ORIGINAL ARTICLE

Proper Hand Washing Realities in Select Nigerian Communities amidst Covid-19 Pandemic

EMMAN OWUMS OWUAMALAM, PhD, COMFORT NKIRU EZEH, PhD & ERNEST EZE

Chukwuemeka Odumegwu Ojukwu University, Igbariam Campus.Novena University, Ogume, Abia State University, Uturu.

Abstract

Proper handwashing as prevention for COVID-19 seems uncommon in Nigerian communities. This study investigated the level of awareness and compliance with proper handwashing as protection protocol against community transmission of the disease. One community each was selected from Imo, Anambra and Delta states in Nigeria for a cross-sectional study involving 373 respondents. It was found that handwashing without soap in stagnant water was common before and after food and on return from farming. Most ruralites doubted COVID-19 as real; hence they had a poor attitude to handwashing as prevention. The low level of awareness influenced the low extent of compliance ascertained. The study recommended that public enlightenment should be aggressively executed to address doubts and improve awareness and compliance with handwashing in communities.

Key words: Proper handwashing, awareness, compliance, rural communities, ruralites.

Introduction

Corona virus, COVID-19, has ravaged world communities with causalities and fatalities. It has currently assumed a pandemic status as declared by the World Health Organization (WHO, 2020). No known cure has been found for it (CDC, 2020). The world is hoping that recent trials of a possible vaccine against virus will aid to assuage its ferocity among humans. This medical lacuna has led to the advocacy of prevention as a strategy for mitigating COVID-19 impact on the communities. One of the recommended preventive measures is proper handwashing or hand hygiene with soap and running water for at least 20 seconds. It is the suggested remedy that is expected to be complied with by communities globally. The issues then arise as to whether rural communities are aware of the recommendation by the WHO and if they comply with it.

The recommendation became necessary as a protective measure to save rural communities in order to address any possible spike in afflictions which may erupt from community transmission. The need to break the transmission chain led the Centre for Disease Control and Prevention (CDC) to suggest proper handwashing with soap and running water for 20 minutes. This study enquired if ruralites living in Nigerian remote areas are aware of the recommendation as incidental to prevention of COVID-19 and whether community members comply with the directive.

Ruralites are persons who live within rural communities in countries like Nigeria. The poor communication infrastructure for receiving valuable information in their areas is worrisome. For instance, the epileptic nature of electricity supply makes it difficult for many ruralites to access television in particular hence making radio (Okunna & Omenugha, 2000) and its battery option preferable in rural areas. Again, the spiral rise in petroleum products prices like the premium motor spirit (PMS), and diesel makes it difficult for poverty-stricken persons to contemplate buying or even buy them to operate household electricity generating plants in the near-absence of solar-powered ones. The situation is unlike what obtains in towns and cities with a better supply of power.

Statement of the Problem

Assimilation of information leads to awareness. Exposure to information source predisposes receivers to content reliability and acceptability (McQuail, 2005). Those characteristics of information consumption depend to a large extent

on individual consumer's perception (Roberts & Schramm, 1981; Owuamalam, 2019). How then do ruralites understand COVID-19 so as to seek ways to its prevention? Do they believe that the pandemic is real and should be combated as a threat to their healthy living? It is where the message receiver agrees with the message content that adoption is sought for dealing with raised issues. This is where compliance to recommended prevention strategies becomes verifiable.

Objectives of the Study

Three objectives were set to be achieved in the study. The set goals were as follows:

1. To find the level of community awareness that proper handwashing prevents COVID-19 infection.
2. To find out how the ruralites respond to the proper handwashing message.
3. To ascertain if any relationship exists between message awareness and compliance with provided recommendations.

Research Questions

Three questions were posed to direct the study as follows:

1. What is the level of community awareness that proper handwashing prevents COVID-19 infection?
2. How do the ruralites respond in adopting the recommendation?
3. What is the relationship between prevention awareness and recommendation compliance?

Research Hypothesis

The only hypothesis tested in the study was:

H_o: Ruralites' awareness of proper handwashing as prevention for COVID-19 does not assure their compliance with hand hygiene.

H_1: Ruralites' awareness of proper handwashing as prevention for COVID-19 assures their compliance with hand hygiene.

Scope of the Study

Only males and females above 18 years participated in the study. Respondents resided in rural areas where there is a potential danger of community spread of the Corona virus (COVID-19). The knowledge of proper handwashing as prevention for the virus was used to know how they complied with the campaign message as recommended by the NCDC.

Conceptual Review

There has been a serious campaign on proper handwashing throughout the world at the wake of COVID-19 outbreak. The importance of handwashing in prevention and containing the spread of Covid-19 is well documented (Aigbiremolen et al., 2015; WHO, 2020; CDC, 2020). When it comes to preventing viral infections, especially those that spread via droplets from coughs and sneezes like COVID-19, washing hands properly with soap and water is always the first-line measure (Onwuzoo, 2020; CDC, 2020; Aigbiremolen et al., 2015**)**. This is because it inactivates and removes virus particles that may be on the hands. When used properly, soap effectively dissolves the fatty membrane that surrounds the virus particles, causing them to fall apart and be inactivated (WHO, 2020; CDC, 2020).

According to Centre for Disease Control and Prevention (CDC), Handwashing with soap helps prevent infections because:

- People frequently touch their eyes, nose, and mouth without even realizing it. Germs can get into the body through the eyes, nose and mouth and make us sick.
- Germs from unwashed hands can get into foods and drinks while people prepare or consume them. Germs can multiply in some types of foods or drinks, under certain conditions, and make people sick.
- Germs from unwashed hands can be transferred to other objects, like handrails, table tops, or toys, and then be transferred to another person's hands.
- Removing germs through handwashing therefore helps prevent diarrhea and respiratory infections and may even help prevent skin and eye infections (CDC, 2020).

In Nigeria, proper hand washing campaigns have been organised since 2004, but the campaigns were officially launched in 2008 when the country took part in the first ever Global Hand washing day commemoration as part of the global initiative of promoting the culture of hand washing (Uneke et al., 2014). Before the COVID-19 pandemic, there was a level of awareness of the importance of handwashing in preventing contagious diseases but*COVID-19* pandemic has caused a resurgence in awareness on handwashing and makes *handwashing* facilities and promotion more critical than ever (World Bank, 2020).

However, despite established evidence of the effectiveness of good hygiene practice like proper handwashing in the 60 highest-risk countries, two out of three people – one billion people in total – lack basic handwashing facilities with soap and water at home (UNICEF, 2020). In Nigeria, about 60 million people lack access to clean water supply services and 150 million people lack basic handwashing facilities with soap and water (WASH NORM, 2018). *The poor level of handwashing practices among the people can be attributed to low level of awareness, low level of priority and funding of hygiene education and promotion, weak and poorly enforced public health laws, poorly motivated sector professionals, and weak human resources (Agberemi, Ofem,& Saidu, 2009).*

Achieving the full public health potential of handwashing with soap may require a sustained communication effort using a variety of communication channels and with a message content that evolves over time as well as better infrastructure (Biran et al., 2020). Although building handwashing skills takes time, once it becomes a habit and a regular part of a child's day, they will practise it throughout their life (UNICEF, 2020). Parents and caretakers, therefore, play an important role in teaching children to wash their hands and wash theirs too.

Significance of Ruralites to the Study

The term 'rural' means a community that generally has a significant portion of its response area undeveloped. Rural communities in developing countries like Nigeria are more disadvantaged in terms of communication and lack adequate water infrastructure (Aigbiremolen et al., 2015) as handwashing practices highly depend on the availability of water and *hand washing facilities such as soap and a clean basin.* Much of the challenge of poor access to water, sanitation and hygiene services is experienced in the rural areas making this segment of the population far more vulnerable (Wateraid, 2020).

In Nigeria, only 8% of those in the rural areas have access to complete basic water, sanitation and hygiene services – compared to 18% of people in urban areas and; about half of all rural dwellers rely on river water as their primary source of water for domestic use and have to trek long distances and spend more than 30 minutes in some cases to get water and sometimes from unimproved sources (Wateraid, 2020).The situations invariably affect the volume of water they use especially for personal hygiene.

A large share of population which may be at higher risk for severe illness, notably the elderly and the poor, reside in the rural areas. Research has shown that as one gets older, the risk for severe illness from COVID-19 increases. The greatest risk for severe illness from COVID-19 is among those aged 65 or older (CDC, 2020; Arbaje, 2020).Those with preexisting medical conditions, especially heart disease, lung disease, diabetes or cancer are more likely to have Coronavirus infection than other age groups. It is reported that eight out of ten COVID-19-related deaths in the United States of America are among adults aged 65 years and older (CDC, 2020).

Rural regions also face important challenges in delivering public services. Health centres are typically not well suited for dealing with COVID-19 in rural areas. There is increased demand for public health services. Small rural areas face particularly acute shortages of medical workers and rural healthcare infrastructure like hospital beds, ICU beds, or ventilators, which can affect their ability to treat patients with COVID-19. Rural residents seeking care must often travel long distances to reach hospitals, health care facilities, and clinical

specialists.

Media and communication support have an increasing importance in stimulating action on problems requiring short-term or simple solutions just like proper handwashing practice. Issues are shaped by the information made available to the people by the media to which they are exposed to directly or indirectly (Ezeh, 2017). The media campaign is to educate the people on the importance of handwashing in preventing and containing the spread of COVID-19.

Empirical Review

Aigbiremolen, Abejegah, Ike, Momoh, Lawal-Luka and Abah (2015) assessed the knowledge and practice of hand washing by mothers and caregivers of children less than five years in Usugbenu-Irrua, a rural Nigerian Community with a view to recommending ways of enhancing the practice in rural communities. Data were collected through survey and 513 mothers and care givers were selected. The study suggests that most of the respondents had good knowledge of hand washing, but there is a gap between knowledge and practice of hand washing. The study indicates that other factors beyond knowledge may be responsible for poor hand washing behaviour.

Prasad, Ng Chok and Wilkes (2017) in their study explored the attitudes and behaviours of patients 'hand hygiene and the perceived practice of nurses at various levels from a tertiary teaching hospital in Western Sydney. The study used patient observations of hand hygiene practices using a validated observation tool, face-to-face interviews with patients, and a survey of nurses. Interviews and surveys were textually and quantitatively analysed. A total of 105 patient observations, 50 patient interviews and 51 nurse surveys were collected. The majority of patients and nurses reported hand hygiene as an important aspect of everyday life in preventing infection in the hospital setting. However, this contrasts with the poor patient hand hygiene compliance identified using the patient observation tool. Patient interviews found that more encouragement and education by staff, increased signage, and easily accessible facilities will increase hand hygiene practices.

Parveen, S., Nasreen, S., Allen, J.V. et al. (2018) explored drivers of handwashing among mothers and other caregivers of neonates and infants in two rural areas of Bangladesh. Forty semi-structured observation sessions were conducted to observe handwashing behaviors of primiparous and multiparous mothers of neonates, and to understand the contextual factors that facilitated or hampered those behaviors. 64 interviews with mothers of neonates and mothers of infants and; 6 group discussions with mothers of infants, other female caregivers and fathers to explore perceptions, beliefs, and practices related to handwashing in the neonatal period were conducted. The study found that respondents perceived a need to wash hands with or without soap before eating or before feeding a child by hand to prevent diarrhea. Mothers expressed the importance of washing their hands before holding a baby but were rarely observed doing so. All respondents prioritized using soap for visible dirt or feces; otherwise, water alone was considered sufficient .

Biran, White, Awe et al. (2020) in their study in rural Nigeria used observation method to test a scalable intervention (*Respect People)* designed to promote handwashing with soap in 14 rural communities in Cross River State Nigeria. The study found that the intervention failed to produce significant changes in handwashing with soap at key times.

Nwobodo and Chukwu (2020)examined the challenges of the rural communities in Enugu West Senatorial District in Nigeria over access to clean water supply and their preparedness to tackle COVID-19 pandemic, following the guidelines from world health experts. The study used survey design and 384 copies of the questionnaire were administered to households in the study community. The result showed general awareness of the pandemic in the selected communities. However, a majority of the respondents neither have access to clean water supply nor any alternative to hand sanitizing agent.

Method of Study

The cross-sectional approach was adopted in this study. It was not feasible to transverse all the communities within the 774 local government areas in Nigeria where the ruralites could be located. It meant that a cross-section of the population was selected from three different states out of the 36 states in Nigeria as the study areas from where the rural population for the study was derived.

The parity method was used to allocate sample to six communities selected through the probability sampling technique involving the use of simple random without replacement method (Owuamalam, 2012). The allocated sample was obtained through the Topman's formula since the exact population of adults in the study area is unknown. The formula used was:

$$n = \frac{Z^2Pq}{e^2}$$

Where n = sample size; Z = assumed value on Z score table, here placed at 95% or 1.94; P = value of positive responses; q = value of negative response and e = margin of tolerable error at 5% or 0.05. 35 ruralites from Uturu in Abia State were asked if they were aware of handwashing and compliance as prevention against COVID-19. A total of 15 or 0.43 said yes while 20 or 0.57 said no. The application of values to the value returned the following:

$$n = \frac{3.8 \times 0.43 \times 0.57}{0.0025} = \frac{0.9318}{0.0025} = 372.552$$

It shows how the chosen sample of 373 was used in this study and considered good by Comrey and Lee (1973) since it is above 300. A minimum of 62 was allocated to each of the selected six villages in the 3 communities in the 3 states of Imo, Delta and Anambra. The table below explains the details:

The questionnaire served as the tool for data collection. It was validated through the face value method while the pilot approach was used to ensure its reliability (Wimmer & Dominick, 2012). Open and closed-ended questions were used to direct answers to research questions while the Likert scale facilitated testing of the research hypothesis. The frequency table method was used to present data for easier analysis.

Table 1: Sample Allocation to Study Centres

State	Communities	Villages	Selected	Allocated
Imo	Umualumaku	Umuoparalum, Umuonyia	Villages	Sample
	Umueze			
	Umualumaku/	Umudibia, Umudim Okoro	Umuihim-Oki	62
	Umuihim	Umuihim-Oki, Alaiyi	Alaiyi	62
		Umuihim Owerre		
Delta	Ogume	Ogbole, Igbe, Utue, Ogbagu	Igbe	62
		Umuchima, Ogbe-Ogume	Umuchima	62
		Obodo ugwa		
Anambra	Umunze	Nsogwu, Ugwuano, Lomu	Ugwuano	63
		Ubaha, Ururo, Ozara, Amuda	Ozara	62
Total 3	4	21	6	373

Theoretical Framework

The social judgment theory (Sherif & Hoveland, 1967), used as a basis for assessing information processing (Miller, 2002) is apt in explaining how perception colours attitude and behaviour. How provided information is received, whether in the latitude of acceptance (assimilation) or in that of rejection (contrast) determines its acceptability or rejection. Also, the behavioural sequence model, BSM, (Owuamalam, 2019) explains belief to colours idea and produces attitude that predisposes behaviour. COVID-19 as an idea depends on how individuals feel about it (Oskamp, 2000) whether real or not.

Data Presentation and Analysis

Eighteen copies or 4.83% of the questionnaire administered to the six select communities as study centres through the convenience method were invalid because 12 were not returned while 6 were partially completed. This explains why the remaining 355 copies or 95.17% was considered valid and used as shown in the tables below – as 100%.

The following details emerged:

R.Q.1: What is the level of community awareness that proper handwashing prevents COVID-19 infection?

Answers to the first three questions in the questionnaire addressed the first research question above:

1. Have you heard that proper handwashing prevents COVID-19 infection?

Table 2: Reception of Information on Proper Handwashing against COVID-19

Response	Frequency	Percentage
Yes	72	20.28
No	167	47.04
Can't Remember	116	32.68
Total	355	100.00

The result above shows that only one-fifth or 20.28% received the information while more than twice that number or 47.04% claimed not to have done so and nearly one-third or 32.68% were not specific if they had. It means that a low level of awareness existed in the rural communities.

Again, item 2 in the questionnaire enquired to know their source of information. How did you hear it?

Table 3: Source of Information on Proper Handwashing

Response	Frequency	Percentage
Opinion Leaders	133	37.46
Radio	88	24.79
Grapevine	90	25.35
Television	44	12.39
Total	355	99.99

The result above shows that opinion leaders form the major source of information to ruralites at 37.46% followed by grapevine (oral contacts) at 25.35% while radio and television trailed the rear with 24.79% and 12.35% respectively. It was seen that no respondent chose newspaper as information source because of its cost and irregularity in access during the COVID-19 period, when this study was conducted.

Also, item 3 in the questionnaire was used to assess the opinion of ruralites on their understanding of proper handwashing by the NCDC. The details are as follows:

Table 4: Awareness of Proper Handwashing Process by NCDC

Item 3	Response						Total	Mean Value $\bar{X}$
	Code value	SA=5	A=4	UD=3	D=2	SD=1	15	
I'm aware of proper handwashing procedure as advised by the government (NCDC).	Frequency	32	95	115	75	38	355	$\frac{1073}{355}$
	Code value result	160	380	345	150	38	1073	= 3.02
	Percentage	9.01	26.76	32.39	21.13	10.70	99.99	$\bar{X}$ = 3.02

The result above shows that whereas 35.77% of ruralites are aware of proper handwashing procedure, 31.83% was not aware while 32.39% was undecided. It meant that although the NCDC created the desired awareness, $\bar{\chi}$ = 3.02> 3.0, many of the ruralites claimed to be unaware of the recommended proper handwashing process.

R.Q.2: How do the ruralites respond in adhering to the recommended handwashing protocol?

Item 4 in the questionnaire was used to enquire if the ruralites as respondents washed their hands properly as protection against COVID-19. Details are as follows:

Table 5: Proper Handwashing Practice by ruralites against COVID-19

Response	Frequency	Percentage
Yes	68	19.15
No	116	32.68
Can't say	171	48.17
Total	355	100.00

The result above shows that whereas nearly one-fifth or 19.15% of the respondents agreed to washing their hands frequently, nearly one-third or 32.68% disagreed while nearly half or 48.17% could not hold any specific opinion on the issue. It means that less persons complied with the proper handwashing protocol.

Again, item 5 was used to find if proper handwashing requirement is known by the respondents. Obtained data were analyzed as follows:

Table 6: Understanding of Proper Handwashing Requirements

Response	Frequency	Percentage
Running water and soap for 20 seconds.	84	23.66
Any water in a bowl to wet the hand.	105	29.58
Water with or without soap.	166	46.76
Total	355	100.00

The result above shows that less than one-quarter or 23.66% know what proper handwashing entails, while more than three-quarters or 76.34% could not say exactly what the NCDC recommended for proper handwashing.

Also, item 6 in the questionnaire asked to know why proper handwashing is uncommon in rural communities.

Why is proper handwashing uncommon in your community? Obtained data were analyzed as follows:

Table 7: Reason for Uncommon Proper Handwashing Situations

Response	Frequency	Percentage
No running water facilities.	91	25.63
Soap to be provided at cost to family.	77	21.69
No monitoring to know if hands are properly washed.	86	24.23
The individual decides to wash hands and anyhow.	101	28.45
Total	355	100.00

The result above shows that 28.45% of the respondents believe that proper handwashing is an individual practice, lack of running water facility accounted for 25.63%. Cost consideration for soap provision at 21.69% ranked least, while nearly one-quarter or 24.23% believed that lack of monitoring affected proper handwashing.

R.Q.3: Does any relationship exists between awareness and compliance with proper and frequent handwashing in rural communities?

Item 7 in the questionnaire was used to know if proper handwashing is possible in rural communities. Proper handwashing is possible in the community. Data obtained were analyzed as follows:

Table 8: Possibility of proper handwashing in rural communities

Item 7		Response					Total	Mean Value $\bar{\chi}$
People in the village wash their hands properly as recommended by the NCDC.	Code value	SA=5	A=4	UD=3	D=2	SD=1	15	$\frac{988}{355}$
	Frequency	27	61	118	106	43	355	
	Code value result	135	244	354	212	43	988	$= 2.78$
	Percentage	7.60	17.18	33.24	29.86	12.11	99.99	$\bar{\chi} = 2.78$

The result above shows that 24.78% of the respondents agreed that people in the village wash their hands properly as recommended while 41.97% disagreed and 33.24% held no particular opinion. It means that more respondents did not agree. This result was confirmed from the findings that the calculated mean value of 2.78 was lower than the decision point value of 3. Hence, $\bar{\chi} = 2.78 < 3$. It means that the null hypothesis, H_o, was accepted and its alternate, H_1, rejected. Note that the decision point for testing hypothesis was placed at 3.0 which is the mean code value in the used Likert scale.

Summary of Findings

The following were found by the study:

1. 20.28% of respondents (ruralites) received the proper handwashing information.
2. Opinion leaders at 37.46% and the grapevine at 25.35% formed the major sources of hand-washing information in rural communities. Radio at 24.79% and TV at 12.39% trailed the rear.
3. 24.78% were aware and 53.52% were not aware that proper handwashing could prevent COVID-19.
4. Awareness was created by NCDC about proper and frequent handwashing as prevention for COVID-19. $\bar{\chi} = 3.02 > 3.0$
5. 19.15% washed their hands properly; 32.68% did not.
6. 23.66% understood the proper handwashing procedure.
7. Lack of running water prevented 25.68%; cost of soap inhibited 21.69%; lack of proper handwashing is among individual decision 28.45%.
8. 24.78% agreed that ruralites washed their hands properly while 41.97% disagreed. The calculated mean value $\bar{\chi} = 2.78 < 3.0$ meaning that the null hypothesis was accepted; hence, awareness does not assure compliance.

Discussion of Findings

There is a low level of awareness of what proper handwashing is among ruralites since only 24.78% was aware of the provided recommendation. It means that more information is required to sensitize the ruralites since as much as 53.52% or more than half could not relate proper and frequent handwashing to COVID-19 prevention. This result accounted for why only 19.15% washed their hands regularly. However, the majority of the ruralites at 28.45% believed that proper handwashing is an individual decision and lack of running water accounted for 25.68% while cost of soap consideration was responsible for 21.69% not washing their hands properly. The tested hypothesis proved that awareness to proper handwashing as COVID-19 prevention does not assure compliance with hand hygiene by ruralites.

The social judgement theory (Sheriff, Sheriff,& Hoveland, 1967) explained the low attitudinal and behavioural stance of the ruralites to the effect of **contrast** over **assimilation**. The provided information from the NCDC created the desired awareness but made only a few ruralites to adopt the proper handwashing practice. Also, the propensity of proper handwashing as individual decision

shows how belief about COVID-19 as an idea affected attitude and behaviour in line with the Behavioural Sequence Model (Owuamalam, 2019).

The major findings from the study were:

1. Opinion leaders form the greatest source of information for ruralites at 37.46% above radio (24.79%) and television (12.39%) combined at 37.18%.
2. Grapevine at 25.35% is a substantial source of rural information.
3. Handwashing monitoring is required to enhance proper practice. Family heads can enforce the practice.

Conclusion

The use of less effective information source for campaign message dissemination produces low awareness level and limited compliance extent since what constitutes proper handwashing is largely unknown to the rural communities. An adjustment is needed.

Recommendations

1. Information sources familiar to the ruralites need to be extensively used for improved believability and message acceptance.
2. Handwashing enforcement is required to change practice attitude in rural communities. Baits like free soap and running water facilities can be provided.

Contribution to Knowledge and Society

Information exposure waste can be minimized where appropriate media are used in a campaign message to deal with a specified target audience. Knowledge of why campaigns fail shows that where raised issues are addressed, success will be assured. It is thus necessary to use what is needed to get the desired result.

References

Agberemi, Z.O., Ofem, L.,& Saidu, A. (2009). Mobilizing people for improved hygiene practices through hand washing campaigns in Nigeria. In Shaw, R.J. (Ed.), *Water, sanitation and hygiene - sustainable development and multisectoral approaches*. Proceedings of the 34th WEDC International Conference, Addis Ababa, Ethiopia, 18-22 May 2009.

Aigbiremolen, A. O., Abejegah, C., Ike, C. G., Momoh, J. A., Lawal-Luka, R. K.,& Abah, S. O. (2015). Knowledge and practice of hand washing among caregivers of under-five children in a rural Nigerian community. *Public Health Research, 5*(5), 159-165.

Arbaje, A. (2020). Coronavirus and COVID-19: Caregiving for the elderly. *Health.* Retrieved from https://www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus

Biran, A., White, S., Awe, B., Greenland, K., Akabike, K., Chuktu, N., Aunger, R., Curtis, V., Schmidt,& Voorden, C. V. (2020). A cluster-randomized trial to evaluate an intervention to promote handwashing in rural Nigeria. *International Journal of Environmental Health Research.*DOI:10.1080/09603123.2020.1788712

CDC (2020). Handwashing: Clean hands saves lives. Retrieved from https://www.cdc.gov/hand washing/why-handwashing.html.

Ezeh, N. C. (2017). Media campaign on exclusive breastfeeding: Awareness, perception, and acceptability among mothers in Anambra State, Nigeria. Management Association (Ed.), *Media controversy: Breakthroughs in research and practice* (pp. 677-698). Hershey, PA: IGI Global.

Food and Agriculture Organization of the United Nations. (2011). *The state of food and agriculture: Women in agriculture*. Rome, Italy: FAO.

Kumwenda, S. (2019). Challenges to hygiene improvement in developing countries. Retrieved from https://www.intechopen.com/predownload/63322.

McQuail, D. (2005). *McQuail theories of mass communication.* London: Sage Publishers.

Miller, K. (2002). *Communication theories: Perspectives, processes and contents.* Boston: McGraw Hill.

Nwobodo, T. N.,&. Chukwu, K. E. (2020). Covid-19 era and water supply: Challenges for rural

communities in Eastern. *Nigeria Journal of Geosciences and Environment Protection*, 8(1), 219-233.

OECD (2020). Policy implications of Coronavirus crisis for rural development. Retrieved from https://read.oecd-ilibrary.org/view/?ref=134_134479-8kq0i6epcq&title=Policy-Implications-of-Coronavirus-Crisis-for-Rural-Development

Onwuzoo, A. (2020, April 29). COVID-19: Why regular hand washing is a challenge in Nigeria. *Punch Healthwise*. https://healthwise.punchng.com/covid-19-why-regular-hand-washing-is-a-challenge-in-nigeria/

Oskamp, S. (2000). *Attitudes and opinion.* Englewood Cliffs, NJ: Prentice – Hall, Inc.

Owuamalam, E. O. (2019). Ascent-descent model of human behaviour. *Concrescence: A book of essays.* Owerri: Imo State University Press Ltd.

Prasad, A., Ng Chok, H.,& Wilkes, L. (2017). Hand hygiene practices amongst patients. *International Journal of Infection Control,3*(2) 1-8. doi: 10.3396/IJIC.v13i2.009.17

Parveen, S., Nasreen, S., Allen, J.V., Kamm, K. B., Khan, S., Akter, S., Lopa, T. M., Zaman, K., El Arifeen, S., Luby S. P.,& Ram, P. K. (2018). Barriers to and motivators of handwashing behavior among mothers of neonates in rural Bangladesh. *BMC Public Health,18* (483), 1-13.https://doi.org/ 10.1186/s12889-018-5365-

Schramm, W.(1981).The nature of communication between humans. In W. Schramm & D.F. Roberts (Eds.), *The process and effects of mass communication*(Rev. ed.). Urbana: University of Illinois Press.

Sherif, M.,& Hoveland, C.I. (1967).*Social judgment: Assimilation and contrast effect in communication and attitude change*. New Haven, Conn Yale University Press.

Uneke, C. J., Ndukwe C. D. P., Nwakpu, K. O., Nnabu, R. C.,& Prasopa-Plaizier, N. (2014). Promotion of hand hygiene strengthen initiative in a Nigerian teaching hospital: Implication for improved patient safety in low-income health facilities. *The Brazilian Journal of Infectious Diseases*, 8(1), 21–27.

UNICEF (2020). To control COVID-19, we have to make hand hygiene accessible to all. – UNICEF and WHO. Retrieved from https://www.unicef.org/press-releases/control-covid-19-we-have-make-hand-hygiene-accessible-all-unicef

Wateraid (2020). Handwashing and COVID-19. Retrieved from https://www.wateraid.org/ng/covid-19.

Wateraid (2020). Nigeria cannot defeat COVID-19 Pandemic without improved access to clean water and good hygiene practices by citizens. Retrieved from https://www.wateraid.org/ng/media/nigeria-cannot-defeat-covid-19-pandemic-without-improved-access-to-clean-water-and-good

World Bank (2020). COVID-19 makes handwashing facilities and promotion more critical than ever. Retrieved from https://www.worldbank.org/ en/news/feature/2020/04/30/covid-19-makes-handwashing-facilities-and-promotion-more-critical-than-ever