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EXTENT OF HAND WASHING PRACTICE AMONG SECONDARY SCHOOL STUDENTS IN EBONYI STATE, NIGERIA

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ABSTRACT: *High incidence of diarrhoeal diseases has been noted among secondary school students in Nigeria. The place of contaminated hands in the transmission of these diseases especially living quarter with close proximity like schools has been observed. These diseases can be prevented if students wash their hands with running water and soap. This cross-sectional survey was designed to determine to what extent secondary school students in Ebonyi State practice proper handwashing. The sample comprised 420 male and female students in both junior and senior classes selected through a multi-sampling method from government schools, located in both urban and rural area of the Ebonyi State were used for the study. The instrument for data collection was a 3-point scaled, 18-item self-structured questionnaire eliciting responses on extent of handwashing with soap and running water in 15 situations requiring handwashing. Face validation of the instrument was obtained by the judgement of 5 experts. The reliability of the instrument was determined using Cronbach Alpha, which yielded 0.862 reliability coefficient. The copies of the questionnaire were distributed among the students at an agreed upon time with the school by trained research assistance. The extent of handwashing practice was determined using the criterion means of 2.01-3.0 as high extent, 1.01-2.0 as low extent and 0.1-1.0 as very low extent. T-test statistic was used to test the hypotheses at 0.05 alpha level. The extent of handwashing was found to be low among secondary school students with a mean score of 1.31. It was found that male students practice handwashing significantly higher than their female counterparts and that there was no significant difference in handwashing practice of student by level of study of students and by location of residence of the students. The findings of the study have implications for the handwashing campaign in Nigeria, the health of the students, method of health education and hygiene education curriculum development. Recommendations were made which included that handwashing be promoted using the mass media, improvement on hygiene education curriculum and its delivery and provision of handwashing facilities for schools to concretize learning.*

KEYWORDS: Handwashing, Hygiene, Secondary School, Practice, Students, Location, Gender

INTRODUCTION

Prevention of infectious diseases has become one of the daunting challenges facing developing countries all over the world in varying degrees. One area of special concern is the control of diseases in a school population where pupil/students live in very close proximity

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with each other. One of the most important vehicles of transmission of diseases in such environment is the hand, spelling the need for appropriate hand hygiene (White, Kolble, Carlson, Lipson, Dolan, Ali, et al., 2003; Galiani, Gertler, & Orsola-Vidal, 2012). Han, Oo, Aye and Hluing (1986) posited that hands readily become contaminated from so many activities like, using the toilet, after changing a baby's diaper (nappy), handling raw food, playing, shaking hands, cleaning, after handling pets and domestic animals, after wiping or blowing the nose or sneezing into the hands and after caring for an infected person (Han, Oo, Aye & Hluing, 1986). In such critical moments, hand hygiene especially handwashing with soap and running water has been scientifically proven and recommended as a cost effective and high impact intervention in reducing morbidity and mortality due to infectious diseases (Curtis & Cairncross, 2003; Agberemi, Ofenu, & Saidu, 2009).

Hand hygiene has been identified as the simplest and the most cost effective method of preventing most common infections that cause mortality and morbidity in human population. Hand hygiene is a general term that applies to handwashing, antiseptic hand washing, alcohol based hand rub or surgical hygiene/antiseptic (Curtis & Cairncross, 2003; Uneke, Ndukwe, Oyibo, Nwakpu, Nnabu, & Prasopa-Plaizier, 2014). Handwashing which is the easiest and commonest among these hand hygiene practices refers to washing hands with plain soap and running water and remains the most sensible and affordable strategy for hand hygiene among the general population.

International agencies and governments because of the obvious benefits of handwashing in infectious disease reduction have been mounting interventions to improve the adoption of handwashing as a standard practice among community members. In Nigeria, handwashing was introduced as one of the strategies for hygiene promotion in the Federal Government of Nigeria (FGN)/UNICEF/Water, Sanitation and Hygiene (WASH) Programme in 2004, it was also relaunched on 20 May 2008 as one of the programme designed to mark the International Year of Sanitation declared by the United Nations General Assembly (Agberemi, Ofenu, & Saidu, 2009; UNICEF, 2006). This programmes where designed focusing more on mothers, children and adolescents.

Targeting school children and young persons in the handwashing campaign will play a significant role in efforts to achieve the Millennium Development Goals (MDGs) connected to health improvements, education and the diminution of poverty and child mortality (Adams, Bartram, Chartier, & Sims, 2009). This will obviously lead to early internalization of handwashing principles and practice from the primary and secondary levels of education and ensure adherence to these practices all through life. Normally in a school setting these practices are internalized through the availability of sanitation facilities and hygiene education programmes which Aremu observed to be grossly inadequate in Nigerian Secondary Schools (Aremu, 2012). Olukanni (2013) in a study in South-Western Nigeria confirmed that the hygiene practices of secondary school students were grossly inadequate. The Nigeria Demographic and Health Survey (NDHS) revealed that diarrhoea and cholera outbreaks which are diseases of poor hygiene are common occurrences in Nigerian schools (National Population Commission, 2004). Diseases in a school population is a major limiting factor in the educational progress of any child, as it leads to absenteeism, poor classroom performance and early school dropout, and all these militate against the achievement of quality universal basic education (White, Kolble, Carlson, Lipson, Dolan, Ali, et al., 2003).

Even though handwashing is a common practice in the Nigerian society, the frequency and method of the practice might not have met internationally recommended standards. Many

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researchers have observed low compliance to standards of hand washing world over even with availability of soap and water; worst still even among medical professionals (Moe, Christmas, Echols, & Miller, 2001; Scott, Curtis, & Ravie, 2003; Uneke, Ndukwe, Oyibo, Nwakpu, Nnabu, & Prasopa-Plaizier, 2014).

Drankiewicz and Dundes reported that most handwashing compliance studies has focused and documented this practice in hospital environments, while very few studies had focused on schools (Drankiewic & Dundes, 2003). In Nigeria the need for such studies in secondary schools is necessitated by the observation of NDHS outbreak of diseases and absence of enabling environment and facilities for the practice of handwashing (National Population Commission, 2004). Therefore, this study is designed to fill that gap by ascertaining to what extent secondary school students in Ebonyi State of Nigeria practice handwashing with soap and water and to determine extent of practice by location, gender and level of study of these students.

METHODS

Participants and setting

A cross-sectional survey was carried out among a sample of 420 students drawn randomly from government owned secondary schools of Ebonyi State. The sample cuts across urban and rural schools; boys and girls school; and senior and junior secondary schools using multi-stage sampling technique, with appropriate sampling method used at every stage of selection of samples.

Instrumentation

The instrument for data collection is an 18-item self-structured Extent of Handwashing practice questionnaire for Secondary School Students (EHPQSSS). The instrument is made up of two sections; section A contained three questions on location, gender and level of study of the respondents, while section B had fifteen items on extent of handwashing with soap and running water in several situations requiring hand washing. The respondents were required to indicate always, often and seldom to the question items in order to indicate extent of handwashing practice. Face validity of the instrument was determined by five experts in health education and measurement and evaluation. Thirty students selected from two LGAs not included in the study were used to establish the internal consistency of the instrument using the statistical tool, Cronbach alpha which yielded a reliability coefficient of 0.862 which is adjudged high reliability.

Data collection

Preliminary Advocacy visits were made and consent obtained from the Principals of all the sampled secondary schools for the study, and also to gain the confidence and co-operation of the class teachers. Four research assistants, who were trained before the exercise, were used for data collection. Questionnaire was administered only on the students who willingly volunteered to participate at the spot (in their respective class rooms) at a mutually agreed time. This is to fulfil ethical demands for the study and avoid disruption of class activities.

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Data Analysis

A total of four hundred and twenty (420) copies of questionnaire were distributed to the respondents, out of which four hundred and eighteen (418) were returned but only three hundred and ninety eight were validated as correctly filled. The options where weighted Seldom = 1, Often = 2 and always = 3. Mean ($\bar{x}$) and standard deviation (SD) were calculated for the purposes of description and to answer the research questions. The following criterion means were used to interpret the results of the study: a mean ($\bar{x}$) of 2.01-3.0 implied that students adopted handwashing practice to a high extent (HE); 1.01-2.0 implied that students adopted handwashing practice to a low extent (LE) and 0.1-1.0 implied that students adopted handwashing practice to a very low extent (VLE).The hypotheses of no significant difference in extent of handwashing practice based on location, gender and level of study were tested at alpha level of 0.05 using t-test statistic.

RESULTS

Table 1: Mean and standard deviation on the extent of handwashing practices among secondary school students in Ebonyi State

S/N	Items	$\bar{x}$	SD	Dec.
	How often do you wash hands with soap and running water			
1.	Before meals	1.10	.35	LE
2.	After meals	1.09	.29	LE
3.	After using the toilet	1.12	.34	LE
4.	After games/sports/play	1.24	.49	LE
5.	When you return from school	1.27	.53	LE
6.	Whenever you touch dirty objects	1.25	.44	LE
7.	Before eating fruits	1.30	.53	LE
8.	After eating fruits	1.40	.16	LE
9.	Before eating snacks	1.38	.56	LE
10.	After eating snacks	1.39	.56	LE
11.	After blowing or wiping nose	1.30	.59	LE
12.	After handling raw food	1.30	.58	LE
13.	After handling live animals	1.36	.67	LE
14.	Before touching genital e.g. Urinate, menstruate	1.75	.89	LE
15.	After touching genitals	1.60	.84	LE
	Overall	**1.31**	**.29**	**LE**

*HE = High Extent, LE = Low Extent, VLE = Very Low Extent

Table 1 indicated that for all the items, the mean scores ranged from 1.10 to 1.75 and with a cumulative mean of 1.31, meaning that secondary school students in Ebonyi State practiced handwashing to a low extent. The lowest mean scores was recorded under the item 'washing hand before and after meals' while the highest mean scores were record under the item 'washing hand before and after touching the genitals'.

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Table 2: Mean, standard deviation and t-test analysis on extent of handwashing practices among secondary school students in Ebonyi State by location of school

S/N	Items	Location	N	$\bar{x}$	SD	t-cal	df	t-crit	*Dec.
1.	Before meals	Urban	225	1.08	0.33				
						1.72	398	1.96	NS
		Rural	175	1.14	0.39				
2.	After meals	Urban	225	1.07	0.27				
						1.4	398	1.96	NS
		Rural	175	1.11	0.33				
3.	After using the toilet	Urban	225	1.13	0.37				
						0.41	398	1.96	NS
		Rural	175	1.11	0.33				
4.	After sports/games	Urban	225	1.26	0.50				
						0.90	398	1.96	NS
		Rural	175	1.22	0.50				
5.	When you return from school	Urban	225	1.28	0.53				
						0.62	398	1.96	NS
		Rural	175	1.25	0.54				
6.	Whenever you touch dirty objects	Urban	225	1.24	0.44				
						0.28	398	1.96	NS
		Rural	175	1.26	0.45				
7.	Before eating fruits	Urban	225	1.33	0.56				
						1.53	398	1.96	NS
		Rural	175	1.25	0.50				
8.	After eating fruits	Urban	225	1.46	0.67				
						2.59	398	1.96	S
		Rural	175	1.30	0.53				
9.	Before eating snacks	Urban	225	1.34	0.60				
						1.52	398	1.96	NS
		Rural	175	1.25	0.52				
10.	After eating snacks	Urban	225	1.39	0.57				
						0.14	398	1.96	NS
		Rural	175	1.39	0.55				
11.	After blowing and wiping nose	Urban	225	1.31	0.62				
						0.62	398	1.96	NS
		Rural	175	1.27	0.55				
12.	After handling raw food, e.g. meat	Urban	225	1.32	0.64				

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						2.23	398	1.96	S
		Rural	175	1.19	0.51				
13.	After handling live animals	Urban	225	1.40	0.70				
						1.44	398	1.96	NS
		Rural	175	1.30	0.63				
14.	Before touching genitals e.g. urinate/menstruate	Urban	225	1.77	0.90				
						0.72	398	1.96	NS
		Rural	175	1.71	0.88				
15.	After touching genitals	Urban	225	1.65	0.87				
						1.46	398	1.96	NS
		Rural	175	1.53	0.79				
	Overall	**Urban**	**225**	**1.34**	**0.32**				
						1.66	**398**	**1.96**	**NS**
		Rural	**175**	**1.29**	**0.27**				

*Dec. = Decision; S = Significant; NS = Not Significant

Table 2 presented the difference in extent of handwashing among the students in urban and rural areas of Ebonyi State. The table indicated that both the urban and rural students practiced handwashing to a low extent. Meanwhile, the cumulative mean score indicated that there is difference in the extent of handwashing practices between the urban and rural students with the urban students having a mean score of 1.34 while rural students had a mean score of 1.29. The standard deviations (urban = 0.32; rural = 0.270) indicate that the deviation from the mean is slim. The item by item t-test indicated that a significant difference existed only in the handwashing practice of washing hand after eating fruit and after handling raw food amongst urban and rural students. The cumulative t-test analyses indicated that there is no significant difference in handwashing practice between urban and rural students in Ebonyi State.

Table 3: Mean, standard deviation and t-test analysis on extent of handwashing practices among secondary school students in Ebonyi State by gender

S/N	Items	Gender	N	$\bar{x}$	SD	t-cal	df	t-crit	Dec
1’	Before meals	Male	214	1.12	0.40				
						1.14	398	1.96	NS
		Female	186	1.08	0.29				
2.	After meals	Male	214	1.09	0.31				
						0.95	398	1.96	NS
		Female	186	1.07	0.28				
3.	After using the toilet	Male	214	1.15	0.41				
						1.90	398	1.96	NS
		Female	186	1.08	0.28				
4.	After sports/games	Male	214	1.33	0.57				
						3.69	398	1.96	S
		Female	186	1.15	0.38				
5.	When you return from	Male	214	1.35	0.59				

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	school								
						3.09	398	1.96	S
		Female	186	1.18	0.43				
6.	Whenever you touch dirty objects	Male	214	1.27	0.46				
						0.78	398	1.96	NS
		Female	186	1.23	0.42				
7.	Before eating fruits	Male	214	1.32	0.54				
						1.00	398	1.96	NS
		Female	186	1.27	0.52				
8.	After eating fruits	Male	214	1.43	0.63				
						1.30	398	1.96	NS
		Female	186	1.35	0.50				
9.	Before eating snacks	Male	214	1.30	0.54				
						0.14	398	1.96	NS
		Female	186	1.29	0.60				
10.	After eating snacks	Male	214	1.43	0.58				
						1.71	398	1.96	NS
		Female	186	1.33	0.53				
11.	After blowing and wiping nose	Male	214	1.33	0.62				
						1.51	398	1.96	NS
		Female	186	1.25	0.55				
12.	After handling raw food, e.g. meat	Male	214	1.31	0.63				
						1.86	398	1.96	NS
		Female	186	1.20	0.53				
13.	After handling live animals	Male	214	1.40	0.69				
						1.42	398	1.96	NS
		Female	186	1.31	0.65				
14.	Before touching genitals e.g. urinate/menstruate	Male	214	1.91	0.92				
						4.07	398	1.96	S
		Female	186	1.55	0.82				
15.	After touching genitals	Male	214	1.80	0.90				
						5.52	398	1.96	S
		Female	186	1.35	0.69				
	Overall	**Male**	**214**	**1.37**	**0.31**				
						4.20	**398**	**1.96**	**S**
		Female	**186**	**1.25**	**0.28**				

Table 3 presented the difference in extent of handwashing practice among male and female secondary school students in Ebonyi State. The table indicated that extent of handwashing practice is low for both male and female student though the extent of practice is higher in male than in female students with cumulative mean scores of 1.37 and 1.25 respectively and that this difference is significant at a 95% confidence level. It also indicated a significant difference for items 4,5,14 and 15.

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Table 4: Mean, Standard Deviation and t-test Analysis of Extent on Handwashing Practices among Secondary School Students in Ebonyi State by level of study

S/N	Item	Class	N	$\bar{x}$	SD	t-cal	df	t-crit	Dec.
1.	Before meals	*JSS	169	1.08	0.31				
						1.23	398	1.96	NS
		SSS	231	1.12	0.39				
2.	After meals	JSS	169	1.06	0.26				
						1.49	398	1.96	NS
		SSS	231	1.10	0.32				
3.	After using the toilet	JSS	169	1.11	0.34				
						0.48	398	1.96	NS
		SSS	231	1.13	0.37				
4.	After sports/games	JSS	169	1.17	0.44				
						2.44	398	1.96	S
		SSS	231	1.29	0.54				
5.	When you return from school	JSS	169	1.20	0.47				
						2.42	398	1.96	S
		SSS	231	1.32	0.57				
6.	Whenever you touch dirty objects	JSS	169	1.22	0.42				
						0.97	398	1.96	NS
		SSS	231	1.27	0.46				
7.	Before eating fruits	JSS	169	1.29	0.56				
						0.24	398	1.96	NS
		SSS	231	1.30	0.51				
8.	After eating fruits	JSS	169	1.43	0.68				
						0.93	398	1.96	NS
		SSS	231	1.37	0.57				
9.	Before eating snacks	JSS	169	1.27	0.56				
						0.84	398	1.96	NS
		SSS	231	1.32	0.57				
10.	After eating snacks	JSS	169	1.33	0.51				
						1.80	398	1.96	NS
		SSS	231	1.43	0.59				
11.	After blowing and wiping nose	JSS	169	1.24	0.56				
						1.69	398	1.96	NS
		SSS	231	1.34	0.61				
12.	After handling raw food, e.g. meat	JSS	169	1.27	0.61				
						0.11	398	1.96	NS
		SSS	231	1.26	0.57				
13.	After handling live animals	JSS	169	1.33	0.66				
						0.67	398	1.96	NS
		SSS	231	1.38	0.69				

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14.	Before touching genitals e.g. urinate/menstruate	JSS	169	1.87	0.96				
						2.41	398	1.96	S
		SSS	231	1.65	0.83				
15.	After touching genitals	JSS	169	1.69	0.90				
						1.86	398	1.96	NS
		SSS	231	1.53	0.79				
	Overall	**JSS**	**169**	**1.30**	**0.30**				
						0.60	**398**	**1.96**	**NS**
		SSS	**231**	**1.32**	**0.30**				

*JSS = Junior Secondary School; SSS = Senior Secondary School

Results in Table 4 indicated that both senior and junior secondary school students in Ebonyi State practice handwashing to a low extent. It also indicated that there is a difference in the mean score of students on extent of handwashing practice by level of study. Those in senior secondary school (SSS) had a higher mean score of 1.32 as against 1.30 for junior secondary school (JSS), but this difference was not significant. The item by item analysis indicated that that SSS students practice handwashing better on almost all the items save for items 7, 12, 14 and 15. The differences in the mean scores were significant only for items 4, 5 and 14.

DISCUSSION

Tables 1-4 showed that extent of handwashing practice among secondary school students in Ebonyi State Nigeria were low with a cumulative mean score of 1.31. The finding is not surprising considering that studies had identified that Nigerian Secondary School were lacking in facilities and quality hygiene education that will help inculcate this good habit in them (Aremu, 2012; Olukanni, 2013). This observed low extent of practice of handwashing might have accounted for the observed high incidence of diarrheal and respiratory diseases among this population as reported by some studies (National Population Commission, 2004; Scott & Vanick, 2007). This finding has serious implication on the health of these students and their quality of education, since ill health has been found to be inimical to the educational progress of students.

The finding in Table 1 that handwashing before and after eating were the least practiced with mean scores of 1.10 and 1.09 respectively is disturbing, this is because of the extent of contamination which the hand is exposed to at every turn in the school environment (Han, Oo, Aye, Hlaing, 1986; White, Kolble, Carlson, Lipson, Dolan, Ali, et al., 2003). Such heavily contaminated hand will act as vehicles for the transfer of pathogens into the body. It is even more worrisome because the practice seems to be common to all the students as indicated by the very slim deviation from the mean (0.29). This implies that there is need for homes/families to be actively involved in hygiene education at early stages of a child's development so that they can internalize this practice and avoid the damages of ill-health associated with poor hygiene.

Table 2 showed the extent of practice of handwashing among secondary school students in Ebonyi State by location of residence. The finding indicated that both rural and urban students practice handwashing to a low extent with mean scores of 1.29 and 1.34 respectively. Even though the urban students had a higher mean score than the rural students,

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it is curious that the difference is not significant, considering the prevailing urban conditions. The urban environment is characterized with access to mass media and the flow of information, it is expected that the urban students will practice handwashing better. This might be an indication that the benefits of hand hygiene has not been given the desired publicity and that the handwashing intervention programmes in Nigeria are not doing enough to improve handwashing uptake by the Nigerian public.

Data on table 3 revealed that males significantly practice handwashing more than the female students. This finding is not in agreement with the findings of other studies which consistently found women as practicing handwashing better than men (van de Mortel, Bourke, McLoughlin, Reis, 2001; Drankiewic & Dundes, 2003)[14, 16]. Table 3 also indicated that males practice handwashing after touching the genitals more than females with mean scores of 1.37 and 1.25 respectively. The finding is surprising because women by their anatomical disposition are supposed to be more careful about genital-hand relationship especially during urination and menstrual period to avoid introduction of pathogens which survive more in the female genitalia. The finding has implication for female hygiene practices especially menstrual hygiene and the care of the female genitalia because it's obvious danger to the reproductive health of the females. The finding also has research implications as the finding differ from findings elsewhere. This will involve investigating the peculiar circumstance that produced this result.

Table 4 showed that there are no significant difference in the extent of handwashing practice among senior and junior secondary school students even though the mean score of senior secondary school students was higher than that of the junior secondary students (1.32 and 1.30 respectively). That there is no significant difference in the extent of handwashing practice is worrisome, implying that there might be deficiencies either in curriculum content, enabling environment or delivery of hygiene education as reported by Aremu and Olukanni (Aremu, 2012; Olukanni, 2013).

CONCLUSION

The result of this study showed that the secondary school students in Ebonyi State Nigeria practice handwashing to a low extent. It indicated that males practice handwashing more than the female even to handwashing as it relate genital hygiene, a finding that did not agree with findings elsewhere. It also indicated that there was no significant difference in the practice of handwashing among urban and rural students and senior and junior student. Based on these findings the following recommendations were made:

1. That the concerned agencies of government should take steps to enhance hygiene education in Nigerian schools, especially in primary and secondary schools in the area of curriculum improvement, delivery and creating the enabling environment for handwashing practice to flourish by providing handwashing facilities in school.

2. The federal government should re-evaluate the effectiveness of the ongoing handwashing intervention campaign in Nigeria with the aim of making it more effective. This can be achieved by using the mass media maximally and targeting special groups like secondary school students.

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3. Parents should be encouraged by government and non-governmental organizations to start inculcating good hygiene habits like handwashing and menstrual hygiene in their children early in life to make it a part of their daily living even into old age.

4. Researchers are encouraged to investigate other factors relating to extent of handwashing compliance to understand why the extent of practice of this all important hygiene activity is low among secondary school students and see if the same result will be found among other segments of society.

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