

AN EXPLORATORY INVESTIGATION INTO THE STATUS OF WATER, SANITATION AND HYGIENE (WASH) OF SCHOOLS IN ENUGU STATE, NIGERIA

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Abstract

The status of water, sanitation and hygiene (WASH) facilities was investigated in sixty schools in seven local government areas of Enugu State, Nigeria. A total of sixty schools comprising of twenty-four (24) private schools, twenty (20) government schools and Sixteen (16) mission schools were investigated in this study. Using questionnaire and on-the-spot assessment, WASH facilities in the selected schools were subjected to in-depth scrutiny. The highest number of schools that do not have a water source within the school premises are government schools (10), followed by private schools (7) and then mission schools (2). About seventy-one percent (71%) of the schools investigated rely on self-help water supply sources such as water vendors, rainwater harvesting and private boreholes. Fifty-seven (57) or 95% of the sixty (60) schools of all the schools have toilet facilities ranging from improved pit latrine (10%), flush toilet (31.7%) and pour flush toilet (53.3%). With respect to toilet cleaning, 33%, 17% and 50% of private, government and mission school clean their toilets every day. Fifty-five percent (55%) of all schools always provide handwashing facilities while 13.3% never provide handwashing facilities. Based on school category, the distribution of schools that provide handwashing facilities are as follows: private schools – 54.2%, government schools – 40% and mission schools – 75%. There was a significant correlation ($r = 0.85$) between availability of toilet facilities and provision of handwashing facilities. There was also a significant correlation ($r = 0.555$) between the provision of handwashing facilities and the provision of soap.

1.0 INTRODUCTION

Water, sanitation and hygiene (WASH) have remained one of the foremost issues of concern in developing countries. The paucity of basic sanitation and personal hygiene facilities both in private homes and public places has imposed an inestimable toll on the health of the most vulnerable members of the society. Infants and school children who spend most of their time in the school premises are usually exposed to environmental conditions that exceed are far less than ideal or desirable. WASH facilities are central to both the transmission and mitigation of routine as well as rare contagious diseases [1]. It has been reported that diarrheal diseases are responsible for one in nine child deaths 88% of which can be attributed to inadequate sanitation, unsafe water and insufficient hygiene facilities [2]. School-aged children are at high risk for water, sanitation, and hygiene (WASH)-related morbidities, including soil transmitted helminths and trachoma [3]. The endemic annual outbreak of diarrheal diseases among children can be traced to the intermingling of infected and health children at school

as well as transmission occasioned by the use of common WASH facilities that do not meet minimum standards. Though women and children are usually saddled with the burden of water and sanitation-related chores in the generality of sub-Saharan African communities, they have been reported to be the most vulnerable and susceptible to the outfalls of poor WASH services [4]. The spike in gastrointestinal and respiratory diseases responsible for half of all child deaths have been linked to poor WASH practices [5].

Shortage of water supply, inadequacy of toilets and general low level of sanitation in schools have been reported in many parts of the world [6]. Even in the most advanced countries, WASH in schools generally lags that of homes and offices. This situation exposes school children to several health risks and routes of infection. Impaired cognitive learning and poor learning performance are long-term outcomes of the negative effects of infections such as diarrhea, worm infestations, and dehydrations which are largely attributed to poor water, sanitation, and hygiene conditions both at homes and in schools [7]. Furthermore, inadequate WASH conditions have been reported to reduce educational outcomes in children by contributing to absenteeism and impaired cognitive abilities [8]. Absenteeism results from time spent at hospitals for consultations and treatments as well as convalescence time at home. Studies have shown that implementation of WASH programmes in schools result in significant reduction in absenteeism [9, 10].

In essence, WASH in schools is a pathway to healthier schools and healthier, better performing children [11]. Overall, the implementation of the WASH in schools has been found to be effective, though poor planning and coordination, inadequate funding, and low technical capacity were identified as barriers to achieve the intended objectives [12]. The educational system in Nigeria has been bedevilled with poor funding which has in turn caused progressive decline in the quality of education and infrastructural decay. Critical facilities such as classroom windows, chairs, school library, science laboratories, art studios and many others have gradually disappeared from government owned schools. This decay has also resulted in the dilapidation of basic WASH facilities which are critical to the wellbeing of school children.

2.0 METHODOLOGY

Seven Local Government Areas were selected for the study namely, Nsukka, Igbo-Eze South, Igbo-Eze North, Udenu, Enugu North, Enugu South, and Enugu East. The schools were selected by dividing the state into three cadres with respect to development namely;

Urban, Semi-urban, and Rural areas and further chosen from different local governments within the state. Data collection was achieved using a combination of survey questionnaire and personal observation. The survey questionnaire was structured to elicit comprehensive data on the problems of WASH, and WASH facilities in schools across the seven local government areas of focus. A total of sixty schools were investigated under the following broad categories: private (24), government (twenty) and mission (16). For each school visited, while questionnaire was being administered, interviews and personal observation of the current state of WASH in the schools were simultaneously undertaken.

The observatory aspect of the study paid attention to the availability of hand-washing facilities, provision of potable water, functionality of the existing latrines, presence of anal cleaning agent in the toilets, drainage channels, and method of solid waste disposal and facilities etc. However, the contradictions of answers given by teachers and students during the questions were noted. Further confirmatory evidence was collected by means of pictorial representation of the true situation of events in those schools.

During the field analysis and data collection participation was made voluntary. None of the students and teachers was coerced to fill out the questionnaire. The respondents particularly school children, were allowed to ask questions at points of confusion and were given ample opportunity to completely understand the question before answering. Teachers and school principals were assured that none of the results deduced from the school analysis would be published or handed over to any governmental agency or rival school. The schools were assessed according to JMP and WHO standards, based on the comfort of the student, teachers and the environment.

3.0 RESULTS AND DISCUSSION

3.1 Water Sources and Supply in Schools

An analysis of the results obtained showed that nineteen (32%) of all schools surveyed do not have a water source in the school premises. The highest number of schools (10) that do not have a water source within the school premises are government schools, followed by private schools (7) and then mission schools (2). Only one school (government owned) has piped water within the premises. The mission schools and private schools mostly resort to self-water for water supply. Fifty percent (50%) of private schools rely on water trucks to supply water to them routinely, while twenty one percent (21%) of them have boreholes within the school premises. This way, constant supply



of water can be guaranteed subject to availability of constant power for pumping. Studies have reported a high rate of dependence on self-help water supply in many developing countries owing to the collapse of municipal water supply schemes [13, 14]. This reality that exists in the larger society is clearly propagated back to the schools. In order to ameliorate the degree of water stress faced by school children and students and also ameliorate the well-established repercussion of water scarcity, some school managements have resorted to rainwater harvesting in order to provide water for the staff and pupils.

Figure 1 shows that 3 government schools and 1 mission school rely on harvested rainwater as their main source of water supply. Even though this measure will go a long way in resolving some of the water-related problems associated with water scarcity, it has some adverse potential health implications for the children when consumed without treatment. The rainwater harvesting system shown in Figure 2b as captured in one of the schools is clearly not competent to serve as a potable water sources. A cursory examination shows that the tank is rusted and the top is open thus making it susceptible to invasion of contaminants. The overhead tank unit shown in Figure 2b is more reliable in terms of supplying potable water supply because it is a closed system that makes very little or no room for ingress of contaminants. If it is connected to a borehole, then the entire process from abstraction to point-of-use delivery is safeguarded against contamination. In a further attempt to cushion the water stress faced by school children, it is common for children to go to school with their personal water flasks which are usually kept on the floor at the back of the classrooms. These water bottles also present some degrees of health risk as a result of the poor hygienic habits of the children. Constant supply of water to school children is critical for the overall wellbeing of the children. Adequate water supply is a basic precursor to improved sanitation, personal hygiene and health of the school child. It has been reported that dehydration can adversely affect psychological factors that in turn affect cognitive performance such as attention, concentration, short term memory, mood and perceived efforts [15, 16]. [3] reported an association between dehydration and cognitive test scores among primary school children in Zambia. [17] reported that rehydration by water supplementation improved the overall cognitive ability and psychological state of college students in Cangzhou, China.

Table 1 further shows that only 18% of all schools surveyed have constant water supply, forty-eight percent (48%) have water sometimes and thirty-five

percent (35%) do not have water at all. It is important to note that the availability of water source or infrastructure within the school premises does not usually guarantee availability of water. This partly explains why some schools might have a water source and yet suffer from lack of water supply. Despite the presence of borehole in some of the schools, reasons why constant water supply cannot be guaranteed include: pump failure, power failure, unavailability of operator, well collapse amongst others.

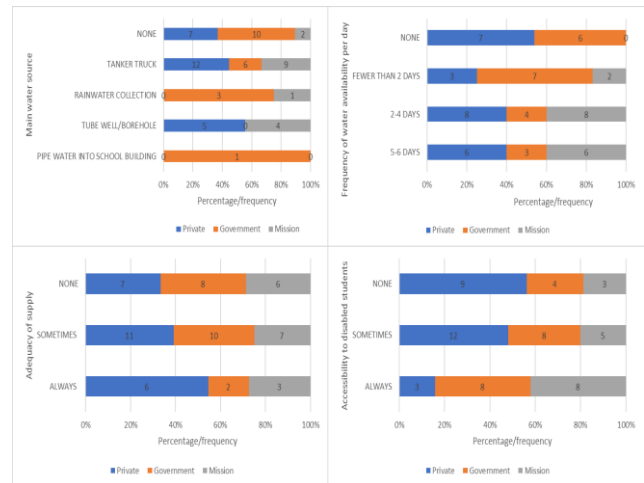


Figure 1: Status of water supply in schools



Figure 2: (a) Rain as water sources in a government school; (b) Overhead tank supply at a mission school

3.2 Provision of Sanitary Facilities in Schools

Results obtained show that 57 (95%) of all the schools investigated in this study have toilet facilities ranging from improved pit latrine (10%), flush toilet (31.7%) and pour flush toilet (53.3%). The improved pit latrine represents a retrofitting of pit latrines in order to improve on sanitary services. This type of toilet was found only in government owned and mission schools with a count of three in each. It is also important to note that most of the mission schools operate a hybrid management that is based on joint participation by the government and churches. Hence, it is expected that there may be some similarities in management

determined aspects of WASH. To further buttress the place of management and administration in determination on WASH status of schools, [18] reported that schools with male heads in Ethiopia were 7% less likely to have basic hygiene services than those with female directors

Two of the schools that do not have toilet facilities are in rural areas while the other one is located in the urban area. Though a very high proportion of the schools surveyed have toilet facilities, further investigation shows that these toilet facilities are grossly inadequate and poorly maintained. The most common type of toilet facilities irrespective of school management is the pour flush toilet type with the following distribution: private (62.5%), government (45%) and mission (50%). The use of flush and pour-flush toilets requires a fairly constant water supply which remains a fundamental problem in many developing countries. Further analysis of the data obtained reveals a worrisome contradiction in the sanitary condition of the schools. Only 26 % of the secondary schools have water supply up to five days a week, yet 80 % of these schools use flush and pour-flush toilets. Obviously, the water supply falls short of the requirement for keeping these toilets in good sanitary condition. Irregular water

supply usually results in a situation where toilets are not flushed even after repeated use by several students, thereby increasing the risk of infection and other health complications. Abundant water supply is a pre-requisite for ensuring public health. The above points are clearly buttressed by Figure 3 showing the squalid and dirty state of some of the school toilets.



Figure 3: Sanitation facilities found in schools

Table 1: Sanitary conditions across various categories of schools

SANITARY STATUS	TYPE OF SCHOOL					
	Private		Government		Mission	
	Count	Percentage	Count	Percentage	Count	Percentage
TYPE OF TOILET						
Pit Latrine	0	0%	0	0.0%	0	0.0%
Improved Pit Latrine	0	0%	3	15.0%	3	18.8%
Flush Toilet	9	37.5%	5	25.0%	5	31.2%
Pour Flush	15	62.5%	9	45.0%	8	50.0%
Compost Toilet	0	0%	0	0.0%	0	0.0%
None	0	0%	3	15.0%	0	0.0%
FREQUENCY OF TOILET CLEANING						
5-6 Days Per Week	8	33%	3	15.0%	8	50.0%
2-4 Days Per Week	12	50%	11	70.0%	8	50.0%
Fewer Than 2 Days Per Week	4	17%	3	15.0%	0	0.0%
None	0	0%	0	0.0%	0	0.0%
NUMBER OF STUDENTS PER DROPHOLE						
< 25	6	25%	0	0.0%	2	12.5%
26-40	13	54%	5	25.0%	9	56.2%
41-50	3	13%	9	45.0%	3	18.8%
50 and above	2	8%	6	30.0%	2	12.5%
GENDER-SEGREGATED TOILETS						
All	15	63%	12	60.0%	16	100.0%
Some	5	21%	5	25.0%	0	0.0%
None	4	17%	3	15.0%	0	0.0%

All the private schools have either the flush or the pour flush toilet types which is an indication of better management and more detailed attention to children's welfare. The private schools tend to provide better learning and sanitary facilities which makes them the more desirable choice for parents who can afford the usually comparatively more exorbitant fees charged by private school operators. Since private school operators

are constantly in competition with one another, they seem to be constantly under pressure to render improved services in order to retain their students and even attract new ones. In a similar study, [19] reported a significantly higher knowledge of basic WASH among students of private school than in public schools in Ibadan. However, this does not necessarily mean that the sanitary levels found in these schools meet relevant



standards. This reality is clearly portrayed in the frequency of toilet cleaning as shown in Table 1 which shows that only 33% of the private schools clean their toilets every day and 17% clean them fewer than two days per week.

The mission schools appear more committed to cleaning their toilet facilities as 50% of them clean their toilets everyday while the remaining 50% clean them two to four times per week. The worst performing are government schools where only 15% of the schools surveyed clean their toilets every day, while 70% clean on two to four times per day and the remaining 15% clean fewer than two days per week. There is clearly a lapse in the area of toilet cleaning in the schools surveyed. This can be attributed to shortage of manpower to undertake such menial and demanding task. Besides, it is a low paid job which only a few persons are willing to take in the interim. The squalid state of these toilets (Figure 4) forces the children to hold themselves until they get home before defecating. Those who cannot bear the unending wait are compelled to use the toilet as they are or even resort to open defecation in bushes and farmlands around the school premises. When people are compelled to use dirty toilets due to certain circumstances, there is usually the tendency to mess it up further. Some children might even defecate on the floor if no one is around or climb the toilet seats to prevent their buttocks from being in contact with the contaminated facilities.



Figure 4: Dilapidated sanitary facilities

Figure 4 shows the general condition of toilets in schools investigated. It would appear that, among other factors, poor maintenance, sheer neglect and poor health education are responsible for the abysmal state of hygiene in these schools. It is not uncommon to find toilets with missing doors, windows and roofs, dirty walls and soiled floors, surrounded by overgrown bushes especially in public schools. All these are

indications of poor sanitary conditions at schools which can have a lifetime effect on the health and psychology of the students. [20] reported a high incidence of gastrointestinal infections among primary school children as a result of poor hygiene.

Another critical aspect to consider about toilet facilities is the number of drop holes per pupil. Table 1 shows that 41.7% of the schools have toilets to students' ratio of more than 1 drop hole per 40 students while the remaining have a ratio of equal to or less than 1 drop hole per 40 students. On category basis, 79% of private schools, 25% of government schools and 68.7% of mission schools have toilets with a drop hole to student ratio of 1:40. The percentage of schools by category with students to drop hole ratio greater than 40 is as follows: private (21%), government (75%) and mission (31.3%). The gravity of the situation is more clearly expressed by looking at the global space of the schools and taking a ratio of number of students to number of toilets. Based on this approach, the average number of students per drop hole is 137 for elementary schools and 366 for secondary schools. Obviously, this is an indication of various degrees of violation of standard guidelines of toilet cubicle to student ratio of 1:50 for boys, and 1:40 for girls. None of the school provided male urinals [12]

Gender-segregation of private activities run very deep in the African culture. Hence, the delineation of boys' and girls' toilets is a very important component of sanitation management and administration in the schools investigated. Table 1 shows that 43 (71.7%) of the schools have strictly gender-segregated toilets with 100% of all mission schools having gender-segregated toilets. Only 7 (11.7%) of all the schools irrespective of ownership or management have gender-neutral toilets. Each of the gender-segregated toilet compartment serves an average of 159 boys and 194 girls in elementary schools. These results bear very strong similarities to the findings of [18] who reported that 86.7% of investigated in the Bishoftu Town of Ethiopia had gender-segregated toilet facilities.

3.3 Exploring Hygiene Levels in Schools

Further assessment of the general sanitary condition of the schools reveals serious lapses that require immediate attention. For instance, not all schools provide handwashing facilities for their students. Table 2 shows that 55% of all schools always provide handwashing facilities while 13.3% never provide handwashing facilities. Based on school category, the distribution of schools that provide handwashing facilities are as follows: private schools – 54.2%, government schools – 40% and mission schools – 75%.



This shows that mission schools are more hygiene conscious than the other two categories of schools, followed by private schools. Closely related to provision of handwashing facilities is the provision of soap for handwashing. The distribution is also similar to that of handwashing facilities with mission schools having the highest percentage of 43.7% as compared to 37.5% for private schools and 20% for government schools. 86.7% of both elementary and secondary schools provide handwashing facilities. The importance of the provision of handwashing facilities in schools cannot be overemphasized because school children are usually exposed to a wide range of contaminants either by contact with various inert surfaces or other children.

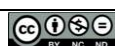
Basically, children are mandatorily expected to wash their hands before eating and after using the toilet. However, this expectation is not usually met due to the absence of the requisite facilities, unavailability of water or lack of basic WASH knowledge among the children. In another study that considered only private and government schools, [19] observed that variables that significantly predicted hand hygiene practice were availability of water in school toilets, comfortability of using school sanitary facilities, availability of toilet cleaners, and practice of open defecation at home. The just exited COVID-19 pandemic played a vital role in properly situating hand-washing as a key defence mechanism against contagious diseases. As countries struggled with the pandemic, hand-washing facilities began to appear in places where hitherto, they were never thought of. It is recommended that hand-washing be observed even after interacting with asymptomatic persons [21]. Hand-washing also helps in curtailing the rate of propagation and transmission of childhood diseases. [22] reported that strategic handwashing interventions for children can significantly improve their health status. More specifically, children who wash their hands regularly four times a day are likely to suffer 24% fewer sick days due to respiratory illnesses and 51% fewer sick days due to gastrointestinal illnesses [5]. It is important to note that [23] reported that hand-washing is most frequently practiced (92.2%

of surveyed households) after using the toilet, while the degree of practice for other activities such as before cooking and before cooking recorded lower frequencies in Ovia Northeast LGA of Edo State, Nigeria.

In terms of provision of information on menstrual hygiene, mission schools again outpaced the other schools with the highest in-category percentage of 56.3% as compared to 33% and 35% respectively for private and government schools. The same also applies to personal hygiene education with all the mission schools surveyed always providing personal hygiene instruction to their students but only 54.2% and 35% of private and government schools respectively providing personal hygiene education to their students. The foregoing reveals a deeper level of commitment of mission schools to environmental sanitation and personal hygiene of their students. This may not be unconnected with the moral inclination of administrating church with the underlying concept of "*cleanliness is next to godliness*". Besides, mission churches seem to have a major departure from private schools in the sense that they are usually not profit-driven which makes them to go the extra mile to provide services the students might not ordinarily be able to afford. Private schools are different in this regard because certain services can only be provided as long as management can afford it within their target margin of profit. Besides, mission school seem to have a more disciplined management and administration which is largely absent in many government owned schools where motivations is abysmally low due to low remuneration. Hence, it appears that while other factors as already identified contribute to the WASH status of schools investigated in this study, availability of finance also plays a critical factor. [18] found a strong association between having a budget line specifically for WASH services and provision of basic WASH facilities. There is no doubt that the consistently low allocation of funds to education in Nigeria is largely responsible for poor staffing and infrastructural decay especially at the primary and secondary school levels.

Table 2: Hygiene status of schools investigated

HYGIENE STATUS	TYPE OF SCHOOL					
	Private		Government		Mission	
	Count	Percentage	Count	Percentage	Count	Percentage
AVAILABILITY OF HANDWASHING FACILITY						
Always	13	54.2%	8	40.0%	12	75.0%
Sometimes	8	33.3%	7	35.0%	4	25.0%
Never	3	12.5%	5	25.0%	0	0.0%
PROVISION OF SOAP FOR HANDWASHING						
Always	9	37.5%	4	20.0%	7	43.7%
Sometimes	11	45.8%	12	60.0%	6	37.5%
Never	4	16.7%	4	20.0%	3	18.8%
INFORMATION ON MENSTRUAL HYGIENE						



Always	8	33.3%	7	35.0%	9	56.3%
Sometimes	9	37.5%	8	40.0%	2	12.5%
Never	7	29.2%	5	25.0%	5	31.2%
PERSONAL HYGIENE EDUCATION						
Always	13	54.2%	7	35.0%	16	100.0%
Sometimes	11	45.8%	10	50.0%	0	0.0%
Never	0	0.0%	3	15.0%	0	0.0%
SOLID WASTE DISPOSAL						
Thrown on Garbage Dump within or Near School Ground	11	45.8%	8	40.0%	9	56.3%
Buried within or Near School Ground	7	29.2%	9	45.0%	4	25.0%
Collected and Taken away by a Waste Disposal Service	6	25.0%	3	15.0%	3	18.7%
HOW OFTEN IS SOLID WASTE DISPOSED OFF						
Once a Day	13	54.2%	4	20.0%	9	56.3%
Between Once a Day and Once a Week	8	33.3%	10	50.0%	7	43.7%
Less frequently than Once a Week	3	12.5%	6	30.0%	0	0.0%

Table 3: Spearman’s rho non-parametric correlation

	Availability of toilet facilities	Provision of handwashing facilities	Provision of soap	Frequency of water availability
Availability of toilet facilities	1.000			
Provision of handwashing facilities	.850	1.000		
Provision of soap	.471	.555	1.000	
Frequency of water availability	-.575	-.407	-.104	1.000

Non-parametric correlation coefficients showed that there is a good correlation ($r = 0.85$) between availability of toilet facilities and provision of handwashing facilities (Table 3). Hence, most schools that have toilet facilities also provide handwashing facilities. This suggests that provision of toilet facilities for students puts on the school authorities the sense of responsibility to also provide handwashing facilities, thereby promoting hygiene among students. Moreover, most water closet toilet units come with wash hand basins. There was also a significant correlation ($r = 0.555$) between provision of handwashing facilities and provision of soap. The complete sequence of handwashing practice includes availability of water sources, provision of handwashing facility and availability of soap. In fact, most schools usually demand that students submit packets of soap and tissue paper at the commencement of every term possibly with the view to encourage handwashing. It would make no sense to ask children to submit soap if handwashing facilities were not provided. Besides, it is the students and not the school management that provides the soap for handwashing.

The good correlations among the WASH components shown in Table 3 is an indication of the interwoven and interdependent nature of these components. Hence, non-availability of one is likely to translate into the non-availability of another. Data generated during field study also shows that open defecation is still practiced in some schools. Inadequate numbers of latrines, limited accessibility and lack of maintenance by school management have been documented as factors that predisposes pupils to defecation on open grounds and nearby bushes [24]. This practice will continue in schools until decent toilet facilities are provided. None

of the schools (Nursery and Primary) visited had a WASH club as at the time of this study. Out of the Secondary schools surveyed none of the schools has ever benefitted in any WASH-related activity/programme.

4.0 CONCLUSION

This study has clearly revealed that water, sanitation and hygiene (WASH) in elementary and secondary schools leave much to be desired and therefore calls for urgent intervention. Bivariate analysis revealed that access to water was rarely available despite the abundance of WASH infrastructures which may pose a threat to the health of schoolchildren and teachers as they both share synergetic relationship for a productive learning. WASH infrastructures are poorly maintained, and infinitesimal health education exist. However, introducing inclusive health education and practise and a more sustainable source of water supply, with support from governmental and non-governmental organisations may reduce to a bearable minimum the lack of WASH practise saturating schools in Nsukka, Nigeria and improve their wellbeing and future.

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