Housing features and household access to sanitation facilities in a rural Nigerian community

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ABSTRACT

Good housing and adequate sanitation are linked as both are important in disease prevention and the overall promotion of health and well-being of man including residents in rural communities. This study was carried out to examine household access to sanitation facilities in Usugbenu, a rural community in Edo State, Nigeria, and to determine what relationship exist between household characteristics and use of such facilities in the study area.

Cluster sampling technique was used to draw a sample of 399 households from the community, and interviewer-administered questionnaires were used to collect data. Data analysis was done using IBM SPSS with statistical significance level set at \( P \leq 0.05 \).

The most common family type was the nuclear family (62.7%); the most common housing unit type was flat/bungalow (57.3%); and the owner-occupier status was 73%. Block/brick wall houses were 63.4% while the common sources of water for household use were sachet water (30.1%), rainwater (28.8%), and borehole (20.1%). Pit toilets were used in 71.7% of households while sharing of toilet facilities occurred in 29.1% of households. Significant factors associated with the use of non-shared toilet facilities in this study were higher (secondary/tertiary) level of education, inherited or self-owned house, and brick/blockhouse wall type.

Factors that compromise sanitation such as poor access to domestic water supply and sharing of toilet facilities were prevalent in the community.

Key words: Household, housing features, rural community, sanitation, water supply

INTRODUCTION

Shelter is one of the man’s most important needs. By extension, housing with adequate sanitation facilities is essential to the health and socioeconomic well-being of households, communities, and the entire society at large.¹,² Good and adequate housing is a matter of human rights.³ It provides shelter, comfort, and access to necessary household facilities including safe water supply, sewage disposal, and energy. Safe water supply is strategic to good nutrition, infection control, and general well-being at the individual household and community levels. Disease transmission and the proliferation of disease vectors such as house flies, cockroaches, and even rodents are related to poor sewage disposal as well as other waste management practices.⁴,⁵

Household characteristics and sociodemographic features of household members are associated with improved sanitation while access to adequate sanitation is worse in rural communities.⁶,⁷ According to the 2013 Nigeria Demographic and Health Survey, only 28.2% of persons living in rural communities in Nigeria have access to improved toilet facilities compared to 42.7% for urban residents.⁸ Improvement in the health indices of a community is closely tied to safe housing, access to clean water, and sanitary waste disposal. According to reports, a substantial part of global deaths and disease burdens are due to environmental factors which are preventable through environmental strategies such as adequate shelter, provision of safe water, adequate hygiene, and improved sanitation.⁹,¹⁰ Rain harvesting, which is a traditional means of getting water in Nigeria, has been found to be inadequate for household water requirements in Edo State while water and sanitation-related diseases are widespread.¹¹,¹²

This study sought to examine household access to sanitation facilities in a rural community in Edo State, Nigeria community and to determine what relationship exist between household characteristics and such facilities in the study area.

MATERIALS AND METHODS

This study was carried out from 2014 to 2016 in Usugbenu, a rural community in Esan Central LGA of Edo State, Nigeria. The maps of the study area are shown in Figure 1. The community is a largely agrarian one though many residents also engage in trading. The Cochran formula¹³ was used to calculate the minimum sample size for this study: \( n = \frac{Z^2pq}{d^2} \) where \( Z \) is the standard deviation at 95%, \( p \) is the prevalence of 28.2% for improved toilet facility.
from the 2013 Nigerian Demographic and Health Survey,[8] q is 1-p, and d is the precision level of 5%. Thus, a minimum sample size of 311 was calculated for the study.

Cluster sampling technique was used to select the participating households adopting the community quarters as clusters. Data collection was done with the use of interviewer-administered questionnaires. Analysis of data was done with SPSS version 21.[14] The level of statistical significance was set at \( P \leq 0.05 \). Ethical guidance was provided by the Department of Community Health and Primary Care, Ambrose Alli University, Ekpoma. In addition, verbal informed consent was obtained from every study participant and confidentiality was assured.

RESULTS

As shown in Table 1, married respondents were the largest group of respondents (45.3%) while the most common occupations were farming and trading (36.6% and 17.3%, respectively). More than half of them had either primary or secondary education. An overwhelming majority of the respondents were Christians and Esans. Table 2 summarizes that most household heads were fathers while 62.7% were nuclear families. More than half (57.1%) of the housing units were bungalows/flats while about one-third were passage (“face-to-face”) houses. Majority of the houses were owner occupied.

About 86% of the houses were roofed with galvanized iron (zinc sheets) while 63.4% were built with blocks or bricks [Table 3]. Over three-quarters of the houses had cement or concrete floors. Table 4 summarizes that the main sources of water for household use were commercially sold sachet water (30.1%), rain (28.8%), and borehole (20.1%). Similarly, Figure 2, the main sources of drinking water were borehole (62.9%) and sachet water (25.6%).

Table 5 summarizes that pit latrines were the most commonly used (71.7%) toilet facilities in the community while 29.1% of households were sharing toilet facilities. As shown in Table 6, owner-occupied or inherited houses and mud/wood houses were significantly associated with not sharing toilet facilities (\( \chi^2 = 32.427, P \leq 0.001 \); and \( \chi^2 = 6.112, P = 0.013 \), respectively).

DISCUSSION

The high proportion of farmers among the study participants is indicative of the agrarian nature of the community. Farming together with small-scale trading (including trading in farm produce) is the main occupation of many rural communities in Nigeria. The size of households, in traditional settings, is commonly influenced by the need to have more family members who can provide labor for farming and related work.[15,16] It is, therefore, common to find households with extended family members as was the case in the community where more than one-third of the households consisted of extended families. Majority of households in this study lived in houses owned by them. This implies that there may be household autonomy with respect to the acquisition and use of sanitation facilities in most households in the community. Where sanitation facilities are within the control of a household, it can take responsibility for maintenance and sustainability of such facilities, thereby guaranteeing protection of health and well-being of household members.

To a very large extent, access to safe housing was observed in the study community with most households living in houses with galvanized iron roofs, block/brick walls, and cement or stone floors. These materials provide general protection against weather elements and disease-causing agents. The high number of households with block or brick walls contrasts with the results of a research done in rural communities in Osun State, Nigeria, where more than 50% of the houses were mud built but compares with the high number of houses with corrugated roofing sheets.[17]

An essential element of good housing is access to clean water both for drinking and other household uses. Commercial sachet water and rain were among the sources of water for domestic use reported by many respondents in this study, and they are fraught with the problems of high cost and seasonal gaps, respectively. However, borehole and sachet water were the most commonly used forms of drinking water. Underground water sources such as borehole are preferable and sustainable water sources in the home. Perennial water shortage is a major challenge in the study area. In a study done in Akwa Ibom State, Nigeria, poor access to water supply was the case in 78% of households.[18]

Pit latrines, which were the most used means of sewage disposal in this study, are culturally acceptable in many developing
Significant factors associated with the use of improved toilet facilities in this study were higher (secondary/tertiary) level of education, house ownership, and house wall type. House ownership or inheritance, which may be used as a proxy indicator countries. However, poor constructions, proximity to water sources, and short distances from the house are some of the problems associated with them. The majority found to have pit latrines in this study differs from the results in some other studies. In more than a quarter of the households, toilet facilities were shared by households. This finding was lower than that found in an Ethiopian study which indicated that only about 35% of households had improved toilet facilities, but much lower than the national survey result which indicate that about 75% of rural households share toilet facilities in Nigeria. Sharing of toilet facilities increases the pressure on the facilities, increases the risk of cross-contamination between members of different households, and may inhibit adequate maintenance due to conflict of responsibilities in sanitation. Furthermore, the resultant compromise in the sewage process increases the risk of disease transmission both at the household and community levels. The relationship between poor sewage disposal and disease proliferation has been established by other authors.

Table 1: Sociodemographic characteristics of respondents

| Variable * (n=399) | Frequency (%) |
|-------------------|---------------|
| Age group (years) |               |
| 18–24             | 52 (13.0)     |
| 25–34             | 85 (21.3)     |
| 35–44             | 80 (20.2)     |
| 45–54             | 74 (18.6)     |
| 55–64             | 49 (12.3)     |
| 65 and above      | 59 (14.8)     |
| Sex               |               |
| Male              | 287 (46.9)    |
| Female            | 212 (33.1)    |
| Marital status    |               |
| Single            | 159 (39.8)    |
| Married           | 181 (45.3)    |
| Divorced/separated| 17 (4.3)      |
| Widowed           | 42 (10.5)     |
| Occupation        |               |
| Farming           | 146 (36.6)    |
| Trading           | 69 (17.3)     |
| Students          | 55 (13.8)     |
| Civil service     | 49 (12.3)     |
| Retired           | 41 (10.3)     |
| Artisanship       | 22 (5.5)      |
| Unemployed        | 17 (4.3)      |
| Level of education|               |
| No formal education| 75 (18.8)    |
| Primary           | 118 (29.6)    |
| Secondary         | 148 (37.1)    |
| Tertiary          | 58 (14.5)     |
| Religion          |               |
| Christianity      | 377 (94.5)    |
| Traditional worship| 17 (4.3)     |
| Islam             | 5 (1.3)       |
| Ethnicity         |               |
| Esan              | 365 (91.5)    |
| Igbo              | 22 (5.5)      |
| Edo               | 9 (2.3)       |
| Others**          | 3 (0.8)       |

Table 2: Household characteristics

| Characteristics (n=399) | Frequency (%) |
|------------------------|---------------|
| Family position of household head |               |
| Father                 | 270 (67.7)    |
| Mother                 | 74 (18.5)     |
| Son                    | 29 (7.3)      |
| Daughter               | 9 (2.3)       |
| Extended family member | 17 (4.3)      |
| Family type            |               |
| Single                 | 13 (3.3)      |
| Nuclear                | 250 (62.7)    |
| Extended               | 136 (34.1)    |
| Type of housing unit   |               |
| Compound               | 34 (8.5)      |
| Duplex                 | 2 (0.5)       |
| Bungalow/flat          | 228 (57.1)    |
| Face-to-face/passage   | 325 (33.8)    |
| Ownership of housing unit |            |
| Family inheritance     | 20 (5.0)      |
| Owner occupier         | 291 (73.0)    |
| Rented apartment       | 82 (20.6)     |
| Government             | 6 (1.5)       |

Table 3: Features of house structure

| Structure      | Frequency n=399 (%) |
|----------------|---------------------|
| Type of roof   |                     |
| Galvanized iron| 343 (86.0)          |
| Asbestos       | 53 (13.3)           |
| Slate          | 3 (0.8)             |
| Wall materials |                     |
| Cement blocks/bricks | 253 (63.4) |
| Mud/reed       | 137 (34.3)          |
| Stones         | 6 (1.5)             |
| Wood/bamboo    | 3 (0.8)             |
| Type of floor  |                     |
| Cement/concrete| 302 (75.7)          |
| Earth/mud/brick| 54 (13.5)           |
| Ceramic/marble | 33 (8.3)            |
| Vinyl/terrazzo tiles | 7 (1.8)  |
| Wood/bamboo    | 3 (0.8)             |

Table 4: Main sources of water for domestic use

| Main source* | Frequency n=399 (%) |
|--------------|---------------------|
| Sachet water | 120 (30.1)          |
| Rainwater    | 115 (28.8)          |
| Borehole     | 80 (20.1)           |
| Pipe-borne water vendor | 43 (10.8) |
| Tanker supply/water vendor | 5 (1.3)  |
| Bottled water| 0 (0.0)             |
| River/stream |                    |

*Mean age: 43.7±17.2 years. **Others: Yoruba, Afemai, Urhobo

*Multiple responses apply
Table 5: Type and use of toilet facilities

| Type of toilet facility                        | Frequency n=399 (%) |
|-----------------------------------------------|---------------------|
| Pit latrine                                    | 286 (72.7)          |
| Water closet                                   | 113 (28.3)          |
| Toilet facility shared with other households   |                     |
| No                                            | 283 (70.9)          |
| Yes                                           | 116 (29.1)          |

Table 6: Factors associated with sharing toilet facilities

| Variable                          | Shared toilet facility | χ² | P value |
|-----------------------------------|------------------------|----|---------|
|                                   | Yes (%) | No (%) |    |         |
| *Level of education               |          |        |    |         |
| No formal/primary                 | 65 (33.2)| 128 (62.3)| 3.837 | 0.050  |
| Secondary/tertiary               | 51 (24.3)| 155 (75.7)|           |         |
| Apartment type                    |          |        |    |         |
| Passage/compound                  | 49 (29.0)| 120 (71.0)| 0.001 | 0.976  |
| Flat/duplex                       | 67 (29.1)| 163 (70.9)|           |         |
| Environmental house ownership     |          |        |    |         |
| Inherited/self-owned              | 69 (22.2)| 242 (77.8)| 32.427 | <0.001 |
| Rented/government                | 47 (53.4)| 41 (46.6)|           |         |
| House type (walls)                |          |        |    |         |
| Block/brick                       | 86 (33.2)| 173 (66.8)| 6.112 | 0.033  |
| Mud/wood                          | 30 (21.4)| 110 (78.6)|           |         |

*Level of education of household head

of socioeconomic status, was significantly associated with not sharing toilet facilities. Educational status has been found to be a significant predictor of the use of toilet facilities.[1]

CONCLUSION/RECOMMENDATION

A large proportion of households in this study live in houses that have features that make for safe housing. However, factors that compromise sanitation such poor access to domestic water supply and sharing of toilet facilities were prevalent in the community. House ownership and level of education which approximates socioeconomic status were associated with access to sanitation facilities. Efforts to enhance socioeconomic empowerment of rural dwellers should be sustained by government at all levels so as to improve housing quality and sanitation in rural communities in Nigeria.

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