

Hand Washing: Knowledge, Attitude and Practice amongst Mothers of Under-Five Children in Osogbo, Osun State, Nigeria

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Abstract

The hands are central to many of our daily activities and the use of contaminated hands for cooking and eating enhances transmission of contaminants/germs into the body through food, thereby causing ill-health. Mothers serve the dual role of the children's nurse (handling their faeces, blowing their nostrils, etc.) as well as the household chef (prepares family's meals, feeds children). This coupled with poor knowledge and practice of simple hygiene increase the risk of spread of diseases to the under-five children. A community based cross-sectional study set out to determine the knowledge, attitude towards and practice of hand washing among mothers of under-five children in Igbona Area of Olorunda Local Government in Osogbo, Osun State, Nigeria. Three hundred mothers of under-five children were selected for the study using a multi-stage technique. Interviewer-administered semi-structured questionnaires were used to collect information on participants' knowledge, attitude towards and practice of hand washing. Overall, respondents had good knowledge of hand washing but their educational status and religion were found to influence degree of knowledge of hand washing ($p = 0.01$ respectively with higher education and Christianity positively impacting knowledge of hand washing). More than three-quarters (81.6%) of them did not think that the use of soap was important in hand washing. Respondents' practice of hand washing was influenced by their age and educational level ($p < 0.0000001$) respectively with older age group and higher educational levels corresponding to better practice. In conclusion, the study found good knowledge of hand washing among the respondents with many of them showing positive attitude in favor of hand rinsing. Those with higher education had better practice of hand washing. To realize the health benefits of hand washing, efforts to improve hand washing in this environment should encourage adding soap to current hand rinsing practices.

Keywords: hand washing, mothers, under-five children, knowledge, attitude, practice.

1. Introduction

Hygiene is the practice of keeping oneself, one's living and working environment clean in order to prevent illness and disease (CDC, 2009). Hand washing is the act of cleansing the hands with water or another liquid with or without soap or other detergents for sanitary purpose of removing soil and/or micro-organisms (Wikipedia, 2011). The practice of hand washing is about as old as man. It was an important practice held by the Jews who ensured that hand washing preceded eating. Good hand washing involves the vigorous, brief rubbing together of all surfaces of lathered hands, followed by rinsing under a stream of water. Hand washing suspends microorganisms and mechanically removes them by rinsing with water. Therefore, the fundamental principle of hand washing is removal, not killing (CDC, 2009).

The hands are central to many of our daily activities like handling objects, farming, poultry keeping, cleaning etc, all of which make the hands to be constantly contaminated. The use of contaminated hands for cooking and eating makes possible the transmission of the contaminants (germs) into the body through food, thereby causing ill-health.

In Nigeria like other African countries, the people are particularly guided by culture. The African culture assigns the mothers the dual role of being the children's nurse (who handles their feces and blows their nostrils, among other things) as well as the household chef (who prepares the family's meals and feeds the children). This coupled with poor knowledge and practice of simple hygiene increase the risk of spread of diseases to the under-

five year old children who by reason of their poorly developed immune system are particularly vulnerable to these diseases.

Some critical times at which hand-washing must be employed include, after using the toilet, changing diapers, attending to a sick person, handling raw meat, fish or poultry, after handling garbage, treating a wound or cut, contact with domestic animals, before food preparation and before eating (CDC, 2009). A great number of diseases can be transmitted from lack of or ineffective hand washing, particularly feco-orally transmitted diseases, ranging from self-limiting infections like diarrhea (Rotaviruses are major causes of diarrhea diseases in human infants), to potentially life threatening diseases like poliomyelitis and hepatitis A virus infection (Black, Morris & Bryce, 2003). Hygienic measures, including hand washing with soap before meals and after use of rest rooms, have been found to prevent hepatitis A virus infection (WHO, 2012).

Hand washing, if regularly and properly practiced by mothers of children of under 5 years old will go a long way in reducing the prevalence of infectious diseases, hospital admissions due to these diseases and also mortality among the under 5 years old children, thereby making them grow well and healthy (Curtis & Cairncross, 2003). Programs for the reduction of morbidity and mortality must include hand washing to prevent contamination of food.

In Nigeria, diarrhea prevalence rate is 18.8%; is one of the worst in Sub-Sahara Africa and above the average of 16%. Diarrhea accounts for over 16% of child deaths in Nigeria and an estimated 150,000 deaths mainly amongst children under five occur annually due to this disease mainly caused by poor sanitation and hygiene practices (Limlim, 2008). A study in Korea directly observed hand washing practices and found that only 63.4% of observed subjects truly washed their hands after using the toilet, despite the fact that 94% of subjects claimed to mostly or always wash hands after using public rest rooms (Jeong, Choi, Jeong et al, 2007). This shows that there is a difference between saying “yes” to hand washing and its actual practice.

The World Bank, the International Monetary Fund, the members of the development Assistance committee of the Organization for Economic Co-operation and Development (OECD) and many other agencies have adopted international Millennium Development goals, one of which (goal 4) is to reduce infant and child (under five) mortality rates by two-third between 1990 and 2015. As a result of this, there is a need to promote child health and reduce under-five and infant mortality rates by utilizing all possible effective strategies. To achieve this laudable goal, the prevention of diseases like gastroenteritis and other diseases associated with poor hygiene, as well as keeping mothers of under five year old children informed on the importance of hand washing has become imperative (Rheingans, Dreibelbis & Freeman, 2006). According to previous studies, hand washing and wearing of face masks minimize the spread of influenza (Cowling, Chan & Fang et al, 2009) and hand washing is crucial to diarrhoea prevention (Luby, Agboatwalla & Painter et al, 2006).

This study is therefore essential because there is still an acceptably high level of mortality rate among the under five year old in Nigeria and a need to explore the current level of understanding of their mothers about the link between hand washing and the risk of developing diseases among this age group. This study set out to determine the knowledge, attitude towards and practice of hand washing among mothers of under-five children in Igbona Area of Olorunda Local Government in Osogbo, Osun State and to explore the relationship between respondents' socio-demographic characteristics and their knowledge, attitude to and practice of hand washing.

1.1 MATERIALS AND METHODS

1.1.1 Background to study area

Igbona is an area located in Olorunda Local Government Area (LGA) of Osun State. It is one of the eleven (11) wards of the LGA. It is located on latitude 4⁰N of the equator. The climate of Igbona is tropical with rainy season beginning in March and ending September while harmattan or dry season begins in October and ends in March. According to the 2006 national census, the population of people in Igbona area was about 5100. Most of the houses are residential. The social amenities in Igbona area of Olorunda Local Government include a major market, a teaching hospital, a military cemetery, several bank, pipe-bourne water, electricity, tarred roads, and a town hall among others.

1.1.2 Study Design - This is a community based descriptive cross-sectional study.

1.1.2 Sample Size Determination

The sample size was determined by using Leslie Fisher's formula (Ray, Dobe & Majhi et al, 2006) for population less than 10,000 which yielded approximately 270 respondents. Assuming a 10% non-response rate, 300 respondents were recruited for the study.

1.1.4 Sampling Method

Multi stage sampling technique involving 4 stages was utilized in recruiting study respondents as follows:

Stage 1: two thirds of all streets in Igbona area was selected (i.e 10 out of 15 existing streets) by simple random sampling (balloting).

Stage 2: Systematic sampling method was used to select houses in each street. This was based on the total number of houses in each street.

Stage 3: all eligible households in each house were selected.

Stage 4: all consenting mothers of under-five in each eligible household were recruited into the study.

1.1.5 Study Instrument

A pre-tested semi-structured questionnaire comprising of questions on respondents' socio-demographic characteristics, knowledge, attitude and practice of hand washing was utilized for data collection.

1.1.6 Data Collection Method

The questionnaire was interviewer-administered to the respondents by the final year medical students of Ladoké Akintola University of Technology (LAUTECH). A pre-test was conducted at Latona area of Osogbo.

1.1.7 Data Analysis

The data collected were entered on a computer and analyzed using the Statistical Package for Social Sciences (SPSS), Version 15. The results were presented with the aid of tables and figures as appropriate. Tables of frequencies and proportions were used for analysis and associations between categorical variables were assessed by using Chi-square test statistics. Statistical confidence interval was set at 95% with significant level of $p < 0.05$.

1.1.8 Scoring of Outcome Variables

Knowledge - 1 mark awarded for every correct answer. No (0) mark was awarded for each wrong answer. The scores were then added and the mean score calculated. Respondents that scored below the mean value were categorized as having poor knowledge while those that scored above the mean value were categorized as having good knowledge.

Attitude: 1 mark was awarded for positive/good attitude, no (0) mark for negative/poor attitude. All scores were added and the mean score calculated. Scores below the mean value were adjudged to signify negative attitude while respondents that scored above the mean value were adjudged to have positive attitude.

Practice: 1 mark was awarded for every correct practice response, no (0) mark was awarded for every wrong practice. All the scores were added and the mean score calculated. Respondents that had scores below the mean value were categorized as having poor practice while those that scored above the mean value were categorized as having good practice.

1.1.8 Ethical Considerations

The proposal for the project was approved by the Research and Ethical Committee of the LAUTECH Teaching Hospital, Osogbo and a letter of approval was obtained from the authorities of Olorunda Local Government Area, Osogbo, Osun State. Verbal consent was obtained from each respondent that participated in the study.

1.1.9 Limitation

Social undesirability bias (responder bias) could not be ruled out from the study participants' responses.

1.1.10 RESULTS

Three hundred mothers of under-five children most of which belonged to the age group of 21-30 years (71.7%) participated in the study. Nearly one-half (48.3%) of them were traders, while about a third (30.0%) were artisans. More than one-half (56.7%) of them had secondary education as their highest educational qualification. A few respondents (2.0%) had no formal education while about one-fifth (18.6%) of them had post-secondary education. Majority of the respondents (98.3%) were married and there were nearly as many Muslims as Christians (48.7% and 51.3% respectively). The respondents mostly had 1 or 2 under-five children each (97%) (Table 1).

TABLE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS(n=300)

Socio-demographic characteristics	Frequency (%)
Age group (in years)	
<20	8(2.7)
21-30	215(71.7)
31-40	71(23.7)
41-50	4(1.3)
>50	2(0.7)
Modal age group = 21-30 years	
Occupation	
Trader	145(48.3)
Artisan	90(30.0)
Civil servant	43(14.3)
Housewife	8(2.7)
Student/Unemployed	14(4.7)
Educational status	
No formal education	6(2.0)
Primary school	68(22.7)
Secondary school	170(56.7)
College of education	22(7.3)
OND/HND/first degree	34(11.3)
Marital status	
Single	5(1.7)
Ever married	295(98.3)
Religion	
Christianity	146(48.7)
Islam	154(51.3)

Most of the respondents were knowledgeable on how the hands could be contaminated with germs (Table 2). When asked about the type of illnesses respondents' children usually came down with, fever was the commonest (61.7%) followed by catarrh (12.7%) and diarrhea (12.0%) (Fig 1).

In their responses to attitudinal statements on hand washing, majority had positive attitude. Majority, 98.3% of them agreed that attending to their under-five child with unwashed hands could result in illness in the child. Furthermore 221(73.7%) of the respondents felt they should wash their hands after sneezing while only 34(11.3%) of them thought that the use of soap was important and necessary in hand washing (Table 3).

TABLE 2: KNOWLEDGE ABOUT HAND WASHING (n=300)

Germs can be acquired (by hands) through the following	Yes (%)	No (%)
Using the toilet	293(97.7)	7(2.3)
Changing baby's diapers	249(83.0)	51(17.0)
Treating wound	277(92.3)	23(7.7)
Attending to sick person	249(83.0)	51(17.0)
Waste disposal	272(90.7)	28(9.3)
Handling raw meat/poultry	222(74.0)	78(26.0)
Contact with domestic animals/pets	228(76.0)	72(24.0)
Hand washing can remove acquired germs	281(93.7)	19(6.3)
Unwashed hands can cause illness in children	295(98.3)	5(1.7)

TABLE 3: Respondents' attitude toward hand washing (n=300)

ATTITUDINAL STATEMENT	AGREE	INDIFFERENT	DISAGREE
Hand washing is very important	297(99.0)	0(0.0)	3(1.0)
Hands should be washed after using the toilet	297(99.0)	1(0.3)	2(0.7)
I ought to wash my hands before cooking	270(90.0)	25(8.3)	5(1.7)
I ought to wash my hands after attending to a sick person	267(89.0)	23(7.7)	10(3.3)
Hands should be washed after waste disposal	289(96.3)	9(3.0)	2(0.7)
I ought to wash my hands before feeding my child	273(91.0)	22(7.3)	5(1.7)
Attending to their under-five child with unwashed hands could result in illness in the child	295(98.3)	1(0.3)	4(1.3)
I should wash my hands after sneezing	221(73.7)	49(16.3)	30(10.0)
Soap is necessary in washing hands	34(11.3)	21(7.0)	245(81.7)
Drying hands after washing is not important	37(12.3)	45(15.0)	218(72.7)
A woman's wrapper is appropriate for drying hands after washing	84(28.0)	15(5.0)	201(67.00)
Clean towel ought to be used in drying hands after washing	281(93.7)	11(3.7)	8(2.7)

With regard to their hand washing practices, 88.7% of respondents always washed their hands after defecation (92.0% of them actually used water to clean up after defecation and 5.7% used tissue paper – Fig. 2), 79.0% after waste disposal, 62.3% before cooking (10.0% of them actually never or rarely washed their hands before cooking) and only 56.3% always washed their hands after urination.

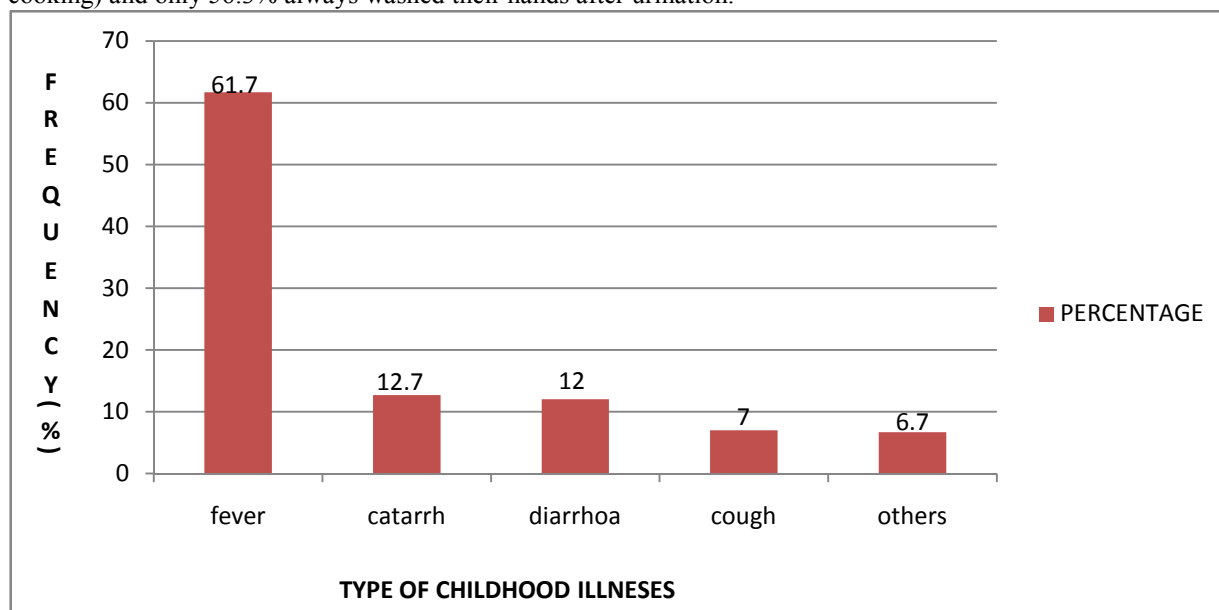


FIG 1: Common illnesses among respondents' under-five children

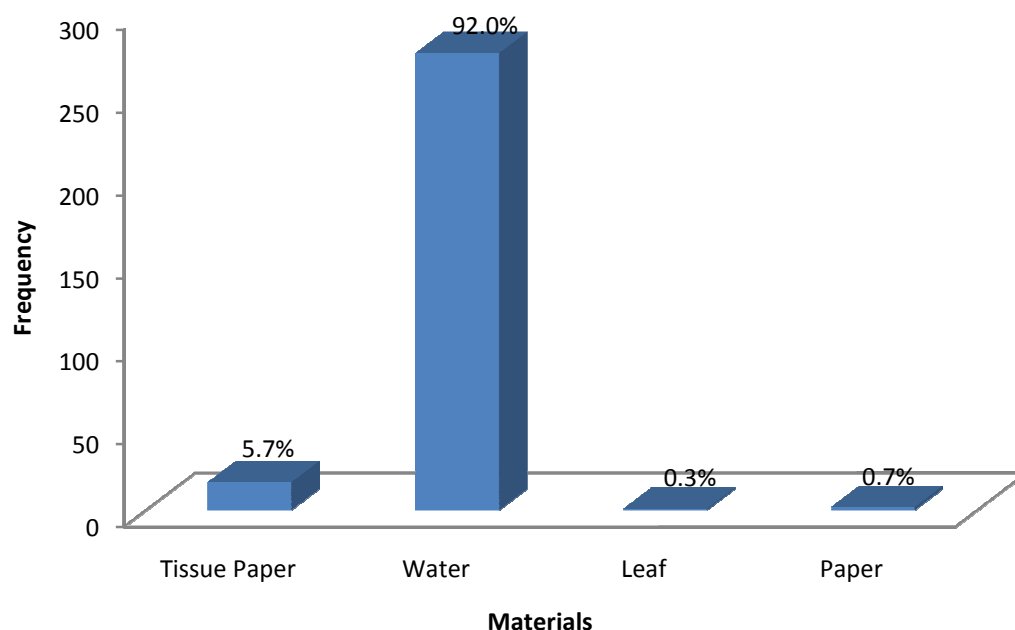


FIGURE 2: Materials used by respondents in cleaning up after defecation

About 18.0% of them rarely or never washed their hands after attending to a sick person. Furthermore, only 27.3% of respondents always use soap and water to wash their hands; about three-quarters (71.0%) use only water. In order to wipe their hands after washing, only 31.3% use dry clean towels while 59.7% use their wrappers or rags. Majority of respondents had good knowledge of and positive attitude to hand washing; 93.0% and 98.7% respectively. However, less than a quarter of the respondents (21.7%) had good practice of hand washing (Table 4).

TABLE 4: RESPONDENTS' PRACTICE OF HAND WASHING (n = 300)

FREQUENCY (%)				
PRACTICE VARIABLES	Always	Sometimes	Rarely	Never
Washes hands:				
After defecation	266(88.7)	26(8.7)	5(1.7)	3(1.0)
Waste disposal	237(79.0)	50(16.7)	10(3.3)	3(1.0)
Urination	169(56.3)	88(29.3)	28(9.3)	15(5.0)
Before cooking	187(62.3)	83(27.7)	23(7.7)	7(2.3)
Attending to a sick person	167(55.7)	78(26.0)	26(8.7)	29(9.7)
Materials most commonly used in hand washing				
Rinse with water only	213(71.0)			
Use of soap and water	82(27.3)			
Use of alcohol based hand sanitizer	5(1.7)			
Material commonly used for wiping/drying hands after washing				
Rub with wrapper/rag	179(59.7)			
Wipe with tissue paper	27(9.0)			
Dry with clean towel	94(31.3)			
Outcome score variables categories				
Knowledge categories				
Good	279(93.0)			
Poor	21 (7.0)			
Attitude categories				
Positive	296(98.7)			
Negative	4(1.3)			
Practice categories				
Good	65(21.7)			
Poor	235(78.3)			

TABLE 5: Relationship between socio-demographic characteristics and knowledge of hand washing amongst respondents (n = 300)

Socio-demographic variable	Knowledge (%)		Statistical indices
	Good	Poor	
Age-group (years)			
≤ 30	207(92.8)	16(7.2)	$\chi^2 = 0.04$ df = 1 p = 0.84 (NS)
>30	72(93.5)	5(6.5)	
Occupation			
Skilled	40(93.0)	3(7.0)	$\chi^2 = 1.63$ df = 2 p = 0.44
Semi-skilled	220(93.6)	15(6.4)	
Unskilled	19(86.4)	3(13.6)	
Educational status			
Less than secondary	63(85.1)	11(14.9)	$\chi^2 = 9.43$ df = 2 p = 0.01 (SS)
Secondary	163(95.0)	7(4.1)	
Post-secondary	53(94.6)	3(5.6)	
Religion			
Christianity	142(97.3)	4(2.7)	$\chi^2 = 6.71$ df = 1 p = 0.01 (SS)
Islam	137(89.0)	17(11.0)	

NS – not statistically significant

SS – statistically significant.

Table 5 shows that knowledge about hand washing was influenced by respondents' educational status and religion with better knowledge being demonstrated by respondents with higher educational levels and Christians ($p = 0.01$ respectively). In table 6 no association was found between respondents' socio-demographic characteristics and attitude to hand washing while in Table 7 Age and educational status showed a statistically significant relationships with respect to their hand washing practices ($p < 0.0000001$) respectively.

TABLE 6: Relationship between socio-demographic characteristics and attitude to hand washing amongst respondents (N = 300)

Socio-demographic variable	Attitude (%)		Statistical indices
	Good	Poor	
Age-group (years)			
≤ 30	220(98.7)	3(1.3)	$\chi^2 = 0.000$ df = 1 p = 1.000 (NS)
>30	76(98.7)	1(1.3)	
Occupation			
Skilled	42(97.7)	1(2.3)	$\chi^2 = 2.46$ df = 2 p = 0.29 (NS)
Semi-skilled	233(99.1)	2(0.9)	
Unskilled	21(95.5)	1(4.5)	
Educational status			
Less than secondary	72(97.3)	2(2.7)	$\chi^2 = 0.74$ df = 2 p = 0.69 (NS)
Secondary	168(98.8)	2(2.2)	
Post-secondary	56(100.0)	0(0.0)	
Religion			
Christianity	144(98.6)	2(1.4)	$\chi^2 = 0.96$ df = 1 p = 1.000 (NS)
Islam	152(98.7)	2(1.3)	

NS – not statistically significant; SS – statistically significant.

TABLE 7: Relationship between socio-demographic characteristics and practice of hand washing amongst respondents (n = 300)

Socio-demographic variable	Knowledge (%)		Statistical indices
	Good	Poor	
Age-group (years)			$\chi^2 = 124.78$ df = 1 p < 0.0000001(SS)
≤ 30	13(5.8)	210(94.2)	
>30	52(67.5)	25(32.5)	
Occupation			$\chi^2 = 0.4$ df = 2 p = 0.82
Skilled	9(20.9)	34(79.1)	
Semi-skilled	50(21.3)	185(78.7)	
Unskilled	6(27.3)	16(72.7)	
Educational status			$\chi^2 = 243.09$ df = 2 p < 0.0000001 (SS)
Less than secondary	5(6.8)	69(93.2)	
Secondary	4(2.4)	166(97.6)	
Post-secondary	56(100.0)	0(0.0)	
Religion			$\chi^2 = 0.03$ df = 1 p = 0.86
Christianity	31(21.2)	115(78.8)	
Islam	34(22.1)	120(77.9)	

NS – not statistically significant; SS – statistically significant.

1.1.11 Discussion

The study respondents demonstrated good knowledge of hand washing and most of them also had good attitude towards hand washing but majority of them did not agree that it was necessary to use soap for hand washing. This agreed with findings from another study that reported good knowledge and attitude to hand washing (Ray, Dobe & Majhi et al, 2006). However figures from these studies were significantly higher when compared to another community based study in which the knowledge and practice of hand-washing was reported to be poor (Hoque, 2003). Our study reported positive attitude to hand washing among respondents, the figures were higher when compared with another study in which about half each of study subjects respectively felt that it was important to wash hands after defecation, before preparing food and feeding child.

These comparative findings may have implications for control of feco-orally transmitted communicable diseases since evidence have shown the importance of hand-washing which include the reduction of the occurrence of diarrheal diseases by about 14-40%, and decontamination of the hands in order to prevent cross-transmission of infections (Bartram & Cairncross, 2010). Hand washing with soap can also reduce the risk of respiratory and skin infections (Scott, Curtis & Rabie, 2003). Public health importance of hand washing has been reiterated time and again in communities and health facilities, it appears as if neither health administrators nor caregivers considered hand washing trivial, but an important tool for prevention of communicable diseases. In addition, hand washing though it appears simple, could enhance the effectiveness of Water and Sanitation (Watsan) programmes.

The generally high prevalence of hand washing reported in this study supports several other studies (Bartram & Cairncross, 2010; Datta1, Singh & Boratne et al, 2011; Halder, Tronchet & Akhteret et al, 2010). However, it is relevant to discuss the quality of these practices since a lack of ‘proper’ hand washing and general cleanliness can have serious consequences. In this study, majority of respondents used only water in hand washing despite their generally favorable attitude, this agreed with another study in which about four-fifth of respondents used only water (Halder, Tronchet & Akhteret al, 2010), and yet another in which the use of only water as a means of hand washing was described as most common (Nasreen, Azziz-Baumgartner & Gurley, 2010). The method of hand washing among the respondents was not done in the ideal manner as some use water only to wash their hands while others use both soap and water and still contaminate the already washed hands by using their wrappers or rags to wipe and dry their hands. Authors therefore conclude that positive attitude may not necessarily translate into good practice. As a matter of practice, very few of our respondents used soap in hand washing despite majority alleging hand washing practice. This is not surprising because majority of our respondents did not think that use of soap was important or necessary in hand washing. In other related studies, combined use of soap and water after defecation was reported among half (Hoque, 2003), one third in another study (Datta1, Singh & Boratne et al, 2011) both of which findings were higher than our findings; and among about one fifth of respondents in yet another study (Bartram & Cairncross, 2010) which is similar to our findings. About three-quarters of study respondents agreed that the hands should be washed after sneezing in contrast to the findings of a study carried out Dhaka, Bangladesh by Nazreen et al where participants never observed hand washing after they coughed or sneezed into their hands. The advantage of washing hands is to cleanse the hands of microorganisms and chemicals which can cause personal harm or disease. Additional use of soap could remove transient potentially pathogenic organisms from the hands, thus washing the hands with only water may not be sufficient to achieve these objectives most especially after critical events like defecation/urination, and

before food preparation for children

It has been documented that the effectiveness of hand washing with soap can reduce diarrheal risk up to 47% when compared to using water alone (Curtis & Cairncross, 2003). The practice of hand rinsing rather than washing hands with soap and water is therefore likely to contribute significantly to the health status of the respondents' under-five children.

Socio-demographic characteristics found to be associated with better knowledge of hand washing in this study included mother's educational attainment which is in agreement with the finding of a Kenyan study by Blanton et al, and another similar study in which mothers with higher socioeconomic status and higher education status were reported to have better hand washing practices (Dattal, Singh, Boratne et al., 2011). Blanton et al also reported an association between parental education on water treatment and improved health status of children following implementation of a school-based program that resulted in pupil-to-parent knowledge transfer (Halder, Tronchet, Akhter et al., 2010). Parental (especially mothers) hygiene education is therefore imperative to the achievement of the millennium development goal (MDG 4) targeted at child mortality reduction (Nasreen, Azziz-Baumgartner, Gurley et al., 2010). Mothers with high socioeconomic status are more likely to have read about the concept and importance of hand washing, are more likely to be able to afford buying soap for hand washing and are more likely to have adequate kitchen and other household facilities that would enable them to practice hand washing effectively.

This study also showed a religious gradient in the knowledge about hand washing with Christians showing better knowledge than their Muslim counterparts. This corroborates the findings from another study (Dattal, Singh, Boratne et al., 2011). In Nigeria, the relative observations reporting Christians to be more educated than other religious groups could explain this religious disparity.

Conclusion

The study respondents demonstrated a relatively good degree of knowledge, attitude and practice of hand washing although those with higher educational levels demonstrated better knowledge and practice of hand washing. The Christian respondents had better knowledge than the Muslims about hand washing. However, a significant proportion of the respondents did not think that it was necessary to use soap for hand washing. To optimally realize the health benefits of hand washing, we recommend that efforts to improve hand washing practices using evidence-based behavior communication strategies and multiple dissemination channels such as campaigns, health outreaches and mass media health education messages in the study community (and in Nigeria as a whole) should be instituted especially to encourage adding soap to current hand rinsing practices. Strategies targeted at improving the educational levels of primary care givers of under-five children should also be embarked upon by the various tiers of government if MDG 4 will be attained in Nigeria.

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