

SEWAGE DISPOSAL METHODS IN A SUB-URBAN COMMUNITY IN EDO STATE, NIGERIA

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ABSTRACT

The sewage disposal method of household members in any community is an important determinant of their health status. This community based descriptive, cross-sectional study assessed the sewage disposal methods and factors associated with its practice among residents of Oluku a sub-urban community in Edo State, Nigeria. A structured, interviewer-administered questionnaire was the tool for data collection. A total of 300 household heads or their representatives participated in the study. A higher proportion of them 40.7% (122/300) were aged 25 – 34 years while their mean age was 31.1 ± 9.1 years. More than half 54.3% (163/300) of the respondents were males. The educational status showed that 50.7% (152/300) and 29.7% (89/300) respondents had secondary and tertiary level of education respectively. Only 22.3% (67/300) were skilled workers while 29.7% (89/300) were unemployed. Almost half 49.7% (149/300) used the pit latrine, 33.3% (100/300) used water closet, 14.3% (43/300) used VIP latrine while 2.7% (8/300) respondents practiced open defaecation as sewage disposal methods. There was a statistically significant association between the method of sewage disposal and the level of education ($p < 0.001$) and the occupational class of the respondents ($p < 0.001$). The predominant method of sewage disposal among residents of Oluku community was pit latrines and water closet. There is need for continued health education on the importance of proper sewage disposal in the community.

Introduction

The World Health Organization (WHO) in her progress report on health related Millennium Development Goals (MDGs) stated that “with regard to basic sanitation, current rates of progress are too slow for the MDG target to be met globally”.¹ The number of people living in urban areas without access to improved sanitation is increasing because of rapid

growth in the size of urban populations.¹ The Nigeria Demographic and Health Survey (NDHS) of 2008 showed that 27% of households use an improved toilet facility (31% in urban areas and 25% in rural areas), while 73% of households use non-improved facilities (69% in urban areas and 75% in rural areas).² Currently in Nigeria, 51% of the population are living in household using improved sanitation facilities. This percentage is 79% in urban and 37% in rural areas.³

The use of non-improved sanitation facilities and the resultant improper disposal of sewage predispose household members to faeco-oral infections and children are most commonly at risk of this. Globally, there are nearly 1.7 billion cases of diarrhoeal disease every year and a significant proportion of

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these diarrhoeal diseases can be prevented through safe drinking water and adequate sanitation and hygiene.⁴ A study carried out in three communities in Benue state, Nigeria, to ascertain the prevalence of intestinal parasites showed that the community in which 70% of households used improved toilet facilities according to the WHO standard recorded a much lower prevalence of intestinal parasites when compared to the other two communities.⁵ Several other studies have also recorded a reduction of diarrhoeal diseases with proper and hygienic disposal of sewage.^{6,8}

In Edo state, Nigeria, 64% of households used improved sanitation facility, 14% used an unimproved sanitation facility while 22% practised open defecation (no facility, bush or field).³ Open defecation of faeces is unsightly and degrades the quality of the environment. It also provides breeding ground for vectors leading to the contamination of both food and water and this can result in outbreaks of diarrhoeal diseases. The sewage disposal method of household members in any community is an important determinant of their health status. Thus, this study was conducted to assess the sewage disposal methods and factors associated with its practice among residents of a sub-urban community in Edo State, Nigeria.

Materials and methods

This descriptive cross-sectional study was carried out in Oluku, a sub-urban community in Ovia North East Local Government Area of Edo State, Nigeria. Oluku community has a total population of 24, 523 and it is located 7 km from Benin City the capital of Edo state. It is bordered in the north by Ovbioge, in the south by Okhunmwun and Iguosa, to the East by Ora and to the west by Agbaen communities.

This study was approved by the Ethics and Research Committee of the University of Benin Teaching Hospital. Permission to carry out the study was also obtained from the Head of the community (Odionwere) while

respondents also gave informed verbal consent before participating in the study.

The study population comprised of Heads of household or their representative if the Head of the household was absent on the day of the study. The minimum sample size required for this study, calculated using the appropriate formula for sample size calculation in a descriptive study and a prevalence of 79% (the proportion of urban household using improved sanitation facilities in Nigeria)³ was 281. The respondents were recruited from selected houses in the community after an initial enumeration of all the houses in the community was carried out and this constituted the sampling frame (852). The houses were selected using a systematic sampling technique. The sampling interval of three used for selecting the houses was determined by dividing the houses in the community by the calculated sample size. The house of the Odionwere was purposively chosen as the first house and the next houses were systematically selected onwards by adding the sampling interval to the Odionwere's house. In any selected house where there are more than one household, a simple random sampling using the table of random numbers was used to select the household that participated in the study.

Data collection was by means of a structured, researcher-administered questionnaire containing both open and close ended questions. The information sought from the respondents included their socio-demographic characteristics and the methods of sewage disposal practiced by them. Data collected were coded, entered, cleaned and analyzed using SPSS version 16 statistical software programme. Univariate analysis was conducted for all variables to assess the distribution for each variable. Continuous variables were summarized using means and standard deviations while

categorical variables were summarized using proportions. A bivariate analysis using chi square test was used to test for associations between the socio-demographic characteristics of the respondents and their practice of sewage disposal. P-values less than 0.05 was considered statistically significant.

Results

A total of 300 respondents who were household Heads or their representatives participated in the study. The socio-demographic characteristics of the respondents are shown in Table 1. A higher proportion of them 40.7% (122/300) were aged 25 – 34 years while their mean age was 31.1 ± 9.1 years. More than half 54.3% (163/300) of the respondents were males and 56.3% were single. The educational status showed that 50.7% (152/300) and 29.7% (89/300) respondents had secondary and tertiary level of education respectively. Only 22.3% (67/300) were skilled workers while 29.7% (89/300) were unemployed.

Table 2 show the sewage disposal methods of the respondents. Almost half 49.7% (149/300) used the pit latrine while one third 33.3% (100/300) of the respondents used the water closet. Open defaecation was practiced by 2.7% (8/300) respondents. Of the households studied, the distance between the point of sewage disposal and their source of water was less than 30 metres in 51.3% (154/300) households while the distance was more than 30 metres in 48.6% (146/300) households.

The use of water closet as a method of sewage disposal increased with increasing level of education while the use of pit latrines, ventilated improved pit (VIP) latrines and open defaecation all decreased with increasing level of education. There was a statistically significant association between the method of sewage disposal and the level of education ($p < 0.001$) and the occupational class of the respondents ($p < 0.001$). Majority

of the respondents who were skilled workers used the water closet as a method of sewage disposal. The use of pit latrine increased from the skilled to the unskilled respondents (table 3).

Discussion

The respondents in this study were predominantly young people and this is typical of a developing country. This finding is consistent with the 2008 NDHS report.² Also, half of them were either unemployed or engaged in an unskilled employment and this could explain their living outside the capital city (Benin City) which may be because of economic reasons as ordinarily the cost of living will be higher in the city, so people in these occupational class tend to aggregate in the suburbs of the city where the cost of living is relatively cheaper. A higher proportion of the households in this study were headed by males, and this was also in keeping with the NDHS of 2008² and the Nigeria Multiple Indicator Cluster Survey (MCIS) of 2011³. However, the proportion of female (45.7%) respondents in this study who may be household heads was far higher than what was reported in the 2008 NDHS (19.0%) and the 2011 MICS (16.1%). This may have accounted for the large proportion of respondents who were engaged in unskilled jobs or who are unemployed. Female headed households are typically poorer than male headed households² and this may affect their ability to pay for houses with basic amenities for proper sewage disposal which could lead to serious health consequences.

One of the targets of the MDG 7 is to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation, while the indicator to measure this is the proportion of population using an improved sanitation facility. With a countdown of one year to the target, about half of the households in this study used pit latrine while one third used water closet as a

Table 1: Socio-demographic characteristics of respondents

Variable	Frequency (n=300)	Percent
<u>Age in years</u>		
15 – 24	85	28.3
25 – 34	122	40.7
35 – 44	67	22.3
45 and above	26	8.7
<i>Mean age 31.1 ± 9.1 years</i>		
<u>Sex</u>		
Male	163	54.3
Female	137	45.7
<u>Marital status</u>		
Single	169	56.3
Married	113	37.7
Divorced	14	4.7
Widowed	7	1.3
<u>Educational status</u>		
Primary	59	19.6
Secondary	152	50.7
Tertiary	89	29.7
<u>Occupational class</u>		
Skilled	67	22.3
Semi-skilled	74	24.7
Unskilled	70	23.3
Unemployed	89	29.7

Table 2: Sewage disposal methods of respondents

Methods	Frequency	Percent
Water closet	100	33.3
Pit latrine	149	49.7
VIP latrine	43	14.3
Open defaecation	8	2.7
Total	300	100.0

Table 3: Sewage disposal methods and educational status/occupational class of respondents

Variable	Sewage disposal methods				P value
	Water closet n (%)	Pit latrine n (%)	VIP latrine n (%)	Open defaecation n (%)	
<u>Educational status</u>					
Primary	7 (11.9)	36 (61.0)	12 (20.3)	4 (6.8)	< 0.001*
Secondary	33 (21.7)	95 (62.5)	22 (14.5)	2 (1.3)	
Tertiary	60 (67.4)	18 (20.2)	9 (10.1)	2 (2.2)	
<u>Occupational class</u>					
Skilled	44 (65.7)	22 (32.8)	1 (1.5)	0 (0.0)	< 0.001*
Semi-skilled	14 (18.9)	39 (52.7)	18 (24.3)	3 (4.1)	
Unskilled	20 (28.2)	39 (55.7)	8 (11.4)	3 (4.1)	
Unemployed	22 (24.7)	49 (55.1)	16 (18.0)	2 (2.2)	

****Statistically significant***

method of sewage disposal. This is in contrast with a previous study in Benin City in which two thirds of the household used water closet for sewage disposal.⁹ A well maintained water closet by flushing after every use and pit latrine with cover slab are sanitary methods of sewage disposal. However, pit latrines without cover slab are considered insanitary because of easy accessibility to vector of diseases. Also worrisome is the fact that half of the households had their source of water supply less than 30 metres from the sewage disposal site. Apart from acting as breeding sites for vectors of diarrhoeal disease causing organisms such as shigella and vibro cholera, members of the households are also prone to direct faecal contamination of their water supply. The combined effect of this could adversely affect the health of residents of the community. In addition to this potential hazard, few respondents (2.7%) in this study still practiced open defaecation. This can lead to pollution of the air and water bodies resulting in air and water-borne diseases such as cholera, dysentery etc. Although this figure was lower than the 22% reported for the whole of Edo state in the 2011 MICS report, the sub-urban nature of the study area may have accounted for low figure. This finding underscores the need for health education in this community.

In this study, the sewage disposal method of the respondents showed a statistically significant association with their level of education and occupational class. Majority of the respondents who had tertiary level of education and those who were skilled workers used the water closet method of sewage disposal. This finding is similar to a study in Bangladesh which showed that education and socio-economic situation influenced the use of sanitary latrines.¹⁰ Another report in Ethiopia by Awoke and Muche¹¹ showed that income level affected latrine coverage as the availability of latrines

was twice higher in households with an income of 5000 Ethiopian Birr or more. The level of education and more importantly occupational class are important determinants of an individual's economic power to afford apartment with improved sanitary facilities.

A limitation in this study is the fact that sewage disposal methods mentioned by the respondents were not verified by observation and it was not ascertained if all members of the household used the sanitary facilities. Also, the occupational class of the respondents was used as a proxy for their income.

In conclusion, the predominant method of sewage disposal among residents of Oluku community was pit latrines and water closet. Higher level of education and skilled occupational class were found to be associated with the methods of sewage disposal by the respondents. The empowerment of members of the community economically through education and employment will improve their standard of living which will in turn influence their sewage disposal methods and thus promote their health. There is also need for continued health education on the importance of proper sewage disposal in the community.

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