Assessment of Water, Sanitation and Hygiene Practices in the Selected Primary Healthcare Centers in Owerri West Local Government Area, Imo State, Nigeria.

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DOI: https://doi.org/10.51244/IJRSI.2025.120700091

Received: 24 June 2025; Accepted: 28 June 2025; Published: 04 August 2025

ABSTRACT

Water, sanitation and Hygiene (WASH) practices remains an issue of global concern in every community level and larger society because several infections and illnesses are linked to water, sanitation and hygiene. The study aimed to assess water, sanitation and hygiene practices in the selected primary healthcare centers in Owerri West LGA, Imo State. A descriptive cross sectional research design was adopted for this study. A multi stage sampling technique was used in recruiting a total of 387 respondents that participated in this study and a pre-tested questionnaire was used to collect data. Statistical package for social sciences (SPSS) version 23.0 was used in the analysis of the study. Results from the study showed that majority, 33.7% (131), of the respondents were between ages 25-34. This study revealed that 56% (217) had access to potable water supply and 51/.7% (200) reported borehole with hand pump as the main source of water supply. In the studied areas; 38.7% (150) reported sachet water popularly known as pure water as the major source of drinking water. Also, 55.6% (215) of the respondents sometimes washed their hands daily, 23% (89) always washed hand. From the finding, 37.5% (145) reported removable plastic waste collection containers (Garbage bins) was used in disposing healthcare waste. Finally, 21.4% (83) used water closets in disposing human waste in the healthcare facilities. The results showed a statistical difference between the age, marital status, cadre of health workers and length in service of respondents and hand washing practices in primary healthcare centers but cadre of health worker (p= 0.0035) and length in service (p=0.0023) were associated with hand washing practices. In conclusion, the study showed that men workers and patients in the healthcare centers responded higher compared to female in relation to water, sanitation and hygiene (WASH) practice. Therefore, they should provide proper enlightenment programmes on water, sanitation and hygiene in all healthcare centers in Owerri West and beyond.

Keywords: Community, Water, sanitation and Hygiene (WASH), Practice, Primary Healthcare

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VII July 2025

INTRODUCTION

Water sanitation and hygiene practices has be regarded as a global issue because of improper management practices that leads to the health challenges [1]. At the community levels, World Health Organization [2] reported that to maintain a hygienic environment, health facilities require an acceptable amount and quality of water to keep a good environment. In a study conducted by Venkataramanan et al. [3], Platzer et al. [4] and United Nations Children Education Fund [5], reported that 45% of infections in a community is attributed or linked to poor water sanitation and hygiene practices. UNICEF [5] and Platzer et al. [4] concluded that diarrheal, schistosmiasis, water contact infections and nosocomial infections and some many other diseases can be control with improvements in sanitation, efficient waste disposal, and personal hygiene. In the community level, primary health centers are first point of contact for patients and also record with a high prevalence of infectious disease agents in which patients, staff, and neighbors of the health-care can face risks of infection if water sanitation and hygiene practices is inadequate [6, 7 & 8].

Following the report of WHO [1], every community health centers should have consistent running water, clean toilets, safe refuse disposal, clean beds and areas for birthing and they should improve on infrastructure and avoid overcrowding in community health facilities. Sustainable Sanitation Alliance (SuSanA) [9] supported the recommendations by World Health Organization (WHO), because increases the risk of infections may prevent patients from visiting the community health facilities, especially when hospitalization is necessary for the patient. Therefore, community health facilities should supply 40–60 liters of water per patient per day in emergency settings, and an extra 5 liters of water per outpatient per day in non-emergency settings [9, 6]. After evaluating the impact of WASH on community health centers, Paranipe [10] issued a call to action for improved water, sanitation, and hygiene (WASH) for maternal and newborn health, stating that improved WASH should be: 1) integrated into infrastructure and supply budget priorities, 2) emphasized in maternal and child health campaigns, and 3) embedded in national and global targets and monitoring frameworks.

Globally, the findings of a research study conducted on water, sanitation, and hygiene (WASH) showed that 74 countries lacked improved water supply and 34 of the 74 countries were in Africa and 13% of community health facilities lacked improved water supply [5]. The UNICEF further went to report the insufficient information on WASH impact in community health centers where majority of available data focuses on WASH in hospitals and recorded low data on the condition of WASH in secondary community health facilities [2].

According to a survey conducted by the United Nations World Water Assessment Programme [11], health facilities provide primary care in rural regions. In Nigeria, there are around 400 health clinics, each with a catchment population of over 20,000 people [7].

It is highly necessary to look at WASH practices at the community healthcare facilities because, most of semi-urban and rural health institutions record about 100 patients each day for basic emergency treatment, prenatal care, normal delivery, post-partum care, family planning, pediatric care and nutrition, and regular clinics [12, 13, 14, 15 & 16]. The problem of poor WASH practices has attracted high attention of health practitioners globally, because of several infections and illnesses that are linked to water sanitation and hygiene [17, 18, 7, & 1]. Poor water supply and hygiene have been attributed diseases such as diarrheal, schistosmiasis, water contact infections and nosocomial infections etc [13, 14 & 15].

From the study conducted by Federal Ministry of Health [19], thirty seven (37) percent of health centers in Nigeria have piped water within the institution and 28 percent have year-round water provided by tap or available within 500 meters of the institution [11].

United Nations World Water Assessment Programme [11] also stated that 59 percent of health facilities had power or a backup generator with fuel during service hours, and 58 percent had a working client toilet, a waiting room shielded from the sun and rain, and basic standards of cleanliness. On comparison aspect, Nigeria has a national strategic plan for management of healthcare waste and has demonstrated better access to infection control materials in HCFs than other countries in Africa. Therefore, this study was considered

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VII July 2025

necessary to help to bridge the knowledge gap through assessment of Water Sanitation and Hygiene Practices in the selected Primary Healthcare Centers in Owerri West Local Government Area (LGA), Imo State, Nigeria.

MATERIALS AND METHODS

A descriptive cross sectional research design was adopted for this study on the assessment of water sanitation and hygiene practices in primary healthcare centers in Owerri West Local Government Area, Imo State. The study population for this study entailed both healthcare workers and patients at the community primary healthcare centers in Owerri West. The sample size for this study was determined using Leslie Kish (1965) formula.

$$n = \frac{Z^2 (p\ q)}{d^2}$$

Where

n =Desired sample size

z=critical value at 95% confidence level of uncertainty (1.96)

d=margin of error between the sample and the population= 5%

p=estimated proportion of WASH =80.0%. p= 0.80

q=complimentary probability of p = (1-p)……., (i.e. 1-p) = 1- 50 =0.5

$$n = \frac{(1.96)^2 \times 0.50 \times 0.50}{(0.05)^2}$$

$$\frac{3.8416 \times 0.25}{0.0025}$$

$$\frac{0.96025}{0.0025}$$

=384.1 ……, = **385.** Due to non-responses, 378 was finally used.

A multi stage sampling technique was adopted for this study on the assessment of water sanitation and hygiene practices in primary healthcare centers in Owerri west LGA Imo state. In the first stage; a probability random sampling technique was used to select three (3) communities in Owerri where the primary health centers are located for the study. In stage two, three (3) primary health facilities were selected for the study. In the third stage, patients and health workers were selected through purposive sampling technique at the community primary healthcare centers.

A structured questionnaire was used to determine the sanitary condition of primary healthcare centers and to get information from respondents at healthcare centers in Owerri west LGA Imo state. The questionnaire was classified into different sections; section A consist of socio demographic data, **section B c**onsist of questions hand washing practices and **section C c**onsisted the method of healthcare waste disposal in primary healthcare centers. The questionnaire was designed for easy comprehension by the respondents. The questionnaire was validated by public health experts and distributed face to face to the respondents (Patients and health workers) at the facilities with the aid of research assistants that was recruited by the researcher. It was attached as **appendix A** (Questionnaire).

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Reliability of the instrument was determined using pre-test method of 10% of the sample size and a reliability coefficient of 0.79 was obtained. The collected data was analyzed using descriptive statistics after entry into computer software called Statistical Package for Social Science (SPSS 21.0). The results were presented in frequency and percentage. A letter of introduction and ethical clearance was obtained from the Department of Public Health Ethical clearance committee before the research was conducted.

RESULTS

A total of three hundred and eighty-seven (387) copies of questionnaires were distributed for the study and they were properly filled and crosschecked for correctness before the analysis. Table 1 presented the socio-demographic characteristics of respondents; 33.7% (131) of the respondents were between ages 25-34years, 24.3% (94) were aged 35-44 years, 23.3% (90) for 15-24 years, and 18.6% (72) of the respondents were 45 years and above. Gender of the respondents; 61.3% (237) of the respondents were male while 38.7% (150) were female. Concerning the religion, 50.1% (194) were Christians, 26.5% (103) reported others, 16.5% (64) Muslims, and 6.7% (26) were Traditional worshipers. The marital status; 42.8% (166) of the respondents were married, 34.9% (135) were single, 12.4% (48) got separated, and 9.9% (38) were widowed. Cadre of health workers; 30.2% (117) of the respondents were Nurses, 28.0% (109) reported Pharmacists, 23.8% (92) reported Doctors, 15.5% (60) reported others, and 2.2% (9) were Med Lab Technicians. From the table, 55.9% (216) said yes they were patients while 44.0% (171) replied no. The duration in healthcare service, 33.2% (129) reported ‘less than 6 months’, 22.7% (88) said 6-12 months, 18.1% (70) reported 1-5 years, 17.2% (67) reported 5-10 years, and 8.5% (33) said above 10 years of service.

Table 1: Socio-demographic Characteristics of Participants

Characteristics		Frequency (n=387)	Percentage (%)
Age of the Participants	15-24	90	23.3
	25-34	131	33.7
	35-44	94	24.3
	45 and Above	72	18.6
Gender	Male	237	61.3
	Female	150	38.7
Religion	Christian	194	50.1
	Muslim	64	16.5
	Traditional	26	6.7
	Other	103	26.5
Marital Status	Married	166	42.8
	Single	135	34.9
	Separated	48	12.4
	Widowed	38	9.9
Cadre of Heath Worker	Doctor	92	23.8
	Nurse	117	30.2
	Med Lab Technician	9	2.2
	Pharmacist	109	28.0
	Others	60	15.5
Are you a patient?	Yes	216	55.9
	No	171	44.0
What is your duration in healthcare service?	less than 6 months	129	33.2
	6-12 months	88	22.7
	1- 5yrs	70	18.1
	5-10yrs	67	17.2
	Above 10 years	33	8.5

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Frequency (Freq) and percentage (%)

Table 2 presented the source of water supply; 56% (217) reported yes to access to potable water while 44% (170). Main source of water supply; 47(12.1%) reported stream/river/well, 51.7% (200) reported borehole with hand pump and 140(36.2%) reported public tap. Out of 400 respondents; 38.7% (150) reported sachet water, 31.7% (123) reported bottle water and 29.4% (114) reported borehole water. Methods of water storage; 27.12% (114) reported plastic containers, 10.3% (40) reported barrels and drums while 52.3% (202) reported gallons.

Table 2: Source of water supply

Variables	Options	Frequency (n=387)	Percentage (%)
Have access to portable water	Yes	217	56.0
	No	170	44.0
Main source of water supply	Stream/river/well	47	12.1
	Borehole with hand pump	200	51.7
	Public tap	140	36.2
Source of drinking water	Borehole	114	29.4
	Sachet water (pure water)	150	38.7
	Bottle water	123	31.7
Methods of water storage	Plastic containers	105	27.1
	Barrels	40	10.3
	Drums	40	10.3
	Gallons	202	52.3

Frequency (Freq) and percentage (%)

Table 3 showed the hand washing practices; 55.6% (215) reported sometimes they washed their hands daily, 23.0% (89) said always, and 21.2% (82) reported never. Cutting of finger nails; 41.3% (160) said always, 32.3% (125) said sometimes, and 26.2% (102) reported never cut their finger nails. Hands before eating; 46.7% (181) said sometimes they do washed their hands before eating 31.5% (122) said never washed their hands, and 21.7% (84) said always washed their hands before eating. Washing of hands with soap after using toilet; 47.8% (185) said sometimes, 34.2% (133) said always and 17.8% (69) never washed their hands after using the toilet. Hand wash when returned from work; 54.4% (211) reported sometimes, 23.3% (90) said never and 22.1% (86) said always. From the result; 58.9% (228) said they always washed their hands after blowing and wiping their nose, 28.9% (112) said sometimes, and 12.1% (47) reportedly never washed their hands after blowing and wiping their nose. Handling live animals; 46.2% (179) always washed their hands after handling live animals, 32.4% (126) said sometimes and 21.2% (82) said never did. Hand washing hands before touching genitals; 47.0% (182) said never washed their hands before touching their genitals, 41.4% (161) said sometimes and 11.3% (44) said always. Hand washing hands after touching genitals; 41.4% (160) said sometimes they washed their hands after touching genitals, 37.1% (144) said never did, and 21.4% (83) said always.

Table 3: Hygiene Practices among Participants

Variables	Options					
	Always		**Sometimes**		**Never**	
	Frq	**%**	**Frq**	**%**	**Frq**	**%**
Do you wash hand daily?	89	23.0	215	55.6	82	21.2
How often do you Cut nails?	160	41.3	125	32.3	102	26.2
Do you wash hands before eating?	84	21.7	181	46.7	122	31.5
Do you use soap to wash hands after using the toilet?	133	34.2	185	47.8	69	17.8
Do you wash hands when you return from work?	86	22.1	211	54.4	90	23.3
Do you wash hands after blowing and wiping nose?	228	58.9	112	28.9	47	12.1

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Do you wash hands after handling live animals?	179	46.2	126	32.4	82	21.2
Do you wash hands before touching genitals?	44	11.3	161	41.6	182	47.0
Do you wash hands after touching genitals?	83	21.4	160	41.4	144	37.1

Frequency (Freq) and percentage (%)

Figure 1 below presented the handwashing practices among participants, 25% reported always washed hand after blowing and wiping nose, 18% said after eating, 17% said after toilet, 12% said on daily basis and after touching genital, 5% said before touching genital and 10% reported after work.

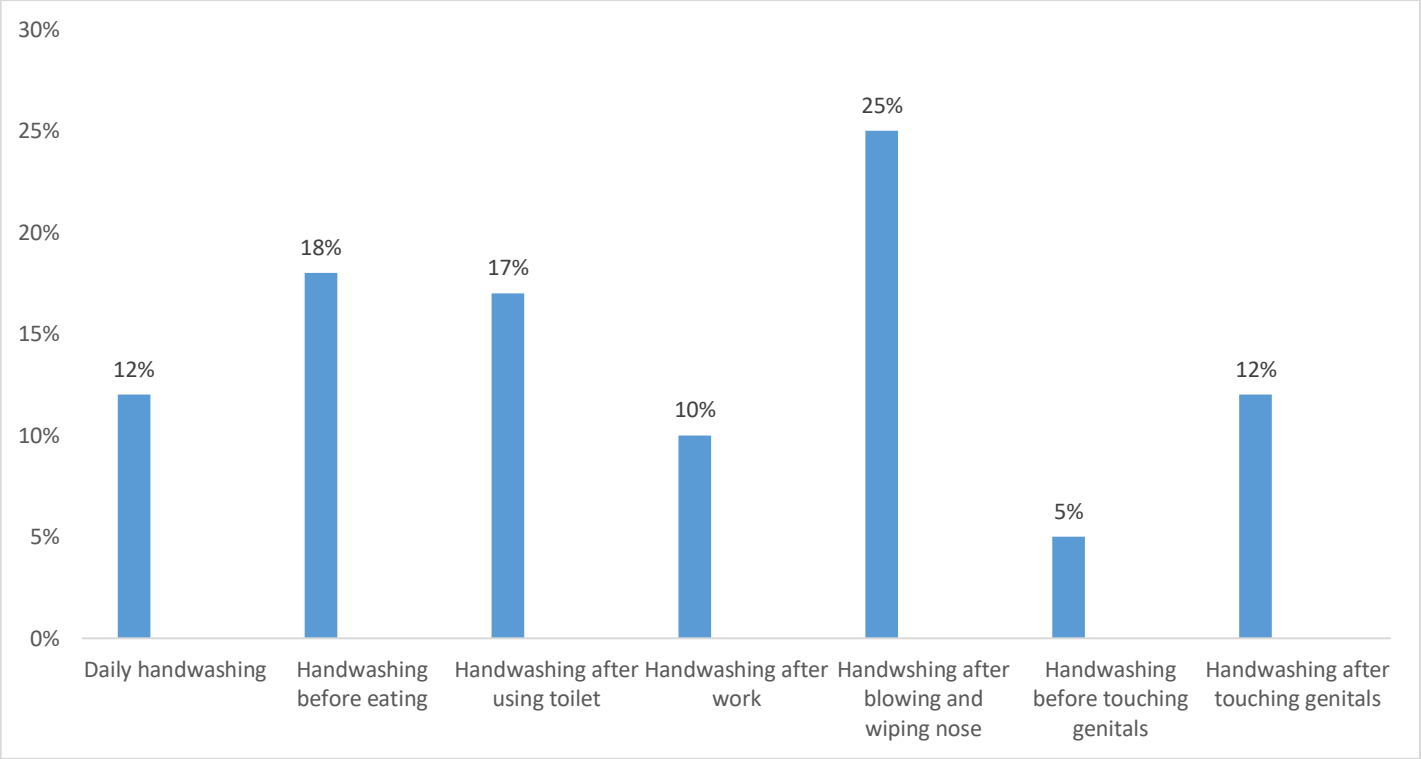

Figure 1: Handwashing Practices among Participants

Table 4 presented method of healthcare waste disposal in primary healthcare centers; 51.7% (200) of the respondents reported always disposed healthcare waste after usage, 30.3% (117) reported sometimes, and 18.0% (70) of the respondents never disposed healthcare waste after usage. The reasons for not disposing healthcare waste include; 38.1% (27) said they did not have time, 33.3% (23) reported others, 23.8% (17) said it is not in my jurisdiction, and only 4.7% (3) reported it did not suit their beliefs. Utilize waste disposal facilities; 34.7% (134) of the respondents said always utilized waste disposal facilities, 33.7% (130) sometimes, and 31.6% (122) never.

Table 4: Method of Healthcare Waste Disposal in Primary Healthcare Centers

Variables		Frequency (n=387)	Percentage (%)
Do you dispose health care waste after usage?	Always	200	51.7
	Sometimes	117	30.3
	Never	70	18.0
What is your reason	It is not in my jurisdiction	17	23.8
	I don't have time	27	38.1
	It doesn't suit my belief	3	4.7
	Others	23	33.3
Do you utilize waste disposal facilities?	Always	134	34.7
	Sometimes	130	33.7
	Never	122	31.6

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Frequency (Freq) and percentage (%)

Figure 2 below presented the type of waste disposal facilities utilized, 37.5% reported use of garbage bins, 21.4% used water closets, 14.8% veronica buckets (for hand washing), and 10.9% said toilet wash hand basin and 15.2% reported others.

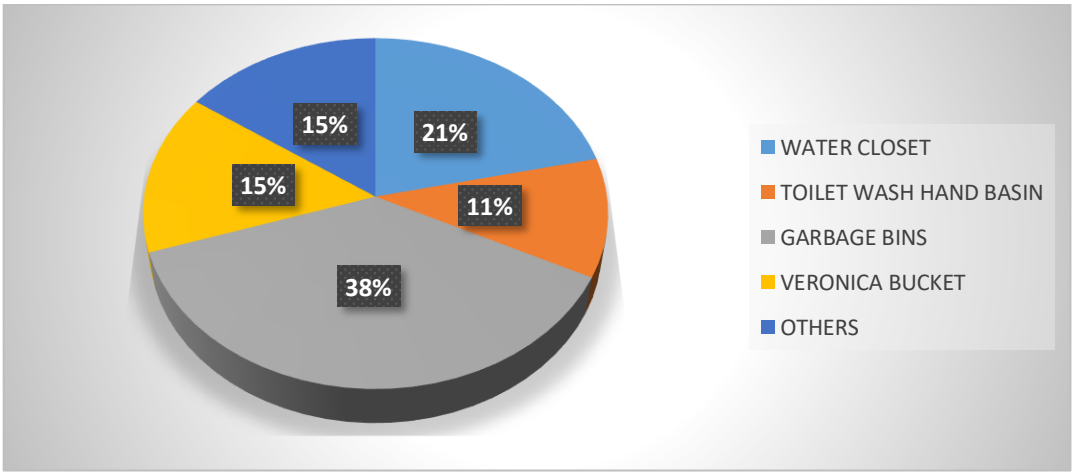

Figure 2: Type of Waste Disposal Facility Utilized

Table 5 below showed the results for the test of a statistically significant association between socio-demographic information of respondents and hand washing practices in primary healthcare centers in Owerri west LGA, Imo state. There was no statistically significant association between age of respondents and hand washing practices in primary healthcare centers at Owerri (p= 0.1686). Testing for association between marital status and hand washing practices in primary healthcare centers among respondents in the study population, there was also no significant relationship (p=0.920). On the hypothesis between cadre of healthcare worker and hand washing practices in primary healthcare centers among respondents, there was a statistically significant association (p= 0.0035). Given the association between length in service and hand washing practices in primary healthcare centers in the study population, there was a statistically significant association (p=0.0023).

Table 5 Association between the socio-demographic information of participants and hand washing practices in primary healthcare centers in Owerri west LGA Imo State

Socio Demographic Information	Hand-washing Practices		X^2	P-value	Decision
	Yes (%)	**No (%)**			
Age of the participants	50.7%	49.3%	3.332	0.1686	**NS**
Marital Status	55.8%	44.2%	8.57	0.920	**NS**
Cadre of Health Worker	84.8%	15.2%	12	0.0035	**S**
Length in Service	73.7%	26.3%	2.0	0.0023	**S**

NS = Not significant, S = Significant

DISCUSSION

Considering the socio-demographic characteristics of this study with regards to age, 33.7% of the respondents were within the age group of 25-34 years, the age seen in this study, is however in disagreement with a statement by Flores [17], that the average age of the participants in a healthcare study was 40 years but is comparable with a similar study conducted in Rivers state which found the average age of participants to be 29 years of age. Findings from this study showed that about half of the respondents (50.1%), were Christians and commonly found among Igbos. The reason was that the study was conducted in the Southern part of Nigeria where the primary healthcare centers were located [8].

Consumption of contaminated water is a viable means of transmission of diarrhoea causing pathogens. Contamination may occur at the water source, during storage by unhygienic packaging, or during meal times

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through contact with unwashed hands or exposure [18]. The availability of potable water may not necessarily be taken for granted in every part of the world especially in health facilities, but the challenge of insufficient or outright lack of potable water is worse in less developed countries, thus predisposing their populations to a higher burden of diarrhoea diseases [19]. Unhygienic handling of drinking water is also an attributable factor for diarrhoea in children [20].

Concerning hygiene practices, a little above half of the respondents (55.6%) sometimes understood the importance of washing their hands. This finding is in agreement to a study conducted by Mara [21], in Ebonyi clinic that affirmed they washed their hands sometimes. Another study by [10] supported this findings where the participants sometimes used soap to wash their hands after using the toilet. According to Duncan [7], this could be attributed to the lack of information on proper hygiene practices. Another study by Platzer *et al.*, [4] reported that half of the participants actively utilized soap while washing their hands after using toilet facilities and blowing and wiping their nose. Venkataramanan *et al.*, [3], reported that they always washed their hands after handling live animals in a study conducted in Kenya which was linked to the recent pandemics and outbreaks that resulted from animals hence the caution in handling them.

One of the most prevalent ways for infections to spread is through improper hand washing with water and soap. The results of this study and those of Orimoloye *et al*. [22], Miner *et al*. [23], Orji *et al*. [24] and Shridar *et al*. [25] showed that the majority of participants washed their hands after using the toilet.

The study on assessment of water, sanitation and hygiene practices in primary healthcare centers in Owerri also showed that moderate percentage (47.0%) of the participants reportedly never washed their hands before touching their genitals and it was in line with the study conducted by United Nations Children Education Fund [5] and they stated that close to half of the patients in that study did not wash their hands before touching their genitals.

In terms of healthcare waste disposal, more than half of the respondents always disposed their healthcare waste after usage. Tilley et al., [26] supported the idea of always disposed of healthcare waste in a study carried out in Benue State and only very few of the respondents reported that practice of poor healthcare waste disposal was due to lack of time [27] Another reason was understaffed as stated by Shepard et al., [28] and there is a need to employ and designate staff specifically for waste disposal.

This study found a positive association between cadre of healthcare worker and hand washing practices in primary healthcare centers ($p= 0.0035$). Ritchie (2018) supported this finding as they suggested in their study that nurses and doctors demonstrated better hand washing practices than laboratory technicians among respondents in primal population ($p = 0.0012$). The group which showed the least sanitation practice had their job descriptions as others. There was also a significant association between length in service and hand washing practices in primary healthcare centers in the study population ($p=0.0023$). Length in service ($p = 0.0036$) showed significant association as suggested by a previous study conducted by George [16] in year 2018.

CONCLUSION

Findings from this study proved that men health workers had good understanding of the importance of water, sanitation and hygiene (WASH) practices as well as hand washing practices compared to female health workers at the primary healthcare centers in Owerri West, Imo State. The findings also showed that lack of time is a factor affecting adequate disposal of waste in the primary healthcare centers.

RECOMMENDATIONS

The recommendations for this study include the following;

1. Proper enlightenment programmes should be provided on water, sanitation and hygiene in all primary healthcare centers in Owerri West and beyond. Governments, NGOs and other relevant authorities should try to achieve smart (safe + green) hospitals, in which one has to make both buildings and operations more resilient, mitigate their impact on the environment and reduce pollution.

2. The HCs needs to provide and ensure compliance to proper infectious waste disposal methods.

3. There is need to address the issue of understaffed to enhance effective practice of WASH and hand washing within the healthcare centers (HCs).

Declarations

Data Availability: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Clarification on Questionnaire: The questionnaire used for this study has never been published elsewhere. The questionnaire was developed for the purpose of this study. The English language version is uploaded as a supplementary file.

Ethics approval and consent to participate:

It was approved by the Public Health Research Ethics Committee, Federal University of Technology, Owerri, with the principles set out in the Declaration of Helsinki. This article is part of the principal investigator of master's project entitled 'Assessment of Water, Sanitation and Hygiene and how to prevent and control its related diseases among healthcare workers at Community level**.** This project obtained informed consent from the participants. Since it is voluntarily, any participant can withdraw or refuse to answer question at any time without any consequences of any kind.

Consent for publication: Not applicable.

Disclaimer: None.

Conflict of interest: All authors of this article report no conflicts of interest throughout the work.

Funding source: No funding was obtained from any person or organization.

Human Ethics Declarations: In this research study that involves human beings, informed consent was given to the participants, each participants was adequately informed of the purpose of the study, methods, sources of funding, conflicts of interest, institutional affiliations of the researchers, expected positive outcomes and possible discomforts the study may cause or impose on human. The norms and standards of the study refrain from stealing, assault, rape, fraud and it embraces the ethical standard of honesty and loyalty. No human fluid sample was required.

Author's Contribution Declaration: Contributing authors assisted in different form such as collection of data, analysis of data, type setting and reviewing the manuscript while the lead author organized for the conduct of the study. The list of contributing authors are as follows; Somtochukwu M. Orji; Ede A. Okorie; Chidiebere Joy Nwankwo; Nwazunku, A. Alugbala; Chinwemadu M. Nwachuwu; Blessing T. Onyeje; Ihekwoaba E. Nwaoma; Kalu O. Obasi; Mbaegbu N. Okwudili and Egbunonu R. Chiamaka.

ACKNOWLEDGEMENTS

We wish to acknowledge the Primary Healthcare Directors in Owerri West Local Government Area, Imo State, Nigeria and Head of Department of Public Health, Federal University of Technology, Owerri, Imo State, Nigeria for their immense contribution in this research study.

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