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ASSESSMENT OF HYGIENE PRACTICE AND ENVIRONMENTAL IMPLICATTION OF OPEN DEFECATION IN SETTLEMENT ALONG RIVER NGADDA OF MAIDUGURI, BORNO STATE, NIGERIA

[1]AHMAD ABUBAKAR MUSA; [2]MABRUKA MAINA AND [3]ABUBAKAR MUSA

[1]Department of Physical and Health Education, University of Maiduguri, P.M.B. 1069, Maiduguri, Borno State, Nigeria. [2]Faculty of Veterinary Medicine, University of Maiduguri, P.M.B. 1069, Maiduguri, Borno State, Nigeria. [3]Department of Basic Science and Technology, Mohamet Lawan College Agriculture, P.M.B 1427, Maiduguri, Borno State, Nigeria.

Corresponding Author: ahmedoontop42@gmail.com

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Abstract

Open defecation and improper hygiene practice are the brazing public health issues of the present society. The study adopted the descriptive cross-sectional sample design. A sample size of 140 household respondents, from settlement along river Ngadda of Maiduguri, was selected for the study. Systematic random sampling technique was used in choosing the respondents of the study. Data was analyzed using descriptive statistics of frequency distribution tables and percentages. Findings revealed that high percentage 78.6% of the respondents were male while female constitute 21.4%, majority of respondents 29.3% were within the age group of 51-60 followed by 27.1% between the age bracket of 60 and above, respondents educational level was low 36.4% attended primary school while 29.3% did not attended formal school, in tern of their occupation 26.4% were labourers and most of the household in the area 7-9 were occupied by 27.9% respectively. The study reveals household accessibility of toilet 32.1% practices open defecation, 27.9% used pit latrine while 15.0% had soakway toilet. Findings also revealed that household hygiene practice was low area 20.0% wash latrine in 2-3 days followed by 17.3% wash hand after

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defecation. Findings further revealed environmental implication of open defecation 27.3% of the opined pollute river water followed by 22.4% opined pollute environment. The recommend that Government should provide appropriate infrastructure and resources so that all human beings at all times have access to toilet and sanitation.

Introduction

Open defecation continues to be a critical health challenge globally affecting almost 1 billion people worldwide and contributing significantly to an estimated 842,000 people who die yearly from sanitation related disease. It is estimated that about 2.4 billion people all over the world do not have access to basic sanitation facilities such as toilets and latrines (WHO, 2016). The practices of open defecation are a public health issue which affect both developed and developing countries across the globe, although it is more prevalent in developing nations such as Nigeria (Ngwu, 2017). The practice of open defecation had a huge health implication for all citizens in Nigeria. The effect is not only limited to those in the rural areas or those practicing it in urban areas but poses a great challenge for all and sundry. Diseases such as diarrhea, typhoid and cholera among others infectious diseases are prevalent in the area where in appropriate disposal of human waste take place. Orilomoy, (2015), explained that agents of diseases or pathogens such as bacteria, viruses, parasites etc. which are passed out in feces if not properly disposed of contaminates the sources of drinking water supply. It has been scientifically established that one gram of feces may contain as many as 10,000 viruses, 1,000,000 bacterial, 1,000 parasites cyst and 100 warm eggs (Rose *et al.,* 2015).

Open defecation has environmental challenges its poses in term of polluting water ways is also a course for concern. Open defecation not only deteriorates the quality of drinking water but also makes the water not potable for drinking purposes (Tambekar *et al.,* 2012). Open defecation has also result in conversion of large areas of land within the community into fecal fields. These fecal fields potentially put the environment and consequently water sources at risk of flooding with fecal materials from surrounding areas during rains (Luby *et al*., 2008).

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with human feces including surface water, public spaces, roadsides and railway lines and it pollutes the air with foul odor. It also manifests through the flying feces which are human excreta wrapped and indiscriminately thrown away. For example, open defecation pollutes beaches in Lagos and other part of Nigerian coastal cities thereby decreasing their potential to attract local and international tourist (Abubakar, 2018). The objectives are to assess the public health challenge of open defecation and examine the environmental implication in the study area.

STUDY AREA

Maiduguri is the capital of Borno state founded in 1907 by the British colonial masters for administrative purposed. It has long been the largest and dominant city in the north eastern region of Nigeria. It lies in the Sudan-sahel transition zone, located between latitude 11° 25'N and 11° 34'and longitude 13° 35' E and 13° 44'E (Musa *et al.*, 2019).). It is the headquarters of Maiduguri Metropolitan council bounded in the north by Jere Local Government Area, in the south-west by Konduga Local Government and in the North by Mafa Local Government Area.

MATERIAL AND METHOD

The study adopted the descriptive cross-sectional sample design. A sample size of 140 household respondents, from settlement along river Ngadda of Maiduguri, was selected for the study. Systematic random sampling technique was used in choosing the respondents of the study. Random starting point was obtained using a random number table with a sampling interval of 5.

DATA ANALYSIS

Data for the study was analyze using descriptive statistics of frequency distribution tables and percentages.

RESULTS AND DISCUSSION

Table 1 Socio-demographic Characteristic of the Respondents (n=140).

Variable	Frequency	Percentage
Gender		
Male	110	78.6
Female	30	21.4
Total	**140**	**100**
Age		
30-40	34	24.3

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Variable	Frequency	Percentage
31-50	27	19.3
51-60	41	29.3
	38	27.1
61 and above		
Total	**140**	**100**
Educational level		
Non-formal	41	29.3
Primary school	51	36.4
Secondary school	29	20.7
Tertiary school	20	14.3
Occupation		
Farmer	11	7.9
Trading	25	17.9
Civil servant	17	12.1
Carpenter	19	13.6
Labourers	37	26.4
Others	31	22.1
Total	**140**	**100**
Household size		
1-4 person	48	34.3
4-6 person	33	23.6
7-9 person	39	27.9
>-9 person	20	1.3
Total	**140**	**100**

The demographic characteristics of the respondents table 1 shows that 78.6% of the respondents were males while 21.4% were females This indicates that males constitutes high percentage of headed households. Regarding gender and the practice of open defecation, this result coincides with the study of Okullo *et al*., (2017) found that in Jos, Nigeria, men resort to open defecation more than females because of the stigma females face when they are found defecating outside. In the same vain, Routray *et al*., (2015) discovered that in India, males defecate in open spaces more than females because females require somewhere safe and convenient in order not to be caught. In terms of age 24.3% respondents were aged between 30 and 40 years, 19.3% were age group between 41 and 50 years 29.3% were aged between 51and 60 years while 27.1% were in aged between 61 years and above. The present study reveals that open defecation

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increases with age because older people, on average, are able to move more freely outside their homes and to enact their preferences. This is because they were born into earlier years when the practices of open defecation were more common than it is today which was consistent with the findings of Ebingbo *et al.*, (2019). In relation to education levels 29.3% had not attended any formal of education, majority 36.4% of the respondents had basic education 20.7% had attended secondary education with only 14.3% attended tertiary education. The effects of education on open defecation is that households with educated heads are associated with a higher likelihood of not defecating in the open than those with non-educated heads. This finding was consistent with the findings of Mumbi and Wilberforce (2017). This observation was expected since educated household heads can understand the effects of open defecation and the relevance of having a toilet at home.

Study revealed 7.9% of the respondents were farmers, 17.9% were traders while 12.1% were civil servant. High percentage of the respondents 26.4% were casual labourers, 13.6% were carpenter and others constitutes 22.1% of the respondent. With regard to household size, most of the respondents 34.3% stated that their family size had 1-4 members, 23.6% had 4-6 members, 27.9% had 7-9 members while 14.3% had greater than 9 members. The size of a household determined the practice of open defecation, meaning households with large size are likely to defecate in the open spaces than those with smaller sizes. Responses from the survey suggest that households with large size are more likely to defecate in the open and agrees with the findings of Kosoe and Osumanu (2018). This suggests that heads of large households may be burdened with the need to carter for basic needs of all members, thereby reducing their capacity to construct toilet facilities at home.

Table 2 Household accessibility of Toilet (n=140).

Variable	Frequency	Percentage
Soakway toilet	21	15.0
Pit latrine	39	27.9
Flush direct to river	35	21.15
Open defecation in River	45	32.1
Total	**140**	**100**

Households accessibility of toilet in table 2 revealed that 15.0% of the respondents have soak way toilet, 27.9% of the households have pit latrine toilet, 21.15% of the household size flush their excrete direct to the river because their house is built in the banks of the river. Majority of the households 32.1% defecate in the river. Findings revealed that the reason for open defecation was the lack of latrines at homes, some households are not

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able to build the latrine due to lack of funds and spaces around the house. This study was consistent with the findings of Dey (2018). Concurring with the findings of our study, findings from Clair *et al.,* (2018) show that people who choose open defecation do so because they find open defecation to be more convenient, enjoyable and healthy due to the long walks.

Table 3 Hygiene practice of the Households (n=140)

Variable	Frequency	Percentage
There are feces around latrine	26	14.1
Presence of soap in the toilet	23	12.4
water is availability in the toilet	28	15.1
Is there water source within the compound	14	7.6
Do you wash your hand with soap in latrine daily after defecation	32	17.3
Do you wash latrine daily	25	13.5
Do you wash latrine in 2 to 3 days	37	20.0
Total	**150**	**100**

In relation to hygiene practice in table 14.1% of the households had their faces around the latrine. 12.4% households had soap for washing hand in their toilet. Findings revealed that only 7.6% of the households visited had water source within their compound. It was observed that 17.3% of the households washed their hands after defecation, 13.5% of the households washed their latrine daily while 20.0% of the washed their latrine in 2 to 3 days. This clearly shows that sanitation and the level of personal hygiene is very low in most of the households under area of study. This finding was in conformity with the studies of Mimbi and Wilberforce (2017) and Ebimgbo *et al* (2019). In contrast to our study, participants in a Zambia report using latrine is more hygienic as open defecation provides more opportunities for animals to come in contact with human feces providing an opportunity for disease transmission Thys *et al.*, (2015). The findings from Zambia differ as the Zambian study was conducted in a Tenia endemic area where latrine use was encouraged to prevent Tenia infestation. This shows the need for identifying ways to disseminate health education regarding feco-oral transmission of diseases in rural Nepal to discourage open defecation. Behavior change in people is highly motivated by health concerns reported for hand washing behaviors in a study in Nepal Momichael and Robinson (2016).

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Table 4 Environmental Implication of Open Defecation (n=140)

Variable	Frequency	Percentage
Pollute the environment	41	22.4
Pollute river water	50	27.3
Pose poor sanitation	30	16.4
Transmit disease	36	19.7
Alter the beauty of the environment	26	14.2
Total	**183**	**100**

Table 4 shows environmental implication of open defecation in the study area. The study revealed that 22.4% of the respondents opined that open defecation pollutes the environment, 27.3% opined defecation openly pollute river water, others 16.4% had opined that it poses poor sanitation, some 19.7% had opined that transmits disease while 14.2% had opined that its alters the beauty of the environment. In conformity with the present study, findings by Mumbi and Wilberforce in their study in Kenya (2017) reveals that air pollution, water pollution, food contaminated from flies and cockroaches occurs in house were major effects of open defecation. Of concern, was the awful smell and spread of diseases that led to diarrhea and finally to death of infants that was associated with open defecation. This study observed open defecation in the river site, river channel as well as the river banks, this causes surface water pollution and penetrate to contaminate the ground water. The aesthetic quality of the environment has been degraded by the flying human excreta resulted to water borne and sanitation related diseases, findings consistent with the study of Dey (2018).

CONCLUSION

Open defecation is a serious sanitation issue most developing countries are struggling with. Elimination of waste is one the basic needs of human beings. Open air defecation is associated with disgust that is elicited when people are closely confronted with human feces in public places and this contributes to its complex phenomenon. When communities have no access to safe human waste disposal facilities, the environment becomes a risky place where diseases are transmitted. Ending open defecation would go a long way in improving the sanitation level in Nigeria and this can best be achieved through the recognition of the right to sanitation.

RECOMMENDATION

i. The study recommends strengthening of government efforts to eradicate the practice; incorporating social workers as facilitators in public health regulations and advocacy in sensitizing households to provide their own toilets.

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ii. Community-led initiatives that draw on the creativity and capacity of local people to take control of their change processes must be integrated into open defecation intervention programmes.
iii. Government should provide appropriate infrastructure and resources so that all human beings at all times have access to toilet and sanitation.

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