

Knowledge and practice of sewage disposal in Abattoir community of Jos South LGA, Plateau State, Nigeria

Miner CA., Tagurum YO., Hassan Z., Afolaranmi TO., Bello DA., Dakhin A.

Abstract

Objective: Insanitary disposal of sewage is a problem that contributes to pollution and impacts negatively on human health. It contributes significantly to the prevalence of diarrhoeal diseases. This study was conducted to determine the knowledge and practice of sewage disposal among selected residents of Abattoir community of Jos South LGA, Plateau State.

Methods: A multistage sampling technique was used to select respondents. Semi-structured interviewer administered questionnaires were used to collect data which was analyzed with Epi info 3.5.4. A p-value of <0.05 was considered statistically significant for this study.

Results: A total of 120 adults from selected households were interviewed. A mean age of 31 ± 2 years was found with a male:female ratio of 1:1.4. Adequate knowledge regarding sewage disposal was found among 94% of respondents. The flush/pour-flush toilet connected to septic tank, simple pit latrine and open defaecation were the methods found in use among them. The choice of sewage disposal type was statistically significantly related to level of education. Other reasons that influenced choice of toilet methods were hygiene, convenience, affordability and ease of maintenance. No cases of diarrhoea were reported in 90% of the households in the 6 months prior to the study.

Conclusion: Despite the commendable findings in this community, the community is still at risk due to the poor practices of a few that were persisting in the community. Both government and community efforts are required to ensure that basic toilet facilities are available to all.

Key words: sewage disposal, knowledge, practice, urban community

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La connaissance et la pratique de l'élimination des eaux usées dans la communauté de Jos Abattoir Sud LGA, Etat du Plateau, au Nigeria

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Resume

Objectif: élimination insalubre des eaux usées est un problème qui contribue à la pollution et les impacts négatifs sur la santé humaine. Elle contribue de manière significative à la prévalence des maladies diarrhéiques. Cette étude a été menée afin de déterminer la connaissance et la pratique de l'élimination des eaux usées parmi les résidents sélectionnés de la communauté de Jos Abattoir Sud LGA, Etat du Plateau.

Méthodes: Une technique d'échantillonnage à plusieurs degrés a été utilisé pour sélectionner les répondants. questionnaires de l'intervieweur administré semi-structurés ont été utilisés pour recueillir des données qui a été analysé avec Epi Info 3.5.4. Une valeur de $p < 0,05$ a été considérée comme statistiquement significative pour cette étude.

Résultats: Un total de 120 adultes de ménages sélectionnés ont été interviewés. Un âge moyen de 31 ± 2 ans a été trouvé avec un ratio hommes: femmes de 1: 1,4. Une connaissance suffisante en matière d'élimination des eaux usées a été trouvé parmi 94% des répondants. Le pour-chasse d'eau de rinçage / relié à une fosse septique, latrines à fosse simple et défécation ouverte ont été les méthodes trouvées en usage chez eux. Le choix du type d'évacuation des eaux usées a été statistiquement significative liée au niveau de l'éducation. D'autres raisons qui ont influencé le choix des méthodes de toilette étaient l'hygiène, la commodité, l'abordabilité et la facilité d'entretien. Aucun cas de diarrhée ont été signalés dans 90% des ménages dans les 6 mois précédant l'étude.

Conclusion: Malgré les résultats louables dans cette communauté, la communauté est toujours à risque en raison des mauvaises pratiques de quelques-uns qui persistaient dans la communauté. Le gouvernement et les efforts communautaires sont tenus de veiller à ce que des installations sanitaires de base sont accessibles à tous.

Mots clés: évacuation des eaux usées, la connaissance, la pratique, la communauté urbaine

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INTRODUCTION

The disposal of human waste is a fundamental environmental health service. Every society has a responsibility for its safe removal and disposal so that it does not constitute a threat to public health. Human excreta is an important source of pathogenic organisms and in addition, faeces can attract flies and other vectors which do not only spread pathogenic organisms but also breed them.

Problems with sewage disposal occur worldwide but are worse in developing countries especially in the tropics, where more than a million children die annually from diarrhoeal diseases (1,2). That is more than the total deaths resulting from AIDS, tuberculosis and malaria altogether. In Nigeria it is not uncommon to see people urinate in open spaces and into public drains. Such actions contribute to environment degradation and pollution.

Insanitary excreta and sewage management as well as deficiencies in other components of environmental sanitation, contribute significantly to the continuing high rate of infant and child mortality from diarrhoeal diseases. Ensuring country wide access to sanitary excreta and sewage management methods will result in lower prevalence of environmental-related diseases.

As at the year 2000, an estimated 2.4 billion people still lacked access to adequate means of excreta disposal system (3). Urban centres in Africa and Asia have been found to have no sewage disposal systems including cities with a million or more inhabitants (3). Twice the number of people who lack access to improved water supply, lack access to improved sanitation facilities, especially in Africa and Asia where rivers and streams are the final points of disposal of untreated human excreta (4).

Knowledge of sewage disposal has been assessed through related practices. In Lebanon, a study looked at the knowledge of inhabitants of a community regarding the waste water in their village. It showed that more than 60% of the respondents had no information on the subject matter. It concluded that "the fact that many people had no idea about treated wastewater quality and the final disposal location shows some lack of knowledge among the local people" (5). Similarly a study conducted among mothers in Peru showed a poor knowledge of proper hygiene practices and faecal disposal practices in respect to their children (6). However, a study in Zaria, Nigeria conducted among students showed

that their knowledge of methods of sewage disposal was high (7).

According to the 2008 Nigeria National Demographic and Health Survey (NDHS), 14% urban populations had no toilet facilities of any type while 31% had unshared improved toilet facilities. Overall, 32 % of households in Nigeria had no toilet facilities. This problem was found to be more common in rural areas with 42% of rural households having no toilet facilities at all and as a result defaecate in the open (8). Intestinal parasites have been shown to predominate in those with poor waste disposal and hygiene practices (9,10). The National Water Sanitation policy aims that "each household in urban areas (population above 20,000) must own and have access to safe sanitary facility that uses suitable and affordable water conveyance systems (at least pour-flush toilet)" (11).

Several factors have been shown to affect sewage disposal practices. Lack of human resources with technical operating experience, lack of financial resources, management capability and political commitment necessary to implement waste management in an effective manner were identified by a study in Lebanon (5). Among students in Zaria, it was found that despite having good knowledge, practice was hampered by the lack of sanitation facilities at school (7). Low socio-economic conditions have also been characterized by inadequate water supply, poor hygienic practices and poor sanitary disposal of faeces.(12,13)

Rationale: Insanitary excreta and sewage management contribute significantly to environmental degradation and pollution and to the continuing high rate of infant and child mortality from diarrhoeal disease. Recent outbreaks of faeco-oral diseases such as cholera have necessitated the need for proper documentation of disposal practices among communities. It is hoped that the information obtained from this study will assist authorities in tackling the ever growing burden of urban waste management and form a basis for further studies.

The objective of the study is to assess the knowledge and practices of sewage disposal among inhabitants of Abattoir community and to identify factors that influence their sewage disposal practices.

STUDY AREA

The study was conducted in Abattoir, an urban community located in Jos South Local

Government Area (LGA) of Plateau State (Figure I). The area is so called because of the State owned slaughter house situated in the area. It covers an area of 510km² with a population of 306,716 as recorded by the 2006 census (14). The topography is characterized by undulating rocky hills, mining ponds and streams. The settlements are urban with the provision of government supplied potable water and electricity. There are several government and privately owned primary and secondary schools and a central market in the area. It has a multi-ethnic population with churches and mosques scattered throughout the area though it is a predominantly Christian population.

METHODS

The study population consisted of adult members of each selected household in the community i.e. those above 18 years of age who had lived in the house for at least 1 year. It was a cross-sectional descriptive study design. Study participants were selected from each household through a multistage sampling technique. Sample size was determined using the formula for descriptive cross sectional studies, $n = z^2pq/d^2$ where, n = calculated sample size, z = standard normal deviate at 95% confidence interval = 1.96, p = prevalence of the sewage disposal method found in a previous study = 92.9% (10), q = $1 - p$ and d = precision level of 5% = 0.05. A non-response rate of 10% was taken into consideration which gave a final sample size of 111 which was rounded up to 120.

Data collection was with the use of a pre-tested interviewer-administered semi-structured questionnaire that obtained information on socio-demographics, knowledge of sewage disposal and practice of sewage disposal. Data was collected from house to house in English or Hausa languages. Data was entered and analysed using the statistical software for epidemiology, Epi-Info version 3.5.4. (2012) developed by the Centers for Disease Control and Prevention (CDC) in Atlanta, USA. Knowledge was graded based on responses to a total of ten questions. Adequate knowledge was graded based on 5-10 correct responses while a total of 4 or less correct responses were grouped as inadequate knowledge. Permission to conduct the study was obtained from the community head known as the 'Mai angwa'. Permission was also obtained from all household heads and respondents.

RESULTS

A total of 120 respondents were interviewed with a response rate of 100%. It was a young population with a mean age of 31 ± 2 years with a male: female ratio of 1:1.4. Majority (54.2%) of respondents were single and 57.5% of them had attained tertiary level of education. A large proportion of students (43.4%) were among the respondents. Other occupations included traders (20.8%), civil servants (13.3%), unemployed (10.8%), others (11.7%) such as farmers, housewives, carpenters, barbers and lawyers. (Table 1)

Majority (94%) of respondents were found to have adequate knowledge regarding disposal of sewage. There were multiple sources of information which had been obtained mainly from the radio and television (36.9%), schools (26%) and family members (19.4%) and as shown in Figure II. When asked about methods of sewage disposal responses included pit toilets (37.5%), septic tanks (36.1%), open defaecation (17.5%), trench latrines (1.1%), bucket latrines (2.9%), chemical toilets and composting (5.0%). Responses regarding the dangers associated with improper disposal of sewage included spread of diseases (44.8%), water pollution (43.2%) and others (8.0%) such as air pollution, vaginal itching and peri-anal itching. A small percentage (4.0%) stated that they didn't know of any dangers. Diseases caused by improper sewage disposal stated by respondents included cholera (24.0%), diarrhoea (18.0%), typhoid (8.0%), dysentery (7.3%), malaria (6.6%). However, 22.2% could not name any diseases.

Majority (112, 93%) of households claimed ownership of a toilet (Figure III). The predominant type of toilet used was the flush/pour flush connected to septic tank (67.5%), 25.8% used simple pit latrines and 6.7% resorted to open defaecation (Table 2). Those who used the latter option corresponded with those who lacked toilet facilities in their homes. There was a statistically significant relationship between choice of toilet type and level of education ($p < 0.05$) but not with having adequate knowledge ($p > 0.05$) as shown in Table 3. A majority (78, 97.5%) of those owning septic tank toilets had sufficient water for flushing after use while a few (3.7%) did not. Choices of toilet methods were based on hygiene (39.1%), convenience (17.2), affordability (15.2%) and ease of maintenance (9.3%). Majority (83.3%) of the respondents stated that they were willing to borrow money to build a household toilet while a

good number of them (69%) also stated that they were unwilling to share a toilet with their neighbours. A total of 52 (43.3%) were very satisfied with their toilet facilities, 25.7% were satisfied while 15.8% and 15% were unsatisfied or very unsatisfied respectively. Seventy-five percent of respondents claimed that they always washed their hands after using the toilet. Majority of the respondents did not have any case of diarrhoea in the household in the 6 months prior to the study (Figure IV).

DISCUSSION

The participants in this study were a fairly young population and most had attained tertiary level of education. The knowledge of respondents regarding sewage disposal methods and the link of poor disposal with certain infectious diseases was high. This is similar to the findings among secondary school students in Zaria (7), among motor park operators in Osun State (15) and also among tertiary institution students in Ekiti (16). Similarly these studies demonstrated that knowledge of waste management was not influenced by the educational level as was seen in this study. As was shown in this study, there are various forms in which information could be obtained. Respondents claimed that most of their information had been obtained through the radio and television. Mass campaigns had been initiated by the Plateau State Government to enlighten residents on the need for proper sanitation and specifically the disposal of sewage/excreta in the light of recent occurrences of cholera outbreaks (17). This may have led to the increased awareness and information among residents generally.

The proportion that owned a household toilet (not shared) is higher than the national average of 37.5% for urban communities recorded in the 2008 National Demographic and Health Survey (8). Members of households surveyed were found to have attained higher levels of education which were found to be associated with the choice of sewage disposal method. This community had an abundant availability of pipe-borne water and this may be responsible for the high proportion of flush toilets in use which were all connected to septic tanks. This advantage may be due to the location of the community in relation to the State's Abattoir that requires and is supplied consistently with potable water from the State's municipal water supply services. This further buttresses the need for the

constant provision of water in the goal to improve sanitation in communities. In this study, 69% of respondents were satisfied with their toilet facilities, which is above the proportion found in a study in a community in Zimbabwe in which less than 50% were satisfied (18).

Reasons offered for the choice of sewage disposal method were mostly based on hygiene indicating that the respondents recognized the importance of sewage disposal. Also less than 20% thought affordability was a determining factor. This is supported by the fact that most stated that they would be willing to borrow money to build a toilet. These findings are similar to a study conducted in Rivers State, Nigeria where concerns for hygiene were stated and cost was not a determining factor for installing a household toilet (19). This attitude is also reflected in the fact that none of the toilet facilities were found to be shared between households.

However, the use of simple latrines rather than the more widely used ventilated improved latrine is a cause for concern in addition to the 7% that lack access to toilets and therefore defaecate openly. Both practices encourage breeding of disease vectors and the propagation of infective diseases even for those who do not live in these households as poorly constructed pits and open defaecation can contaminate water sources. There is also concern for simple pit latrines as they easily attract and support breeding of insect vectors. As those that lacked toilets were the ones who defaecated in the open, it suggests that if toilets were available in their homes, it might deter them from this practice.

There have been cholera outbreaks in the recent past in Plateau State (20) which may have influenced the stating of cholera more frequently than other diseases that were mentioned. People have been known to associate poor sewage disposal with occurrence of diarrhoeal diseases or diseases that present with passage of loose watery stools (21,22).

Consequent upon the availability of household toilets, there were only 10% of diarrhoeal cases among members of the households of the respondents in. Hand washing practices were also found to be good as 80% would 'always' wash their hands after defaecation. This is higher than what has been obtained in other studies on hand washing (23,24,25).

The findings in this community are encouraging and commendable, unlike what is obtainable in many other communities in the state

and country at large. However it is recommended that public health education services and programmes on sewage disposal and related practices should be sustained by public and private institutions. Despite this commendation, the community is still at risk of diarrhoea and other infectious diseases. Efforts need to be made to provide toilets for the small percentage that have none or ill equipped toilet facilities.

Conflict of interest: No conflict of interest declared.

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Table 1: Socio - demographic characteristics of respondents of Abattoir community

Characteristic	Frequency (%) (n = 120)	
Age group		
20 - 24	29	(24.2)
25 – 29	43	(35.8)
30 – 34	13	(10.8)
35 – 39	16	(13.3)
40 – 44	7	(5.8)
45 – 49	6	(5.0)
50 – 54	3	(2.5)
55 - 59	3	(2.5)
Sex		
Male	51	(42.5)
Female	69	(57.5)
Marital status		
Single	65	(54.2)
Married	52	(43.3)
Divorced	1	(0.8)
Widowed	2	(1.7)
Level of education		
None	4	(3.3)
Primary	10	(8.3)
Secondary	37	(30.8)
Tertiary	69	(57.5)
Occupation		
Students	52	(43.3)
Civil servants	16	(13.3)
Trader	25	(20.8)
Unemployed	13	(10.8)
Others*	14	(11.7)
Number of household members		
5	72	(40.0)
>5	48	(60.0)

*Farmer, housewife, carpenter, lawyer, barber

Table 2: Method of sewage disposal used by respondents

Types of toilets	Frequency (%) (n = 120)	
Flush/pour flush to septic tank	81	(67.5)
Simple pit latrine	31	(25.8)
Open defaecation	8	(6.7)

Table 3: Relationship of level of knowledge and educational level with sewage disposal method

Variable	Method of sewage disposal			p-value
	Flush/pour flush	Simple pit	Open defeacation	
Level of knowledge	Freq (%)	Freq (%)	Freq (%)	
Adequate	77 (64.2)	30 (25.0)	6 (5.0)	0.053
Inadequate	4 (3.3)	1 (0.8)	2 (1.7)	
Level of education				
None	2 (1.7)	1 (0.8)	1 (0.8)	0.00001
Primary	3 (2.5)	1 (0.8)	6 (5.0)	
Secondary	24 (20.0)	12 (10.0)	1 (0.8)	
Tertiary	52 (43.3)	17 (14.2)	0 (0.0)	

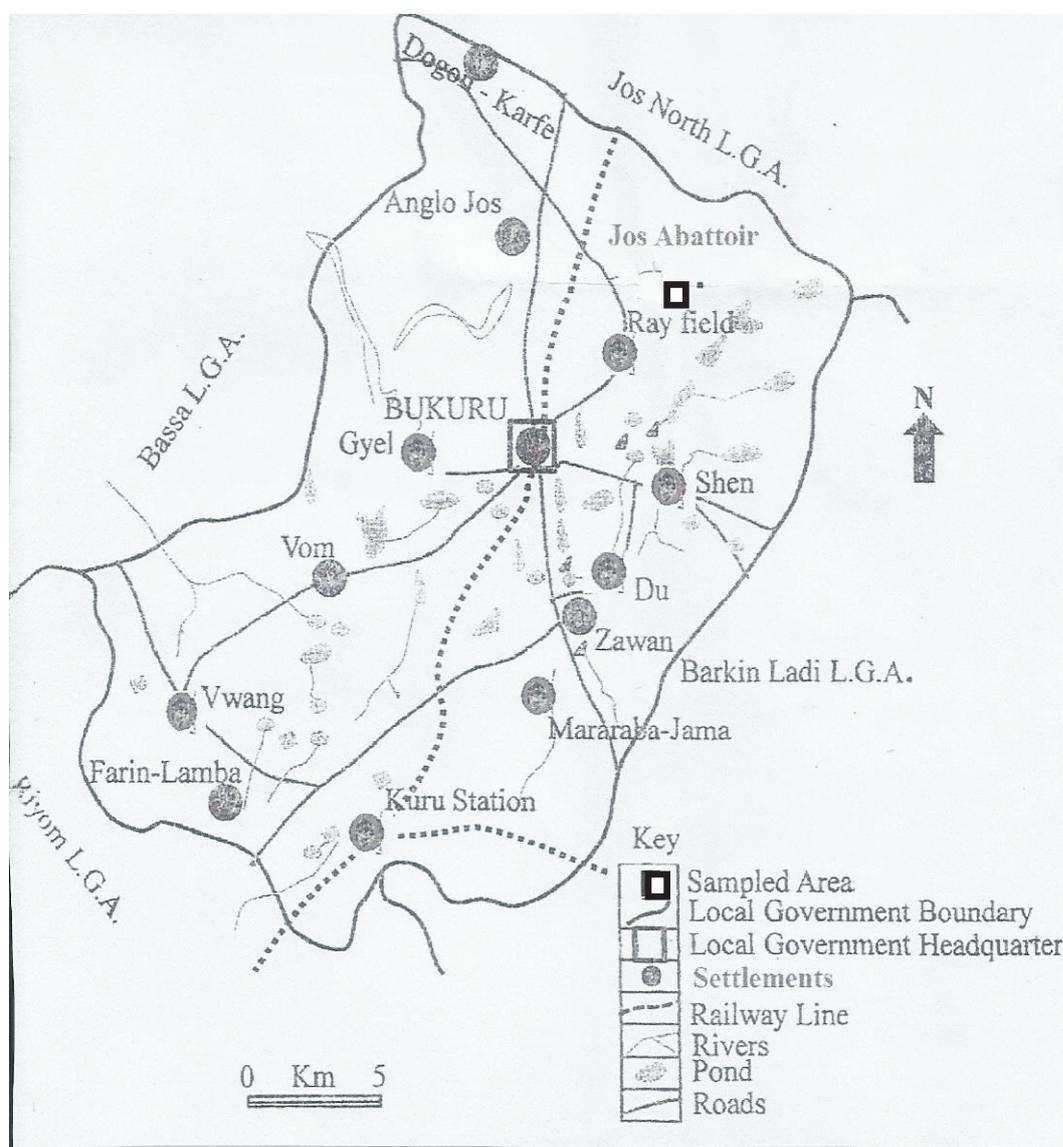


Figure: Map of Jos South Local Government Area indicating sampled area (Source: Jos South Local Government Council)

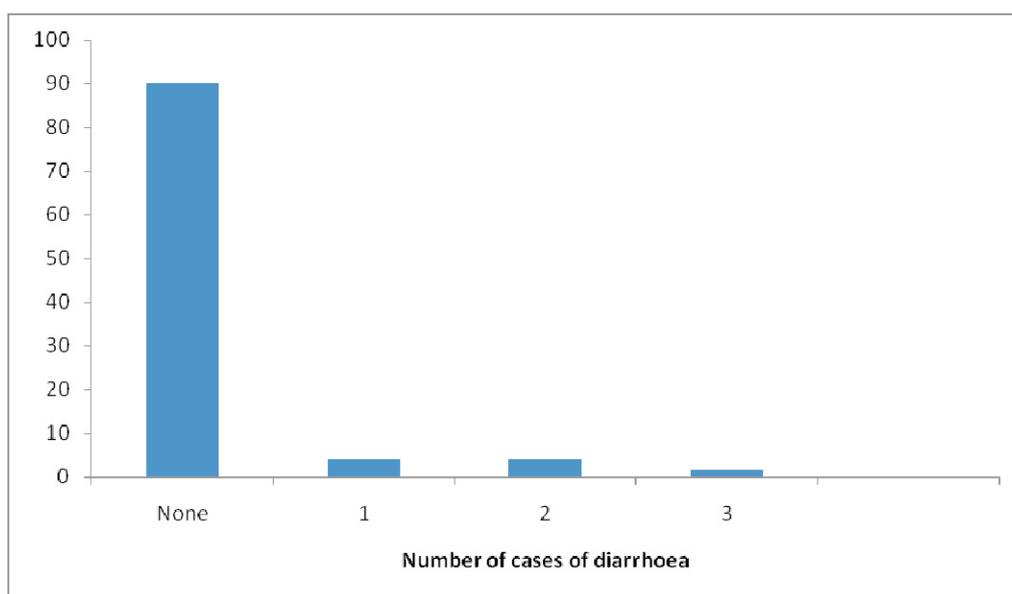


Figure IV: Number of cases of diarrhoea per household