Hand hygiene practices in the context of Ebola virus disease: A cross-sectional survey of Lagos residents

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Modupe R Akinyinka^{1,2} , Omowunmi Q Bakare^{1,2},
Esther O Oluwole² and Babatunde A Odugbemi²

Abstract

Background: The Ebola virus disease outbreak that ravaged parts of West Africa has been described as the most severe acute public health emergency seen in modern times. Hand washing was promoted among other measures for infection prevention.

Objective: This study assessed the awareness of Ebola virus disease and hand-washing practices among Lagos residents, southwest Nigeria.

Methods: A descriptive cross-sectional study was used. A total of 1982 respondents aged 18 ≥ years were selected using a multi stage sampling technique. An interviewer-administered, pre-tested questionnaire was used for data collection between August and November 2015. Data were analysed using the Statistical Package for Social Sciences (SPSS) version 22, with level of significance set at 0.05.

Results: Almost all (97.3%) respondents were aware of Ebola virus disease, with over half of respondents having heard about it from television. A majority of 1890 (95.4%) respondents were aware of the importance of hand washing in disease prevention. Similarly, high proportions of respondents were aware they should wash their hands after an outing, toilet use, touching pets, before and after meals, while 1628 (82.1%) of respondents knew to wash their hands after a hand shake. However, less than half of respondents (38.8%) always washed their hands after handshakes.

Discussion: A majority of respondents surveyed were aware of Ebola virus disease and hand washing, but the practice of hand washing, which is key in prevention of infection, lagged behind the knowledge of the respondents.

Keywords

Community, hand-washing practices, disease prevention, Ebola virus disease, hand hygiene

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Background

Ebola virus disease (EVD) is highly contagious and could spread very fast among family members of infected victims, medical doctors, nurses, laboratory workers and other caregivers, co-travellers, friends and any individual who has contact with the blood, sweat, urine, saliva or any other body fluid of EVD patients. The mortality rate from EVD is quite high and has been put at 30–50% (Lucas and Gilles, 2003; Smith, 2005).

The outbreak in West Africa in 2014 was described by ABC News (2014) as ‘the largest, most complex and most severe ever seen ... racing ahead of control efforts’.

The outbreak was one of the most severe acute public health emergencies seen in modern times (WHO News release, 2014).

¹Department of Community Health and Primary Health Care, Lagos State University College of Medicine, Lagos, Nigeria

²Department of Community Health and Primary Health Care, Lagos State University Teaching Hospital, Lagos, Nigeria

Corresponding author:

Modupe R Akinyinka, Department of Community Health and Primary Health Care, Lagos State University College of Medicine, 1-5, Oba Akinjobi Road, Ikeja, Lagos, Nigeria.

Email: apodupsy@yahoo.com

In Nigeria, poverty, ignorance, social, cultural affinity, tradition and attitudes of people tend to facilitate the spread of infectious diseases. Lagos state has a major international airport, seaports and land borders with other countries and this facilitates easier importation of infectious diseases, including EVD into the country. The very dense population of Lagos, with close human relationships, is also a factor in the spread of diseases and, if uncontrolled, infections may spread to the rest of Nigeria through residents in Lagos with very lethal consequences (Ayenigbara, 2014).

Though there is no certified drug to cure Ebola fever, evidence has shown that prompt commencement of treatment, rehydration, adequate feeding to support the immune response and treatment of complications show promise in relation to recovery from the disease (Ayenigbara, 2014). Therefore, prevention is the most viable option and may be achieved through health education and good hygiene. During the outbreak, control measures instituted included increased surveillance at the country's borders, improvement in tracking of cases and contacts, providing education to reduce disinformation and increase accurate information, and the teaching of appropriate hygiene measures in every area of the country (Reuters, 2014). Hand washing was particularly promoted among other measures as a means of preventing acquisition of Ebola infection. This study aimed to provide valuable information about public awareness after the epidemic and an insight to the practice of hand washing among the population, which would be useful to those planning interventions in the future.

The objectives of the study were to assess the awareness of EVD among Lagos residents, assess the hand-washing practices (HWP) of Lagos residents and identify factors affecting the HWP of respondents.

Methods

Description of study area

The study area was Lagos State, located in southwest Nigeria, on the Atlantic coast in the Gulf of Guinea. Lagos lies on longitude 3°24'E and latitude 6°27'N. Lagos State has an estimated population of about 15 million people (Akinyinka et al., 2015). Lagos has a tropical climate with distinct wet and dry seasons. It is made up of 20 Local Government Areas (LGA) and 37 Local Council Development Areas (LCDA). There are four rural and 16 urban LGAs.

The study population was selected from the residents of Lagos State who were aged ≥ 18 years. The study was cross-sectional and descriptive in design with quantitative data collection methods using a structured, interviewer-administered questionnaire.

The required sample size was determined using the appropriate formula for prevalence studies: the statistical assumptions for determining the minimum sample size

were a standard normal deviate of 1.96, a prevalence of 0.5 and a precision of 0.025; a minimum sample size of 1537 was derived, which was adjusted for non-response using an expected response rate of 80%. A final sample size of 1921 which was rounded up to 2000 was used for the study.

A multi-stage sampling method was used to select the participants for this study.

Stage 1: From the 20 LGAs, one LGA was selected out of the four rural LGAs and four from the 16 urban LGAs by a ballot (simple random sampling). The selected rural LGA was Epe and the urban LGAs were Ikeja, Alimosho, Eti-osa and Kosofe.

Stage 2: At each of the selected LGAs, two wards per LGA were selected by a ballot.

Stage 3: Using the sampling frame of all streets in the selected wards, 10 streets were selected by simple random sampling (ballot).

Stage 4: On each selected street, 20 houses were selected using a ratio of the total number of houses to 20 to get a sampling interval. The first house was selected according to the LGA house numbering system or the first house on the right where there was no clear numbering seen.

Stage 5: One member from each household who met the inclusion criteria and gave consent was included in the study. Where there was more than one eligible person per household, a quick ballot was done by the trained research assistants to select the respondent.

This was done on all selected streets until the sample size was attained.

To be included in the study, the respondents had to be aged ≥ 18 years and must have been resident in Lagos State for at least one month before data collection.

Survey instrument and method of data collection

An interviewer-administered, pre-tested questionnaire was used to collect data. The pre-testing was done among 200 residents of Mushin LGA. The questionnaire was structured into the following sections: socio-demographic profile; knowledge of EVD cause; and knowledge and practice of hand washing. Questionnaires were administered to 2000 participants, but in 18 the interview was not completed and a total of 1982 respondents were included in the analysis.

Data were collected from August to December 2015 by five trained research assistants.

Data analysis was done using the Statistical Package for Social Sciences (SPSS) version 22. Univariate and bivariate analyses were done with the level of significance set at 0.05 and a 95% confidence interval was used. Outcome

Table 1. Awareness of when to wash hands.

When to wash hands	Urban LGAs (Frequency (%))	Rural LGA (Frequency (%))	Total (n = 1982) (Frequency (%))	Significance
After outing	1498 (94.5)	378 (95.2)	1876 (94.7)	$\chi^2 = 0.310$ $P = 0.578$
After toilet use	1531 (96.6)	381 (96.0)	1912 (96.5)	$\chi^2 = 0.362$ $P = 0.547$
After touching pets	1515 (95.6)	381 (96.0)	1896 (95.7)	$\chi^2 = 0.114$ $P = 0.736$
Before and after meals	1546 (97.5)	387 (97.5)	1933 (97.5)	$\chi^2 = 0.004$ $P = 0.947$
After handshakes	1245 (78.5)	383 (96.5)	1628 (82.1)	$\chi^2 = 69.529$ $P < 0.001$

measures included awareness of EVD, critical points to engage in hand washing and HWP.

Ethical considerations

The nature of the study was explained to the participants and written informed consent was obtained from each individual before participation in the study. Ethical clearance was obtained from the hospital's health research and ethics committee.

Results

The highest level of education of the 1982 respondents was as follows: 13.3% (n = 263) primary; 55.0% (n = 1090) secondary; 23.2% (n = 459) tertiary; 5.0% (n = 99) post-graduate; 1.1% (n = 22) Quranic education; 2.1% (n = 42) no formal education; and 0.4% (n = 7) gave no response to this question. Over half of respondents (n = 1189, 60%) were women. The mean age of respondents was 32.9 ± 11 years. Over half of respondents (58.2%) were married while 37.5% were single; 3.5% (n = 68) were separated, divorced or widowed (16 [0.8%] gave no response). Most of the respondents were of Yoruba ethnic origin (72.5%), followed by Igbos (13.4%) and Hausas (3.9%), while other groups and those who gave no response made up 9.2% and 1%, respectively.

Most of respondents (97.3%) had heard of EVD.

Over half of respondents (54.6%) heard about EVD from the television, while 20.5% heard about it from the radio.

A little over one-tenth (13.2%) of the respondents had heard about EVD before the year 2014 (the Nigerian EVD epidemic), while others became aware of it in 2014 and later.

Of the respondents, 89.5% (n = 1774) were aware of the recent outbreak of EVD and half (49.5%) of these heard about it from the television.

Most respondents (n = 1888, 95.3%) were aware of the fact that hand washing prevents disease.

Most of the respondents (82.1%) were aware that they ought to wash their hands after shaking hands with other people; this was significantly more in the rural LGA (96.5%) than in the urban ones (78.5%) (Table 1).

A majority, 92.3% (n = 1830), were aware that water and soap were needed for hand washing.

Over one-third of respondents (38.8%) always washed their hands after handshakes; this practice was significantly greater (47.9%) among respondents residing in the rural LGA when compared with the urban dwellers (36.6%) (Table 2).

Socio-demographic factors, such as educational level and marital status, were not found to be significantly associated with HWP of respondents.

A significantly larger proportion of respondents who had heard about the recent EVD outbreak always washed in between their fingers and after handshakes (Table 3).

Discussion

Respondents in this study expectedly had similar education rates (the majority had secondary education) when compared with a study conducted by the Epidemiology and Surveillance Team/Operational Research of the national Ebola Emergency Operation Centre (EEOC) in Lagos as part of the response to the EVD outbreak in Lagos State (Gidado et al., 2015).

Almost all respondents (97.3%) had heard about EVD, which was not surprising considering the recent epidemic; of these, a majority became aware in 2014 or beyond. This was better than the 92.5% reported from a study conducted

Table 2. Hand-washing practices.

Hand-washing practices (always) (non-responses excluded)	Urban LGAs (Frequency (%))	Rural LGA (Frequency (%))	Total frequency (%)	Significance
Wash before cooking	1357 (87.2)	279 (71.5)	1636 (84.1)	$\chi^2 = 60.894$ $P < 0.001$
Wash after outings*	863 (55.5)	216 (55.7)	1079 (55.6)	$\chi^2 = 2.972$ $P = 0.226$
Wash after using toilets	1358 (87.8)	270 (69.6)	1628 (84.2)	$\chi^2 = 82.126$ $P < 0.001$
Wash before eating	1419 (91.3)	300 (77.1)	1719 (88.5)	$\chi^2 = 62.681$ $P < 0.001$
Wash hands with soap	997 (64.6)	255 (66.4)	1252 (64.9)	$\chi^2 = 1.007$ $P = 0.604$
Wash hands with clean water	1136 (73.7)	239 (62.7)	1375 (71.5)	$\chi^2 = 18.447$ $P < 0.001$
Wash between fingers	971 (62.5)	207 (53.2)	1178 (60.6)	$\chi^2 = 14.012$ $P = 0.001$
Wash after hand shakes	563 (36.6)	184 (47.9)	747 (38.8)	$\chi^2 = 27.752$ $P < 0.001$

*Activities carried out away from the house or home.

by Shittu et al. (2015) in a family practice setting in Ilorin, probably on account of the fact that EVD was introduced to Nigeria in Lagos. Television and radio were the most common means identified by respondents as responsible for making them aware of EVD (as also shown by the EOCC study); therefore, the use of these media of communication should be maximised in our interventions to educate our people. When asked directly about the recent outbreak of EVD in Lagos, most respondents were aware of it and half had heard about it from television. This was another pointer in support of television as a means of disseminating essential health information.

Most respondents were aware that they should wash their hands after handshakes with other people and almost all respondents knew about other critical times that demanded hand washing; however, awareness did not necessarily translate into action with regards to HWP as only about half of the respondents always washed their hands after outings, and even less after handshakes. This was also noted in a study among school children in Ghana by Steiner-Asiedu et al. (2011). The proportion of respondents who always washed their hands before eating was, however, much higher than the reported finding from a study conducted by Ogunsola et al. (2013) in Kuramo, Lagos State, where only 46% washed their hands before eating, but less than the 91.5% reported among school children by Steiner-Asiedu et al. (2011). The differences

are probably because we expect students to be in constant touch with hygiene education unlike the community members who may not routinely receive much of this. The results from this study being self-reports may imply even lower rates of actual practice than acknowledged by respondents. The proportion of respondents who claimed to wash their hands with soap was much higher than that reported in a study by Vivasa et al. (2010) among school children in rural Ethiopia, where only 36.2% washed their hands with soap. This difference may be because Lagos is predominantly urban, unlike the rural setting of Ethiopia where the study was conducted. However, a study conducted in Mumbai, India by Gawai et al. (2016) among school children revealed that 91.5% of these children reported washing their hands with soap. This difference shows there is a large gap and that more needs to be done to promote hygiene in our communities. This is of great importance as hand hygiene cannot be overemphasised in the prevention of infections within the community (Bloomfield et al., 2007). A rural–urban comparison reveals similar awareness of critical points for hand washing except with regards to washing after handshakes, which was significantly better in the rural LGA. The practice of washing hands after handshakes was also observed to be significantly better among the rural dwellers. Other HWP were either similar or better among the urban dwellers. This may be on account of the greater availability of

Table 3. Association between awareness of recent EVD outbreak and hand-washing practices (HWP).

Aware of recent EVD outbreak	HWP			Significance
	Always Frequency (%)	Sometimes Frequency (%)	Never Frequency (%)	
	<i>Wash before cooking</i>			
Yes	1476 (84.6)	253 (14.5)	15 (0.9)	F _{exact} = 2.871 P = 0.411
No	135 (80.8)	31 (18.6)	1 (0.6)	
	<i>Wash after outings</i>			
Yes	967 (55.6)	674 (38.7)	97 (5.6)	F _{exact} = 1.926 P = 0.932
No	91 (54.5)	66 (39.5)	10 (6.0)	
	<i>Wash after using toilets</i>			
Yes	1465 (84.3)	262 (15.1)	11 (0.6)	χ^2 = 0.328 P = 0.864
No	141 (86.0)	22 (13.4)	1 (0.6)	
	<i>Wash before eating</i>			
Yes	1544 (88.7)	194 (11.1)	3 (0.2)	F _{exact} = 4.817 P = 0.097
No	146 (87.4)	19 (11.4)	2 (1.2)	
	<i>Wash hands with soap</i>			
Yes	1132 (65.5)	584 (33.8)	13 (0.8)	χ^2 = 4.288 P = 0.104
No	99 (59.3)	68 (40.7)	0 (0.0)	
	<i>Wash hands with clean water</i>			
Yes	1235 (71.8)	480 (27.9)	5 (0.3)	F _{exact} = 0.322 P = 0.742
No	117 (70.1)	50 (29.9)	0 (0.0)	
	<i>Wash between fingers</i>			
Yes	1060 (60.9)	663 (38.1)	18 (1.0)	χ^2 = 11.799 P = 0.005
No	97 (58.1)	63 (37.7)	7 (4.2)	
	<i>Wash after hand shakes</i>			
Yes	686 (39.8)	733 (42.5)	305 (17.7)	χ^2 = 8.334 P = 0.015
No	47 (28.5)	81 (49.1)	37 (22.4)	

water and sanitation facilities that are essential for hand washing in the urban areas.

When HWP were examined in view of knowledge of the recent epidemic, significantly better practices were only reported in association with washing between fingers and washing hands after handshakes. This left much to be desired considering the high level of awareness that was recorded and shows a need to intensify efforts at enlightening the populace about the need to keep washing hands to protect themselves.

One limitation of this study is that it may have been subject to bias as we elicited self-reports of people's practices and not direct observations of behaviour. Further studies that include observations and qualitative means of data collection are recommended to shed more light on the HWP and availability of facilities that encourage good practices.

Conclusion and recommendations

The study revealed that majority of respondents were aware of EVD and critical points for hand washing; however, these did not translate into good HWP. This may imply inadequate knowledge, motivation and facilities to carry out the protective measures of hand hygiene and will require further research.

Health education of the general populace is essential and recommended at every opportunity to improve their knowledge about the prevention of infectious diseases, particularly low-cost, effective preventive practices such as hand washing. Knowledge of critical points for hand washing, materials required, technique and benefits should be part of what is taught and freely disseminated.

The use of television is expected to give maximum effects in this drive as a majority who were aware of EVD heard about it from the television.

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ORCID iDs

Modupe R Akinyinka <https://orcid.org/0000-0002-7930-1003>
Babatunde A Odugbemi <https://orcid.org/0000-0001-7551-4450>

References

- ABC News. (2014) Ebola cases could zoom to 10,000 a week, WHO warns. ABC News. Available at: <https://abcnews.go.com/Health/ebola-cases-zoom-10000-week-warns/story?id=26181200> (last accessed 14 October 2014).
- Akinyinka MR, Wright KO, Alakija W, Apoola AO and Oluwale EO. (2015) Modifying the sexual behavior of patients attending Human Immunodeficiency Virus treatment centres in Lagos. *Nigerian Postgraduate Medical Journal* 22: 202–208.
- Ayenigbara GO. (2014) The facts, the fears, and the prevention of Ebola haemorrhagic fever: a focus on Nigeria. *International Research Journal of Public and Environmental Health* 1: 192–196.
- Bloomfield SF, Aiello AE, Cookson B, O'Boyle C, Larson E and Michigan AA. (2007) The effectiveness of hand hygiene procedures in reducing the risks of infections in home and community settings including hand washing and alcohol-based hand sanitizers. *American Journal of Infection Control* 35: S27–64.
- Gawai PP, Taware SA, Chatterjee AS and Thakur HP. (2016) A cross sectional descriptive study of hand washing knowledge and practices among primary school children in Mumbai, Maharashtra, India. *International Journal of Community Medicine and Public Health* 3: 2958–2966.
- Gidado S, Oladimeji AM, Roberts AN, Ngukwu P, Nwangwu IG and Waziri NE. (2015) Public knowledge, perception and source of information on Ebola Virus Disease - Lagos, Nigeria; September, 2014. *PLOS Currents* 1. doi: 10.1371/currents.outbreaks.0b805cac244d700a47d6a3713ef2d6db.
- Lucas AO and Gilles HM. (2003) *Short Textbook of Public Health Medicine for the Tropics*. 4th ed. London: Book Power.
- Ogunsola F, Balogun M, Aigbefo S, Oduyebo O, Oladele R and Olufemi J. (2013) Perception and practice of hand washing in Kuramo community, Lagos, Nigeria. *International Journal of Infection Control* 9: 10780.
- Reuters. (2014) British military to provide support in Ebola hit Sierra Leone. Available at: <https://www.reuters.com/article/us-health-ebola-britain-military/britain-to-send-750-troops-to-sierra-leone-to-build-ebola-treatment-center-bbc-idUSKCN0HX1L220141008> (last accessed 12 October 2014)
- Shittu RO, Sanni MA, Odeigah LO, Akanbi II AA, Sule AG and Isiaka-Lawal S. (2015) Awareness, knowledge and misconceptions about Ebola Virus Disease (EVD) in a family practice setting in Nigeria, West Africa. *Journal of Antivirals & Antiretrovirals* 7: 010–014.
- Smith T. (2005) *Ebola (Deadly Diseases and Epidemics)*. Langhorne, PA: Chelsea House Publications.
- Steiner-Asiedu M, Van-Ess SE, Papoe M, Setorglo J, Asiedu DK and Anderson AK. (2011) Hand washing practices among school children in Ghana. *Current Research Journal of Social Sciences* 3: 293–300.
- Vivasa A, Gelayea B, Aboset N, Kumiec A, Berhane Y and Williams MA. (2010) Knowledge, attitudes, and practices (KAP) of hygiene among school children in Angolela, Ethiopia. *Journal of Preventive Medicine and Hygiene* 51: 73–79.
- WHO News release (3 September 2014). UN senior leaders outline needs for global Ebola response. Available at: <https://www.who.int/media-centre/news/releases/2014/ebola-response-needs/en/> (last accessed 7 September 2014)