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Schools in Nigeria: An Assessment of Water, Sanitation, and Hygiene in Sokoto State

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Abstract

The aim of this study is to assess the level of water, sanitation, and hygiene services in public secondary schools in Sokoto, state Nigeria using a survey of 120 student-teacher respondents determined using Raosoft Calculator. The study design was descriptive survey that allows the researcher to have an in-depth understanding of perception of the respondents. The sample size was calculated using a Raosoft calculator. The outcome of water services supplies at public secondary schools in Sokoto state, Nigeria divulged an overall basic service as 25.0%, the limited services recorded are 25.0%, and no services were recorded in 50.0% of the schools. Survey on level of sanitation has shown that 40.0% have basic sanitation, 20.0% have limited sanitation, and 40.0% have no sanitation services at all. The result showing the level of hygiene services indicates that, the secondary schools surveyed have 8.3% hygiene services, 25.0% have limited hygiene services, and 66.7% of the schools have no hygiene services at all. From this study, it has indicated that there are significantly poor wash services in public secondary schools in the state, and in turn could pose public health problems to the school actors (especially the youngsters, girls and women teachers), the surrounding public, and the entire society at large.

Keywords: *Infectious diseases, chronic diseases, toilets, malnutrition.*

Introduction

The practice of persistence water, sanitation, and hygiene (WASH) behaviors are needed to reduce the tendency of contamination that occur due to fecal materials and in turn help in improving the health of children and adults in the society (Winter et al., 2021). Therewith, there is need for imbibing the provision of WASH infrastructures and behavior change strategies. However, there is still a noticeable problem regarding the WASH progresses in the Africa and Sub-Saharan regions of Africa; that is why school-based WASH programs are out there to serve as a platform that spread the health promotion efforts to the larger audience to increase awareness and practice in the society. The program indeed takes students as good ambassadors that are supposed to massively relate the good WASH policies to the larger society at home (Winter et al., 2021). An act of providing safe water, sanitation, and hygiene at schools is influential in improving health, boosting education, promoting gender equity, and consequently impacting positively in the society at large. It is indeed a key method that provides rights to students, that is provision of right to health, and the right to clean environment, and the right to education as well (Olukami, 2013).

On the other hand, education is the ingredient for any development. Therewith, secondary school is the fulcrum in the education system that formed a relay between primary and higher education. Secondary school education is ideally received by students after completing their primary education with a view to gain a perquisite for advanced education that will resurfaced ahead. The system of secondary school is framed to provide smooth opportunities to primary school graduates to obtain advanced education irrespective of their affiliation, religion, sex, etc.; to diversify curriculum to cater for diverse talents of students; to elicit students with the desire for achievement and self-improvement; to foster national unity and self-reliance in students, to churn-out students that will be modified into different professionals in the advance institutions (Bello et al., 2017; Ibrahim et al., 2017; Nanbak, 2020). Schools are a significant portion of any community constituting an avenue that houses at least 18% of every population.

School is an environment that is a first contact of children with the surrounding that takes much time of the children away from home.

Therein, children spend many years learning, growing and developing to reach the adulthood. A healthy youngster has more potential to attend, and finish schools as well (Jiya et al., 2020). However, some reports from developing nations such as Nigeria has been negative about the achievement of WASH in schools. Many (secondary) schools are in deplorable state, some having no WASH indicators at all; and most of the available data on WASH focuses on the households no other avenues like schools, despite the schools been very significant to children/ students. Schools held a crucial role in the life of children and youngsters that when there are bad indicators of WASH, a chain of disease transmission could be improved and schools become fruitful avenue for transmission of diseases (Olukami, 2013). Enough hazards can emanate from schools to pollute the entire environment at the societal levels, likewise, presence of WASH at schools is in tandem with attendance and performance of students; consequently, it is utmost to have proper WASH at schools (Olukami, 2013).

The assessment of WASH at schools is indeed a portend to policy makers to determine how to manage WASH and make new policies to remedy water-related issues in the entire society, because schools are avenues for socialization that needs highest water quality services to save lives of children and youngsters especially those before the age of five (Toleubrkov et al., 2022). Poor WASH endanger the education of youngsters, especially the females that often left schools for a bid to defecate in the bush, and are often harassed or undignified due to lack of WASH at schools (Sridhar et al., 2020). Young people are more vulnerable due lack of WASH especially in developing nations that are characterized with high morbidity and mortality due to water-related problems under the age of five, all due to poor WASH that has directly spurs open defecation and its consequences (Sridhar et al., 2020; Mustapha et al., 2022).

Therefore, WASH in schools has to be of great concern in a region of Sokoto, a place that is situated in the semi-arid region known with pathetic rainfall variability, drying of waterbodies, water scarcity, poverty, and other unsuitable climatic conditions that have further devastated the issues causing a double burden of diseases (Mustapha et al., 2022). Therefore, it is indeed imperative to utilize efforts aimed at harnessing the health of youngsters at school especially in Sokoto to give them potentials to learn

and lead a productive life in the future in a state that is statistically disadvantaged with low literacy level. Focusing in improving actions that promote children's health is vital to achieving completion of basic schools, improving health of community, and better future for the state and country at large (Okediji, 2015; Gado and Alkammawa, 2017; Yamma, and Izom; 2018; Jiya et al., 2020). Additionally, the situation in many schools especially the public ones are faced with lack of infrastructures and other relevant resources needed at a proper learning environment despite the tangible reports showing how school environment influences successes or failures of education (Inuwa, and Yusof, 2012; Inuwa, and Yusof, 2014; Dange and Dange, 2019; Abubakar et al., 2022). A preliminary surf shows very few studies had worked on WASH in Sokoto state, let alone among secondary schools, therefore it is imperative to fill the gap therein (Mustapha et al., 2022). The aim of this work was to assess the levels of WASH services in public secondary schools in Sokoto. The research questions are: 1. What is the level of water services among secondary schools in Sokoto state, Nigeria? 2. What is the level of sanitation services among secondary schools in Sokoto state? 3. What is the level of hygiene services among secondary schools in Sokoto state?

Literature Review

Due to OD or lack of sanitation millions of school-children suffered episodes of diarrhea. When diarrhea strikes, children become dehydrated and more vulnerable to infection, which can be deadly sometimes. Children who suffered repeated bouts of diarrhea, undernutrition, can be malnourished and stunted (Bello et al., 2022). Malnutrition and stunting are responsible for reducing the intelligence quotient of students. Apart from diarrhea other diseases that are transmitted by OD are: topical enteropathy, polio, typhoid fever, Ascariasis, dysentery, trachoma, bookworm etc. When children fall sick, they avoid schools (Bello et al., 2022).

Inadequate school toilets or open defecation is a risk to children's safety. More especially, girls are vulnerable to violence and bullying from classmates and adults (Bello et al., 2022). Having to defecate in the open infringes on human dignity and safety of the school children. Specifically, women and girls are liable to lose privacy and face having to defecate in

the open, or have to painfully wait until night falls in the school. Lack of toilets or an accessibility to women or girls during menstruation, they remain excluded from opportunities to attend school (Bello et al., 2022).
Boys or girls or women without toilets have to travel to public toilets (in some distances) or bushes. This in turn, increases their chances of being attack by others (Bello et al., 2022).
Due to lack of toilet or sanitation, children struggle to complete their education. They are face with related diarrhea; they miss school, and fall behind in class. Practice of OD by children due to lack of toilet at schools can lead to anxiety and stress. In turn discouraging children from attending classes. Lack of sanitation tends to force girls to stay at home or seek for toilets or private space at far places. This increases absenteeism and drop-outs (Bello et al., 2022).

Research Questions

The following research questions were formulated to investigate the study:

1. What is the level of water services among secondary schools in Sokoto state, Nigeria?
2. What is the level of sanitation services among secondary schools in Sokoto state?
3. What is the level of hygiene services among secondary schools in Sokoto state?

Rational of Study

There is need for water, sanitation (toilets), and hygiene (water and soap for handwashing) to scuttle the chain of disease transmission. When any of the three parameters is absent, disease can spread easily especially in children, girls/ women and youngsters easily. Consequently, leading to hospitalization, malnutrition, poor academic performance, morbidity, indignity, school absenteeism, and the likes; therefore, it is pertinent to carry out this study to examine the level of the said parameters in secondary schools in Sokoto, Nigeria (a state suffering from poverty, poor western literacy, malnutrition, poor state of basic education, and other inequalities) (Bello et al., 2022).

Figure 1

How OD Causes Problems, adopted from Bello et al. (2022)

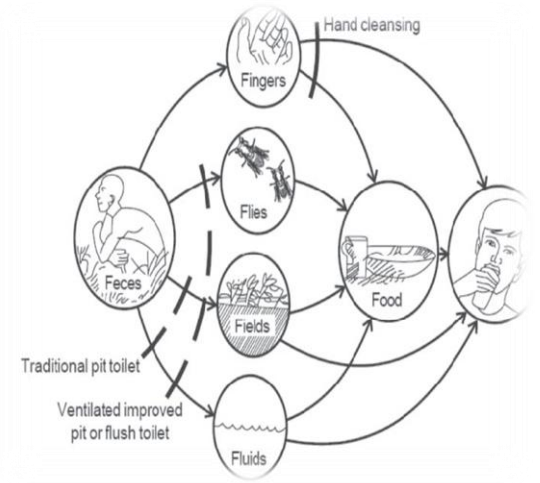
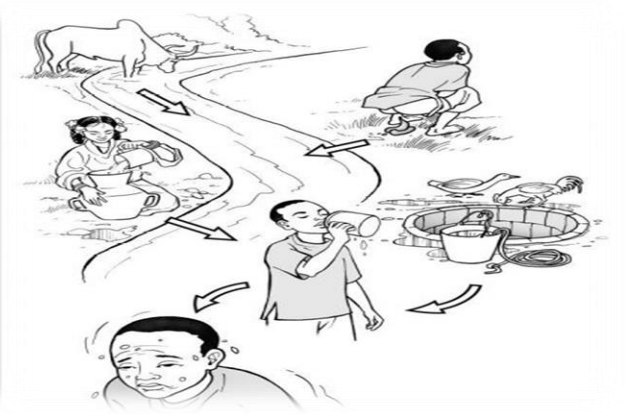


Figure 2

Faeces Flow Diagram of Open Defecation due to Poor WASH, Adapted from Bello et al (2022)



Significance of the Study

The study, will benefit policy makers in knowing how far has gone in delivering dividends of democracy to the citizens to know how far have they gone? It is also important to advocates, educators, donors, and people of the community to be alerted on the very important factor of poor infrastructure that affect the education of their wards with a view to come up with community-based solutions. Researchers will find this work useful as a baseline data that can be further validated or harnessed to save our education sector.

Methodology

Study Area

The study was carried out in Sokoto state, Nigeria. Sokoto State is located at the extreme Northwest corner of Nigeria, it lies between latitudesm11E and longitude 4N bounded in the East by Zamfara State, in the North by Niger Republic and in the west by Kebbi State. It is within the savannah region with scanty vegetation and shrubs. Two intermit rivers cut across the State i.e. River Sokoto and River Rima with a confluence at Wamakko, move southwest and finally discharge into River Niger (Mustapha et al., 2022).

Research Design

The study design was descriptive survey that allows the researcher to have an in-depth understanding of perception of the respondent (Nasiru *et al*., 2015)

Target Population and Sample Size

The population includes students that are in the School of Science, Shehu Shagari College of Education Sokoto, Nigeria, particularly these that study Biology as a course at Nigeria Certificate of Education level. The size was calculated using a Raosoft calculator at a margin of error of 5%, 95% confidence limit, 177 population size of secondary schools (Ministry of Education Sokoto in 2010 related that there are 177 Junior Secondary Schools in the state) in the state, and a response distribution of 100%. 120 respondents that are NCE student-teachers that have done their teaching practice or are currently doing it were employed using simple random

sampling because qualitative data focus on quality not the much quantity provided saturation is anticipated (Nasiru, 2015).

Data Collection and Analysis

Data was collected with the aid of semi-structured questionnaire, and tape recorder where necessary. The questionnaire was developed based on the WHO/UNICEF Joint Monitoring Program guidelines for assessing WHASH at schools. The data collected was analyzed using content analysis, descriptive statistics were yielded.

Results & Discussion

Table 1

Result showing the demographic characteristics of respondents surveyed in secondary schools in Sokoto state, Nigeria

Item/ Parameter/ variable	**Frequency**	**Percentage**
Age		
21-24	120	100.0
Sex		
Male	40	33.3
Female	80	66.7
Religion		
Islam	120	100.0
Tribe		
Hausa/ Fulani	120	100.0
Level of education		
National Certificate of Education (NCE)	120	100.0
Marital status		
Single	40	33.3
Married	80	66.7

Table 1 shows the demographic characteristics of the respondents' student-teachers in this study. Majority are females (66.7%), and minority (33.3%) are males; all are between 21-24 years (100.0%); and all (100.0%) are Muslims, all (100.0%) are Nigeria Certificate of Education holders/ students; and Hausa/ Fulani (100.0%). Majority are married (66.7%), and minority of them are single (33.3%). Therefore, the respondents are from box sexes and student-teachers that visit schools routinely can be able to know the nature of their toilets and their sex-specifications, a valid data has to be tap from them as the subjects of the study.

What is the level of water services among secondary schools in Sokoto state, Nigeria?

Table 2

Revealing the outcome of water services supply survey at public secondary schools in Sokoto state, Nigeria

Service level	Service/ nature of observation	Frequency	Percentage
Basic service	Presence of basic service of drinking water from an improved source and water availability at the time of the visit	30	25.0
Limited service	Presence of drinking water from an improved source or no water available at the time of the visit	30	25.0
No service	Drinking water from an unimproved source or no water is available at the time of the visit	60	50.0

Total	120	100.0

The table 2 has revealed the outcome of water services supply at public secondary schools in Sokoto state, Nigeria. Therein, the overall basic services recorded were 25.0%, the limited services recorded are 25.0%, and overall no services were recorded in 50.0% of the schools. The findings of the water supply survey have revealed a poor status in majority of the areas. This has been in consistent with what was divulged by Mustapha et al (2022) in their recent study of WASH awareness and practices in Sokoto (albeit most of the subjects therein are from Sokoto central zone) with a major water source from an unprotected hand-dug well. Thus, seeing a poor water services in the schools is relevant to a poor water services in the society at large. Access to water, sanitation and hygiene is a basic human right and necessity that every human being supposed to have, let alone the youngsters and the girls/ women in particular. Shortage of safe water has been significantly implicated as the cause of high rate of many infectious diseases like diarrhea, trachoma, polio, acute respiratory infections, malnutrition and many other problems.

However, there are still millions of people that are using unsafe water, and some even suffer to access the unsafe water types; likewise, millions of people are unable to have access to sanitation and hygiene and have to indulge in open defecation (even at schools) that further deteriorates the scarce water resources available and escalates spread of infectious diseases leading to high morbidity and mortality especially among children and women/ girls (Mustapha et al., 2022). More often, the issue of water scarcity or unsafe is more pronounced in the regions like Sokoto where the climate is semi-arid due to extreme water variability, climate change, poverty, low public education etc (Mustapha et al., 2022). In a similar streak, another study from Kaduna state, Nigeria that assess the conditions of educational facilities shows that 88.0% of the schools do not have water supply (Kanayochukwu et al., 2020). In a similar episode indicating water scarcity in the state, on 29th 2013, the students of Usmanu Danfodiyo University Sokoto protested against water scarcity in the University until the management had to closed the institution immediately and indefinitely to abate destruction of facilities of the university and save lives from attacks.

This has shown how lack of water can deleteriously affect education in the state (Magami & Ibrahim, 2016). Haply, showing that, the issue of poor water supply to schools is a well-versed challenge in the region of Northwestern part of the country. Particularly, water is tied to life, air, food, industries, and agriculture. Indeed, water is an abundant natural resource that is scarce in many areas of the world and can easily be subjected to pollution; therein, Sokoto is facing water scarcity and poor educational status especially due to poor water and education policies, because the state is bestowed with abundant water sources (Magami & Ibrahim, 2016).

Among the other uses of safe and accessible water in schools is to halt the chain of disease transmission of diseases among children to allow them take in safe food (made from safe water), take bath with safe water to avoid skin diseases and confer personal hygiene, and wash hands always when in contact with contaminants, waste, chemicals in the laboratory, and avoid fecal. When there is an inability of the children to have safe and enough water chain of diseases transmission is improved leading to sicknesses, malnutrition, hospitalization, poor performances, absenteeism, and even morbidity or death. Teachers and other school actors are protected against diseases when there is safe and enough water at schools (Mustapha et al., 2022).

What is the level of sanitation services among secondary schools in Sokoto state?

Table 3

Showing the results of the survey pertaining sanitation services among public secondary schools in Sokoto state, Nigeria

Service level	Service/ nature of observation	Frequency	Percentage
Basic service	Improved sanitation facilities at the school that are single-sex and	48	40.0

	usable at the time of the visit		
Limited service	Improved sanitation facilities at the school that are not single-sex or not usable at the time of the visit	24	20.0
No service	Unimproved sanitation facilities or no sanitation facilities at the school	48	40.0
Total		120	100.0

As far as sanitation is concern is mostly talking about the toilet services in the area of the study. Table 3 has displayed the survey on level of sanitation services in secondary schools in Sokoto and has shown that 40.0% have basic sanitation, 20.0% have limited sanitation, and 40.0% have no sanitation services at all. This has shown a submission of poor service of sanitation among the secondary schools in the state, similar to what was reported by Mustapha et al. (2022) that 78.9% of the households in the state practice open defecation and poor fecal waste disposal, due to poverty as a major factor. Consequently, the situation has led to diarrhea and malaria, and dysentery been common in the area as reported by Mustapha et al (2022). Kanayochukwu et al. (2020) from a study in Kaduna state, Nigeria found that, no fewer than 24% of the observed schools have toilet facilities at all, not minding their accessibility (Kanayochukwu et al., 2020).

A primary school study in the Sokoto Metropolis observed by Abubakar & Raji (2021) has shown that only 27.5% of the schools had basic sanitation services. A similar trend of toilets in secondary schools in Bayelsa state has revealed toilets being in deplorable states in majority of the schools observed by Ogbuehi et al. (2020). The essence of sanitation, that connotes toilet in this work cannot be over-reiterated. It is a tool that ensures complete separation between man and human excreta, thereby preventing diseases. When there is no improved toilet, disease transmission will be

ensured, and children will be more affected. They have to leave classes during sickness, they can be malnourished due to parasitic worms, they can have poor academic performance as well and other effects that affect education resultantly.

What is the level of hygiene services among secondary schools in Sokoto state?

Table 4

S*howing the level of hygiene services among public secondary schools in Sokoto state, Nigeria*

Service level	Service/ nature of observation	Frequency	Percentage
Basic service	Handwashing facilities with water and soap available at the school at the time of the visit	10	8.3
Limited service	Handwashing facilities with water but no soap available at the school at the time of the visit	30	25.0
No service	No handwashing facilities or no water available at the school sanitation facilities or no sanitation facilities at the school	80	66.7
Total		120	100.0

Hygiene services are referring to availability of water and soap or relations in the toilet premises to wash hands or relations in the course of using the toilets (Sridhar et al., 2020). Table 4 is showing the level of hygiene services among secondary schools in Sokoto state, Nigeria. Therein, the secondary schools surveyed have 8.3% hygiene services, 25.0% have limited hygiene services, and 66.7% of the schools have no hygiene services at all. This has shown a poor level of hygiene, in relevant to what was reported by Mustapha et al (2022) from Sokoto. Therewith, it has reported 82.5% poor hygiene practices by households and 55.6% do not use water and soap to wash hands after toilets (Mustapha et al., 2022). An assessment of school health services in the primary schools in the Sokoto Metropolis has revealed only 7.5% hygiene services in all schools observed by Abubakar & Raji (2021).

In another study performed among secondary schools in the Bayelsa sate, a Southern part of the country, it was found that majority of the subjects had no hygiene services/ practices; therewith, 53.5% of the students do not used soap after toilet, and 57% do not have accessibility to water. This has been in tandem with negative (in which the toilets/ latrines are deplorable in most cases and had no handwashing facilities or soap) findings revealed in table 4 (Obguehi et al., 2020).

Moreover, a study from Lagos city had found that availability of hygiene in latrines was grossly inadequate as reported by (Olatunji & Thanny, 2020). In a nit bit, this has shown how the poor hygiene indicators have traverses many schools in the country and consequences are bound to revamp on the health of children and the entire public health (Olatunji & Thanny, 2020). Hygiene in this context simply means availability of soap and water to wash hands after toilet to ensure hygiene and halt the fecal-oral and other routes of transmission of diseases, that when allowed could lead to many effects like abandoning classes by children, malnutrition, crippling (in case of polio), morbidity, and death in some cases; in turn affecting education as well.

In the developing countries, there is double burden of diseases causing devast6atig health effects on citizens. One of the burdens due to infectious diseases is related to lack of water, sanitation, and hygiene (Azuogu, et al., 2016). It is a great challenge and concern to prevent diseases in public schools where students interact with closeness (Azuogu, et al., 2016).

More especially, the Sokoto that lies in an arid region characterized with many challenges including climate change, pollution, poor infrastructural provision in the schools, and poor academic outcome in often times (Boyi, 2013; Suleiman et al., 2021; Yarima et al., 2021 Mustapha et al., 2022).

Certainly, the proximate effects of WASH are huge and results in spread of water-borne and water-related infections among teeming population affect the children, old, and women/ girls in a more pronounced fashion. It was related that lack of WASH spurs at least ¼ of all child deaths and account for 20% of the entire childhood burden of diseases across the entire globe (Obguehi et al., 2020).

Unfortunately, as revealed by this study and other antecedent studies there is poor WASH indicators in majority of the public secondary schools in the state and part of the country. A visit to many schools will unravel the serious public health concern displayed in the form of inadequate water supply, unsafe water supply, and poor sanitation, inadequate toilets availability, poor toilets nature, and the likes; a situation that could invariably harm the ability of students and other actors to engage in learning activities properly to achieve greatness (Salihu et al., 2017; Obguehi et al., 2020). Indeed, it will affect their health, more especially the children are mostly devastated because of their growing nature of the body. They have to abandon schools/ classes when sick due to infectious diseases (like the perennial typhoid fever, and malaria), or wander to fetch water/ find a place to defecate; and in turn causing absenteeism and low academic performance (Umar et al., 2017; Umar et al., 2021).

More often, the girls/ women among students and staff have to leave schools/ classes because of lack of water and toilets for their menstrual period or for defecation or urination; in turn affecting their attendance and performance and can exposed them to indignity, rape, and possible injuries from animals like reptiles whenever wandering to find a place to ease themselves or fetch water (Magami & Ibrahim, 2016; Obguehi et al., 2020). It is imperative to call on the policy makers to bring up policies that will harness the water bodies in the semi-arid region of the state to supply enough and safe water to the public, and imbibe feasible methods to make latrines available and accessible in public, household and school areas. Likewise, there is need for provision of hygiene hardware in the schools to support the health promotion of students, other school actors, and the entire

public (Sifawa & Muuhammad, 2014; Magami & Ibrahim, 2016; Shehu et al., 2014; Mustapha et al., 2022); because in every schools there is need for proper water, sanitation, and hygiene fulfillment so that the environment would be conducive, safe, and suitable for learning activities to take place smoothly (Kasarawa et al., 2017; Yahaya et al., 2019). Consequently, there would be achievements in terms of safety of girls, socioeconomic development of community, gender equality, reduced child mortality, achieving goals of education in the Sustainable Development Goals (Ogbuehi et al., 2020; Abubakar & Raji, 2021; Winter et al., 2021; Nair, 2022).

Conclusion

For every child or youngster or human, there is need for water, toilet, and hygiene at home or school in order to cut up the chain of disease transmission; but when there is scarcity or inadequacy, there is every possibility of transmission of diseases (infectious due to microbes and chronic due to chemicals at school laboratories or classes); that is why this study was carried out to assess the level of water, sanitation, and hygiene among secondary schools in Sokoto, Nigeria. From the finding of this study, it has indicated that there are significantly poor WASH services in public secondary schools in the state, and in turn could pose public health problems to the school actors (especially the youngsters, girls and women teachers), the surrounding public, and the entire society at large. The poor WASH can devastatingly affect academic performances of students through school absenteeism during sick days or open defecation or menstrual hygiene or as a result of shyness or searching for water or due to malnutrition gotten from parasitic worms. It also affects the girl-child education as well. The situation can easily be aggravated by the improper utilization of water resources in the state, climate, poor funding, and poor infrastructures in many schools of the state.

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