

Socio-Demographic Predictor of Handwashing Practice Among Health Care Workers in A Tertiary Institution in Nigeria.

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Abstract:

Background & Objective: Hand washing practice is a well-recognized preventive measure against infectious organisms including COVID-19. There is a need to find out factors that may influence good hand washing practice. This study was done to investigate the socio-demographic predictors of good hand washing practice among the healthcare workers in the Federal Medical Centre, Asaba.

Method: This was an institutional-based, cross-sectional study carried out among 247 Health care workers using a systematic sampling design. A structured, standardized questionnaire was used to collect data. SPSS version 25 was applied for data analysis. Statistical significance was set at a p-value < 0.05. Logistic Regression analysis was done to determine the socio-demographic predictor of good hand washing practice.

Results. The majority of Health care workers had good knowledge (91.9%) and practice (98.9%) of hand washing. The respondent's profession (chi-square value 4.71, p-value <0.03) and Gender (chi-square 5.24, p-value < 0.22) were statistically associated with the practice of good hand washing. Gender is the only significant predictor of good hand washing practice on the Multivariate analysis level.

Conclusion: Gender is a predictor of good hand washing practice among health care workers in Federal Medical Center Asaba. Efforts should be made to establish an Infection prevention committee in every Health care facility. This will ensure regular training of staff to eliminate Hospital-acquired infection to the barest minimum.

Keywords: Socio-demographic, Predictor, Hand-washing, practice in Nigeria.

I. INTRODUCTION

Hands are considered the most important medium of pathogen transfer; hand washing is a method of social vaccination and is similar to vaccination. Personal observance of this process guarantees adequate prevention of infection for oneself and others (WHO, 2019) this shows that hand hygiene is the single factor that can help to prevent the spread of highly infectious diseases. It is still the main protection

despite the mask and protective gear (WHO, 2019). Washing hands with soap and running water is vital, the temperature of the water does not matter much. The fundamental principle is to make sure that the water is clean, so using running water from a sink is safer than placing hands in a basin of standing water that has been polluted through previous use, thereby supporting the spread of infectious/communicable diseases (WHO, 2020).

Hand washing is one of the ways to limit the spread of COVID-19 and other highly infectious diseases, Wearing gloves is not an alternative for washing our hands (Unicef for every Child, 2021). Hand hygiene is a term that applies to either handwashing with soap and running water or hand rubbing with 70% alcohol-based liquid or surgical hand antiseptics (Unicef for every child 2021).

The World Health Organization (WHO) introduced the five moments of Handwashing, before touching a patient, before a clean/aseptic procedure, after exposure to patient body fluid, after touching a patient, and lastly after touching the patient's surroundings (WHO,2010). The following are the five steps of handwashing, every time: a)Wet your hands with clean running water, turn off the tap, and apply soap; b) Lather your hands by rubbing them together with the soap, lather the backs of your hands, between your fingers, and under your nails; c) Scrub your hands for at least 40-60 seconds d) Rinse your hands well under clean, running water, e) dry your hands using a clean towel or disposable tissues or air dry them(D. T. S. Chou, P Achan, M Ramachandran,2012). For Alcohol-based hand hygiene, you time yourself for 20 secs (D. T. S. Chou, P Achan, M Ramachandran, 2012).

Each year on October 15, Global Handwashing Day is observed to focus on the significance of handwashing with soap and water at home, in the communities, and around the hospitals (K. Gulilat and G. Tiruneh,2014). This event was established in 2008 to remind the world that handwashing with soap is one of the best steps we can

take to avoid spreading germs to others (Stotie Alemu B, Bezune A. D, Joseph J, et al, 2015).

That's why our hands are on the front lines in the war against Covid-19. The Nigerian Centers for Disease Control and Prevention (CDC) recommends washing hands with soap and water (Timothy AE, 2013) as the best way to clean our hands. However, in the absence of soap and water, a hand sanitizer with at least 70% alcohol-based can be used (NCDC, 2022). Poor hygiene is accountable for the spread of 80 percent of infectious diseases in a developing country, according to medical experts (Daniel Eshetu et al, 2020). In a 2013 study by Michigan State University researchers, it was found that only five percent of the participants washed their hands long enough to kill the germs that can cause infections after using the bathroom. About a third didn't use soap, and the worst part is that 10 percent of them didn't wash their hands at all (Melisser Anders, 2013) the study found that people only wash their hands, on average, for about six seconds. Experts have stated that it takes between 15 and 20 seconds of handwashing to effectively kill the germs. Dr. Christopher Lee, head of the Infectious Diseases Unit and the Department of Medicine at Hospital Sungai Buloh, says good hand hygiene is one of the key factors in restricting the transfer of bacteria, viruses, and other microbes from sources of contamination. He says with proper techniques, the simple act of handwashing with soap and water can significantly reduce the transmission of these pathogens (Christopher Lee, 2018).

A study done in General Hospital Ikot Ekpene, Akwa Ibom State¹⁴, Nigeria, revealed that 82.4% of respondents had good knowledge of handwashing and 17.6% had poor knowledge. Observations on the practice of handwashing revealed that 42.2% of respondents always practiced hand washing and 34.3% practiced occasionally, and 23.5% never practiced hand washing (Ojong I N, Etim Mfon, Akpan M, 2014). In an observational study conducted among Healthcare Providers in a Tertiary Hospital in Ghana, a handwashing compliance rate ranging from 9.2% to 57% among doctors and 9.6% to 54% among nurses was reported (Yawson A E and A. A. Hesse A A, 2013). A study conducted at Jimma University Hospital in Southwest Ethiopia also indicated that the practice of handwashing by the nursing staff was inadequate. This confirmed that only 43.2% of the nursing staff practice adequate hand washing while 56.8% of them practice inadequate handwashing (Zegeye W, 2018)

Socio-demographic analysis of two studies showed that females were expected to show a better attitude toward hand-washing than were males, however they presented with a higher percentage of total coliforms in the hand examination. The older age group had better hand-washing behaviors than the younger age group and had fewer total aerobic bacteria on their hands (Kim JG, 2019). The outcomes show the dissimilarities in hand hygiene between genders. These differences can be seen in the attitude and practice of hand hygiene and the act of the 5 moments of hand hygiene. In the other study female Saudi nursing students also have a better attitude toward hand hygiene and better self-reported

performance of the 5 moments of hand hygiene while their male counterparts have better practice (Cruz JP et al, 2015).

Hand washing is a simple procedure yet often overlooked by most Healthcare workers, it is a critical component of infectious disease prevention and control (Almutairi SM, Alotaibi A, et al, 2020), therefore, key in the prevention of COVID-19 and other highly infectious diseases. It is easy to perform yet often not carried out, it should be performed first on arrival to work and the last thing while leaving work it is the best and most consistent way of preventing the spread of the coronavirus.

There is a paucity of data in our environment as to socio-demographic determinants of good hand-washing practice. Hence this study is expected to find out the socio-demographic predictors of good Handwashing Practice among health care workers in a tertiary institution in Nigeria.

II. MATERIALS & METHODS

We conducted a descriptive cross-sectional study design of adult (> 18 years) Health care workers in Federal Medical Center, a tertiary health facility located in the city of Asaba-Nigeria.

The various professions in the departments were grouped into two for the study. Those who worked directly with patients in the wards. They had responsibilities related to diagnosis and treatment. They were considered "Clinical Health Care Workers". This represented the Doctors, Nurses, and dentists (Cruz JP et al, 2015). Those who did not work directly with patients in the ward and had no responsibilities relating to diagnosis and treatment were considered "Non-Clinical Health Care Workers. This represented others (Andrew C. S, Marley H, 2020). Those who were willing to dispense information and those who gave consent among these groups were included in the study while those who did not give consent were excluded.

The minimum sample size of this study was determined by using the formula.

$$[N = \frac{Z^2 PQ}{D^2}] \text{ (Franklin Chibuacha, 2021),}$$

$$D^2$$

Where:

N = the desired sample size

Z = the standard normal deviate usually set at 1.96 (or more simply at 2), this corresponds to the 95 percent confidence level. 8

P = the proportion in the target population estimated to have a particular characteristic. Which was 82.4% (0.824) as in a study carried out in Ikot Ekpene (Ojong I N, Etim Mfon, Akpan M, 2014).

$$Q = 1.0 - P = 0.176$$

D = Degree of accuracy desired was set at 0.05

$$N = \frac{1.96^2 (0.824) (0.176)}{0.05^2}$$

$$= \frac{3.8416 \times 0.824 \times 0.176}{0.0025} = 223$$

223 + 10% non-response ratio

$$N = 223 + 23 = 246.$$

Sampling Method

The sample size for different professions was determined by the number of healthcare workers in the nominal roll of Federal Medical Centre Asaba. In the nominal roll, the different professions were represented as Doctors 283, Nurses=456, Pharmacist 52, Physiotherapist 8, Radiographers 9, Lab science 44, Health attendant 50 giving a total of 902 staff. The respondents were sampled by using simple random sampling or systematic sampling (Adam Hayes, Somer Anderson, 2021). Proportional allocation was used in sharing the sample size.

Therefore;

Sample size/total number respondents = proportionate ratio

$$\text{Proportionate ratio} = 246/902=0.273$$

$$\text{Proportionate ratio} = 0.273$$

Therefore, we used the proportionate ratio to multiply the total number for each category of health care worker, which determined the proportionate allocation.

$$\text{Doctors } 283 \times 0.273 = 77.259 \approx 77$$

$$\text{Nurses} = 456 \times 0.273 = 124.488 \approx 124$$

$$\text{Pharmacist } 52 \times 0.273 = 14.196 \approx 14$$

$$\text{Physiotherapist } 8 \times 0.273 = 2.184 \approx 2$$

$$\text{Radiologist } 9 \times 0.273 = 2.457 \approx 2$$

$$\text{Lab science } 44 \times 0.273 = 12.012 \approx 12$$

$$\text{Health attendant} = 50 \times 0.273 = 13.65 \approx 14$$

Total= 245, the sample size

From the total list of health care workers in the different categories, a sampling ratio was calculated for each category-:

$$\text{Doctors } 283 / 77 = 4$$

$$\text{Nurses} = 456 / 124 = 4$$

$$\text{Pharmacist } 52 / 14 = 4$$

$$\text{Physiotherapist } 8 / 2 = 4$$

$$\text{Radiographer } 9 / 2 = 4.5 \approx 5$$

$$\text{Lab science } 44 / 12 = 4$$

$$\text{Health attendant} = 50 / 14 = 4$$

Therefore, a systematic sampling method was used in selecting every 4th person in each category of a health care worker, except for radiographers who were the 5th person.

III. DATA COLLECTION.

The study was conducted by using a semi-structured interviewer-administered questionnaire (Agbana RD, 2020). The questionnaire was developed with the help of previous literature on the Knowledge and Practice of Handwashing by Health care workers and WHO (Eshetu O, Kifle T, Hirigo AT, 2020) and consisted of three parts :(1) demographic characteristics (age, gender, professions, etc). (2) Knowledge of hand washing. (3) Practice of handwashing aimed at assessing moments and stages of hand washing.

The Hospital had earlier set up an Infection, Prevention Committee, Which had one-week training on Infection and prevention and how to uphold the protocol on infection prevention in January 2020. This training was stepped down to all the departments in the hospital in February 2020 for one month. The committee also supervised the availability of soap and running water in the wards and recommended places where they were stationed in the hospital. Six months later we decided to look at the impact of the training on the staff by evaluating the Socio-demographic predictor of good hand washing practice.

Before the inception of the study, the nature and purpose of the study were explained to each respondent, and informed consent was obtained. The duration of the study was for one month.

For the convenience of analyses, the total number of questions to assess knowledge was ten (10) and each correct response from respondents scored one (1) and each wrong response was zero (0) score. The total scores for each respondent were converted to percentage scores and a score of > 80% represented Excellent Knowledge, a score of 79% to 50% represented good knowledge, and a score of < 50% was termed poor knowledge.

The total number of questions for practice was fifteen (15) and each correct response was scored one (1) and each wrong response was zero (0), The total scores for each respondent were converted to percentage scores, and a score of > 80% represented excellent practice, a score of 79% to 50% represented good practice and a score of < 50% was termed poor practice.

IV. DATA ANALYSIS

Data were screened for completeness, entered, and analyzed using Statistical Package for Social Sciences (SPSS V. 25.0). The univariate analysis was carried out as quantitative variables using frequency, percentages, and mean value (standard deviation). The bivariate analysis was also carried out between the socio-demographic variables and the practice of Handwashing among Health care workers. Association was tested using the chi-square and by calculating the odds ratio with a 95% confidence interval. A p-value less than 0.05 was

considered statistically significant. Logistic regression (multivariate analysis) was applied in finding out the significant independent predictors of good Handwashing practice.

Ethical Issues/Consideration

Ethical permission to conduct this research was gotten from the Research and Ethics Committee and the due processes in carrying out research in the hospital were maintained and no harm or discomfort to the participant during the questionnaire distribution was allowed. Privacy and confidentiality were

upheld. The code of ethics was aimed at protecting the rights of individuals that were used as subjects of the research. Financial responsibilities were solely the researcher's obligation.

V. RESULTS.

Characteristics of the study subjects

The 247 subjects studied comprised 66 male (26.7%) and 181 female patients (73.3%) with a male to female ratio of 0.4: 1. Their ages ranged from 20-59 years with a mean of 34.87(\pm 8.38) years

Table 1: Socio-Demographic Characteristics of Healthcare workers

Sociodemographic information	Cases (n=247)*	(%)
Age(in Years)		
Mean	34.87 \pm 8.38	
Range	20-59 years	
Group		
< 30 years	80	32.4
> 30years	167	67.6
Gender		
Male	66	26.7
Female	181	73.3
Marital Status		
Single	98	39.7
Married	149	60.3
Educational Level		
Poorly educated	20	8.1
Tertiary educated	227	91.9
Profession		
Clinical Health care workers	203	82.2
Non-Clinical Health care workers	44	17.8
Religion		
Christianity	232	93.9
Muslim	15	6.1
Years of experience		
0-5	91	36.8
> 5 years	156	63.2

The majority of the Healthcare workers were adults greater than 30 years (67.6%) of age with a female (73.3%) preponderance among this group. One hundred and forty-nine (60.3%) were married and 98(39.7%) of respondents were single. Two hundred and twenty-seven respondents (91.9%) completed tertiary education while 20(8.1%) were poorly educated. Two hundred and three of them (82.2%) were

clinical Healthcare workers, and 44(17.8%) were non-clinical healthcare workers. Most of the subjects (93.9 %) belong to the Christian denomination, and 15(6.1%) of them were Muslims. One hundred and fifty-six healthcare workers (63.2%) had experience on the job for more than five years and 91(36.8%) of them had experience of five years and below on the job (table 1).

Table 2. Aggregate Knowledge (%) group of Health Care Workers on Handwashing.

Knowledge	Frequency	Percent (%)
Excellent knowledge	20	8.1
Good Knowledge	227	91.9
Poor Knowledge	0	0.0
Total	247	100

The majority of 227 (91.1%) participants had good knowledge of Handwashing in the study. (table2).

Table 3: Aggregate Practice (%) group of Health Care Workers on Handwashing

Practice	Frequency	Percent (%)
Excellent practice	20	1.1
Good practice	227	98.9
Poor practice	0	0.0
Total	247	100

Two hundred and twenty-seven (98.9%) respondents had good practice of handwashing (table 3).

Table 4: Socio-Demographic relationship with Practice of Handwashing

Variables	Aggregate practice (%) Group		Chi-square	p-value	Odd ratio 95%CI
	Excellent practice (%)	Good practice (%)			
Gender					
Male	1 (1.5)	65(98.5)	5.24	.022	7.62 (1.0-58.1)
Female	19 (10.5)	162(89.5)			
Age					
1-30 years	7(8.7)	73(91.3)	0.80	0.07	0.88 (0.34-2.30)
>30 years	13(7.8)	154(92.2)			
Marital Status					
Single	8(8.2)	90(91.8)	0.001	0.98	0.99 (0.39-2.51)
Married	12(8.1)	137(91.9)			
Educational level					
Poorly educated	0(0)	20(100)	1.92	0.17	1.10 (1.10-1.14)
Tertiary educated	20(8.8)	207(91.2)			
Profession					
Clinical Healthcare workers	20(9.9)	183(90.1)	4.71	0.03	0.90 (0.86-0.94)
Non-Clinical Healthcare workers	0(0)	44(100)			
Religion					
Christianity	19(8.2)	213(91.8)	0.04	0.83	0.80 (0.10-6.42)
Islam	1(6.7)	14(93.3)			
Years of experience					
0-5yrs	10(11.0)	81(89.0)	1.62	0.20	0.56 (0.22-1.39)
> 5yrs	10(6.4)	146(93.6)			

One hundred and sixty-two (89.5%) female subjects had good handwashing practice compared to 65(98.5%) male subjects. The association between the gender of the patient and good handwashing practice was statistically significant, (Chi square=5.24, p value=.022) (table 4).

One hundred and fifty-four (92.2%) respondents whose ages were greater than 30 years had good practice of handwashing compared to 73(91.3%) patients whose ages were 30 and below. The association between the age of the Health care workers and good practice of handwashing was statistically not significant (Chi square=0.80, p value=0.07) (table 4).

One hundred and thirty-seven (91.9%) Healthcare workers who were married had a good handwashing practice compared with 90(91.8%) that were single. The association between the marital status of subjects and good handwashing was not statistically significant (Chi square= 0.001, p value=0.98) (table 4).

Two hundred and seven (91.2%) of the studied subjects that had tertiary education had a good handwashing practice compared with 20(100%) of them who were poorly educated. The association between Educational level and good

handwashing practice was not statistically significant (Chi square=1.92, p-value =0.17) (table 4).

One hundred and eighty-three (90.1%) of them that were clinical healthcare workers had good hand washing practices compared to 44(100%) of Non-clinical Healthcare workers. The association between professions and good hand washing practice was statistically significant (Chi square= 4.71, p value=0.03) (table 4).

Two hundred and thirteen (91.8%) of healthcare workers were Christians and they had good hand washing practices compared with 14(93.3%) of Muslims. The association between the Religion of healthcare workers and good hand washing practice was not statistically significant (Chi square= 0.04, p value=0.83) (table 4).

One hundred and forty-six (93.6%) of them who has five years of experience and more had good hand washing practice compared to 81(89.0%) Subjects whose experience was below five years. The association between Years of Experience and good hand washing practice was not statistically significant (Chi square=1.62, p-value =0.20) (table 4).

Table1.5 Predictors of Good handwashing practice among Socio-demographic variables.

Variables	B (regression coefficient)	p-value	Odds ratio (Exp B)	95% C.I. (Exp B)	
				Lower	Upper
Gender Male Female	-2.21	0.036	0.11	0.01-0.87	
Age 1-30 years >30 years	0.01	0.84	1.10	0.42-2.91	
Marital Status Single Married	0.98	0.84	1.10	0.43-2.82	
Educational level Poorly educated Tertiary educated	-17.38	0.99	0.00	0.00-0.00	
Profession Clinical Healthcare workers Non-Clinical Healthcare workers	19.14	0.99	205385000	0.00-0.00	
Religion Christianity Islam	0.51	0.63	1.67	0.21-13.53	
Years of experience 0-5yrs > 5yrs	0.75	0.11	2.12	0.84-5.38	

The only significant predictor of good hand-washing practice from the logistic regression model was the gender of the patient. The male sex was likely to have good hand washing practice with an odds of 0.11 ($p < 0.036$) (table 4).

VI. DISCUSSION

Hand hygiene remains the most effective method for reducing healthcare-associated infections (HAIs). HAIs are important causes of morbidity and mortality in clinical practice and pose an ethical challenge to healthcare delivery. One of the easily identified routes of transmission of HAI is the hands of Health care workers (Huis A, Achterberg T V, 2012). HAI are a burden to both physicians and patients, as they lead to complications in therapy, an overall increase in admission days, increase healthcare costs, and may result in mortality (Umar MA, Kehinde JA, 2017). The respondents in this study demonstrated good knowledge (91.9%) of handwashing which is in agreement with other studies in Sokoto and Lagos University Teaching Hospital (LUTH) in Nigeria that reported 91.7% and 83% respectively (Timothy AE, 2013). However, the participants in our study fared better in the practice of handwashing 98.9% when compared to the survey done in Sokoto (69.8%) and LUTH (69.9%). The findings from other studies show that the rates of compliance in good handwashing practice from some hospitals are still very low as only 29.7% of the Health care workers (Eshetu O, Kifle T, Hirigo AT, 2020) could claim to have performed hand-washing on an average of 81 to 100% of situations and alarmingly 42.7% of them could not even remember to perform the act at all (Adam Hayes, Somer Anderson, 2021). Similarly, only about 56.2% practiced hand-washing after interacting with patients and 5.6% said they never did (Eshetu O, Kifle T, Hirigo AT, 2020). The better result in our study may not be unconnected to the regular training by the Hospital Infection, Prevention committee. In our Hospital, they have regular ward rounds and departmental step-down training. This is also reflected in that Non-clinical Health care workers (100%) had good handwashing practices when compared with Clinical Healthcare workers (90.1%). This was also observed with poorly educated Healthcare workers ((100%) when compared with Tertiary educated participants (91.2%). One of the studies (Timothy AE, 2013) showed that exposure of participants to training contributed to their good handwashing practices as evidenced by the statistically significant association found between HCWs who attended training/seminars on infection control (Timothy AE, 2013) and those who did not, with the former having a better handwashing practice. Other studies done in Saudi Arabia (Almutairi SM, Alotaibi A, Kofi M, Alsuraimi A, Bawazir A, 2020) and the United Kingdom (Andrew C. S, Marley H, 2020) also showed that training had a positive relationship with Handwashing compliance among all medical staff. This

may be because training built the knowledge of health care providers which had a significant association with Handwashing compliance and those Health Care Workers who had got training is expected to be role model for others in terms of practicing good Hand Hygiene. We also had one month of intense training on Infection, prevention in the hospital before the commencement of this study. This shows that regular training and retraining may bring the knowledge and practice base of all health care workers to almost the same level.

Another study was conducted to determine the gender differences in the mean score of knowledge, attitude, and practice to hand hygiene among Saudi Nursing Students. The mean score showed that males (21.33) have better practice than females (19.99) p value=0.025, While females (37.53) have a better attitude than their male (35.43) counterparts value = 0.016. This is consistent with our findings that male Healthcare workers (98.5%) have a better handwashing practice than females (89.5%) p -value = 0.022. They found out that Male nursing students needed more encouragement than women to engage in proper handwashing behavior and compliance with hand hygiene. Knowledge of both genders is moderate. Therefore, there is a need to further evaluate factors responsible for gender differences in the practice of handwashing in our environment. So Measures to improve hand hygiene should be targeted based on this gender bias. More so, this will require gender-specific interventions among the Health care providers.

VII. CONCLUSION

There is good Knowledge and practice of handwashing in this study. Gender and Profession were the sociodemographic determinants of good handwashing practice in Federal Medical Centre Asaba. Gender is the predictor of good handwashing practice among Health care workers in Federal Medical Centre Asaba. We found out that males had better handwashing practices than females. More studies are recommended to look into gender differences in the practice of handwashing,

The government and hospital authorities should establish policies and protocols that will ensure adequate provision of soap and running water and regular training and retraining of staff on infection prevention. This is very necessary now due to emerging and re-emerging diseases.

Limitation of the Study

This will include the fact that most of the responses from respondents cannot be verified since responses were self-reporting, and the practice of handwashing was not observed but rather self-reported.

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Conflict of interest

None

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