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Users' perception of the need for universal design accessibility and circulation provisions in selected old people's home in Lagos state, Nigeria

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Users' perception of the need for universal design accessibility and circulation provisions in selected old people's home in Lagos state, Nigeria

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Abstract: This study investigated the perception of the elderly towards the Universal Design accessibility and circulation provisions in their living environment and how these provisions enhance their livability within the spaces in these homes. This research was carried out in a survey of the elderly residents (n=90) living in three selected old people's home in Lagos state, Nigeria. The findings suggested that all accessibility and circulation provisions in the living environment of the residents in old people's home are important. However, some of the accessibility and circulation provisions were perceived to be more important than the others. The findings in this study suggested that all the accessibility and circulation parameters based on universal design should be considered in the design of old people's home in other to enhance the livability of the elderly in these selected homes.

Keywords: Universal Design, Accessibility, Circulation, Old people's home, livability

1. Introduction

Old people's home or community is a welfare and social facility that houses the elderly, a place where old people can live together and be properly taken care of when they are too weak or too ill to adequately cater for themselves [1]. These communities have high level of medical and nursing facilities. Medical practitioners and caretakers are usually available around the clock to cater for the well-being of the senior citizens. However, well-being is not just the absence of pain, diseases and discomfort, but well-being includes a sound physical and mental health [2]. According to [3], suitable living is crucial to the well-being of the elderly. This implies that for the elderly to be in a state of well-being, the elderly must have access to comfortable and suitable spaces that meet his needs. It is observed that the more dependent or less competent a person becomes, the more the built and un-built environment has a greater influence in limiting or aiding the individual's capacity [4]. Therefore, in a view to improving functionality, productivity, and well-being of the elderly, it becomes necessary to design and build environments that enhance easy access and circulation, for good independence and livability of the environment.

Universal design concept is a concept that involves accessibility, usability and circulation as an added margin of safety. In universal design, the designer is sensitive to and is knowledgeable about the different abilities of users of these spaces particularly the elderly [5]. Universal Design is ometimes referred to as "lifespan" design or "trans-generational" design, it includes and much more than accessibility, adaptability and barrier-free concepts or philosophy (circulation) [6]. In other, for the elderly to have a livable environment, it is important that the accessibility and   circulation provisions cater to the needs for which they are provided.

Accessibility involves the ease at which a building can be approached and used. Accessible   design process understands that different people have different abilities; hence, the needs of the   disabled are

particularly put into considerations when designing indoor and outdoor spaces. The ability of a product, facility or services to accommodate people with a wide range of abilities is sometimes referred to as Accessibility [5], while circulation is the movement of people within a space. It can also be defined as a space between a space having connective functions. It is a concept that captures the three-dimensional experience within spaces [7]. As for accessibility, there are six aspect to rate accessibility which are: the connection between one space and another within a building complex (15%), how accessible these buildings or spaces are (25%), the degree to which these spaces are usable without the need for assistance (20%), the degree of safety of these spaces (20%), how these spaces integrate with other spaces (10%), the degree to which these spaces are operational and the degree of maintenance quality and culture(10%), All of these indexes comes up to a total of 100% where the pass mark is recommended as 65% out of the 100%[8] . However, in the case of circulation within a building, it involves horizontal circulation, vertical circulation, public circulation and private circulation. Hence, the Universal Design accessibility and circulation provision in old people's homes are car-parks, main entrances, internal doors, walkways, internal corridor, dropped kerbs, steps, ramps, handrails, non-slip floors, grab bars and support rails.

Due to economic situations in recent times, family members can no longer adequately cater to their own needs, hence, attending to the needs of their elder ones seems almost impossible [9]. Attempts have been made to alleviate these problems as we have about 7 care facilities for the elderly in Lagos state [10]. However, the accessibility and circulation needs of the elderly were not fully considered in the design and construction of these homes. Problems such as too many stairs, slippery floor materials, circulation problems within and outside the homes, lack of social interaction spaces, spaces that are not inclusive, privacy, safety, accessibility were found in these homes.

In Nigeria, some researches have been carried out in an attempt to solve problems with space accessibility for disabled people in learning facilities. These include areas like Inclusive Design for Disabled Students [11]; Universal Design in Learning Places [12]; Universal Design as a Strategy for Sustainability [13]; Aging, disability, and fragility: implication for universal design[14]; Accessible Environment towards Universal Design [15]. However, some kinds of researches [16] have been done on solving problems of accessibility in the everyday living of the elderly. Therefore, this research sets to investigate the perception of the needs of the universal design accessibility provisions in the living environment of the elderly.

2. Methodology

The study area for this research work was Lagos state, Nigeria which was chosen because of the number of old people's homes in the state. Lagos state has the highest number of these homes in Nigeria with a total number of seven (7) out of the 13 homes we have in Nigeria (Table 1). The remaining homes are located in Anambra and Oyo states. The study frame was selected using a simple random method which led to the selection of three (3) homes as shown in Table 2. These homes were selected based on ownership, consisting of one publicly owned and two privately owned homes. Data were collected with the use of a questionnaire to investigate the users' perception of the need for universal design accessibility provisions in these homes. The data collected was then analyzed and presented using SPSS (Statistical Package for the Social Sciences) analysis.

The questionnaire was divided into two sections. The first section consisted of the respondents' profile including sex, age, marital status, years of stay in the homes, right or left handed, disability and preference of vertical movement. The second section had questions on the perception of users on accessibility provisions in living environments. The questionnaires were distributed in the following homes:

    i.   Rock Garden Home, Ikorodu, Lagos State.

  ii. Winiseph Care Home, Omole Phase 1, Lagos State
  iii. Old People's Home, Yaba, Lagos State

Table 1: List of the Old People Home and care facility in Lagos State, Nigeria

S/N	Old People's Home	Type of Care Available	Public or Privately owned
1	Rock garden homes, Ikorodu	Live-in care facility	Private
2	Winiseph Care Home, Omole Phase 1	Live-in care facility	Private
3	Old People's Home, Yaba	Live-in care facility	Public
4	The Cathedral Circle Initiative	Live-in care facility	Public
5	Mariam Akintola Senior Citizens Care Home	Live-in care and daycare facility	Private
6	Purple Square LTD, Senior living solutions	Daycare and real estate community	Private
7	Old people's home	Live-in facility	Private

Source: Ministry of Youth and Social Development (2019)

Although many statistical formulae have been advanced for the purpose of calculating sample size, this research has been restricted to a formula developed by Yamane (1967).

$$n = \frac{N}{1+N(e)^2}$$

Where,

n= sample size

N= Population size

e= level of precision expressed as a proportion (0.03)

The equation above shows that a minimum of 46 samples is appropriate for Rock Garden Homes. A total number of 50 residents live in the Rock Garden homes, Ikorodu. At 0.03 level of significance level, the minimum size found is 46. A total number of 17 residents were identified in the Winiseph Care Home. At 0.03 level of significance level, the minimum size found is 15. A total number of 36 residents live in Old People's Home, Yaba, Lagos State. At 0.03 level of significance level, the minimum size found is 46. This brought the overall sample size to 90 respondents. Seventy-two (72) questionnaires were returned, which represents 80 percent of the sample size.

Table 2: List of homes showing the population of the elderly

S/N0	Old People's homes	Public or Privately owned	The Population of Elderly in These Homes	Sample Size
1	Rock garden homes	Private	50	45
2	Winiseph Care Home	Private	17	15
3	Old People's Home	Public	36	30
	Total		103	90

3.0 Data Presentation

3. 1 Respondents Profile

3.1.1 Gender Distribution of the respondents

Table 3 shows that 59.8% of the respondents are female and 40.3% are male. This expresses the ratio of male to female that live in the facility for the elderly and from the analysis, more female elders live in the facilities than their male counterparts. This could be because of the higher life expectancy in women which is 55.7% while their male counterpart is 54.7%, [17]. Hence, consideration should be made for male and female spaces such as male and female toilet.

Table 3. Gender distribution of the respondents

Sex	Frequency	Percentage
Male	29	40.3
Female	43	59.7
Total	72	100.0

3.1.2 Age range of the respondents

The result expresses that 26.4% of the respondents fall between the age range of 60-69, 44.4% of the respondents fall within the age range of 70-79, while 29.2% fall within the age range of 80-89, as shown in Table 4. The majority of the respondents fall within the age range of 70-79; the least population falls within the age of 60-69 and an average population between 80-89 years. This implies that the dominant age range that makes use of these facilities is the respondents within the age range of 70-79. This provides a guide to the consideration of needs along with the other classes of respondents.

Table 4: Age range of the respondents

Age	Frequency	Percentage
60-69	19	26.4
70-79	32	44.4
80-89	21	29.2
Total	72	100.0

3.1.3 Length of stay of respondents
Table 5 shows the period the elderly has been living in the homes. 62.5% of the elderly have lived in these homes for an average of 1-5 years, the minority population of the respondents has lived in these homes for more than 11 years and the remaining elders have lived in these homes for an average of 0-1 year (18.1%) and 6-10 years (18.1%). This infers that the elders were in the best position to assess the facilities since they had lived in them for some time.

Table 5. Length of stay in the homes of respondents

Length of Stay	Frequency	Percentage
0-1	13	18.1
1-5	45	62.5
6-10	13	18.1
11+years	1	1.4
Total	72	100.0

3.1.4 Right-handed and left-handed respondents.
Table 6 shows the dominant use of the hands of the respondents. 84.7% of the population makes use of their right-hand while the remaining 15.3% use their left hand. This shows a ratio of right and handed users which express that both kinds of abilities are present in these homes. Hence, accessibility and circulation should be considered for both right- and left-handed elders. For example, toilet flush would be in the middle instead of the typical right-hand side.

Table 6 Right-handed and left-handed respondents

Right and Left Handed	Frequency	Percentage
Right-handed	61	84.7
Left-handed	11	15.3
Total	72	100.0

3.1.5 Mobility aid used by the respondents
Table 7 shows the mobility aid used by the elders in these homes. The percentage of elders using wheelchairs are 12.5%, those using walking sticks is 8.3% of the total population. The population of elders using walking frames is 2.8%. However, the dominant population of the elders, which is 76.4% has no mobility challenges. This implies that the elders have different mobility abilities. Hence, accessibility and circulations would be considered for all categories of elders' populations, irrespective of their mobility abilities.

Table 7 Mobility aid of the respondents

Mobility Aid	Frequency	Percentage
Wheelchair	9	12.5
Walking stick	6	8.3
Walking frame	2	2.8
None	55	76.4
Total	72	100.0

3.2 Perception of Respondents to the Universal Design Accessibility and Circulation Provisions in their Environment

3.2.1 Need for Car-park
Users' perception of the need for car parks is presented in Table 8 A majority (48.6%) of the population stated that car-park is needed in their living environments, while 27% highly needed the facility, probably because of their inabilities. These ratios show that car-parks are of great importance to the living environment of the elderly to enhance their livability within the environment. This implies that adequate car-parks should be provided for the elderly even if they cannot drive.

Table 8 The respondents' perception of the need for car-park

Car park	Frequency	Percentage
Highly needed	27	37.5
Needed	35	48.6
Uncertain	7	9.7
Not needed	3	4.2
Total	72	100.0

3.2.2 Need for the main entrance
Table 9 shows the analyses of the respondents' perception of the need for large main entrance doors in their living environment. A majority (40.3%) of the respondents were uncertain about this accessibility provision; another set of respondents (33.4%) felt that entrance door provision is needed. 26.4% did not see the need for larger entrance door provision. This implies that the elders have different levels of need for a larger entrance door. Hence, larger entrances doors should be provided to accommodate the different disabilities of the elderly.

Table 9 Perception of the need for a larger entrance door

Entrance Doors	Frequency	Percentage
Highly needed	4	5.6
Needed	20	27.8
Uncertain	29	40.3
Not needed	13	18.1
Not needed at all	6	8.3
Total	72	100.0

3.2.3 Need for larger internal doors
Table 10 shows the analysis of the respondents' perception of the need for larger internal doors. 29% of the respondents were uncertain about the need for a larger internal door; 20% of the respondents indicated that larger internal doors were needed; 13% of the respondents did not see the need for wider internal doors; 6% of the respondents did not need the provision of larger internal doors at all, and 4% of the respondents felt that larger internal doors were highly needed. This implies that the elderly had different needs for internal doors. The majority of the respondents were uncertain. However, the second highest group signified the need for larger internal doors, hence, larger internal doors should be provided in design especially for users on wheelchairs.

Table 10. Respondents' Perception of the need for larger internal doors

Internal Doors	Frequency	Percentage
Highly needed	4	5.6
Needed	20	27.8
Uncertain	29	40.3
Not needed	13	18.1
Not needed at all	6	8.3
Total	72	100.0

3.2.4 Need for External Walkway

Table 11 reflects the analyses of the respondents' perception of the need for external walkways. Thirty-nine (39%) of the respondents needed external walkways, 14% of the respondents were uncertain about their needs for external walkways, 12% of the respondents' highly needed external walkways and 7% of the respondents did not have needs of external walkways. The dominant population needed external walkways, which implies a definite need for external walkways in the living environment of the elderly. Hence, external walkways of adequate size according to [5] should be considered in the design of homes for the elderly.

Table 11. Respondents' perception of the need for external walkways

Walkways	Frequency	Percentage
Highly needed	12	16.7
Needed	39	54.2
Uncertain	14	19.4
Not needed	7	9.7
Total	72	100.0

3.2.5 Need for internal corridor

Table 12 shows the respondents' perception of the need for internal corridor in their living environment. 29% of the respondents needed internal corridors, 14% of the respondents do not need internal corridor, 13% of the respondents highly needed internal corridor 12% of the respondents were uncertain of their need of internal corridor and 2% had no need at for internal corridors at all. The majority of the respondents identified the need for internal corridor. This implies that internal corridor is vital to the accessibility and circulation needs of the elderly. Hence, it should be considered in the design of homes for the elderly.

Table 12. Respondents' perception of the need for Corridors in their living environment

Corridors	Frequency	Percentage
Highly needed	13	18.6
Needed	29	41.4
Uncertain	12	17.1
Not needed	14	20.0
Not needed at all	2	2.9
Total	72	100.0

3.2.6 Need for dropped kerbs

Table 13 shows below the respondents' perception of the need for dropped kerbs in their living environment. The majority of the respondents needed dropped kerbs on their walkway, 32.9% of the respondents are uncertain about the need of dropped kerbs on walkways, 17.1% of the respondents did not need dropped kerbs. This implies a ratio of respondents that need dropped kerbs and those that do

not need dropped kerbs. This shows that the respondents have different accessibility needs and knowledge of dropped kerbs. Hence, dropped kerbs should be considered in the design of walkways for the elderly to meet the needs of all the elders in their living environment and enhance their livability especially for elders with mobility disabilities.

Table 13. Respondents perception of the need for dropped kerbs in their living environment

Dropped Kerbs	Frequency	Percentage
Highly needed	4	5.7
Needed	28	40.0
Uncertain	23	32.9
Not needed	12	17.1
Not needed at all	3	4.3
Total	70	100.0

3.2.7 Need for steps where there is a change in level

Table 14 shows the respondents perception of the extent of the need for steps where there is a change in level in their living environment. Majority (38.9%) of the respondents had a need for steps to navigate change of level, 22% of the respondents were uncertain as to the need of steps to navigate between change of levels, 11% of the respondents highly needed steps to navigate change in levels, 9% of the respondents had no need for steps to navigate change in levels in their living environment and 2% of the respondents did not require steps at all to navigate change in levels within their living environment. This implies that the respondents have different preferences of vertical circulation within their living environment. Hence provisions of steps would be considered in the design of homes or the elderly to encourage easy accessibility and circulation for all the needs of the respondents to enhance their livability within their living environment.

Table 14. Respondents' perception of the extent of need of steps to navigate vertical circulation in their living environment

Steps	Frequency	Percentage
Highly needed	11	15.3
Needed	28	38.9
Uncertain	22	30.6
Not needed	9	12.5
Not needed at all	2	2.8
Total	72	100.0

3.2.8 Need for ramps where there is a change in level

Table 15 shows the respondents perception of the extent of the need for ramps where there is a change in level in their living environment. The majority (47.2%) of the respondents were uncertain of their extent of needs for ramps in their living environment, 27.8% of the respondent had need for ramps to navigate vertical circulation in their living environment, 12.5% of the respondents had no need for ramps to navigate change in level, 9.7% of the respondents highly needed ramps to navigate change in level in their living environment, and 2.8% of the respondents had no need for ramps at all. This implies that the respondents have different abilities, hence, the need for different means of vertical circulation to navigate between floors and change in levels within floors in their living environment. The provision of ramps would be considered in the design of the homes for the elderly to enhance circulation and accessibility of spaces in the living environment of the elderly, which would, in turn, enhance their livability within their living environment.

Table 15. Respondents' perception of the extent of need for ramps in their living environment

Ramps	Frequency	Percentage
Highly needed	7	9.7
Needed	20	27.8
Uncertain	34	47.2
Not needed	9	12.5
Not needed at all	2	2.8
Total	72	100.0

3.2.9 Need for handrails along stairs

Table 16 shows the respondents perception of the extent of needs for handrails along stairs or steps in the living environment of the elderly. The majority of the respondents (54.2%) needed handrails in their living environment. 25% of the respondents had a high need for handrails along with steps or stairs, 8.3% of the respondents were unsure as to the extent of the need for handrails in their living environment. This implies that the dominant population of the respondents needed handrails along with steps or stairs in their living environment. Handrails are much needed for support while climbing stairs, to prevent accidents.

Table 16. Respondents' perception of the extent of needs for handrails along stairs in their living environment

Need for Handrails	Frequency	Percentage
Highly needed	25	34.7
Needed	39	54.2
Uncertain	6	8.3
Not needed	2	2.8
Total	72	100.0

3.2.10 Need for handrails along ramps

Table 17 shows the respondents' perception of the extent of need for handrails along ramps in the living environment of the elderly. The majority of the respondents (28%) needed handrails along ramps in their living environment. 23% of the respondents were uncertain of the extent to which they needed handrails alongside ramps provided in their living environment. 17.1% of the respondents did not need handrails alongside ramps, 5.7% of the respondents had a high need for handrails along ramps in their living environment and 4.3% of the respondents did not have any need for ramps in their living environment. This implies that there is an average need for handrails along ramps in the living environment of the elderly. However, considerations of handrails along ramp would be considered in the design to ensure that the elders are protected from falling off the ramps, and for easy ascend and descend.

Table 17. Respondents perception of the extent of need for handrails along ramps

Handrail alongside ramps	Frequency	Percentage
Highly needed	4	5.7
Needed	28	40.0
Uncertain	25	32.9
Not needed	12	17.1
Not needed at all	3	4.3
Total	72	100.0

3.2.11 Need for firm, non-slip floors
Table 18 below shows the respondents' needs for firm, non-slip floors. A majority (58.3%) highly needed firm, non-slip floors in their living environment. 33.3% of the respondents needed non-slip floors in their living environment, 5.6% of the respondents were uncertain as to the extent of the need for non-slip floor, and 2.8% of the respondent did not need firm, non-slip floors in their living environment. This implies that majority of the respondents needed firm, non-slip floors in their environment. Hence, firm, non-slip floor type would be considered in the design for the elderly as it would help in better circulation regardless of the state of the floor; wet or dry. This would also encourage accessibility in the living environment of the elderly.

Table 18. Respondents' perception of the extent of need of firm, non-slip floors in their living environment

Need for non-slip floors	Frequency	Percentage
Highly needed	42	58.3
Needed	24	33.3
Uncertain	4	5.6
Not needed	2	2.8
Total	72	100.0

3.2.12 Need for toilet grab bar and support rails
The need for toilet grab bar and support rails in the living environment of the elderly is presented in Table 19 below. The majority of the respondents were uncertain as to the extent of their needs for toilet grab bars and support rails in their living environment. 21% of the respondents needed toilet grab bar and support in their living environment, 11% of the respondents highly needed toilet grab bar and support bars in their living environment, 11% of the respondents did not need toilet grab bar and support bar, 3% of the respondents did not need toilet grab bars and support bars at all. This implies that majority of the respondents' rate toilet grab bar and support bars as important in their living environment, hence, toilet grab bars and support bars would be considered in the design of the homes for the elderly to enhance accessibility and circulation.

Table 19. Respondents' perception of the extent of need of toilet grab bar and support bars in the living environment of the elderly

Need for Toilet Grab Bar	Frequency	Percentage
Highly needed	11	15.3
Needed	21	29.2
Uncertain	26	36.1
Not needed	11	15.3
Not needed at all	3	4.2
Total	72	100.0

4.0 Conclusion

The research identified the Universal Design accessibility and circulation provisions in the design and construction of old people's homes. It also analyzed the perception of the elderly to the needs of the provision that have been identified. These provisions when properly implanted would enhance inclusion and independence for the elderly which would, in turn, enhance livability for the elderly in these homes. From the results, it is observed that the residents (elderly) have a high need for the

accessibility parameters provided for in their living environment as all the universal design accessibility parameters were perceived as important and needful. However, some parameters are perceived to be needed more than the other. Non-slip floors, car-parks, handrails along stairs and ramps, dropped kerbs and toilet grab and support bars are the most needed. This implies that these provisions are perceived by the elderly in these residents as important needs that should be available and functional for them to have livable spaces. However, the majority of the population of the elderly were uncertain about the need for large interior doors and large main entrances in their living environment. This means that all these parameters should be considered to enhance the livability of the elderly in these homes but to different degrees.

In line with these, it is recommended that the government create policies that ensure that the accessibility parameters of universal design are implemented before approvals are given for the construction of old people's homes. The Nigeria of Architect (NIA,) which is a membership body that brings together all registered architects, should also organize seminars and workshops to   enlighten their members on the various strategies of universal design. Universal Design should be incorporated into the architecture curriculum of students to ensure that the students of architecture can   have   an excellent knowledge of the principles before they become professionals.

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