

Open Defecation Practices in Rural Areas Threat Public Health: An Assessment of Selected Area in Sokoto, Nigeria

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Abstract: The study aimed to assess open defecation amongst residents in a rural area of Wuruno local government, Sokoto, Nigeria. The design utilized was cross-sectional survey, applied to gather information of the participants and their environment with the aid of structured questionnaires at a given time. The collected information was subjected to descriptive statistics and X² test at p<.05. The results reveal, majority of the participants (77.8%) are into open defecation; minority (22.2%) always do it. 77.8% of them always practice it, 11.1% never had open defecation, and 11.1% often do it. Majority (77.8%) had untidy toilets, minority (22.2%) had clean latrines. 72.2% that is majority of the toilets in the area had no water supply, and minority (27.8%) of them had water. Toilets are shared by 9 people (72.2%) mostly, then 12 individuals (16.7%), and by 8 persons (11.1%). Majority (72.2%) of them do not wash hands with soap after toilet; and minority use soap after toilet (27.8%). All respondents agreed to burning of their waste (100.0%). Mostly open defecation is due to insufficient toilets (36.1%), then poor awareness (32.2%) and, poverty (31.7%). There was stool in the area (80.0%) and two defecators seen during the early morning (76.1%), 5 and above defecators were seen (12.8%), and only one person was seen (11.1%). Children (51.1%) are the most defecators, then adolescents (48.9%). Mostly, defecators are males (51.1%), 48.9% females. Open defecation is a much threat in children and women. Enough toilets and efforts are needed.

Keywords: *Open defecation, rural, diseases, malnutrition, polio, water supply*

Introduction

The act of defecation perpetrated by an individual or groups of people in an open space, waterbodies, bushes, etc. is defined as open defecation. It is an act of avoiding toilet while defecating and an act of passing stool in a manner that does not support hygienic separation of human waste and the human body and ultimately lead to so many adverse effects to the public health at large (Center for Legislative and Research and Advocacy, 2013; Coffey, 2015; Saleem et al., 2019; Onyemaechi et al., 2022). Therefore, open defecation is regarded as an unimproved method of sanitation and the least status on the sanitation ladder that affects everyone. From the global dimension, about 0.9 billion people are still into the act of open defecation, and in sub-Saharan region of Africa about sixteen million citizens to two hundred and twenty million are perpetrating the act unabated (Ntaro et al., 2022). In Nigeria, there are some reports that show that, still about 62.5% of the citizens are defecating in the open with variation among the various regions of the country (Onyemaechi et al., 2022).

Open defecation is a principal threat to public health in many ways especially in rural settings. It is a main factor that spurs much contamination of the environment, water resources; and in turn increasing the risks of waterborne and water related diseases. Low sanitation has led to higher mortality and morbidity rates especially among children that are below five years old; therewith, about 70, 000 deaths are recorded every year in the country (Adeoye, 2015; Ufomba et al., 2021). Diarrhea, intestinal worms, polio, typhoid fever, hepatitis, trachoma, are some of the diseases challenging the health of Nigerians because of open defecation or poor sanitation practices (Ufomba et al., 2021).

Pertaining economics, there are a lot of effects arising from the open defecation practices and the effects are meted on about 1 billion people worldwide (Ufomba et al., 2021). Parable, when a person disgorges 1 gram of stool in the open, about 1,000 parasitic cysts, 1,000, 000 bacteria, 100 parasitic eggs, 10, 000, 000 viruses, and other pathogens are released. Consequently, this combo of microbes

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finds its way into the water, food, and cling to the flies, fingers, soils, animate, and inanimate objects; thereafter, a fecal –oral transmission is facilitated (Routray et al., 2015; Mara, 2017; Ajayi & Philip, 2021)

The most affected portions of the population due to the open defecation are the children and women or girls. Children are subjected to diseases, malnutrition, stunting, intellectual derangement, academic problems, and the likes. Parents, wards, patients, and relatives had to spent vital portion of their income in the treatment of diseases caused by open defecation, working hours are lost, and school hours are lost because of sicknesses or relations (Kwiringira et al., 2015; Ajayi & Philip, 2021). Moreover, women or girls are major victims in the open defecation debacle by been subjected to indignity, school abandonment, poor academic achievement, etc. In often, women and girls are risk with the possibility of being raped or stink by animals along the course of open defecation (Sarkingobir et al., 2019; Ajayi & Philip, 2021). However, there is still need for empirical data outcomes in places like Sokoto rural area because the rural dwellers have been characterized as the most perpetrators of the act and most affected by the outcomes because of factors like poverty, poor healthcare, poor knowledge, and the likes (Sarkingobir & Sarkingobir, 2017; Amanabo-Arome & Abbas, 2021; Belay et al., 2022). Thus, the aim of this study was to assess the level of open defecation amongst inhabitants in a rural area of Wurno local government, Sokoto state, Nigeria.

Materials and Method

Study Setting

“Sokoto State is in the Northwest Zone of Nigeria between longitude 11° 30–13° 50 and latitude 4°–6°”. It borders Niger Republic to the north and Benin Republic to the northwest, Kebbi State to south and Zamfara State to the east. It has a land mass area of about 32,000 sq. km and consists of 23 local government areas and 244 political wards. The population is predominantly rural, Muslim and consists almost entirely of Hausa/Fulani ethnic groups” (Sarkingobir *et al.*, 2021).

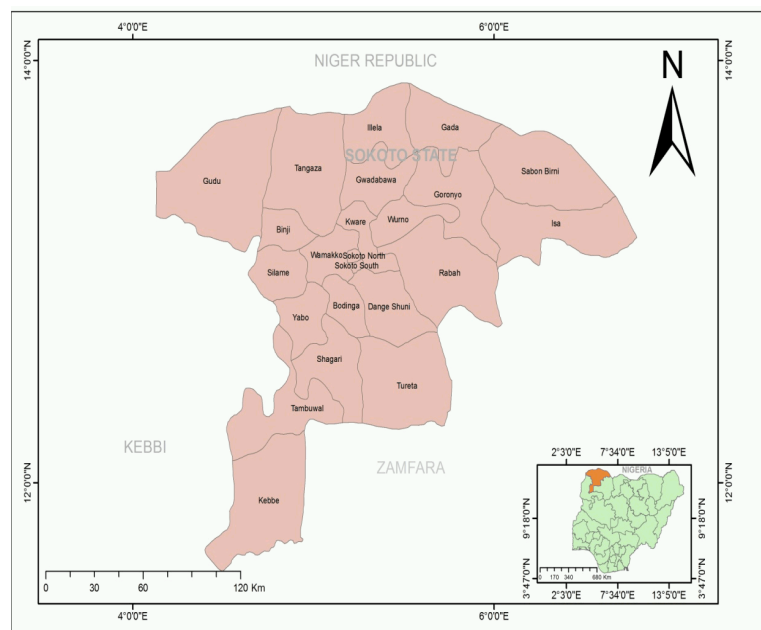


Figure 1: Map of the study area, Source: Hamza et al., (2023)

Research Design

The study design utilized in this work was cross-sectional survey design to collect data at a given time from a given portion of the environment and the respondents.

Population of The Study

The population of the study consists of all the households residing in Zayawa area in Wurno local government, Sokoto state, Nigeria. The sample was drawn from this very population using specific sampling strategy.

Sampling, Sample Size

In a qualitative survey there is need to explore quality, other than the bulky size of the sample in the study. Thus, major applied sample size for this study type was reported as fifteen (Sarkingobir *et al.*, 2021). To have proper data, an inspection of the environment of the area was coupled with face-to-face interview of the participants using simple random sampling approach. The sample size of the study was 179, according to the formula stated in Oche *et al.*, (2011).

$$n = \frac{(U\sqrt{[A_1(1-A_1)+B_2(1-A)]} + V\sqrt{[2A(1-A)]})^2}{(A_2-A_1)^2}$$

Where $A = A_1 + A_{2/2}$

U = One sided percentage point of normal distribution corresponding to 100% (power). Here power = 90%, U = 1.28

V = Percentage point of the normal distribution corresponding to the two sided significance level = 50%, V = 1.96.

A₁ = Proportion of value (open defecation coverage) to be determined = 30% in a previous report (Sarkingobir *et al.*, 2021).

A₂ = Proportion of value to be determined post- intervention = 15%

n = 162

to compensate for non-response and attrition with anticipated 90% response rate, n = 180. In this study was the size was 180, according to the formula stated on Oche *et al.*, (2011).

Data Collection Instrument and Validation

In this study, a semi-structured questionnaire was used to collect data which is based on the past studies search. The questionnaire consists of subsections as follows: Section A is pertaining the demographic characteristics of the study participants, section B is about the open defecation practices (level of sanitation and relations), section C is about WASH parameters and motives to OD, and section D is about visible OD indices in the area and quasi.

Techniques of Data Analysis

After collection, the data (filled questionnaires) were analyzed using descriptive statistics to give frequency and percentage, wherever necessary the interview was analyzed using thematic content analysis.

Ethical clearance

For conducting this research work, an ethical clearance was obtained from the Sokoto state Ministry of Health

Table 1. Showing Characteristics of Respondents of the Study

Item	Frequency	%
Sex		
Male	80	44.4
Female	100	55.6
Marital Status		
Married	80	44.4
Divorce	50	27.8
Single	50	27.8
Age		
15 – 25 years	30	16.7
26 – 35 years	120	66.7
36 – 45 years	30	16.7
Occupation		
Farming	180	100.0
Education Qualification		
Is open defecation harmful?		
No	140	77.8
Yes	40	22.2

Source: Field Work, 2022

Results and Discussion

The results for this study are revealed in Tables 1, 2, 3, and 4. In Table 1, the characteristics of respondents were divulged. Majority are females (55.6%), and minority are (44.4%). On marital status, the highest status was married (44.4%), followed by divorced (27.8), and single (27.8%). Respective age ranges are: 15 – 25 years (66.7%), 36 – 45 years (16.7%), and 15 – 25 years (16.7%). Their major occupation is farming (100.0%) and education is Arabic (100.0%); therewith, most of them think that, defecation in the open and the perpetrators are harmful (77.5%), minority of them regarded the practice as harmless. From this finding it can be found that, the characteristics of the respondents are poor and might have motivated them to the practice; because lack of western literacy, poor income source, are among the factors that ensure poor health outcomes in often times, and might be the reason why the respondents think open defecation is harmless (Tsinda et al., 2015; Mara, 2017; Culley, 2018; Abebe, 2020).

Table 2: Responses on Open Defecation Practice among residents of Zayawa community, Wurno local government

Item	Frequency	Percentage (%)
I used toilet to defecate		
Sometimes	140	77.8
Always	40	22.2
I indulge in open defecation		
Never	20	11.1
Often	20	11.1
Mostly	140	77.8
I wash my hands after defecation		
All the time	180	100.0

Source: Field Work, 2022

The evaluation of open defecation in a rural area reveals in Table 2 that, majority of the participants (77.8%) are in the habit of sometimes engaging in open defecation; and minority (22.2%) are always in the habit of defecating in the open. From this it has been indicated that open defecation is a norm in the rural area and potentially affects public health. This work had a similarity with a finding in an Indian study that found open defecation in a village area (Dev, 2018). Like the finding in this study, in that Indian study, most of the household of the assessed village had no toilet, situation that forced people to engage in open defecation or low sanitation level practice (such as shared sanitation) (Dev, 2018; Saleem et al., 2019; Trimmer et al., 2022). 77.8% of the respondents agreed that they always practice open defecation, 11.1% never engaged in open defecation, and 11.1% practice open defecation often.

Assessment of status regarding water, sanitation, and hygiene was shown by table 3. For people to be able to abide by the conduct of proper sanitation, water supply is inevitable. However, the evaluation of water, sanitation, and hygiene (WASH) items in the area confirmed that, majority (77.8%) had untidy toilets, and minority (22.2%) had clean latrines. The issue of unclean toilet is of great concern in sanitation, because people tend to shun toilets if they are dirty. 72.2% that is majority of the toilets in the area had no water supply, and minority (27.8%) of them had water. Therefore, the lack or insufficiency of water in the toilet premises or environment is a major thing that motivates people to avoid toilets and make achievement of sustainable sanitation difficult. In a study similar to this, lack of water supply was fingered as a major factor that causes among open defecation among higher institution students in Nigeria (Ajayi & Philip, 2018). Moreover, another study from sub-Saharan countries reiterated that limited water availability trigger people to use pen defecation as a substitute (Belay et al., 2022). Toilets are shared by 9 people (72.2%) mostly, then 12 individuals (16.7%), and lastly by 8 persons (11.1%). This has pointed that, all available toilets are shared, and the sharing could make the toilets untidy easily or spoil some of the hardware available; thereby motivating open defecation on the other hand. To safeguard public health by breaking the chain of transmission of pathogens, a person is supposed to clean his hands with soap always after toilet; therefore, every toilet needs to have a supply of enough soap for that respect. However, in the study area, majority (72.2%) of the respondents confided that, washing hands with soap after toilet is not their norm (because there was no soap in their toilets); and minority had summited to the use of soap after toilet (27.8%). This is in consonant with a study

reported from Indian village that, majority of the households studied had nothing for handwashing after toilet visits (Coffey, 2015; Dev et al., 2018).

Table 3: Assessment of Water, Sanitation and Hygiene Parameters and motivators to open defecation in the Study Area

Item	Frequency	%
Toilets are:		
Clean	40	22.2
Dirty	140	77.8
Is there Water Supply?		
Yes	50	27.8
No	130	72.2
Individuals Per Toilet		
9	130	72.2
8	20	11.1
12	30	16.7
Is there any of Soap at the latrine?		
No	130	72.2
Sometimes	50	27.8
Method of Waste Treatment		
Burning	180	100.00
Possible motivators to Open Defecation		
Insufficiency of Toilets	65	36.1
Poverty	57	31.7
Insufficiency of Awareness	58	32.2

Source: Field Work, 2022

The major thing that motivates them to open defecation is insufficient toilets (36.1%), then poor awareness (32.2%) and lastly, poverty (31.7%). This study has shown from the submissions of the participants that there are several causes or factors that motivate people to persist on open defecation norm especially in the rural setting. In some other corroborating studies, there had being similar reports on causes of open defecation in the country; parable, poor knowledge and awareness, and availability of facilities were fingered as major factors harboring poor sanitation in the country as illustrated by Olaitan et al., (2022); another study shows that as the education of the household go higher, the tendency of open defecation goes lower (Belay et al., 2022), and indeed the poverty is fingered issue to harbor open defecation in many situations (Belay et al., 2022). Similarly, in a study in Osun state, Nigeria, rural areas were more prone to open defecation than urban ones, and education of the head in any household reduces open defecation among the participants in the study (Onyemaechi et al., 2022).

People are expected to manage their waste properly for the protection of health. In this study, the respondents instead of abiding by good practices, they subscribed to burning of their waste materials (100.0%). In this vein, Dev (2018) reported that waste disposal in the examined village is extremely and poorly managed by dispensing on river sides, beside the house, and in the field. However, the practice of open burning of waste as a norm of the study respondents is a thing of great concern especially when the practice is perpetrated at home. It increases the risk of heart disease and aggravate the suffering of people battling with respiratory illnesses like emphysema, and asthma. Other effects can be nausea, rashes on the body, reduction of vision, effect on liver, kidney, and nervous system disorders; therewith, the resultant effects of burning of waste at home are more pronounced on the children (Karshima, 2016; Kaoje et al., 2017; Magami et al., 2017; Kaoje et al., 2018).

Table 4 identifies the actual open defecation in the area. There is noticeable stool in the area (80.0%) and two defecators during the early morning visits (76.1%), 5 and above defecators were seen (12.8%), and only one person was seen (11.1%). There are types of people that mostly engaged in open defecation, and there are types of people that are mostly inflicted by consequences of open defecation in any given area. As revealed by this study, children (51.1%) are the major perpetrators, then adolescents (48.9%). And unfortunately, they are the ones that are mostly affected by the consequences of open defecation in the environment. Mostly, defecators are males (51.1%), are significant of portion of the defecators are females (48.9%). It is unfortunate to find children and the female gender in involved in the practice of open defecation, because they are the most vulnerable to the consequences of that scourge (Abebe,

2020). Children are naturally known with weak immunity, a growing and developing body, longer life expectancy, curiosity, and tendency to contact soil or contaminated objects carelessly and therefore have more chance to be affected with the open defecation practice (Clasen, 2015; Spears et al., 2015; Sarkingobir et al., 2021; Dikko et al., 2022; Miya et al., 2023; Sarkingobir et al., 2023). Likewise, the women have extensive needs for better sanitation and hygiene, because of the gender; and in the other hand lack of proper sanitation subject them to indignity, rape, school abandonment, stink from animals and other related effects (O'Reilly, 2016; Ngwu, 2017).

Table 4. Investigation of Open Defecation among residents of rural area of Wurno local government, Sokoto state, Nigeria

Parameter	Frequency	%
Noticeable stool in the area		
Yes	180	100.0
No	0	0.0
Presence of people defecating during the Early Morning Visit		
Number of Defecators noticed	180	100.00
1	20	11.1
2	137	76.1
5 and above	23	12.8
Types of People Seen Defecating		
Children	92	51.1
Adolescents	88	48.9
Gender of Defecators		
Males	92	51.1
Females	88	48.9

Source: Field Work, 2022

Conclusion

Open defecation is a practice of defecating outside a designated toilet. It is a practice that harbors the contact of human with excreta and in turn facilitating the transmission of diseases. People defecating in the open are releasing millions of microbes to the environment for upward intake into the human body and in turn a factor that is responsible for transmission of many diseases and effect such as polio, cataract, typhoid, cholera, hepatitis, malnutrition etc. Therefore, it is needed to explore the exact nature of the situation more especially in the rural areas, to know the motives and hindrances of the practice, and to identify the WASH sanitation levels and relations. Therefore, this study was conducted and has conclusively; revealed that, there was poor sanitation (toilets) levels and open defecation had been practiced by most of the inhabitants of the rural Zayawa area, Wurno local government, Sokoto state.

Recommendations

Toilets are very significant to maintain the health of the public. It can be recommended based on this study that:

1. The government, nongovernmental organizations, communities of rural areas or governments should provide initiatives to provide adequate toilets at homes, school environment (in hostels and school premises), more especially to the females. These toilets can also be built by other organizations such as Muslim Society organizations and relations.
2. There should be proper awareness among residents on dangers of opens defecation to public health. Teachers, leaders, and unions should engage in massive campaigns against poor sanitation and hygiene.
3. There should be encouragement of enough individuals to clean toilets regularly. Youngsters are also enjoined to support in cleaning their environment.
4. Walk of shame should be used to invite people to cleanliness in their toilets or environments.

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