial infections</b>		
Yes	90	93.8
No	6	6.2

In Table 2 above on Knowledge of WASH among the health workers, 88.5% of them had heard of WASH. The most frequent source of information on WASH was seminar/health talks (64.7%). Over 60% of them knew that WASH was important for disease prevention and 93.8% of them considered it useful in preventing nosocomial infection.



**Fig 1: Pie chart showing knowledge scores of respondents to WASH**

From the pie chart above it was observed that most of the health workers (84%) had good knowledge of WASH, 8% had fair knowledge while 7% had poor knowledge of WASH in the hospitals.

**Table 3: Accessibility and Availability of WASH facilities**

Variable	FREQUENCY (N= 96)	PERCENTAGE (%)
<b>Source of water in your facility</b>		
Groundwater	46	47.9
Rain water	3	3.1
Surface water	17	17.7
Others	30	31.3
<b>Is water source safely monitored</b>		
Yes	70	72.9
No	26	27.1
<b>Frequency of monitoring</b>		
Weekly	16	16.7
Monthly	16	16.7
Every 6 months	31	32.3
Yearly	15	15.6
Any other time	18	18.8
<b>Is water available and accessible at all times</b>		
Yes	77	80.2
No	19	19.8
<b>No of people utilising inpatient toilet</b>	<b>n=77</b>	
≤5	34	44.2
6-15	22	28.6
>15	21	27.3
<b>No of people utilising outpatient toilet</b>		
1-3	36	46.8
4 & above	41	53.2
<b>Are toilets well maintained</b>		
Yes	56	58.3
No	40	41.7
<b>Reasons for non maintenance</b>	<b>n=40</b>	
Lack of toileteries	11	52.5
No water	21	27.5
Insufficient staff	8	20.0
<b>Are there color-coded containers?</b>		
Yes	76	79.2
No	20	20.8
<b>If No, why?</b>		
Lack of skills/knowledge	7	35.0

Insufficient finance	6	30.0
Lack of seriousness on the practice	2	10.0
Lack of seriousness on the practice	2	25.0
<b>How often is waste disposed?</b>		
Daily	83	86.5
Weekly	6	6.3
Monthly	4	4.2
Any other time	3	3.1
<b>Any handwashing point in the facility?</b>		
Yes	89	92.7
No	7	7.3
<b>Are soap and water available at all times?</b>		
Yes	70	72.9
No	26	27.1
<b>Reasons for non availability</b>		
Poor funding	13	50.0
Management problem	13	50.0

Table 3 above shows the accessibility and availability of WASH facilities in the hospitals. Ground water is the major source of water in the hospitals (47.9%). The source is being monitored (73%) every 6 months (32.3%). 80.2% of health workers (HWs) reported that water is available and accessible at all times. Inpatient toilet is being utilized by 5 persons or less (44.2%) and 15 people (28.6%) while the outpatient toilet is utilized by more than 4 persons (53.2%). 58.3% of the HWs said their toilets were well maintained. Lack of water (52.5%) was blamed for the poor maintenance of toilets. Most of the health facilities 79.2% had colour-coded waste containers in their facilities. Those that did not have cited lack of skills/knowledge (35%) as the major reason. 86.5% of the Health workers responded that waste was disposed on a daily basis while 76% said the waste was treated before being disposed.

Majority of the HWs (92.7%) had handwashing points in their facilities while (72.9%) of the facilities have soap and water present at all times. Reasons for non-availability of soap and water are poor funding and management problems.

**Table 4: Factors affecting knowledge of WASH**

Variables	Poor/Fair knowledge N=15 n(%)	Good knowledge N=81 n(%)	$\chi^2$	p- value
<b>Age group(in year)</b>				
<18	2(13.3)	2(2.5)	3.741	0.114
18 and above	13(86.7)	79(97.5)		
<b>Gender</b>				
Male	6(40.0)	25(30.9)	0.483	0.552
Female	9(60.0)	56(69.1)		
<b>Religion</b>				
Christianity	12(80.0)	79(97.5)	7.878	0.026*
Others	3(20.0)	2(2.5)		
<b>Job description</b>				
Medics	9(60.0)	57(70.4)	0.634	0.545
Non-medics	6(40.0)	24(29.6)		
<b>Work experience (in yrs)</b>				
<4	8(53.3)	31(38.3)	1.90	0.391
4 and above	7(46.7)	50(61.7)		

\*Significant

Table 4 shows the factors affecting the knowledge of WASH among the health workers. Though most of the Christians were found to have good knowledge of WASH when tested it was found to be statistically significant which means that their religious beliefs had an impact on their knowledge on WASH.

**Table 5: Practice score**

Variable	Frequency	Percentage (%)
Poor Practice (0-4pts)	17	17.7
Good Practice (5-9pts)	79	82.3



Figure 2: Pie chart showing practice score of WASH

Table 5 and Figure 2 above show the practice scores of WASH by the health workers. The chart shows that 82% of the health workers had good practice of WASH while 18% had poor practice of WASH in the health settings.

Table 6: Factors affecting practice of WASH

Variables	Poor practice N=17 n(%)	Good practice N=79 n (%)	$\chi^2$	p-value
<b>Age group (in years)</b>				
<18	2(13.3)	2(2.5)	3.741*	0.114
18 and above	13(86.7)	79(97.5)		
<b>Gender</b>			0.483	0.552
Male	6(40.0)	25(30.9)		
Female	9(60.0)	56(69.1)		
<b>Religion</b>			7.878*	0.026**
Christianity	12(80.0)	79(97.5)		
Others	3(20.0)	2(2.5)		
<b>Job description</b>			0.634	0.545
Medics	9(60.0)	57(70.4)		
Non-medics	3(20.0)	24(29.6)		
<b>Work experience(in years)</b>			9.047*	0.042**
<1	2(11.8)	5(6.3)		
1-3	6(35.3)	26(32.9)		
4-6	0(0.0)	22(27.8)		
7-9	39(17.6)	6(7.6)		
10 and above	6(35.3)	20(25.3)		

\*Fisher’s exact test

\*\*Significant

Table 6 above shows the factors affecting the practice of WASH. Though a high proportion of the respondents were 18 years and above, of female gender and medics, these differences were however not statistically significant (P=0.114, P=0.552 and P=0.545) respectively. Statistically significant differences were seen with being a Christian and work experience of four years and above (P=0.026 and P=0.042).

IV. DISCUSSION

Out of 96 respondents that were health workers that participated in this study, most of the respondents 85(88.5%) were knowledgeable about WASH in the health facilities with a corresponding high knowledge score (84.4%). This corroborates a similar study on hand washing among health workers in Northeast Ethiopia which states that 60(65.9%) out of 91 respondents had knowledge of WASH in the

health facilities. Fifty-five (64.7%) of the health workers got their knowledge of WASH during seminar/health talks in the facility (Suoud, 2018). This also further agrees with the study done by the health workers on knowledge of WASH in Northwest Nigeria which stated that 95% of the health workers got their knowledge of WASH from the training given to the health workers on WASH (Auwal et.al, 2020). This high knowledge of WASH could be attributed to the seminars/health talks that are continuously held in the health facilities.

A good number of the health workers 46(47.9%) reported that their health facilities had ground water as the major source of water in the hospital. This corroborates with the findings from a study on health facilities in rural areas of Uganda which reported that majority of the health facilities (94%) had improved sources of water in the health facilities (Edgar et al, 2018).

At least 15 (28.6%) of the health workers in this study use a toilet on an inpatient basis while more than 4 health workers use a particular toilet on an outpatient basis in the health facilities however this disagrees with the study done in health facilities in Uganda which reported that most of the health facilities (96%) had functional toilet facilities (Edgar et al, 2018).

Lack of water (52.5%) was reported as the major reason the toilets in the health facilities was poorly maintained. This agrees with the study done on hand hygiene knowledge and practice among health workers in south western Nigeria which states that the main reason why hand hygiene was not practiced regularly was because of absence of running water (53.4%) (Oluwalana et al, 2021). This could be attributed to poor management in the health facilities. Most of the health workers 76(79.2%) reported to have the colour-coded waste containers for segregation and disposal of medical wastes while 20.8% of the facilities still did not found possess the different colour-coded waste containers. This means that more education and awareness programmes on WASH and its practices should still be conducted in these health facilities so as to increase their knowledge on WASH and how it can be effectively and efficiently practiced. Even though majority of the facilities reported to dispose their wastes on a daily basis, a reasonably large percentage of the health workers (6.3%, 4.2% and 3.1%) respectively were reported to dispose their medical wastes weekly, monthly and any other time they wished to. This makes WASH not to be effectively practiced in these facilities because presence of these medical wastes will increase the risk of nosocomial infections being spread among the health workers. It will also expose these health workers to needle prick injuries.

Most the health workers 89(92.7%) reported to have handwashing stations present in their health facilities while 7.3% of these health facilities was reported not to have handwashing stations at all present in them. Also only 70(72.9%) of the health workers reported to have soap and water present at all times in their handwashing stations hence this causes the practice of hand washing with water and soap not to be regularly adhered to at all times within these health facilities thereby exposing the health workers to the risk of acquiring nosocomial infections. This finding is also in line with the study done on assessment of WASH and its practice among health workers in Ekiti state tertiary hospital which stated that only 68.6% of the health workers used water and soap for handwashing (Oluwalana et.al, 2021). This corroborates with the findings by Anderson et.al, 2008 which states “Health care workers’ hands are the most usual type of vehicle for transmission of health care associated infections”. This further agrees with the report by World Alliance for patient safety, (2009) which states that “about 50% of health care associated infections occur due to hand of health care providers (HCPs)” hence the need for hand washing stations with soap and water to always be present in the health facilities at all times. However this does not agree with findings from the study done in rural healthcare facilities in Uganda that reported that only 24%

of the health facilities had both water and soap present in the handwashing stations.

This findings means that hand washing is not properly practised among the health workers in the health facilities even though most of the facilities had a handwashing station present in them. This could cause an increase in the spread of nosocomial infections among these health workers since they are always exposed to nosocomial infections due to nature of their work on a daily basis.

In this study, only religion (Christianity) showed statistically significant association with good knowledge of WASH ( $P=0.026$ ). This means that the religious belief/perceptions of the health workers could have an impact on their knowledge of WASH. Contrary to our finding, the study done on health workers in a specialist hospital in Kano found that health workers with work experience of up to 3years and above had good knowledge of WASH and its practice, which was attributed to the training that they acquired on WASH over their years of work in the health facilities.

Similarly, the practice of WASH in this study was 82% corresponding to 78.3% reported in an Ethiopian study (Besha et al, 2016). This agrees with the study done among health workers in North-Western Nigeria which stated that 127 (73.4%) of the health workers practiced WASH by washing their hands correctly (Garba, 2018). Respondents’ religious belief and work experience of 1-6 years had good practice score of WASH which was statistically significant ( $P=0.026$  &  $P=0.042$ ) respectively. This also corroborates the study done among health workers in North West Nigeria which stated that 60.1% of the health workers had 5 years or less of work experience (Garba, 2018). However, in the Ethiopian study, place of residence and availability or accessibility of water were likely predictors of handwashing practice (Besha et al, 2016). This significant association between their practice of WASH and work experience could be attributed to their years of knowledge and experience acquired while attending seminars/health talks and health education programmes done regularly in the health facilities which further strengthened their beliefs on WASH.

## V. CONCLUSION

Essential components for rendering healthcare services are the provision of adequate clean Water, Sanitation and Hygiene (WASH) and its practices. Results gotten from the study showed that most of the health workers were quite knowledgeable about WASH and its practices but a reasonable proportion of them were still lacking the basic knowledge on WASH as well as its practice. Hence, more health education programmes, seminars/health talks and training pertaining to WASH and its practice come highly recommended. Also, provision of adequate WASH facilities like handwashing stations with soap and water present, improved toilet facilities, improved source of water within the health facilities and adequate colour-coded waste disposal bins should be made available and be well maintained.

## REFERNCES

- [1]. Agbana, Ogundeji and Owoseni, (2020). A survey of hand hygiene knowledge, attitude practices among healthcare workers in tertiary hospital South western Nigeria. *Community Medicine Public Health* 6(2), 146-151.
- [2]. Agency for Healthcare Research and Quality (2012). *Patient safety primers: healthcare-associated infections*. [Accessed April 3, 2018]. Available from: <https://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/hais/index.html>
- [3]. Anderson, J.L., Warren, C. A & Perez, E (2008). "Gender and ethnic differences in hand hygiene practices among college students," *American Journal of Infection Control*, vol. 36, no. 5, pp. 361–368, 2008. View at: Publisher Site | Google Scholar
- [4]. Angel, R. G (2015). "Knowledge and Practice Regarding Hand Hygiene among HealthCare Professional Staffs in Area Hospital Suryapet, Telugana India," *International Journal of Social Sciences Arts and Humanities*, vol. 3, no. 1, pp. 1–5, 2015. View at: Google Scholar
- [5]. Auwal Umar, Usman Muhammad & Rabiuh Ibrahim Jalo, (2020). Reported healthcare workers knowledge and practices of hand hygiene in specialist hospitals of Kano, Northwest Nigeria. *Pyramid journal of Medicine* 3(2).
- [6]. Besha B, Guche H, Chare D, Amare A, Kassahum A et al.(2016), Assessment of Hand Washing Practice and its Associated Factors among First Cycle Primary School Children in Arba Minch Town, Ethiopia, 2015. *Epidemiology (Sunnyvale)* 6:247. Doi:10.4172/2161-1165.1000247
- [7]. Edgar Mugema Mulogo, Micheal Matte and Moses Ntaro (2018). Water, Sanitation and Hygiene Service Availability at Rural Health Care facilities in Southwestern Uganda. *Journal of Environmental and Public Health*. Vol. 2018, Article ID 5403795 7pages. <https://doi.org/10.1155/2018/5403795>
- [8]. Garba Gwarzo (2018). Hand Hygiene practice among healthcare workers in a public hospital in north-western Nigeria. Vol 15, pg 109-113.
- [9]. National Population Commission of Nigeria (2006), National Bureau of Statistics (web).
- [10]. Oluwalana Timothy, Samsudeen Adeniran & Damilola Oguntumbi, (2021). Assessment of knowledge and practice of handwashing among healthcare workers in a Tertiary Hospital in Ekiti Southwestern Nigeria. *Asian Journal of Medicine and Health* Vol 10(Issue 1).
- [11]. Suoud Jemal (2018). Knowledge and practices of Hand Washing among Health Professionals in Dubti Referral Hospital, Dubti Afar Northeast Ethiopia. *Advances in Preventive Medicine*, Vol 2018, ArticleID 5290797, 7pages. <https://doi.org/10.1155/2018/5290797>
- [12]. Wateraid Nigeria, (2016). Caring for patients without clean water and sanitation in Nigeria: Nigeria retrieved from <https://reliefweb.int/report/nigeria/caring-patients-without-clean-water-and-sanitation-nigeria>
- [13]. WHO/UNICEF, (2015). Progress on sanitation and drinking water: 2015 Update and MDG assessment. [http://www.unicef.org/publications/index\\_82419.html](http://www.unicef.org/publications/index_82419.html) Accessed January 7, 2016
- [14]. Williams, I. & Ejemot-Nwadiaro, R., (2018). Assessing utilization of Primary Healthcare services in Essien Udim, Nigeria: Pinpointing determinants and implications. *Scholars Journal of Applied Medical Sciences*, 6(3): 1331-1339
- [15]. World Alliance for Patient Safety (2009). "WHO Guidelines on Hand Hygiene in Healthcare," May 2009. View at: Google Scholar