Full Length Research Paper

# Knowledge, Attitude and Practice of Handwashing amongst Residents of Orlu Metropolis

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Abstract

With the ongoing epidemic of Ebola viral disease (EVD) across West Africa, the degree to which communicable diseases can cause physiological, psychological and socio-cultural disruptions cannot be overemphasized. There is therefore the need to inculcate helpful preventive practices of which regular and effective hand washing is one. To assess the knowledge, attitude and practice of hand washing amongst residents of Orlu Metropolis, Imo State, Nigeria, a cross sectional descriptive study involving 405 participants. Data was collected by use of questionnaires that were both selfadministered and interviewer-administered depending on the respondent's literacy level. The study revealed that the level of knowledge about diseases transmissible through dirty hands was 97.6%. The majority of the respondents (90.4%) had knowledge of alternatives to hand washing which included the use of hand sanitizers (67.06%). 93.64% of respondents thought that hands should always be clean and 98.3% agreed that hand washing could prevent diseases. On the practice of hand washing, 92.65% used soap and water to wash hands; out of which only 33.89% washed their hands under running water. 65.16% always dried hands after washing of which 62.80% used dry towels, 3.08% used paper towels and 26.54% used personal handkerchiefs. The constraints to washing hands effectively were forgetfulness (34.48%), lack of water (14.66%), busy schedule (13.48%) and ignorance (10.40%) while 26.95% gave no reason. The residents of Orlu Metropolis have good knowledge and attitude about hand washing. Their practice of hand washing is suboptimal because though they washed their hands with soap and water, they did this in basins of water instead of under running water and dried their hands with cloth towels instead of disposable paper towels. We recommend provision of adequate quantities of pipe-borne water to Orlu Metropolis. Health education would also improve the knowledge, attitude and practice of hand washing in this community and thereby, improve their quality of life.

Keywords: hand washing, infection control, hygiene, Orlu Metropolis, Nigeria.

# INTRODUCTION

### BACKGROUND

With the ongoing epidemic of Ebola viral disease (EVD) across West Africa, the degree to which communicable diseases can cause physiological, psychological and socio-cultural disruptions cannot be overemphasized. There is therefore the need to inculcate helpful preventive practices of which regular and effective hand washing is one.

Hand hygiene is recognized as the leading measure to prevent cross-transmission of microorganisms. Faeces from people or animals is an important source of infective organisms like Salmonella, E. coli and norovirus that cause diarrhoea, and it can spread some respiratory like adenovirus infections and hand-foot-mouth disease. These kinds of organisms can get onto hands after people use the toilet or change a nappy, but also in less obvious ways, like after handling raw meats that have invisible amounts of animal faeces on them. Infective organisms can also get onto hands if people touch any infected object that has pathogens on it because someone coughed or sneezed on it or was

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touched by some other contaminated object (CDC, 2014). When these pathogens get onto hands and are not washed off, they can be passed from person to person and make people sick. Hand washing with soap removes germs from hands. This helps prevent infections because: people frequently touch their eyes, nose and mouth without even realizing it. Pathogens can get into the body through the eyes, nose and mouth and cause diseases. Microbes from unwashed hands can get into foods and drinks while people prepare or consume them. They can multiply in some types of foods or drinks, under certain conditions, and make people sick. They can be transferred to other objects, like handrails, table tops, or toys, and then transferred to another person's hands. Removing Microbes through hand washing therefore helps prevent diarrhoea and respiratory infections and may even help prevent skin and eye infections. (CDC, 2014)

Hand washing, according to the Centre for Disease Control (CDC), is defined as the vigorous, brief rubbing together of all surfaces of lathered hands, and followed by rinsing under a stream of water (CDC, 2014). Hand hygiene is defined as any method that removes or destroys micro-organisms on the hand (Wikipedia, the freeencyclopaedia.Handwashing.en.m.wikipedia.org/wiki /handwashing). It is well documented that the most important measure for preventing the spread of pathogen is effective hand washing (CDC, 2014). The amount of time spent washing hands is important to reduce the transmission of pathogens to foods, water, other people and inanimate objects (fomites), such as door knobs, hand railings and other frequently touched surfaces. Proper hand hygiene involves the use of soap and running water, rubbing hands vigorously for at least 20 seconds; paying close attention to the nail areas, as well as the area between the fingers (CDC, 2014). Careful hand drying is a critical factor for bacterial transfer to skin, food and environmental surfaces (CDC, 2014).

Some specific activities where hand washing is required include before preparing food/drink, before and after eating and drinking, after using the toilet, after sneezing, coughing or blowing the nostrils, after handling faeces or urine, after handling surfaces that many people touch, such as doorknobs and railings, after handling animals or animal waste, after handling money, at the end of a day at school, work, market, play, sex, at the end of a journey, after handling uncooked eggs, meat, after handling garbage (CDC, 2014).

The value of hand washing for the prevention of cross-infection was first observed in the middle of the nineteenth century (CDC, 2009). Hand washing especially when done with soap, can remove agents of infection both at the time they were emitted from the primary host and prevent them from reaching the secondary host. Regular hand washing is thus an excellent way of preventing the transmission of pathogens from one person to another and has been described as a "modest measure with big effects" (CDC, 2009). Hand washing is especially important where people congregate (schools, offices, markets), where ill or vulnerable people are concentrated (hospitals, nursing homes), where food is prepared and shared and in homes, especially where there are young children and vulnerable adults. (Teare et al., 1999)

Hand washing is so important that the United Nations General Assembly, in 2008, set aside 15<sup>th</sup> October as Global Hand washing Day. (WHO, 2008) Therefore, promoting adequate knowledge, correct attitudes and proper practices of hand washing is of paramount importance. With the advent of the Ebola Virus Disease pandemic in West Africa, extra attention has to be paid to the cleanliness of the hands as a means of preventing infection. Till date, no study has been conducted on hand washing in Orlu, Imo State, thus the need to assess the knowledge and practices of hand washing among the residents. There is a paucity of studies exploring this subject in adult non-healthcare providers in Africa.

# MATERIALS AND METHODS

#### Study area

The study was conducted among the residents of Orlu metropolis in Orlu Local Government Area of Imo state in South Eastern Nigeria. Orlu is the third largest city in South East Nigeria's Imo state with an estimated population of 220,000 consisting mainly of farmers and Traders. It is located between latitudes  $5^0$  43' N to  $5^0$  51' N and longitudes  $7^0$  00' E to  $7^0$  09' E.<sup>7</sup>Orlu metropolis consists of Amaifeke, Umuna and parts of Orlu town (Wikipedia, the free encyclopaedia. Orlu).

### Study population

Individuals (adults and non heath care personnel) males and females who have lived in Orlu metropolis for at least one year prior to the survey. The individuals who did not meet these criteria were excluded.

### Study design

A cross-sectional descriptive study design.

## **Data collection**

Data was collected with the use of questionnaires containing semi-structured and structured questions. The questionnaires were both self-administered and interviewer administered depending on the literacy level of each respondent.

### Data analysis

Data were analyzed using computer statistical software SPSS 15.0 for windows (Inc., Chicago, USA, 2001).

#### **Ethical consideration**

Consent was obtained from the Ethics Committee of Imo State University and the participants of the study prior to the interview.

#### RESULTS

Of the estimated sample size of 422, only 405 questionnaires were returned, giving a response rate of 96%.

Table 1: The socio-demographic parameters of the respondents showed: Five age groups were involved in the study, they include age groups 10-19,20-29,30-39,40-49 and 50 and above. 128(31.45%) persons were within the age group of 10-19years, 148(36.36%) persons were within 20-29 years age group, 65(15.97%) made the 30-39years respondents up ade group,35(8.6%) and 31(7.62%) persons made up the 40-49years, 50years and above age group respectively. A total of 140males and 265 females took part in the study giving a male to female ratio of 1:2. The respondents had different occupations represented, these included civil servants 23(5.7%), students 214 (52.8%), traders 85(21.0%), teachers 42(10.4%), clergy 4(1.0), Hair dresser 5(1.3%), drivers 3(0.7%), tailors 3(0.7%), artisans 12(2.9%), and 14(3.5%) others persons fell into no specific group.

Of the respondents 265(65.1%) persons were single and 142 (34.9%) were married. 417(99.76%) were Christians whilst one person (0.24%) was Muslim. In educational attainment included, primary, secondary, tertiary and postgraduate and those who had no academic attainment at all, they were 88(21.7%), 199(49.1%), 107(26.4%), 9(2.3%) and 2 (0.5%) person respectively for each group.

Table 2 shows that of the respondents 404(99.75%) had a good knowledge of hand washing. 179(42.42%) of the respondents heard about hand washing at home while 158(37.44 %) heard it from school. Newspaper, mass media and seminar as source of information concerning hand washing were 57(13.51%), 140(33.18%), and 50(11.85%) respectively. The church was 35(8.29%).

On the question concerning what respondents thought hand washing is, 13(3%) persons know it to be dipping hands inside water, 82(18.7%) persons know it to be rubbing hands together inside basin of water, and 33(7.5%) persons know it to be rubbing hands together under running water. 310(70.8%) persons know hand washing as vigorously rubbing soapy hands under

running water. 395(97.6%) respondents agreed that dirty hands can transmit diseases, 2 (0.48%) did not agree and 8(1.92%) persons did not know. When guizzed on their knowledge of the diseases that can be transmitted by dirty hands, Ebola took the greater rating being known by 248(58.8%) persons, next diarrhoea 167(39.75%) and then others which included cholera 141(33.41%), skin infections 59(13.98), respiratory infections 31(7.35%), hepatitis 29(6.9%), and polio 27(6.4%) persons respectively. With regards to the number of diseases each individual knows, 13(3.08%) people seemed not to know any of the diseases, 281 (66.59%) respondents knew just one disease, 40(9.48%) people knew two diseases, 41(9.75%) people have an idea of three of the diseases, 19(4.5%) people have knowledge of four diseases, 9(2.13%) persons have idea of five diseases, 4(0.95%) people know about six of the diseases, 6(1.42%) people know about seven diseases and 9(2.13%) people know about 8 of the diseases.

On knowledge of hand washing alternatives, 358(90.4%) respondents had knowledge of alternatives to hand washing, and 38(9.6%) of them had no knowledge. The respondents had more knowledge of hand sanitizers as alternative means to hand washing than commonly used disinfectants 283(67.06%) against 94(22.27%) respondents, the rest were the use of hot towels 18(4.27%) and alcohol wipes 26(6.16%) respondents.

On attitude to hand washing, 385(95.1%) of respondents agreed that hand washing was important, 2(0.5%) did not agree while 10(2.5%) did not know whether hand washing was important or not. 383(93.6%) of respondents thought it was important for hands to always be clean, 24(5.9%) thought the hands could be clean sometimes while 2(0.5%) thought that it was not often that the hands should be clean. 398 (98.3%) agreed that hand washing could prevent diseases, while 3(0.7%) did not agree.

Table 3: Practice of hand washing shows that 258(62.4%) of respondents said they always washed their hands first thing in the morning, 129(31.2%) did this sometimes while 26(6.3%) never washed their hands first thing in the morning.

330(82.1%) of respondents always washed their hands after using the toilet, 65(16.2%) only did this sometimes while 7(1.7%) never washed their hands after using the toilet.

305(75.9%) of respondents always washed their hands before preparing meals while 97(24.1%) only did this sometimes. 236(58.7%) always washed their hands before and after eating meals like rice and beans, 105(37.3%) did this sometimes while 16(4%) never did this. 146(36.5%) of respondents always washed their hands before and after drinking water, soda and alcoholic beverages, 168(42%) only did this some of the time while 86(21.5%) never washed their hands at this time. 239(63.5%) of respondents always washed their hands before feeding a baby, 115(30.6%) did this some Table1. Socio-demographic parameters

Age		
Age	Frequency	Percentage %
10-19	127	31.4
20-29	147	36.3
30-39	65	16.0
40-49	35	8.6
50 and above	31	7.7
Total	405	100
Gender		
Sex	Frequency	Percentage %
Male	140	3/ 57
Female	265	65.43
Total	203	100
	403	100
	Fraguanay	Porcontago %
	Frequency	
	23	5.7
Studying	214	52.8 24.0
Trading	85	21.0
leaching	42	10.4
Clergy	4	1.0
Hair dressing	5	1.3
Driving	3	0.7
Tailoring	3	0.7
Skilled Artisans	12	2.9
Others	14	3.5
Total	405	100
Marital Status		
Marital Status	Frequency	Percentage %
Single	264	65.1
Married	141	34.9
Separated	0	0
Divorced	0	0
Widowed	0	0
Total	405	100
Religion		
Religion	Frequency	Percentage %
Christianity	404	99.76
Islam	1	0.24
African Traditional Religion	0	0
None	0	0
Total	415	100
Educational attainment		
Highest Level of Education Attained	Frequency	Percentage %
Primary	88	21.7
Secondary	199	49.1
Tertiary	107	26.4
Postgraduate	9	23
None	2	0.5
Total	405	100

Table 2. Knowledge of hand washing

Yes No Total	404 1	99.75
No Total	1	
Total	•	0.25
	405	100
Source of information on hand washing	Frequency	Percentage %
Home	179	42.42%
School	158	37.44%
Newspaper	57	13.51%
Mass media e.g. TV, Radio	140	33.18%
Church	35	8.29%
Seminar	50	11.85%
What respondents know as hand washing	Frequency	Percentage %
Dipping hands inside water	13	3.0
Rubbing hands together inside basin of water	82	20.2
Rubbing hands together under running water	33	8.1
Vigorously rubbing soapy hands together under running water	310	76.5
Response to the idea that dirty hands can transmit diseases	Frequency	%
Yes	395	97.5
No	2	0.5
l don't know	8	2.0
knowledge of disease that can be transmitted via dirty hands	Frequency	%
Diarrhea	167	39.57
Cholera	141	33 41
Ebola	2/18	58 77
Typhoid	2 <del>4</del> 0 70	11 61
Polio	+3 27	64
	20	0.4
nepallis	29	0.9
Skin iniections	59	13.90
Respiratory infections	JI Francisco	7.30 Dereentere 9/
Number of diseases known by each respondent	Frequency	Percentage %
	13	3.08
1	281	66.59
2	40	9.48
3	41	9.72
4	19	4.50
5	9	2.13
6	4	0.95
7	6	1.42
8	9	2.13
Do you know any alternative to hand washing?	Frequency	Percentage %
Yes	358	90.4
No	38	9.6
Hand washing alternatives used by respondents	Frequency	Percentage %
Hand sanitizers	283	67.1
Use of hot towels	18	4.27
Alcohol wipes	26	6.16
Disinfectants e.g. Bleach, dettol.	94	22.27
Do you think hand washing is important?	Frequency	Percentage %
Yes	393	97.06
No	2	0.47
I don't know	10	2.47
Should your hands be clean	Frequency	Percentage (%)
Always	383	93 64
Sometimes	24	5 97
Not often	2 <del></del> 2	0.07

Table 2. Continue

Never	0	0
Can hand washing prevent diseases	Frequency	Percentage (%)
Agree	398	98.3
Don't agree	7	1.7

Table 3. Practice of hand washing

Do you wash your hands	Always		Somet	imes	Never	
	Frequency	(%)	frequency	(%)	frequency	(%)
First thing in the morning	258	62.47	129	31.23	26	6.30
After using the toilet	330	82.09	65	16.17	7	1.74
Before preparing meals	305	75.87	97	24.13	0	0
Before/after eating	236	58.71	150	37.31	16	3.98
Before/after drinking	146	36.5	168	42.0	86	21.5
Before feeding a baby	239	63.56	115	30.59	22	5.85
After changing diapers	279	73.04	74	19.40	29	7.59
After sneezing	182	46.31	155	39.44	56	14.25
After handling Naira	145	39.94	146	40.22	72	19.83
At the end of the day	258	74.78	76	22.03	11	3.19
How do you wash your hands	Frequency			Percentage	(%)	
With water only	49			11.61		
Soap and water	391			92.65		
Ash and water	3			0.71		
Sand and water	1			0.24		
How respondents washed their						
hands:						
Do you wash your hands	Frequency			Percentage	(%)	
In a basin of water	291			71.9		
Under running water	114			28.1		
Do you dry your hands after washing			Frequency		Percentage (%)	
Always			245		60.5	
Sometimes			128		31.6	
Never			32		7.9	
With what	Frequency			Percentage	(%)	
On your clothes	48			11.85		
On a nearby towel	41			10.12		
On a dry towel	265			65.4		
On paper towels	13			3.25		
On personal handkerchiefs	38			9.38		
Respondents' sources of water:						
What is your source of water supply		Fre	equency		Percentage (%)	
Borehole			289		71.4	
Тар			39		9.2	
Rain			69		16.4	
Stream			8		1.90	
Tanker			55		13.03	

of the time while 22(5.9%) never washed their hands before feeding a baby.

279(73%) always washed their hands after changing baby diapers, 74(19.4%) washed sometimes while 29(7.6%) never did this. 182(46.3%) of the respondents said they always washed their hands after sneezing,155 (39.4%) sometimes washed their hands after sneezing while 56(14.3%) never washed. 145(39.9%) said they washed their hands after handling Naira notes, 146(40%) said they did this sometimes while 72(19.8%) never did this. 258(74.8%) said they washed their hands at the end of the day, 76(22%) did this sometimes while 11(3.2%) never did this.

391(92.7%) of respondents indicated that they used soap and water to wash their hands, 49(11.6%) used only water without soap, 3(0.7%) used ash and water while 1(0.2%) used sand and water to wash their hands. 291(69%) of respondents washed their hands in a basin of water while 143(33.9%) washed their hands under running water. 245(65.2%) of respondents in our study always dried their hands after washing, 128(34%) dried their hands sometimes while 3(0.8%) never dried their hands. (11.4%) of respondents dried their hands on their clothes, 41(9.7%) used nearby towels, 112(26.5%) dried their hands on their personal handkerchiefs, and 265(62.8%) used dry towels while only 13(3%) used disposable paper towels.

Table 4: Proximity of sources of water to respondents: 289(68.5%) of our respondents had borehole as their source of water, 69(16.4%) got their water from rain, 55(13%) have tankers supply water to their homes, 39(9.2%) said they had pipe-borne water while 8(1.9%) had to go to streams to fetch water.

More than half of our respondents 239(56.9%) had their water source at home, 157(37.4%) had theirs close to home while 24(5.7%) said their source of water was far from their homes or places of work. 259(62.6%) said they always had enough water for their daily use, 127(30.7%) had enough water only some of the time while 28(6.8%) indicated that it was not often that they had enough water for their needs.

Table 5: limitations to hand washing

What prevented respondents in our study from washing their hands include forgetfulness 146(34.6%), lack of water 62(14.7%), busy schedule 57(13.5%) and ignorance 44(10.4); 114(27%) of respondents said nothing prevents them from washing their hands.

### DISCUSSION

This is a community based study on adult residents of Orlu metropolis. There is a paucity of studies exploring this subject in literature. Most studies on hand washing has been hospital based and carried out on health care providers (Opara and Alex Hart, 2009; Ekwere and Okafor, 2013; Bello et al., 2013). This study showed that residents of Orlu metropolis have good knowledge of hand washing which may have been due to the recent Ebola outbreak in West Africa and Nigeria as health information was constantly aired to the public on radios and television in Nigeria.

Of respondents in this study 97.6% agreed that dirty hands could transmit diseases. This agrees with the findings in a study amongst mothers of under-5 years children in Osogbo, Osun state, (Asekun-Olarinmoye et al., 2014) where the mothers agreed that dirty hands could pass diseases to their children. The work indicated (as in this study) that most of the respondents were knowledgeable on how the hands could be contaminated with germs, and responded positively to attitudinal statements on hand washing (Asekun-Olarinmoye et al., 2014). When asked on the type of illnesses their children suffered, they mentioned fever, diarrhoea and catarrh. Majority agreed that attending to their children with unwashed hands could result to illness in the child. Only a small percentage admitted to not washing their hands following attendance to a sick person. Concerning hand drying practices, a greater percentage said they cleaned their hands with dry towels while the rest admitted to either using their wrappers or rags for hand-drying (Asekun-Olarinmoye et al., 2014)

On attitude to hand washing, majority of the respondents in this study agreed that hand washing was important and that it was important for hands to always be clean and regular hand washing could prevent diseases. As seen in studies on hand washing practices among school children (Lau et al., 2012; Steiner-Asiedu et al., 2011; Azor-Martinez et al., 2014). In these studies, children who washed their hands adequately were found to have less diarrhoea and other illnesses and had less absenteeism from schools.

On practice of hand washing: in this study,75.9% of respondents always washed their hands before preparing meals while 24.1% only did this sometimes. 58.7% always washed their hands before and after meals, 37.3% did this sometimes while 4% never did. 36.5% of respondents always washed their hands before and after drinking water, soda and alcoholic beverages, 42% only did this some times while 21.5% never washed their hands at this time. 63.5% of respondents always washed their hands before feeding a baby, 30.6% did this sometimes while 5.9% never washed their hands before feeding a baby.

73% always washed their hands after changing baby diapers, 19.4% washed sometimes while 7.6% never did this. 46.3% of the respondents said they always washed their hands after sneezing, 39.4% sometimes washed their hands after sneezing while 14.3% never washed.

39.9% said they washed their hands after handling Naira notes, 40% said they did this sometimes while 19.8% never did this. 74.8% said they washed their hands at the end of the day, 22% did this sometimes while 3.2% never did this. All these tally with the study on health care workers where 69% of doctors and other health workers always washed their hands before meals, while 8.5% occasionally washed before taking their meals. After defecation 58.1% of participants always washed their hands, while 11.6% occasionally washed their hands (Pritchard and Raper, 1996). Washing hands with water alone is significantly less effective than washing hands with soap in terms of removing germs. Although using soap in hand washing breaks down the grease and dirt that carry most germs, using soap also means additional time consumed during the massaging, rubbing and friction to dislodge them from fingertips and between the fingers, in comparison with just using water for hand washing (Samuel et al., 2005).

92.7% of respondents indicated that they used soap and water to wash their hands, 11.6% used only water without soap, 0.7% used ash and water while 0.2% used Table 4. Proximity of sources of water to respondents

Where is your source of water	Frequency	Percentage (%)		
At home	239	59.0		
Close to home	157	38.8		
Far from home	9	2.2		
Do you have enough water for your personal hygiene				
Always	259	62.6		
Sometimes	127	30.68		
Not often	28	6.76		
Never	0	0		

Table 5. limitations to hand washing

What prevents you from washing your hands always	Frequency	Percentage (%)
Ignorance	44	10.40
Forgetfulness	146	34.5
Busy schedule	57	13.5
Lack of water	62	14.7
Nothing	114	27.0

sand and water to wash their hands. Hand washing with soap and water has clearly been shown to reduce the rates of Clostridium difficile infection and hence, hospital-acquired infections (Hsu, 2010). A study carried out among school children in Ghana showed that 88.3% of them washed their hands with soap after visiting the toilet (Steiner-Asiedu et al., 2011). 2.3% of mothers studied in an observational research washed their hands with soap, a further 6.7% washing them with soapy water and 16.3% with water alone (Hsu, 2010). Whilst in this study 69% of respondents washed their hands in a basin of water while 33.9% washed their hands under running water. This is in contrast to a study on health workers where running tap water with antiseptic soap were most commonly used for hand washing (68.4%) (Ekwere and Okafor, 2013). In another study, 67.4% of respondents washed their hands with soap and running water, 15.1% used running water alone (Pritchard and Raper, 1996).

Experts argue that hand drying is as important as hand washing in maintaining hand hygiene (Pittet et al., 1999; Tibballs, 1996). In this study, 65.2% of respondents in our study always dried their hands after washing, 34% dried their hands sometimes while 0.8% never dried their hands. 82.5% of respondents in a study among health care workers in a tertiary institution in South Western Nigeria dry their hands after washing (Ekwere and Okafor, 2013).

Despite conflicting findings, the general opinion seems to be that single-use paper towels are the most appropriate hand drying method. They are said to rub away transient organisms and dead skin cells and remove bacteria from deeper layers due to associated friction from rubbing (Tibballs, 1996). Common cloth towels and handkerchiefs which become damp and contaminated can act as reservoirs for bacteria and therefore have the potential to become significant sources of infection (WHO, 2008; Gould, 1994). In our study, 11.4% of respondents dried their hands on their clothes, 9.7% used nearby towels, 26.5% dried their hands on their personal handkerchiefs, and 62.8% used dry towels while only 3% used disposable paper towels. 35.9% of health workers in one study reportedly used personal handkerchiefs to dry their hands after washing, while 22.5% dry their hands with common towels (Ekwere and Okafor, 2013).

Factors affecting hand washing that were studied in this research include source of water supply, relative distance of source to the respondent, and what may hinder the actual washing of hands even when water is available.

68.5% of our respondents had borehole as their source of water, 16.4% got their water from rain, 13% have tankers supply water to their homes, 9.2% said they had pipe-borne water while 1.9% had to go to streams to get water.

More than half of our respondents (56.9%) had their water source at home, 37.4% had theirs close to home while 5.7% said their source of water was far from their homes or places of work.

62.6% said they always had enough water for their daily use, 30.7% had enough water only some of the time while 6.8% indicated that it was not often that they had enough water for their needs.

What prevented respondents in our study from washing their hands include forgetfulness (34.6%), lack

of water (14.7%), busy schedule (13.5%) and ignorance (10.4); 27% of respondents said nothing prevents them from washing their hands. Lack of soap was the most identified constraint to hand washing as reported by Pritchard and Raper 1996, 34.6% of the participants. Major constraint to hand washing in another study was the busy work schedule of respondents (56.5%) (Ekwere and Okafor, 2013).

#### CONCLUSION

The residents of Orlu Metropolis have good knowledge about hand washing and good attitude towards it. Their practice of hand washing was not optimal. Although majority of them washed their hands with soap and water, they did this in basins of water instead of under running water and dried their hands with common towels instead of disposable paper towels. Their practice of hand washing was also affected by the human factor of forgetfulness and the fact that Orlu Metropolis has no public water supply.

### RECOMMENDATIONS

Based on our findings, we recommend provision of adequate quantities of potable pipe-borne water to Orlu Metropolis. Health education would also improve the knowledge, attitude and practice of hand washing in this community and thereby, their quality of life.

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#### **Competing interests**

The authors declare that they had no competing interests.

#### Author's contributions

Merenu IA, Uwakwe KA, Duru CB, Diwe KC, and Chineke HN designed the study. Data analysis was by Merenu IA, and Diwe KC. Merenu IA wrote the manuscript and all the authors read and approved the final version of the manuscript.

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