Assessment of Housing Conditions and Occurrence of Arthritis Among Residents in Owerri West Local Government Area, Imo State.

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Abstract

Introduction:

Housing is defined 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. Poor housing conditions is one of the major public health challenges facing most rural and urban communities in Nigeria. One of the significant objectives of designing building to ensure the internal comfort of occupants is that most people generally spend 85 – 90% of their time indoors and thus providing a comfortable and healthy environment is imperative. The aim of this study is to assess the housing conditions and occurrence of arthritis among residents in Owerri West Local Government Area, Imo State, Nigeria.

Methods

A cross – sectional descriptive study design was built for the study, where 400 residents in Owerri West Local Government Area, Imo State Nigeria were recruited through a multi-stage sampling method. The people were first stratified according to their house locations or clans, that is, the three clans which are Ara, Ochie and Umunwoha in the ratio of 2:3:1 respectively. This is with respect to their population size. The second stage involved randomly selecting autonomous communities in each of the clans and then locating the buildings and the occupants in their communities according to their places of residence using Proportional Sampling method to get the exact number of people to be selected from each clan. Systematic Sampling was used to select the occupants in each house of residence for the study communities and balloting was applied to determine the direction of villages in the chosen communities to start. 133, 200 and 67 occupants in Ara, Ochie and Umunwoha Clans respectively were interviewed using a well-structured questionnaire that was validated and its reliability tested. The relative humidity and temperature of the houses in the studied areas were also measured using Humidity meter (Hygrometer).

Result:

The result depicted that 240 (60%) of the Housing patterns in the studied area were single rooms, 100 (25%) were flats, 40 (10%) were bungalow and 20 (5%) duplex. In terms of compliance with the National Building Code (Building Bye-Laws), 120 respondents (30%) said that their building plans were approved by Owerri Capital Development Authority (OCDA) while 280 respondents (70%) said that their building plans were not approved by Owerri Capital Development Authority (OCDA). 181 respondents (45.3%) said that they are aware that the conditions of their houses can affect their health while 219 respondents (54.7%) said that they are not aware that the conditions of their houses can affect their health. 20 respondents (16.6%) had severe pains due to arthritis and the study showed that the respondents in single rooms located in damped/humid areas had reports of severe pain due to arthritis. Association between type of housing condition/pattern of the participants and awareness that the condition can affect health were statistically significant ($p<0.001$, $x^2 =192.383$, $df =3$). High level of awareness that the condition of house can affect participants' health was obtained in respondents living in duplex (18, 90%), flat (86, 86%) and bungalow (36, 90%).The awareness was very low among the single room residents (41, 17.1%).

Conclusion: *The findings showed that higher percentage of the housing conditions are built with lower quality materials and the buildings lacks proper drainage systems causing flooding in most areas that makes the houses humid/ damp especially during rainy season. This could have possible health effect (arthritis) on the people in the studied area. Therefore, every house should be built in compliance with the National Building Code. Every house should provide good physical and environmental conditions to prevent health problem (Arthritis). The Government and Non-governmental Organizations related to housing should sensitize the people on the need to build residential buildings on a permanent basis with adequate physical infrastructure and social amenities in planned, decent, safe and sanitary manner.*

Key words: *Health, Housing, Ventilation, Indoor Air Quality, Temperature, Humidity, Rural, Urban, Owerri, Nigeria*

Introduction

Housing is defined 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 (Ogundahunsi, 2014). Poor Housing conditions is one of the major Public Health challenges facing most rural and urban communities in Nigeria

Generally, poverty is taken as lack of access to basic human needs of which housing is paramount. In fact, in Nigeria like other developing countries where the majorities are poor, the necessity of housing for survival apart from food cannot be over-emphasized (Gbadebo & Adeoti, 2015**)**. Housing is recognized world-wide as one of the basic necessities of life and pre-requisite to survival of man (Onibokun, 2013). A house is a place that provides shelter, refuge, comfort, security, and dignity. The housing industry can be a stimulus to national economy. A house also provides the physical framework in which human, social, economic and cultural resources are realized, enriched, and integrated (Onibokun, 2013).

Since the dawn of time, humans have designed places of abode that people afford for protection from the natural elements. Most of these efforts have attempted to create internal environments that are conducive for living and the optimal performance of daily activities (Altgeld, 2014). In order to develop these internal environments, man has developed and utilized a range of sophisticated tools and scientific methods to gain an understanding of his surrounding climatic conditions. With this knowledge, man has endeavoured to design building materials that are capable of assisting in creating an appropriate climate in indoor space that will alleviate the effects of the external environment on personal comfort (Wafi & Ismail, 2008).

One of the significant objectives of designing buildings is to ensure the internal comfort of occupants is that most people generally spend 85-90% of their time indoors and thus providing a comfortable and healthy environment is imperative (Wafi & Ismail, 2008).

The importance of housing covers the entire aspects of human life. Primarily, it involves physical protection from hazards which ordinarily may be regarded as shelter but also provide the setting from many of the basic biological and social processes necessary to sustain life, which permitting the healthy growth and development of the mind. In all, housing as a unit of the environment of man, has a profound influence on the health, social

behavior, satisfaction and general welfare of the community. It reflects the cultural, social and economic values of a society as it is the best physical and historical evidence of civilization in a country (Aluko, 2009).

The National Building Code, NBC 2006 set out minimum standards on building pre-design, design, construction and post construction stages in order to guarantee good building practice- through the attainment of quality, safety, and expertise. Despite the existence of National Building Code (NBC), 2006 many individuals still build their houses the way it suits them. One will wonder if they are not aware of the existence of the National Building Code (NBC), 2006.

The quality of housing conditions plays a decisive role in the health status of the residents. Many health problems are either directly or indirectly related to the building itself, because of the construction materials that were used and the equipment installed, or the size or design of the individual dwellings. Representing the spatial point of reference for each individual, the home also has a broad influence on the psychosocial and mental well-being by providing the basis for place attachment and identity as well as a last refuge from daily life. However, especially, for this mental dimension of housing satisfaction and the meaning of home to the resident, not much data on the relation between health and well-being, and subjective satisfaction, and housing perception are available (Ranson, 2011).

Materials and methods

A cross-sectional descriptive study design was built for the study which involves the collection and analysis of data from a population or a representative subset at a defined time. It focuses on the assessment of housing conditions and occurrence of arthritis among residents in Owerri West Local Government Area, Imo Sate.
A well-structured questionnaire was designed for the collection of relevant data for this study. The questionnaire (instrument) was designed in self-administration type and it was prepared in simple English language.
The questionnaire was divided into five (5) sections where **section A** contains socio-demographic characteristics of respondent such as age, gender, income, education etc; **Section B** covers housing patterns where questions were asked to ascertain their knowledge on the condition and structure of the building. **Section C:** covers the compliance with National building code where questions were asked to ascertain the level of compliance of the people with National Building Code. **Section D** covers knowledge of the people on housing conditions where questions were asked to ascertain their knowledge on housing conditions. **Section E** covers health problems associated with poor housing condition where questions were asked on health problem associated with poor housing conditions.
Humidity meter (Hygrometer) was used to measure the relative humidity of houses in the studied areas.

Results

Socio-demographic Characteristics of the respondents
The result in table 1 presented socio-demographic characteristics of respondents; where their ages were as follows: 1 (0.3%) were less than 18-28years, 2 (0.6%) were between 29-38 years, 247 (25%) were between 39-48 years, 100 (25%) were between 49-58 years and 50 (12.5%) were 59 years and above. In respect to gender, 280 (70%) were male while 120 (30%) were for female.
On the same table, the highest percentages 200 (50%) of the participants were married followed by widow ones with 99 (24.8%) and 10(2.5%) were single and separated. Majority 170(35.4%) of participants were in secondary school followed by non- formal education with 120 (30%), tertiary education had 80 (20%) and only 20 (5%) had primary education. Also, highest percentages (45.3%) of the respondents were Artisan, 20% was for petty trading/farming and 15% was for Civil Servant/Public Servant and unemployed/student/apprentice had 10%. On monthly income allowance of the respondents, highest response 180(45%) were on those reported between ₦18, 000- ₦48, 000 ₦11,000-N20,000; between ₦ 49, 000- ₦78, 000 recorded 100 (25%), ₦ 79,000-₦ 108, 000 has 80(20%), greater than ₦ 109, 000 has 40 (10%). (see table 1 below)

Pattern of Housing in Owerri West Local Government Area
The figure 2 presented the type of housing pattern of the participants, highest percentage was 40% for single room, followed by 25% for flat, 10% for bungalow and the least was duplex with 2.5% (see figure 2 below)

Compliance with National Building Code
The result in table 6 below presents the compliance with National Building Code120. 120 participants (30%) said that their building plans were approved by Owerri Capital Development Authority (OCDA) while 280

participants (70%) said no to that. Majority 150 (53.6%) of the participants said their building plans were not approved by Owerri Capital Development Authority because there was no time to pass through the process of approval, 99 (35.3%) said no money to pay the necessary fees and 31 (11.1%) approval by OCDA is not necessary. **(see table 6 below)**

RELATIONSHIP BETWEEN RELATIVE HUMIDITY AND TEMPERATURE AGAINST TYPE OF HOUSING

As shown in Table 8 below, the relationship between relative humidity and type of housing was tested using analysis of variance and the result indicated that occupants of Duplex building had a higher relative humidity (95.4 +/- 1.5) compared to others, this was followed by Thatch house (89.50 +/- 0.70). This was found to be statistically significant (p-value < 0.001).

Furthermore, the relationship between relative humidity and type of housing was tested using Analysis of Variance and the result indicated that occupants of Duplex building also had the highest relative humidity (26.175 +/- 0.61) compared to others, this was followed by Flat (26.012 +/- 0.41). This was found to be statistically significant (p-value < 0.001). (see table 8 below)

Knowledge of the People on Housing Conditions

The result in table 7 presents the knowledge of the people on housing conditions; 181 (45.3%) said they were aware that the condition of their houses can affect human health while 219 (54.8%) said no. The source(s) of the awareness; Environmental Health Officers had 20 (5%), Television had 259 (64.8%), radio was 43 (10.8%), public lecture 78 (19.5%). Aware of the existence of National Building Code; 121 (30.2%) agreed while 279 disagreed to that idea. The source(s) of the awareness of building bye-laws; Environmental Health Officers had 152 (38%), Television had 149 (37.3%), radio was 61 (15.3%), public lecture 38 (7%). (see table 7 below)

Health Problem associated with Poor Housing Conditions

Table 9 below presents the health problem associated with poor housing conditions. Out of 400 participants, 120 (30%) said yes they still suffering from chronic waist pain that seems never to go away while 280 (70%) said no case of waist pain; 122 (30.5%) said they were feeling serious swollen pains all over their waist, legs and back pains so serious they make them very uncomfortable and restless while 278 (69.5%) said nothing like that. From the table, 120 (30%) said having back pains that are so critical, do prevents someone from doing practically anything. Also, 122 (30.5%) said feeling of excruciating pains on all the joints, such a person will find it hard to pick even a pen on the ground and 120 (30%) said they have gone for treatment since this pains started; 101 (25.3%) reported they visited hospital while 299 (74.9%) said they do visit patent medicine shop. Out of 400 participants, 322 (80.3%) said they were diagnosed of arthritis as the cause of the pains, 77 (19.2%) said malaria. Again, 91 (22.8%) said that Doctor/Herbalist were associate the pains experienced above with the type of living housing condition and 309 (77.3%) reported against such association. (see table 9 below).

Association between type of housing Condition/Pattern and health of the people in Owerri West LGA

The result in Table 10 showed relationship between type of housing condition/pattern of the participants and suffering from chronic waist pain that seems never to go away; majority (160) of them said no on single room type of housing and 100 said yes on the flat type of housing. Used of Pearson Chi-Square (X^2) test showed significant relationship (X^2 = 364.286; df = 5 at P-value < 0.05). (see table 10 below).

Association between type of housing Condition/Pattern and awareness on the condition of a house can affect health

The result in Table 11 showed relationship between type of housing condition/pattern of the participants and awareness that the condition of a house can affect health; majority (129) of them said no single room type of housing and Pearson Chi-Square (X^2) test showed significant relationship (X^2 = 299.115; df = 5 at P-value < 0.05). (see table 11 below).

DISCUSSION

The findings from the study titled assessment of housing conditions and occurrence of arthritis among residents in Owerri West Local Government Area, Imo State showed that greater percentage (80.3%) were diagnosed of pains due to arthritis. The findings indicated that some of the respondents were still suffering from chronic waist pain because of the arthritis from poor housing conditions.

From the results, it was observed that housing condition were classified into four different types and type A and B were fairly good housing conditions in relation to building material, housing roofs, doors and windows, cemented/tiled floors and adequate spacing within the housing premises compared to type C and D of housing conditions. This research outcome also conforms to the opinion of Olotuab (2006), who stated that, houses in Nigeria are thus characterized by structurally unsound, functionally obsolete, economically unprofitable and socially unacceptable houses both in urban and rural area.

However, there was moderate level of awareness on the housing condition which can affect the health of people, because poor living condition can lead to disease occurrence. This is due to the fact that most people within the area cannot afford to build or pay for rent that has standard structure. Studies have shown that poor housing will increase the demand for available resources such as water, toilet facilities and kitchen facilities. As was observed from this study, poor housing can increase the incidence of infection and discomfort. In general speaking, the housing conditions of both rural and urban area is seemed to be the same while dimensions of their problems differ as a matter of fact, the trend at which the percentage populations of rural area decrease with respect to the total population of the country actually made the rural area not to experience overcrowding.

According to Gbadebo & Adeoti, (2015), the high percentage of poverty profile at rural environment no doubt contributed much to the poor quality of rural housing landscape where not less than 65 percent of housing stocks have corrugated roofing material, 71 percent with mud wall material as well as poor housing facilities as compared with this study result with 30% of housing with mud blocks and roofed with corrugated iron sheets.

Following the instruction from Kayode (2010), it was identified the materials used for construction, building condition, and age of building as physical housing status indicators were not good enough.

The results of the study showed high number of substandard buildings in the community, constructed with low quality and non-permanent materials unsuitable for urban housing such as mud blocks, iron sheet, strips of timber. And such poor housing can result to unhealthy living conditions which associated with the lack of basic services coupled with visible open uncontrolled dumping of wastes, and polluted environments. Some of people in the study area reported poor knowledge and awareness of housing conditions and such information were from Environmental Health Officers and television.

It was observed that the studied areas were presented with poor quality of housing in type D due to poor compliance with building plan by Owerri Capital Development Authority (OCDA) and poor quality of building materials used for construction, the inadequate technology, and poor planning standard in line with Owerri Capital Development Authority (OCDA). Some people within the area used mud material, timber, sun dried blocks and cement blocks for constructing their buildings due poor funding or poverty level among them. According to Owoeye (2013), sun dried blocks and mud accounts for the highest material used for building in most remote areas.

In respect to water supply, the findings indicated tap water, well water and borehole as the common source of water supply in type A and B of housing conditions.

Amadi (2011) stated that housing conditions have different ways in which it can protect against contaminants and they includes the following; provision of safe and sanitary water supply, protect the water supply system against pollution, provision of toilet facilities that minimize the danger of transmitting disease, protection against sewage contamination of the interior surfaces of the dwelling, avoid unsanitary conditions near the dwelling, allow sufficient space in sleeping rooms to minimize the danger of contact infection and allow sufficient space in sleeping rooms to minimize the danger of contact infection.

RECOMMENDATION

The following recommendations are made based on the findings of the study:

1. Every house should provide good physical and environmental conditions in order to prevent health problems
2. Good hygiene practices should be applied in every household to avoid creating an environment conducive to pest
3. Every house should have a constant potable water supply.
4. There should be proper ventilation in all homes because inadequate ventilation prevents unpleasant odour from being removed.
5. Poor lighting within the home should be avoided because it can also make people feel more depressed. The problems of poor lighting can be remedied by adding windows to the house to increase the amount of natural light, which is much stronger than light from candles or lamps.

Competing Interests

Authors have declared that no competing interests exist

Authors Contributions

Ene, Francis S conceived the study, designed the questionnaire and performed data collection and also measure relative humidity of the houses in the studied areas.

Okereke C.C.A supervised the work and contributed in drafting the manuscript.

Amadi, C.O.A co-supervised the work and also critically validated the statistical analysis.

Agwu, N.A participated in reviewing of related literature and critical review of the instrument for data collection.

Iwuoha G.N participated in reviewing of related literature and review of the instrument for data collection.

Nwankwo, O.K participated in reviewing of related literature.

Ntegun, E.L participated in reviewing of related literature.

Sponsorship

This study was solely sponsored by the principle researcher and no funding was received from anybody or organization.

Table 1: Socio-demographic Characteristics of Respondents in the study area

Statements	Frequency	Percentage
Age range of the participants		
18-28years	1	0.3
29-38years	2	0.6
39-48years	247	61.7
49-58 years	100	25.0
59 years and above	50	12.5
Total	400	100.0
Gender range of the participants		
Male	280	70.0
Female	120	30.0
Total	400	100.0
Marital status		
Single	10	2.5
Married	200	50.0
Separated	10	2.5
Divorced	30	7.5
Widow	99	24.8
Widower	51	12.8
Total	400	100.0
Educational status		
Non- Formal Education	120	30.0
Primary Education	20	5.0
Secondary Education	180	45.0
Tertiary Education	80	20.0
Total	400	100.0
Occupation of the participants		
Unemployed/Student/apprentice	40	10.0

Artisan	181	45.3
Petty trading/farming	80	20.0
Civil Servant/Public Servant	60	15.0
Business tycoon	39	9.8
Professional (Doctor, Lawyer, Engineer	0	0.0
Total	400	100.0
Monthly income range		
₦18, 000- ₦ 48, 000	180	45.0
₦ 49, 000- ₦78, 000	100	25.0
₦ 79, 000- ₦ 108, 000	80	20.0
₦ 109, 000 and above	40	10.0
Total	400	100.0

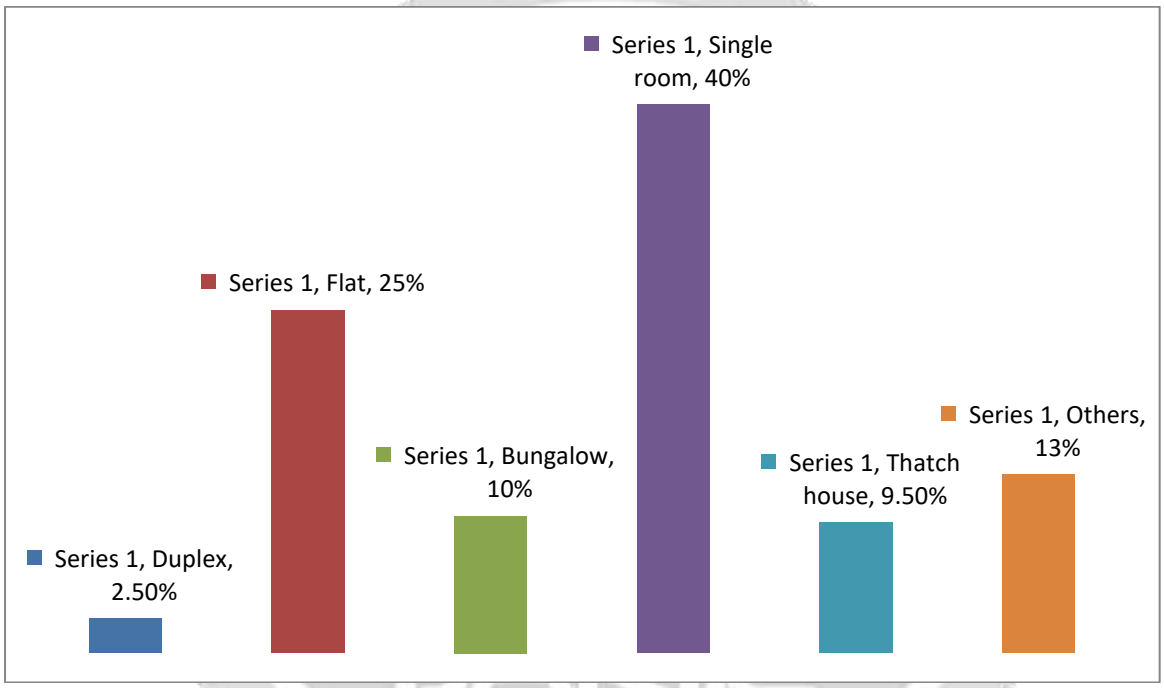

Figure 2: Type of housing Patterns in the study area

Table 6: Compliance with National Building Code

Statement	Frequency	Percentage
Was your building plan approved by Owerri Capital Development Authority (OCDA)?		
Yes	120	30.0
No	180	70.0
Total	400	100.0
If no, why was the building plan not approved by Owerri Capital Development Authority?		
No time to pass through the process of approval	150	53.6
No money to pay the necessary fees	99	35.3
Approval by OCDA is not necessary	31	11.1
Others	0	0.0
Total	280	100.0

Table 7: Knowledge of the People on Housing Conditions in the study area

Statement	Frequency	Percentage
Aware that the condition of your house can affect your health		
Yes	181	45.3
No	219	54.8
Total	400	100.0
Which source(s) did you get the awareness from?		
Environmental Health Officers	20	5.0
Television	259	64.8
Radio	43	10.8
Public Lecture	78	19.5
others	0	0.0
Total	400	100.0
Aware of the existence of building bye-laws		
Yes	121	30.3
No	279	69.8
Total	400	100.0
Which source(s) did you get the awareness?		
Environmental Health Officers	152	38.0
Television	149	37.3
Radio	61	15.3
Public Lecture	28	7.0
others	10	2.5
Total	400	100.0

Table 8: ANOVA showing the relationship between Relative Humidity and Temperature against Type of Housing

Variable	Type of housing	Mean (+/- SD)	ANOVA	P-Value
RH %	Duplex	95.400 (1.50)	43.205	< 0.001
	Thatch house	89.500 (0.70)		
	Bungalow	83.367 (2.75)		
	Single Room	87.525 (0.98)		
	Flat	83.813 (0.50)		
Temperature	Duplex	26.175 (0.61)	3.541	0.025
	Thatch house	24.250 (4.45)		
	Bungalow	24.950 (0.40)		
	Single Room	23.450 (1.68)		
	Flat	26.012 (0.41)		

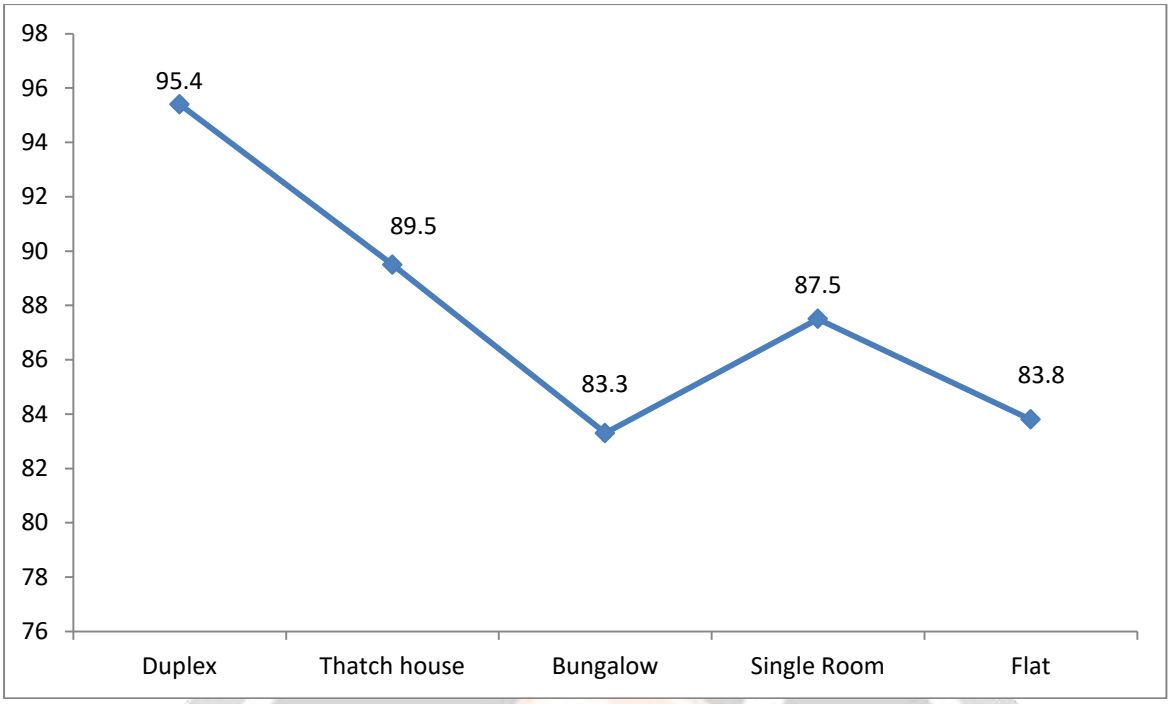

Figure 7: Relative humidity percentage of the various housing types

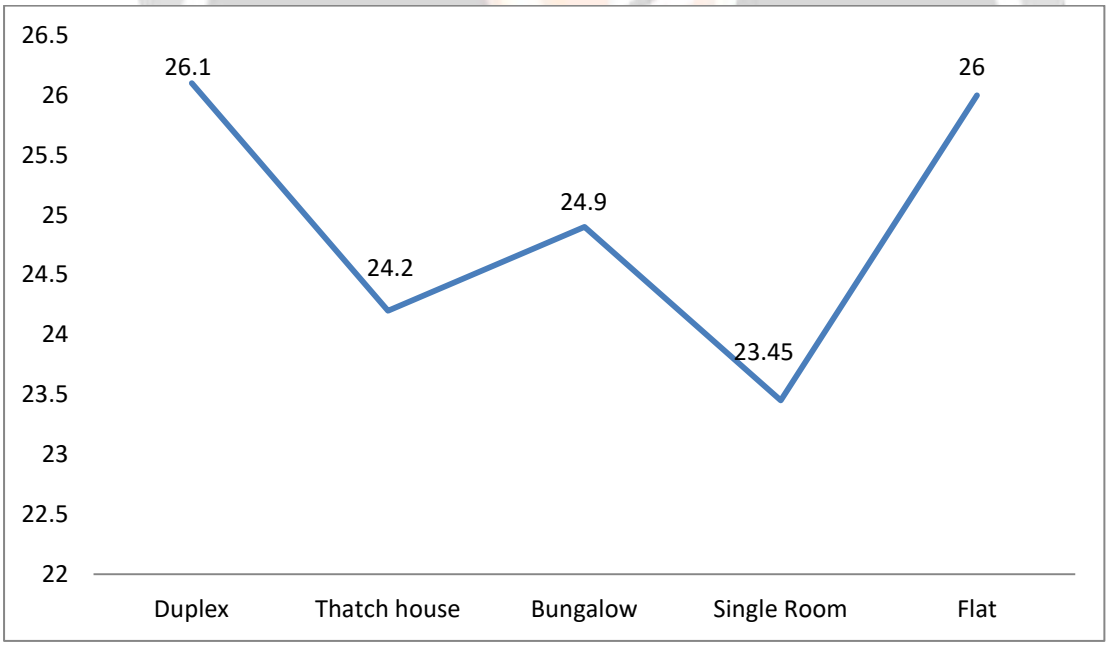

Figure 8: Temperature recording of the various housing types

Table 9: Health Problem associated with Poor Housing Conditions in the study area

Statement	Frequency	Percentage
Suffering from chronic waist pain that seems never to go away		
Yes	120	30.0
No	280	70.0
Total	400	100.0
Feeling serious swollen pains all over your waist, legs and back pains so serious they make you very uncomfortable and restless		
Yes	122	30.5
No	278	69.5
Total	400	100.0
Have back pains that are so critical, that prevents you from doing practically anything		
Yes	120	30.0
No	280	70.0
Total	400	100.0
Feel excruciating pains on all the joints of the body, pains so serious to extent someone find it hard to pick even a pen on the ground		
Yes	122	30.5
No	278	69.5
Total	400	100.0
Have you gone for any treatment since this pains started?		
Yes	120	30.0
No	280	70.0
Total	400	100.0
Where did you go for treatment?		
Hospital	101	25.3
Laboratory	0	0.0
Patent Medicine Shop	299	74.9
Herbalist	0	0.0
Others	0	0.0
Total	400	100.0
What was diagnosed to be the cause of the pains?		
Arthritis	322	80.3
Malaria	77	19.2
High blood pressure (hypertension)	2	0.5
Diabetes	0	0.0
Obesity	0	0.0
Others	0	0.0
Total	400	100.0
Do the Doctor/Herbalist associate the pains experienced above with the type of your housing condition		
Yes	91	22.8
No	309	77.3
Total	400	100.0

Table 10: Relationship between type of housing Condition/Pattern and health of the people in Owerri West LGA

Type of housing Condition/Pattern		Suffering from chronic waist pain that seems never to go away		Total
		Yes	No	
Type of housing Condition/Pattern	Duplex	10	0	10
	Flat	100	0	100
	Bungalow	10	30	40
	Single room	0	160	160
	Thatch house	0	38	38
	Others	0	52	52
Total		120	280	400

Pearson Chi-Square (X^2) = 364.286; df = 5 at P-value < 0.05

Table 11: Association between type of housing Condition/Pattern and awareness on the condition of a house can affect health

Type of housing Condition/Pattern		Aware that the condition of your house can affect your health		Total
		Yes	No	
Type of housing Condition/Pattern	Duplex	10	0	10
	Flat	100	0	100
	Bungalow	40	0_b	40
	Single room	31	129	160
	Thatch house	0	38	38
	Others	0	52	52
Total		181	219	400

Pearson Chi-Square (X^2) = 299.115; df = 5 at P-value < 0.05

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