Comparative Analysis of Housing Quality and Health between Residential Zones in Maiduguri Metropolis

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Abstract: *In recent times, there has been a growing concern in the deteriorating state of housing quality in most urban areas of Nigeria. Housing quality refers to the physical condition of a person's home as well as the quality of the social and physical environment in which the home is located. The data for this study was collected from both primary and secondary sources. Primary data was obtained through the administration of questionnaires. The questionnaire administration was concentrated mainly on the selected adult heads of households. The secondary data was obtained through literature searches of both published and unpublished materials. The findings rreveal that, in the overall sample proportion male accounted for 81% while female-headed households constitutes 19%. 52% of the overall sample proportion enjoy owner occupier status and 91% used cement blocks/bricks as construction material. Also 37% of the respondents acknowledged that a household member had been ill with one of the ten diseases listed in the past three months. The study recommends that, there should be an effective enforcement of building codes by the Borno State Urban Planning and Development Board and the need for public enlightenment by the Borno State Ministry of Information and the Ministry of Health among others.*

Key words: *Construction Materials, Environment, Household, and Quality.*

Introduction

The most visible and obvious consequences of urbanization in developing countries, such as Nigeria, is often rapid deterioration of urban housing and living conditions. Maryam et al, (2021), observed that, Nigerian cities are usually associated with housing problems such as poor housing conditions evidenced by overcrowding and inadequate dwelling units; high densities resulting from land market failure; inadequacy of essential public and infrastructural services; solid waste problems; increasing deterioration of the natural landscape; water, air and noise pollution. In the same vain, Streimikiene (2015), has succinctly posits that, most urban centres in Nigeria are characterized by high densities of buildings, the crowding of large numbers of

people into those buildings, lack of space for open air living between houses, poor health, substandard housing, and acute environmental and sanitary problems.

There has been a growing concern in the deteriorating state of housing in most urban areas of the developing nations. Owolabi, (2019), defined housing as "the process of providing a large number of residential buildings on a permanent basis with adequate physical infrastructure and social amenities, (services) in planned, decent, safe, and sanitary neighborhoods to meet the basic and special needs of the population". Adequate housing should provide protection from the weather elements, and contribute to the physical, mental and social well-being of the occupants. While Maryam et al, (2021), refers to housing quality as the physical conditions of the housing units in a particular area regarding their structural soundness, ventilation, natural and artificial lighting, including essential facilities such as water and electricity supply, toilet, bathroom, kitchen, among others.

Naturally, as a form of shelter, housing has three quality components, namely; neighborhood, location and structural quality (Adebayo and Aliu, 2018). Housing quality has to do with the physical conditions of the housing units in a particular area in terms of their structural soundness or fitness, adequate space and ventilation, natural and artificial lighting as well as essential facilities such as water, electricity, adequate drainages, and proximity to children playgrounds, recreation and markets among others. One major element of the quality of housing conditions is the availability of sufficient space in the dwelling. The main indicator that has been developed to describe space problems is the overcrowding rate, which assesses the proportion of people living in an overcrowded dwelling, as defined by the number of rooms available to the household, the household's size, as well as its members" ages and family situation. Inah and Mark.(2021), buttressed aesthetics, sanitation, drainage, age of the building, access to basic housing facilities, burglary, spatial adequacy, noise level within the neighborhoods, sewage and waste disposal, air pollution and ease of movement, among others, are used as the relevant quality determinants in assessing the quality or suitability of housing.

Housing quality can also be assessed by looking at other housing deficiencies, such as lack of certain basic sanitary facilities in the dwelling (such as a bath or shower or indoor flushing toilet) and problems in the general condition of the dwelling (leaking roof or dwelling being too dark). The proximity of public services such as schools and hospitals is important indicator of quality of life related with housing. Maryam et al, (2021), further buttressed that, the realization of a decent home in a suitable living environment requires the availability of clean air, potable water, adequate shelter and other essential services and facilities.

According to Coker et al (2017), the quality of life of residential area not only mirrors the city development, planning and allocation mechanisms between socioeconomic groups, but also shows the quality of life of urbanites. The adverse health and environmental effects of poor housing quality are well established (Micheal et al, 2016); in industrialized countries too relation between housing quality and health were reported (Kahlmeier, 2021).

Cities in all the under developed countries face the same problem (Arthur and Simon, 2014). Maiduguri being a capital city has attracted large numbers of people within and outside Borno State. The population is growing very fast due to mass immigration and high birth rate. As a result, several settlements have cropped up, especially around the city's peripheral areas. Many of these areas lack basic amenities such as electricity, drainages, potable water, waste disposal systems, roads, etc. This has brought with it many problems, perhaps the prominent of all the problems is that of providing adequate, safe, decent and sanitary housing for the growing population. This study is therefore designed to investigate housing quality and health between residential zones in Maiduguri metropolis.

Statement of Research Problem

Housing problems have been generally accepted as being diverse and complex (Oluwoye and Olugbenga, 2017). In Nigeria, most people live in poor housing quality and in unsanitary environment (Sule, 2015). Housing difficulties are more serious for the low income groups. High rents in the housing markets; inadequate mortgage finance; and inaccessibility to mortgage loans (Joseph, 2017). These problems have resulted in overcrowding, poor and inadequate social amenities, unsatisfactory and unwholesome environmental conditions, the absence of open spaces, inaccessibility within residential areas and overcrowding of buildings.

Other problems include; lack of essential basic amenities in houses and the surrounding neighborhoods such as pipe borne water, electricity, drainages and good road network. Where such sites were provided, people have converted them to other uses, as put by Muhammad and Abbas (2009}, that, drainage systems were converted to waste disposal points.

Another problem of the Nigerian built environment is noncompliance with building bye laws and regulations (FMH&UD, 2016; Ogunsakin et al, 2015). The major areas of default are in the areas of zoning setbacks, building along utility lines and non-adherence to provision of adequate ventilation. According to Muhammad and Abbas (2009), influx of people has made people to build houses in areas that have been inadequate before. Increasing deterioration of

the natural landscape as well as the natural ageing of buildings is amongst the problems in the built environment.

> In Nigeria, several studies were conducted to ascertain the housing quality in urban centers. However, little or no attention has been directed towards the relationships that exist between the housing quality and resident health. Odunola (2015), assessed the impact of housing condition on residents' health in Ogbomosho North Local Government Area. And found that, the conditions of housing environment where residents dwell happen to be deficient of requirements that ensured a safe and sound health. Babatunde and Emilia (2017), examined the effects of poverty among urban residents on their living and housing conditions in Nigeria. They found out that, robust and positive relationship between residents socioeconomic and urban housing condition exist. Also Bankole and Oke (2016), provides an understanding to the relationship between housing quality, overcrowding and psychological wellbeing.

Knowledge regarding the relationship between the housing quality and health is limited in Nigeria, especially with regard to urban communities. In view of the limited study on housing quality and little attention paid to the residents' perception of housing quality and health. This study considered the   housing quality attributes and health in the context of urban communities holistically in Maiduguri urban.

The specific objectives of the study are;

i.   to examine the socio-economic attributes of the residents in the study areas
ii.   to examine the residential circumstances in the study areas
iii.   to describe the neighborhood quality of the study area'
iv.   to describe housing quality and health of the residents in the area

Conceptual Framework and Literature Review

The statutory standard of fitness was first introduced as a concept in the United Kingdom around 1919 and remains in use as the key legal standard for the assessment of housing condition (Coker et al, 2017). Housing standard vary from one nation to another and also within a particular country. Variations in climate, culture, degree of urbanization, and socioeconomic progress affect standards. It has been argued that, standards should combine the best features of traditional practice with the economy and rationality of modern techniques.

In a study of Benin city, Oluwoye (2017), empirically classified housing standard in Nigeria into two categories, first, space standard which defines housing intensity in terms of plot sizes; number of buildings per unit area of land and occupancy sizes. The second relates to performance standard, which describe the quality of the environment.

Housing can therefore be conceptualized as a multidimensional package of goods and services, which enhance good living as well as neighborhood quality. In a report on qualitative evaluation prepared by the Housing Corporation of Britain in 2007, three basic indicators were outlined for determining the quality of any existing housing development, these are location, design and external environment of the house (Adesoji, 2018). Variables classified under these indicators include access to basic housing and community facilities, the quality of infrastructural amenities within housing neighborhoods, spatial adequacy and quality of design, fixtures and fittings, building and landscaping noise and pollution control as well as security, among others. Inah and Mark (2021), identified the type of construction, materials used, the number of spaces available, services and facilities, burglary, condition of facilities within and outside dwelling functions and aesthetic, among others, as relevant indicators for quality evaluation. While, Ebong, (2013), suggested the use of four major indicator variables to analyze quality;

1. Housing consumption: dwelling size and occupancy rates.

2. Connection to services: levels of mains infrastructure such as water, sanitation, waste disposal.

3. Neighborhood/site characteristics: playgrounds, open spaces, and other community facilities.

4. Location characteristics: there may be trade-off between journey-to-work time and size of units.

The essential point derived from the literature is that, the measurement of housing quality cannot be limited to the physical characteristics of the housing unit, but must necessarily embrace the neighborhoods/environmental and locational characteristics. In this study, qualitative evaluation will based on user's assessment of the physical criterion of housing in terms of the residential and the neighborhood circumstances.

Housing Quality and Health

The range of health problems which can be attributed to poor housing conditions is large from psychological and physiological effects to specific diseases varying in the degree of associated morbidity. There is a large and significant body of scientific literature that demonstrates convincingly that there are direct causal links between different aspects of poor housing condition and particular health conditions (Aderemo and Ayobolu, 2017, and Olotuah and Bobadaye, 2019). All the interrelated variables- level of education, health, income, employment opportunity etc. associated to poor housing condition have ways of impeding with the level of economic enterprise of an individual on one hand and the economic development of a nation on the other hand. Hence, housing reflects the cultural, social and economic stance of any given society (Inah and Mark, 2021).

Housing quality refers to the physical condition of a person's home as well as the quality of the social and physical environment in which the home is located. Aspects of housing quality include air quality, home safety, space per individual, and the presence of mold, asbestos, or lead. It is affected by factors like a home's design and age. Poor-quality housing is associated with various negative health outcomes, including chronic disease and injury and poor mental health (Aderemo and Ayobolu, 2017).

The quality of a home's neighborhood is shaped in part by how well individual homes are maintained, and widespread residential deterioration in a neighborhood can negatively affect mental health. Healthy homes promote good physical and mental health. Good health depends on having homes that are safe and free from physical hazards. In contrast, poor quality and inadequate housing contributes to health problems such as chronic diseases and injuries, and can have harmful effects on childhood development. Residential crowding has been linked both with physical illness, such as tuberculosis and respiratory infections, and with psychological distress among both adults and children.

Along with conditions in the home, conditions in neighborhoods where homes are located also can have powerful effects on health. Social, physical and economic characteristics of neighborhoods have been increasingly shown to affect short- and long-term health quality and longevity. Substandard housing such as water leaks, poor ventilation and pest infestation can lead to an increase in mold, mites and other allergens associated with poor health. Concentration of substandard housing in less advantaged neighborhoods further compounds differences as well as socioeconomic disparities in health. The World Health Organization (2016), stated that a good house should have the following items:

- ✓ A good roof to keep out the rain
- ✓ Good walls and doors to protect against bad weather and to keep out animals.
- ✓ Sunshades all around the house to protect it from direct sunlight in hot weather.
- ✓ Wire nettings at windows and doors to keep out insects like house flies and mosquitoes.

In essence, housing quality can be judged from the physical appearance of the buildings, facilities provided, quality of wall used in the building construction, eminence of the roofing materials, condition of other structural components of the house, and the neighborhood condition of the house.

Study Area and Methodology

Maiduguri is the capital of Borno State, it has long been one of the dominant cities in the north eastern Nigeria, and its location close to the republic of Chad, Niger and Cameroun, gives it an increasing significance as a center of commerce, transport, education, religion and

administration. It covers a total area of 543sq km which makes it the largest city in the North Eastern region of Nigeria.

The city is located at the northeastern corner of Nigeria on latitude 11 15 North and longitude 13 05 east and it stands some 350 meters above sea level. Although Maiduguri is predominantly a Kanuri town, it has always been and the host to other parts of Nigeria and Africa. The nearest major towns in Nigeria are Damaturu (about 135km), the capital of Yobe state, Bauchi the capital of Bauchi state and Kano the capital of Kano state, which are almost 450 and 600km to the southwest from the state capital.

The vegetation of this area is similar to that of Sahel Savanah. Maiduguri is transverse by the Bama Ridge which runs in a north west - southeast direction from the Republic of Niger boundary to the Cameroun Mountains, it is a high dune of sand and grit thrown by Mega Chad at its southwest shoreline. The topography and landscape to its northeast and southwest is featureless and flat.

The relief of the area is relatively plain and slopes gently towards the Ngadabul River. This river is also referred to as River Alau, where it receives a tributary from the southwestern parts of Maiduguri. The floodplain is covered with superficial deposits of sand and clay. They are devoid of rocks rather sand deposits.

Sources of Data

The data for this study was collected from both primary and secondary sources. Primary data was obtained through the administration of questionnaires on selected household heads. The questionnaires were designed and included answer codes for open ended questions. The questionnaire covered information on the respondents' personal backgrounds, on the physical characteristics of the dwellings such as the distribution of dwellings by structural characteristics and constructional materials and by residential amenities, additional information was also obtained on the residents' perceptions on health (diseases), and of the existing neighborhood facilities and street conditions.

The secondary data was obtained through literature searches of both published and unpublished materials. These include the use of textbooks, journals, seminar papers, magazines, and internet materials.

Sampling Techniques

Residential neighborhoods in Maiduguri metropolis were stratified into low, medium and high density residential neighborhoods. There are 8 wards in the high density areas, 4 wards in the medium density and 4 in the low density zone. A total of 16 residential wards were

found across the three residential zones. Out of which 25% was selected for the survey in each of the zone and this represents the sample population. This resulted to the survey of 4 residential wards. Classifications of residential zones were based on the assumption that people of similar characteristics tend to "cluster" or live together in designated areas - sociologist may refer to as "cultural areas" (Mallo and Aregun, 2010).

A total of 628 structured questionnaires was administered in the proportion of 157 respondents in each of the selected ward. Therefore the sample was generated through stratified-systematic sampling method. This was complemented by observations and information from the secondary source. Information obtained was analyzed using simple descriptive statistics.

Discussion of Results

The questionnaire administration was concentrated mainly on the adult heads of households. In the overall sample proportion male accounted for 81% while female headed households constitutes 19%. This agrees with the Nigerian Demographic and Health Surveys Data (2017), that household composition in Nigeria are predominantly headed by men and less than one in five are headed by women. Also the low density zone subsample proportion indicated that, 83% accounted for male while 17% are female headed households. Surprisingly 92% of the high density zone subsample proportion are male headed households while 8% of the respondents accounted for female headed households.

The occupational/ employment and income distributions are closely related. About 35 % of the overall sample proportion engage in trading activities, 15 % in different crafts works like tailoring, mechanics, vulcanizing etc. while 9 % engage in farming and the significant   41% % are civil servants. Significant 38% of the overall sample proportion receives monthly income between less than N30, 000 -45,000, only 11 % earn N75, 000 and above respectively.

Significant 63% of the high density zone received less than N30,000 and above, 39% of the medium density zone equally earned less than N30,000 -45,000. As expected, low density zone recorded the highest income with insignificant 6% recorded less than N30, 000 – 45,000. The findings have revealed that the general income is below the national average income of N30, 000-N45, 000 per month. With this low income distribution, to afford good quality housing and or proper maintenance of existing ones might be difficult, if not impossible. It has also been observed that, the distribution of income was closely linked with the occupational status of residents. This class of individuals is very poor and cannot afford to pay rent for relatively good quality houses or build decent houses.

The study also revealed that 19% of the overall sample proportion of the respondents have no formal education; 34% have secondary school certificates or its equivalent and 33% have

attended various levels of tertiary education while the remaining 14% have Arabic/Quranic education. Low density zone recorded significant percentages of 66%, that attended tertiary education; 37% in medium density zone also attended tertiary education while the insignificant 11% in high density zone. Surprisingly, 58% of the respondent in high density zone have Arabic or Quranic education, 24% of medium density have Arabic knowledge and equally 24% attended secondary level of education. Neighborhoods with high unemployment, low income, and low educational status are associated with poverty and economic deprivation and are majorly with poor health outcomes.

Most of the study respondent 52% in the overall sample proportion enjoy owner occupier status, while 28 % occupy rental accommodations. Another 20% of the overall sample proportion live in family houses where no rent is paid or squatting with some other people. In low density zone, 67% enjoy owner occupier status, and 12% are in family houses where no rent is paid, while 45% dwelt in rental accommodation. 43% of high density zone resides in houses where rents are paid and 33 % enjoy owner occupier status where no rent is paid. Surprisingly, 66% of the Medium density zone reported owner occupier status and 32% enjoy rental accommodations.

The physical characteristics of household dwellings are important indicators of the socioeconomic and health status of households (Demographic and Health Survey, 2017). Of the overall sample proportion, significant 91% used cement blocks/bricks as constructional material; 67% are make-up of corrugated iron sheet as roofing material; 32% use tiles as their floor material. As expected, significant 77% used aluminum long span as roofing materials in the low density zones, 38% of the residents in the medium density and the insignificant 5% in the high density zones. Similarly, 91% of the floor material are tiles in the low density; and 63% in the medium density zones and 13% in the high density zone respectively.

The overall sample proportion shows that, as much as 63% of the high density zone have no pipe borne water in compounds; 21 % have to go varying distances in the street or other streets to fetch water; 26 % in the medium density enjoy pipe borne in compounds while 78% of low density zone enjoy pipe borne water in compounds. Pipe borne water in compounds could be in the form of privately owned bore holes or through the public sources. These findings suggest that, both the high and medium density enjoyed lesser attention and quality of services in terms of water provision. Water is collected from roof tops in the wet seasons and supplemented through purchase in the dry season (in some cases). The quality and quantity of available water to users has been related to determine the level of sanitation and health.

Electricity appears to be the universal facility in the study area. The main source of electricity supply is through the PHCN which accounts for over 89 % in the overall sampled

houses. Alternatively, 56% of the overall sample used generating plant or as supplements, while the significant 21 % depended solely on rechargeable lamps. In the low density zone, 48% relied primarily on Generators, this was followed by medium density zone with 38 %. In the same vain, 34 % of the residents of high density zones use other alternative sources instead of the Generator such as rechargeable lamps. Only 11 % of the medium zone relied on other alternative sources apart from Generators. Constant failures, erratic supplies and low voltages might have what necessitates for the use of Generators and other sources. There are cases of some of the study wards been put to total darkness, for days without electricity from the PHCN. Although electricity does exist, most of the tarred streets has no street lights.

57% of the all sample proportion reported, there was no public refuse disposal system in the area; for 24% refuse disposal is irregular or inadequate; only 15% enjoy the presence of such facility. The distribution of waste disposal in the different zones shows that, most of the households in the medium zone 34% dispose there refuse through landfill, 21% high density zone reported by burning and a good number of 35 % in low density zone dispose there refuse through landfill. Indiscriminate refuse disposal hampers free flow of run off and efficient discharges of domestic liquid waste (from the residents). This could affect the general environment, create objectionable views and the health of the residents.

Drainage facilities were equally examined. The survey revealed that, there are total absence of this facility in some parts of the area studied. Where such facilities were provided, they are often being misused through incessant dumping of refuse and human defecation. These facilities are often irregularly maintained. From the overall sampled proportion, 32% of the area experience flooding, while 21% have the problem of water logging; and only 29% reported street tarred. Based on the analysis, the results shows that, in the low density zone, 22% of the respondent reported seasonal flooding and surprisingly, 14% complaints of water logging and 25% in the high density reported water logging, usually after heavy rain that may remain for days or weeks in some circumstances. 38 % of the medium density zone reported street tarred, and subsequently 42 % of the respondents in the high density zone reported street tarred.

Ensuring adequate sanitation facilities is another of the Millennium Development Goals that Nigeria shares with other countries. Given the private incapacity to dispose refuse far away, the immediate housing environment get littered with massive household solid/liquid wastes discharges. It is therefore not surprise that, as much as 43% of the overall sampled respondents considered the standard of sanitation in their neighborhood as poor, and 21 % as very poor. In the low density zone, 36 % of the respondent reported the level of sanitation as fair, likewise 32 % of the medium density as fair. Only 14 % of high density zones reported the level of sanitation as good.

The relations between housing quality and health have been found in the US using the ''broken windows'' index. A study in New Orleans collected data on homes with structural damage, street litter, and prevalence of abandoned cars, graffiti, and other physical problems. In this study, respondents were asked about ten specific physical complaints experienced at least once a month and affirmative responses obtained shows in the overall sample proportion as, headaches accounted for 18%; cough reported 19%, and dizziness 7%; malaria 25%; typhoid 9%; skin infections 3%; respiratory tract infection 5%; gastroenteritis 9%; measles 2% and Injury 4% . 37% of the respondents also acknowledged that a household member had been ill with one of the diseases listed above in the past three months.

The survey also reveals that, 37% of the respondents in the high density zone admitted to have a household member that was affected by one or two of these illnesses; 23% in the medium density zone and 18% in the low density. Respondents naturally could have a positive view of health especially if they were not sick at the time of interview or if illness did not limit their physical or economic activity.

The quality of urban environment depends a great deal on the quality of essential infrastructure and their appropriate management. The general observation make during the study reveals that, the non challant attitude and lack of positive action of resident could have what brought about some of the cases of environmental problems in the study area. For example, indiscriminate refuse disposals or into existing drainages, buildings along utility lines, open defecation along streets and the general lack of regular sanitations. Hence, people who live near or within dumpsites are vulnerable to various diseases.

Recommendations

The following measures are therefore recommended for the improvement of the study area and the quality of housing.

➢ Effective enforcement of building codes: The Borno State Urban Planning and Development Board should properly enforce the building codes right from the plan approval stage up to the implementation stage to ensure that buildings are constructed according to the approved specifications.

➢ There is the need for public enlightenment by the Borno State Ministry of Information and the Ministry of Health about the causal relationship between housing condition and healthy living. Also the BOSEPA should ensure effective Environmental Sanitation in the residential surroundings.

➢ Government at all levels should make soft loans available to residents for constructing and maintaining healthy housing units. Such a loan could also be procured to rehabilitate and renovate existing buildings and other essential infrastructure to the required standard.

➢ Government at the three levels should work together to design and implement housing policies that will ensure easy access to affordable, adequate and safe housing for all.

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