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Effect of Open Defecation on Human Health: A Case study of Machina Local Government, Yobe State

*I. Audu and M. Mohammed
Department of Biology, Yobe State University, P.M.B 1144 Damaturu,Yobe State
*Correspondence E-mail: iliyaaudu41@yahoo.com

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Abstract

The effect of open defecation on human health is quite detrimental and cause several outbreak of disease worldwide which has become an annual epidemic in Machina Local Government area of Yobe State. This study therefore aimed at identifying the effects of open defecation on human health through the following objectives: determining the socio economic characteristics status of the study area, determining the effect and possibly establish awareness among individuals within the study area and finally, suggest proactive measure in mitigating open defecation hazard among individuals in the study area. The study utilizes five (5) wards within the study area which include: Bogo, Dole, Damai, Falimaram and Machina kori. Data were collected through quantitative and qualitative methods. Quantitative data was statistically analyzed using Statistical Package for Social Science (SPSS). Findings reveals that strategies deployed by relevant authorities in the study area is feeble, with partially participatory by individuals. The result shows that due to the polygamy nature of respondents, increase in population, lack of toilet facilities and inadequate public toilets people are forced to practice open defecation as they are left with no option. The study therefore recommends that the Health Department of Machina LGA should deploy the use of Community Led Total Sanitation that will target all categories of people and eventually lead to change in behavior and drastic reduction of open defecation practice. The members of the community should be trained as peer educators so that they can form discussion group within local language.

Keywords: *Effect, open, defecation, human, health, LGA.*

Introduction

According to the [1] states that, in sub-Saharan Africa where 25% of the population practice open defecation, health problem such as diarrhea and cholera which are describe as the third biggest killer disease in the tropics. A previous by[2] estimated that a child dies every 2.5 minutes due to diarrhea as a result of open defecation. Children with diarrhea eat less and nutrients from food eaten are limited and as a result of these, they become more vulnerable to disease related illnesses [3]

In another study [4], reveals that children with health problems as a result of open defecation are most vulnerable to acute diarrhea and lack access to potentially life-saving health services. A report [5], emphasized that no fewer than 49 million Nigerians still defecate openly. The high prevalence of open defecation in Nigeria has implications on the health, well-being and socio-economic development of its citizenry. Nigeria is ranked 4th in the world based on the prevalence of open defecation practice and has already set a target date of 2018 for eradication of open defecation which has now been shifted to 2025 for the total eradication of open defecation [4]. Sanitation practice can currently be rated around 40 percent which is low compared to the rate of open defecation generally in the country. These is largely practiced in the northern part of Nigeria [5]. Nowadays, it is common to find human faeces in open spaces even in the best cities across the country. From the backyard of an average compound in Nigeria, to public places such as railways, motor parks, airport terminal buildings, filling stations, footpaths, highways, street roads, playing grounds, prayer houses, forests and stadia [3].

According to the National Outcome Routine Mapping [4], 47 million Nigerians defecate in the open while the country loses N455 billion (US$ 1.3b) annually due to poor sanitation. It is common to see people selling foods, sleeping, eating and drinking beside human feces in Lagos and across the 36 states of the federation. Several questions have been raised on why many Nigerians engage in open defecation. There seems to be no definite answer to these questions. While some claimed open defecation is due to poverty and lack of government support in providing toilet facilities, and even in places where the facilities are available, people still defecate openly. Open defecation, according to experts, is the emptying of bowels in the open without the use of properly designed structures built for the

handling of human waste such as toilets. According to documented findings [9], open defecation can lead to serious negative effects on health and the environment? Even though, these bodies, (governmental, non-governmental and international agencies) have carried out several campaigns, health talks, sensitization and awareness on the health dangers associated with open defecation in Nigeria, however, the efforts of most of these agencies were merely geared towards giving information on people's unhealthy attitude and proposing practices that can promote healthy living. Among the organizations involved in the campaign are UNICEF, Water Aid, WHO, State Water and the Disease Control and Prevention Unit of the Primary Healthcare at the Local Government Area (LGA) levels across Nigeria, to mention but a few.

Yobe State Government has declared war against open defecation, communicable diseases and environmental degradation through advocacy and community sensitization. Declaring the war on March 2020 in Potiskum town, "*Governor Mai Mala Buni, represented by his Deputy Idi BardeGubana, said the dangers and consequences of open defecation in the state ranging from infestation of diseases such as typhoid, cholera, malaria among others. He said it has also negative effect on the environment by polluting the air with bad odor and making the land."*

The significance of personal and community hygiene is to safeguard human health, hence according to UNICEF, (2019) 892,000,000 people are practicing open defecation worldwide.

This among other reasons prompted President Muhammadu Buhari to sign Executive Order 009 on November, (2019) and set a target for eradicating open defecation in Nigeria on or before 2025", he noted. In a bid to complement Federal Government's effort. In Yobe State, Governor Buni "*said the state government deemed it fit to take the advocacy campaign against the menace to the 17 local government areas to sensitize people on the dangers and negative consequences of open defecation"…* Shehu U. reported in 2020.

According to Gov. Mai Mala Buni, the move is to protect the environment, culture, norms and values of people, adding that open defecation free society reduces the incidence of disease and other anti-social behavior in the state. *"When open defecation is not properly managed, the diseases causing organisms in human excreta find their way back to our food and water through run off, while in some instances houseflies can perch on these open excreta and settle on edibles, thereby infecting those that ingest the food or drinks"…* Buni stressed.

The governor then called on the local government councils, community heads and traditional rulers and other important stakeholders to set up action and assist in preventing open defecation through sensitization of community, support the community to construct household latrines, construct latrines in public places, markets, motor parks, schools and hospitals among others.

The purpose of this research is to find out the effect of open defecation on human health in Machina LGA. For better understanding of characteristics of the local communities living in the study area, demographic characteristic of the respondents who participated in the research study regarding their sex, age, and marital status, level of education, household size, and occupation was captured.

Figure 1: Photograph of people practicing open defecation

Materials and Methods

The study adopted both qualitative and quantitative research approaches. Qualitative research approach was used to derive useful and comprehensive data for this study. It gives chance for respondent/informant to express themselves on certain phenomena rather than being streamlined to direct structured questions. Quantitative data on open defecation on human health

in the study location was captured using a questionnaire. The method of collection was the use of primary and secondary data. The questionnaire is divided into two sections based on design and administered to the sample locations. Section I was designed for the personal demographic data, while section II is structurally design to answer the research questions. Closed ended questionnaire was used to collect quantitative data while Interview Guide was also used to get some qualitative data. For the purpose of this researcher stratified sampling is used in which individuals have equal chance of being selected. Samples are collected from Machina town. A total of fifty-one (51) questionnaires were distributed across the study area. All data collected were presented using the Frequency, Percentage, Mean and Standard Deviation distribution tables.

Study area

Machina (originally called Mazna before the coming of the Whiteman) town which was known as"Machinakarbikauwa" (water drawing container and rock) is located in the Sahara area of Yobe North, Yobe State Nigeria at 13 08 11N, 10 02 57E. It has an area of 1, 213 Sqkm and population of 61,606 census (2006). The town of Machina bordered with Niger Republic by the north and Jigawa State by the south and west. Furthermore, Machina border with Nguru and Yusufari local government by the east. Machina emirate is located in Machina town. There are dozens of rocks around the headquarters from the West, North, East and South of the town. Machina local government was established in the year 1991.

Results and Discussion

Demographic characteristics of the study area

In order to properly examine the effects of open defecation on Human Health of the respondents in the study area .A multi-stage random sampling techniques was used. In the first phase of the study: this involved a purposive selection of the Local Government Areas. In the second phase, five (5) wards were selected in each village. In the third phase 1000 respondents was selected to be the population of the study .In the fourth phase 5% of the population was selected making a total of 100 as sample size.

Table 1: Population distribution and percentage of households in sampled communities

S/NO	Ward	Population	Percentage (%)
1.	MachinaKori	300	15
2.	Dole	250	12
3.	Bogo	150	7
4.	Falimaram	200	10
5.	Lamisu	150	7
	TOTAL	**1000**	**51**

Source: Field Survey, 2021.

The main function of the sample size technique is to utilize individuals from the population sample which reflect the overall results. The researcher used probability sampling technique in the collection of data through a quantitative approach in other to make good analysis in terms of Disease Prevention and Control Unit of the Primary Healthcare Department under Machina LGA in addressing open defecation.

Therefore, the total of fifty one (51) copies of questionnaire was administered to the respondents within Machinakori, Dole, Bogo, Falimaram and Lamisu wards based on their respective population, in the following distributions:

Table 2: Population distribution and percentage of households in each ward.

S/No.	Ward	Population	Percentage (%)	Sample size for each ward
1.	MachinaKoro	8207.9	300	15
2.	Dole	6220.3	250	12
3.	Bogo	5150.7	150	7
4.	Falimaram	6160.6	200	10
5.	Lamisu	5063.5	150	7
	TOTAL	30803	1000	51

Source: Field Survey, 2021.

Quantitative data was statistically analyzed using computer software program, known as Statistical Package for Social Science (SPSS) to yield some statistics for comparison and establishment of nature of relationship between variables. Descriptive analysis was used to analyze qualitative data in the study in order to upscale the respondents view on the activities of the study area. Data from Questionnaire were supported with the Focused Group Discussion, with a key Informant Interview and Observation.

Table 3: Demographic characteristics of the Respondents

Variables	Frequency	Percent
Sex		
Male	32	68
Female	15	32
Total	**47**	**100**
Age		
20-30	24	51
31-40	16	34
41-50	5	11
50 and Above	2	4
Total	**47**	**100**
Marital Status		
Married	35	75
Single	11	23
Divorce	0	0

Here, information captured were presented and analyzed through two instruments: the Questionnaire and Focused Group Discussion (FGD). One Focused Group Discussion (FGD) in each of the selected wards under Machina Local Government Area of Yobe State was conducted, researcher engaged two (2) persons in Damai ward, one (1) discussant in Lamisu ward, three (3) participants in Machinakori Ward, two (2) persons in Dole ward, as well as two (2) participants in Falimaram ward making a total of ten (10) discussants.

To further verify the responses from the FGD, the researcher distributed 51copies of questionnaire across the wards. A total number of forty-seven (47) copies of the questionnaire were filled and returned, representing 98%.

Furthermore, the SPSS scaling of percentage was used to analyze the data from the Questionnaire. The analysis in this chapter is divided into three sections.

Section A consists of demographic characteristics of the respondents, while other sections (B, and C) dealt with the responses to the research questions of the study as earlier stated in chapter one. The last section provides summary tables and the discussion of findings on the data analyzed.

Widow	1	2
Total	**47**	**100**
Level of Education		
Primary	4	9
Post primary	9	19
Tertiary	33	70
Non formal	1	2
Total	**47**	**100**
Occupational Status		
Farmer	22	47
Civil Servant	9	19
Business Man	13	28
Others	3	6
Total	**47**	**100**

Source: Field Survey, 2021.

Table 3 above shows the sex distribution of the respondents within Machina Local Government Area that were sampled through the questionnaire survey. Out of the 4 7respondents, 32 were male representing 68% while 15 were female representing 32%. This result shows a fair representation of sex distribution in the study. It also implies that the study is gender-inclusive and it can further be deduced that open defecation is largely practiced among the male population.

The table further shows the respondent's age distribution, where 24 respondents between ages 20-30, representing 51% had the highest frequency followed by 16 respondents between the ages of 31-40 represent 34%, 5 respondents between the ages of 41-50 represent 11% and also 2 respondents with the age group of 50 and above were the least with 4%. However, the average age of the respondents for this study was 31. This implies that majority of the population are youth which suggests that they are likely to be the highest precursor of open defecation. Marital status of the respondents in this study was also carried out and it shows that 35 respondents representing 75% were married, 11 respondents representing 23% were not married and 1 respondent representing 2% was a widow.

The table also studied the educational status of the respondents and concludes that 4 respondents representing 9% had primary education, 9 respondents representing 19% has secondary education, and 70% of the respondents consisting of 33 persons had tertiary education. Inferences can therefore be drawn that majority of the respondents had tertiary education.

Tertiary education could also mean possessing Diploma, Grade II, NCE Certificate and Bachelor's Degree. Significantly. Result of the occupational status of the respondents in this study showed that 22 respondents representing 47% were famers, 9 respondents representing 19% were civil servants, 13 respondents representing 28% were doing business and 3 respondents representing 6% had other form of occupation.

Table 4: Response to Availability of Toilet Facility in the study area.

	Frequency	Percentage	Cumulative Percentage
Strongly disagreed	6	12.8	12.8
Disagreed	2	4.3	17.0
Neither agreed /disagreed	3	6.4	23.4
Agreed	16	34.0	57.4
Strongly agreed	20	42.6	100.0
Total	47	100.0	

Source: Field data, 2021

Table 4, indicated the merged responses of strongly agreed and agreed showing 77% with 36 respondents who agreed to have toilets within their household. 17% from the merged responses of strongly disagreed and disagreed with 8 respondents disagreed of not having proper toilet facilities in their house hold. While 6% from the merged responses of neither agreed/disagreed with 3 respondents neither agreed nor disagreed. Data from FGD in the five locations proved that there were toilets within our households but were mainly used by the female and under 7 years old, while the male members of the family and older male find alternative

places to defecate (FGD response, Bogo, Dole, Falimaram, Lamisu, and Machinakori, June,2021).

Sometimes, the resulting factor which contributes to people practise OD is due to the large family size. (FGD response Falimaram, Machina LGA, June, 2021).

The implication from this finding indicates that limited toilet and over population in some households can be attributed as factors responsible for the prevalence of open defecation practice in the study area.

Table 5: Open defecation is a shameful attitude that can affect our dignity

	Frequency	Percent	Cumulative Percent
Strongly disagreed	4	8.5	8.5
Disagreed	2	4.3	12.8
Neither agreed /disagreed	1	2.1	14.9
Agreed	5	10.6	25.5
Strongly agreed	35	74.5	100.0
Total	47	100.0	

Source: Field data, 2021

Table 5 explained the statement related to the respondent views on whether there were act of shame as regard to open defecation practice in their community, From the merge responses, 85% of the respondents agreed and strongly agreed that they felt ashamed about open defecation practice in their community, 13% falls within strongly disagreed and disagreed, while 2% of the respondents are indifferent about the practice of open defecation within their community. This data showed that majority of the respondents dislike the practice of open defecation and would not like to be identified with such habit given that it is not hygienic, causes a lot of diseases to the community and also pollute the environment and does not give a good description of their environment.

Table 6: Open defecation can recognized as public health hazard

	Frequency	**Percentage**	**Cumulative Percentage**
Strongly disagreed	1	2.1	2.1
Disagreed	4	8.5	10.6
Neither agreed /disagreed	1	2.1	12.8
Agreed	11	23.4	36.2
Strongly agreed	30	63.8	100.0
Total	47	100.0	

Source: Field data, 2021

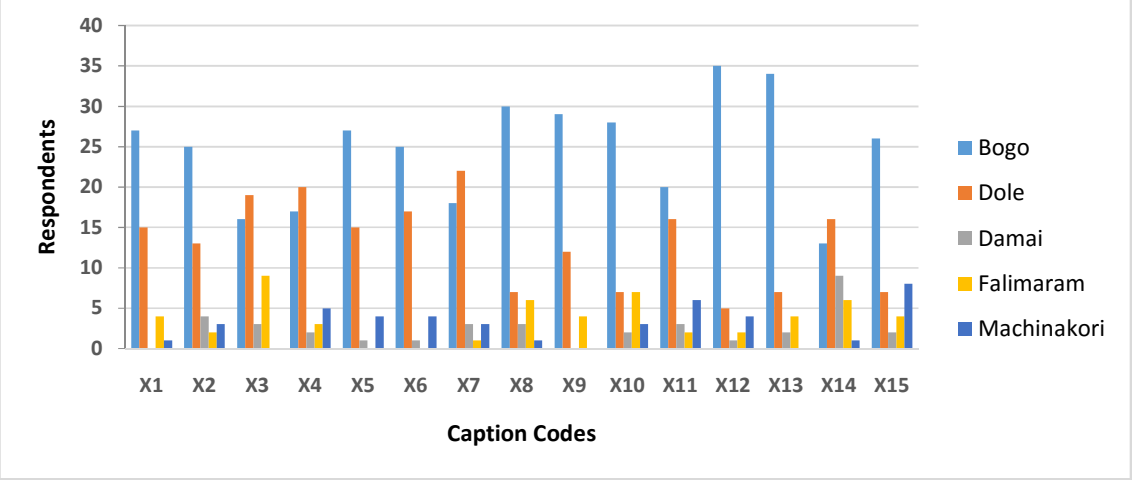

Figure 2: Collective responses to questions on open defecation as a menace on public health.
Source: Field data, 2021

In a related distribution in Table 6, eighty-seven percent (87%) represented the responses of respondents that agreed and strongly agreed that open defecation can recognized as public health hazard, 2% were undecided while 11% of the respondents disagreed and strongly disagreed with the statement. This connotes that highest population of respondents recognize that open defecation can cause serious harm to their health and their general wellbeing.

Table 7: Data Information for Figure 1

Codes	Captions
X1	Poverty/low income of house hold contribute to the open defecation
X2	Limited toilet in some house hold can contribute to open defecation
X3	Over population in some house hold can be contributed as factors responsible for the prevalence's
X4	Ignorance on disease related to open defecation contribute to open defecation
X5	Open defecation practices is privileges in rural community than in urban area
X6	Open defecation has the negative effect on the level of people awareness about the health danger associated to open defecation
X7	Health education can reduce the level of open defecation
X8	Health education can help the people on the complication of open defecation
X9	Open defecation can recognized as public health hazard
X10	Open defecation can lead to contamination of food and water.
X11	Is there sufficient toilet in your area
X12	Open defecation is a shameful attitude that can affect our dignity.
X13	Open defecation can lead to outbreak of cholera and diarrhea.
X14	Open defecation lead to the health complication and death
X15	Open defecation lead to infectious disease

Findings from this study reveals the evaluation of health effect on open defecation in Machina LGA, established that Primary Healthcare's Communication Approach was the only means of awareness to the people which seem not to be enough. This process was incapable of changing their attitude towards open defecation. Though the LGA's has other communication channels to the people, but individuals were not involve in the design and dissemination except at the level of information.

Conclusion

The study identified multiple communication media especially the use of interpersonal and alternative media like Traditional Media, Social Media, and Theatre for Development to successfully curb open Defecation practice. When these information properly reached the target individuals, it will effectively curb open defecation within the study area with the view that the aforementioned findings, the study further recommends that: Local authorities should conduct a baseline study on the cultural and behavioral factors responsible for non-compliance or poor communication among people on open defecation, and upgrade the Community Led Total Sanitation. The introduction of peer educators in the communities forming discussion groups in local language. Construction and posting of signs on public toilets in designated locations can reduce freely open practice of such activities.

Sample questionnaire

Questionnaire on the assessment effects of open defecation on human health: A case study of Machina Local Government, Yobe state.

Please kindly tick (√) or write answer as appropriate in the space provided

Section A. Social Demographic Characteristics of Respondents.

1. Location: ……
2. Sex : Male ( ) Female ( )
3. Age: 20 – 30 ( ) 31 – 40 ( ) 41 – 50 ( ) 51 and above ( )
4. Marital Status: Single ( ) married ( ) divorce ( ) widow ( )
5. Educational Status : Primary cert ( ) Post Primary ( ) Tertiary ( ) Non Formal ( )
6. Occupation: farmer ( ) civil servant ( ) Businessmen ( ) Others ( )

SECTION B

To determine the socio economic status of the study area

7. Poverty/low income of house hold contribute to the open defecation
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed / disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )
8. Limited toilet in some house hold can contribute to open defecation
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed/ disagreed ( )
   d. Strongly disagreed ( )
9. Over population in some house hold can be contributed as factors responsible for the prevalence's
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed / disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )
10. Ignorance on disease related to open defecation contribute to open defecation
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed / disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )
11. Open defecation practices is privileges in rural community than in urban area
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed / disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )

To determine the effect and establish the level of people awareness about the health danger associated to open defecation

12. Open defecation has the negative effect on the level of people awareness about the health danger associated to open defecation
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed / disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )
13. Health education can reduce the level of open defecation
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed / disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )
14. Health education can help the people on the complication of open defecation
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed / disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )
15. Open defecation can recognized as public health hazard
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed / disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )
16. Open defecation can lead to contamination of food and water.
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed / disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )

To develop the proactive and suggest sensitization means of militate open defecation practices in the study area

17. Is there sufficient toilet in your area
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed / disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )
18. Open defecation is a shameful attitude that can affect our dignity.
   a. Strongly agreed ( )
   b. Agreed. ( )
   c. Neither agreed/disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )
19. Open defecation can lead to outbreak of cholera and diarrhea.
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed / disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )
20. Open defecation lead to the health complication and death
   a. Strongly agreed ( )
   b. Agreed ( )
   c. Neither agreed / disagreed ( )
   d. Disagreed ( )
   e. Strongly disagreed ( )
21. Open defecation lead to infectious disease

a. Strongly agreed ( )
b. Agreed ( )
c. Neither agreed / disagreed ( )
d. Disagreed ( )
e. Strongly disagreed ( )

Declaration of conflicting interests
The authors declared no potential conflicts of interest

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