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Educational Attainment of Household Head and Household Size Patterns in Mass-Housing Apartments in Lagos State, Nigeria

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Abstract: Demographic and crowding experiences in multifamily apartments built by the Lagos State Development and Property Corporation (LSDPC) in Lagos, Nigeria, are now seen as affecting households' well-being and quality of life. One of the emerging criteria for general social class grouping is educational attainment of household head. This study focused on investigating the impact of educational attainment of the head of household on household crowding experiences in the multifamily apartments belonging to LSDPC. There was no evidence that this gap had been addressed by previous researchers. The research adopted a purposive case study of four big housing estates that are dominated by multifamily apartments. In all of these, a total of 7,764 multifamily apartments constituted the sampling frame from which a sample of 7.5% (582) was eventually used. A pre-tested questionnaire was distributed using stratification and systematic random techniques. Six variables were used to measure educational attainment: below Primary School; Primary School; Secondary School; College of Education; Polytechnic; and University. A major finding shows that when other socio-demographic indicators were isolated, the educational attainment of the head of household had a significant effect on crowding in two out of the six multifamily apartment types investigated, namely Type 3 (three-bedroom) at Abesan and Type 5 (three-bedroom) at Dolphin II. Possession of a university education is a strong indicator that the LSDPC's multifamily apartment occupied will experience a lower occupancy rate or lower household size. Therefore, it is suggested that social policies in the domain of education should be incorporated into

LSDPC's housing development programmes in order to moderate crowding propensity in its mass-housing apartments of the future.

Keywords: Crowding, Educational attainment, Household size, Multifamily apartments.

1.0 Introduction

In recent years, attention seems to be inclining towards the demographic characteristics of the residential environment that may affect the well-being and quality of life of household members. At the scale of the household, a starting point in attempting to describe the residential environment could include the quality of housing and other variables such as household size, privacy, and social class (Jorda and Alonso, 2016).

Evidence abounds concerning the existence of several ways by which social class demographics can be grouped and identified, for example, socio-economics, ages, gender, education, profession, marital status, etc. (Wanka and Rena 2019; Das and Mishra, 2020) Within the household, experience has been largely differentiated to reflect class, region, ethnicity, etc. The composition of the typical household has dramatically altered in the last few decades. Further disaggregation of the household unit is now speculated to be bringing new insights into the way and patterns households use their apartment's spaces. In this wise, educational attainment of household members is taken as a major aspect of social class grouping and provides a pathway for interpreting housing experiences and behavioural traits. In fact, household heads with the same level of educational attainment tend to exhibit similar group characteristics and social identification in different forms (Yan et al., 2021).

Crowding within the household is a complex, multi-dimensional socio-demographic problem. In this study, attention is focused on understanding the impact of educational attainment on average household size in the Lagos State Development and Property Corporation (LSDPC)'s multifamily apartments in Lagos, Nigeria.

To some extent, household size is taken as a surrogate for household crowding. Iweka (2012) classifies crowding as a social issue and asserts that it is technically an objective measure of the number of persons per room in a housing unit. He further contends that overcrowding is a subjective expression of a normative judgement depicting that a given crowding measure is too high or negative and varies between nations, cultures, socio-economic classes and contexts.

The study aimed at analyzing the relationship between the education levels of household heads as a revealing indicator of housing consumption pattern and crowding of the home environment in LSDPC's multifamily apartments. Basic to this relationship is the assumption that household size plays a role of shaping the occupants' attitudes towards apartment's domestic spaces, hence the need to explore a further dimension of household crowding in multifamily apartments belonging to LSDPC.

This study is motivated by the current policy interest in the question of whether or not, the level of educational attainment is one of the key demographic factors that influence household sizes (crowding) across segments of the urban population in Lagos State, Nigeria. In other words, is educational attainment a determinant of household crowding in multifamily apartments built and operated by LSDPC in Lagos State, Nigeria? Aggregate changes in the size and structure of households based on education level of household head are not well understood, especially in LSDPC's multifamily apartments. There is no evidence that this question has been addressed by earlier researchers.

This research draws attention to the growing fluidity of socio-demographic variables in household living patterns and experiences. The study can be useful for LSDPC's policy formulators on contemporary urban housing problems and trends in the sense that it draws attention to specific demographic character of the household in the area of educational attainment as it affects household size in multifamily apartments.

2.0 Literature Review

2.1 Concept and factors of Educational attainment

The literature is replete with a good number of definitions of educational attainment. These range from researches that use different indicators such as years of schooling that have been successfully completed, levels of education completed and ability to read and write (literate) (Thomas et al 2001; Barro & Lee 2010; Adegboye & Kote 2011). Educational attainment, education level and educational qualification are sometimes used interchangeably by authors (Schneider, 2011). Sometimes these are viewed from the broad perspective of number of years a person has spent in school, in the pursuit of knowledge acquisition. This way of interpreting educational attainment makes it easy to establish educational cycles that are complete and those that are incomplete, based on if the educational cycle has been finished or not (Jorda and Alonso, 2016).Some illustrators of educational attainment differentiate people according to a hierarchical vertical scale. There are other perspectives that organize educational attainment according to broad groups representing four layers namely: no schooling; primary; Secondary and tertiary education (Lauer 2002; Jorda & Alonso, 2016). According to Alonso, these classifications can be further stratified into complete and incomplete to indicate whether the cycle for such category was finished or unfinished. All the aforementioned aspects of education belong to the formal sector. It is necessary to note that another sector (informal) also exists. Beyond the completion of formal schooling, there are views that educational attainment should include distributional dimensions such as occupation. Indeed the overall educational potential of a household may not necessarily be conditioned by the formal education level of the household head alone. Levels of academic attainment may also be improperly construed in the sense where attention is in the direction of vocational education, skills, competencies and qualifications. This paper focused on the formal aspect of education, associated skills and knowledge acquired as a categorical variable.

2.2 Household Size and Crowding

Household size is taken as the number of usual residents who share household expenses and common kitchen (Kamuzora, 2001). These are regarded as the *de jure* residents. They include the children of the household head and other members. Practically, those other members are involved in the day-to-day welfare of the household, who have stayed continuously in the apartment for six months, thereby merit being described as usual residents. The household is seen as a social context for many possible ways in which apartment occupants can coexist, depending on the average household size and other demographic characteristics like education level of household head. Living and sleeping arrangements for individuals that are nested within households constitute a basis for determining whether or not the home is crowded. Crowding, simply considered, is a continuous measure of persons per room. That is, the result obtained when total number of household residents is divided by the total number of habitable rooms in the apartment (Solari & Mare, 2012). The habitable rooms are taken as the result when the number of bedrooms is added to the other rooms that are not bedrooms. However, bathrooms, halls, lobbies and utility rooms are excluded. Also excluded are kitchens that measure less than 6.5 square metres (Iweka 2012). In counting the rooms, those that measure 19.0 square metres or more are taken as double rooms. The crowding ratio obtained is regarded as a standard measure of home crowdedness, reflecting the profile of a specific household and the specific demographic indicators under reference.

The collateral relationship between crowding in the home and household headship characteristics is based on the general perception that a household head can greatly influence a large proportion of decisions or actions taken within the household. Hence being a prime decision-making authority in the household, it can be inferred that the education attainment of the household head represents the overall household's education potential. Therefore, this study considers the head of household's education level to influence crowding experiences of all other individuals in the household as well. That is, the relationship between household head's education level can intrinsically be a reference point for suggesting the probability of crowding risk in the apartment. An assumption here is that crowding in LSDPC's multifamily apartments available in its low income and medium income residential estates can be controlled if government focuses attention on the education level of prospective future occupants of the apartments.

3.0 Methodology

Apartment crowding research normally uses residents of public housing or inmates of public institutions. Four of the largest residential estates built and operated by LSDPC were purposively chosen as a multiple-unit case study to interrogate the specific issues of crowding and educational attainment of household heads in multifamily apartments.

Of the four estates selected three where in the low-income category while one was in the medium income category. The details are as follows:

(1) Low income Estate at Abesan containing 1,672 units of two-bedroom multifamily apartments and 2,600 units of three-bedroom multifamily apartments.

(2) Low income Estate at Dolphin II containing 576 units of two-bedroom multifamily apartments and 136 units of three-bedroom multifamily apartments.

(3) Low income Estate at Iba containing 2388 units of three-bedroom multifamily apartments.

(4) Medium income Estate at Ebute-Metta containing 528 units of four-bedroom multifamily apartments.

In all of these a total number of 7,764 units of multifamily apartments were available and this constituted the sampling frame for the study.

The apartments that were used for questionnaire distribution were selected based on a sample of 7.5% (582 units). In determining this sample size, this study relied on published tables which provide guidelines for a given set of precision, confidence levels and variability. This sample size of 582 (7.5%) was considered adequate because it far exceeds the figure of 366 (4.71%) recommended many years ago as appropriate for a study population of 7,764, based on assumed standard error of 0.5 (Krejcie & Morgan, 1970). The procedure further follows the recommendation of Denscombe (1998) that researchers should build an allowance in the sample size for non-responses. Hence, the sample size was deliberately increased to compensate for non-response.

The distribution of the sample followed stratification technique: (1) 320 units from Low income Estate at Abesan comprising of 125 units of 2-bedroom types and 195 units of three bedroom types; (2) 43 units from Low income Estate at Dolphin II consisting of 15 units of 2-bedroom types and 28 units of three-bedroom types; (3) 179 units of three bedroom type at Iba Low income Estate; (4) 40 units of four bedroom type at Ebute-Metta Medium income Estate. The multifamily units eventually chosen were identified by applying systematic random technique to each of the stratum already described.

In determining the crowding measures to be adopted, it was found that in Nigeria, records of occupancy by previous researchers were inconsistent (Onibokun, 1981; Igwe, 1987; Obateru; 2005; Iweka, 2012). It is equally acknowledged that measures of crowding vary across the continents. However, three globally accepted indexes are most commonly used within housing and urban policy circles to discuss occupancy and crowding. These are the American Crowding Index (ACI) as developed by the United States Census Bureau; the Canadian National Occupancy Standard (CNOS), developed by the Canadian Mortgage and Housing Corporation; and the Equivalized Crowding Index (ECI), developed by Australian Bureau of statistics.

The Canadian National Occupancy Standard (CNOS) is given credence as being more detailed than any other one, in the sense that it gives consideration for the type of rooms in the dwelling and makes adjustments for the age and sex of the usual residents. Hence, this study adopted the Canadian National Occupancy Standard (CNOS) for establishing the number of persons in the apartment. This provided the basis for establishing the number of adult-equivalent occupants that could inhabit a room, in order not to violate the internationally-acclaimed norms for sleeping, that recognizes the sanctity of marriage and the separation of gender.

Thus, the questionnaire sought to know the ages, gender and marital status of usual occupants in the apartment. The CNOS stipulates the following arrangements as acceptable:

i. Not more than two persons should be assigned to a room
ii. Children one year old and below are disregarded
iii. Children above one year of age but below five years can share a room, irrespective of their gender
iv. Children of the same gender who are below eighteen years of age can share a habitable room
v. All persons eighteen years and above who are not in a marital relationship should have a separate room each
vi. All parents or couples in a marital relationship are to share a room.

In applying the CNOS, children who are one year old and below are disregarded. All other children that are not up to eighteen years of age are considered as "half" of an adult. Individuals who are married are assigned as "half" of an adult each. Other individuals eighteen years and above are designated as "one" adult (Iweka, 2012).

This paper investigates the effect of household educational attainment on average household size in the multifamily residential apartments belonging to LSDPC in Lagos. The head of household was taken to be self-determined by the respondents as the person who typically plays an important role in major decision-making in the home. The head of household's gender was considered to be inconsequential because the target was the household unit and educational attainment of the head. Only the levels of education completed by the head of household were considered and used as measurement indicators for assessing educational attainment. In this wise, the highest level of educational attainment by a household head was taken to mean the highest level of education that the head of household has duly completed. This was categorized into six levels from low to high: "below primary school", "primary school", "secondary school", "college of education", "polytechnic", "university"

The study did not however attempt to validate the claims of educational attainment through certificate verification or assessment of knowledge, skills and competences acquired. Neither did the study seek information about the institution the respondent attended. Again, gender and occupational differences in the levels of education were discountenanced.

4.0 Results and Discussion

The questionnaire sought to find out from the respondents: "which of these best describes the education level of the head of household"? The response options supplied for educational attainment of household heads were given as follows: "below primary school", "primary school", "secondary school", "college of education", "polytechnic", "university", "others (specify)".

The total effective return rate was 30% (175) out of a total of (582) questionnaires distributed. High return rates were recorded in estates located in metropolitan areas such as Dolphin II (98%) and Ebute-Metta (90%). Conversely, the suburban estates located at Iba and Abesan recorded low return rates of 9% and 28% respectively. Though perceived as low, a

comparison with a similar study in the United Kingdom that investigated residents' satisfaction in private homes built since 2002 in Greater London and Southern England with a 20% effective response rate and another study that examined public housing in South-West Nigeria that yielded a response rate of 48%, justifies that the present study's response rate is adequate (CABE, 2009; Illesanmi (2005).

Table 1.0 reveals that majority of those who responded to the questionnaire were holders of University degree 58.9% (103), or the recognized equivalent, the polytechnic education 20.0% (35). Household heads who have completed the Secondary School education and Colleges of Education constitute 9.1% (16) each, and represent the third highest number of respondents. Persons whose education level was Primary school and below represent an insignificant proportion of 2.9%. The preponderance of respondents with high level of literacy cum high level of educational attainment was a significant attribute that planners attached to LSDPC can deploy to improve strategies used to communicate effectively with tenants of multifamily apartments in the study area.

Table 1: Educational Attainment of Household Head

Educational attainment of household head	**Number of Respondents**	**Percentage**
Below primary school	1	0.6
Primary school	4	2.3
Secondary school	16	9.1
College of education	16	9.1
Polytechnic	35	20.0
University	03`	58.9
Total	**175**	**100.0**

In this study, crowding was measured using three indicators namely (1) the number of habitable rooms in the apartment, (2) the total number of bedrooms in the apartment (3) the total size (or area in square metres) of each apartment. Table 2.0 points out that respondents whose education level did not exceed primary school were more available in Type 3 (three-bedroom) multifamily apartments located at Abesan and Type 5 (three-bedroom) multifamily apartments located at Dolphin II. This appears to highlight that people whose highest educational attainment is not beyond primary school were not available in the two-bedroom multifamily apartments evaluated in this research.

Evidence suggests that holders of primary school education certificate are not available in the four-bedroom apartments located in Ebute-Metta. This tends to follow the general perception that persons in this category are not capable of affording and maintaining such opulent and grandiose apartments. It is, however, curious to observe that the situation in the

two-bedroom apartments at Abesan and Dolphin II seemed like a kind of counter-intuitive revelation.

Increase in formal education is regarded as a key factor for estimating well-being (Alonso, 2016); and often serves as a proxy for sensitivity analysis of skills and competencies, as well as social signals in the labour and marriage markets, (Schneider, 2011). The expectation in this study is tied to the usual societal perception that persons who possess primary school education as their highest attainment belong to the lower rung, hence ought to cluster most around two-bedroom apartments. Though not a theory, this perspective was further supported by the argument that the longer a person is exposed to education, the higher the skills and knowledge he or she can accumulate (Laucer, 2002; Wanka and Rena 2019; Das and Mishra, 2020).

Table 2: Crowding Outcome for Six Levels of Educational Attainment in Six Apartment Types

		Type 1, 2-bedroom, Abesan	**Type 2, 2 bedroom, Dolphin**	**Type 3, 3-bedroom, Abesan**	**Type 4, 3 bedroom, Iba**	**Type 5, 3-bedroom, Dolphin**	**Type 6, 4-bedroom, Ebute Metta**
Design occupancy by habitable rooms		7.0	7.0	8.75	8.75	10.5	9.0
Design occupancy by bedrooms		3.5	3.5	5.25	5.25	5.25	6.0
Design occupancy by apartment size		7.43	8.99	11.37	9.66	13.08	15.36
Crowding during habitation	Below primary school	-	-	2.0	-	-	-
	Primary school	-	-	9.75	-	1.75	-
	Secondary school	-	4.5	2.79	3.5	4.5	6.0
	College of education	1.5	8.0	2.5	7.0	5.0	3.5
	Polytechnic	2.92	5.17	3.06	3.1	4.0	2.5
	University	1.35	2.94	2.76	3.19	4.34	3.44

Contrary to this perception, evidence from this study reveals that holders of primary school education are more in favour of the three-bedroom apartments at Abesan and Dolphin II; even though the two-bedroom units are available in the same estates. This tends to imply that the choices made were attributable to other exogenous circumstances, and not likely by compulsion.

As shown in Table 2.0, household heads whose highest level of educational attainment was secondary school were scarcely available in Type 1 (two-bedroom) apartments located at Abesan Estate. On the other hand, this group of respondents

were readily found in each of the other five apartment types covered by this investigation. Based on the three indicators adopted in this research for measuring crowding, under-occupancy was revealed in Type 3 (three-bedroom) at Abesan, Type 4 (three-bedroom) at Iba and Type 5 (three-bedroom) at Dolphin II, in all cases. Under-occupancy was also recorded in Type 6 (four-bedroom) apartments at Ebute-Metta, using all crowding measurement indicators, except when the number of bedrooms indicator was applied. In this circumstance, 6.0 occupants were recorded, which is considered to be a special case because the apartment was occupied as designed. For the Type 2 (two-bedroom) apartments at Dolphin II, over-occupancy was recorded on number of bedrooms indicator while under-occupancy was experienced when the indicators of number of habitable rooms and total area of apartment were applied.

Looking at crowding in multifamily apartments where the head of household's highest level of education is college of education, Table 2.0 shows that this group of respondent's was found in each of the six apartment classifications investigated. Based on all the three measurement indicators deployed to evaluate crowding in this study, under-occupancy was generally experienced in Type 1 (two-bedroom) apartment at Abesan, Type 3 (Three-bedroom apartment) at Abesan, Type 4 (three-bedroom) apartment at Iba, Type 5 (three-bedroom) apartment as Dolphin II and Type 6 (four-bedroom) apartment at Ebute-Metta.

On other hand, significant difference in the results for crowding were observed when Type 2 (two-bedroom) apartment at Dolphin II were compared with other apartment types. The Type 2 (two-bedroom) apartment at Dolphin II experienced over-occupancy based on the number of habitable rooms and number of bedrooms. There seems to be no discernable clue to justify why high level of disparity existed between household crowding results from Type 2 (two-bedroom) apartment at Dolphin II and the rest of the apartments that were investigated in this research. Another revelation emanating from table 2.0 that can be considered as unique is that under occupancy was recorded in all the six apartment types based on only one measurement indicator (total area of each apartment).

For apartments where the respondent's higher level of educational attainment was polytechnic degree, under-occupancy was observed in four apartment types based on the three assessment indicators that were used in this study. The apartments were Type 1 (two-bedroom) apartment at Abesan, Type 3 (Three-bedroom apartment) at Abesan, Type 5 (three-bedroom) apartment as Dolphin II and Type 6 (four-bedroom) apartment at Ebute-Metta.

For respondent's whose highest academic attainment is a university degree, The outcome of crowding estimation shows that all the six apartment types covered in this study were under-occupied irrespective of the assessment indicator used. The generally held perception that apartments where household heads possess university degrees tend to be relatively less crowded appears to be supported by data from this research.

It is necessary to acknowledge that a major limitation in the results is the challenge of making a categorical statement based on the outcome. Some other specific collateral socio-demographic variables within the household were kept in abeyance, indicating that the results from the present study may not be accepted as entirely a conclusive evidence of the relationship between education level of household and size of the household. Further limitation arises from the fact that considering only the head of household's education level may perhaps be inadequate under certain living arrangements.

Statistical Validation of Effect of Education Level of Household Head on Apartment Crowding

A chi-square statistical tool was used to validate the effect of head of household's educational attainment on size of household in LSDPC's multifamily apartments. Table 3.0 shows that at 95 percent confidence level, household head's educational attainment in the apartments investigated had significant effect on the size of households, which is taken as a proxy for crowding in this research. Specifically, the two apartments largely affected are the Type 3 (three-bedroom) located at Abesan and the Type 5 (three-bedroom) located at Dolphin II.

Table 3: Effect of Household Heads' Educational Attainment on Household Crowding

Apartment type	Chi-square Value	P-Value	Remark
Type one (two-bedroom), Abesan	9.291	0.054	Education level has no significant effect on crowding in apartment Types 1 &2
Type two (two-bedroom), Dolphin II	4.348	0.630	
Type three (three-bedroom), Abesan;	34.031	0.000	In apartment Type 3, education has a significant impact on crowding.
Type four (three-bedroom), Iba	7.453	0.281	In apartment Types 4, education has no significant bearing on household crowding.
Type five (three-bedroom), Dolphin	17.500	0.025	In Type 5 apartments, educational attainment of household head has significant effect on crowding
Type six (four-bedroom), Ebute-Metta	12.000	0.062	In apartment Type 6, educational attainment has no significant effect on household crowding.

Conversely, for the other four apartment types, Type 1 (two-bedroom) at Abesan, Type 2 (two-bedroom) at Dolphin II, Type 4 (three-bedroom) at Iba, and Type 6 (four-bedroom) at Ebute-Metta, the influence of household head's education level on

crowding was not significant at 95 percent confidence level

5.0 Conclusion and Recommendations

Ordinarily, a normal assumption is that the level of household head's educational attainment minimizes crowding tendencies and that possession of a university education will reduce crowding even more. The current study's findings seemed to support this notion. The fact that a household head has acquired a university degree is a strong indicator that the LSDPC's multifamily apartment that he occupied will experience a lower occupancy rate or lower household size. The study found that when other socio-demographic indicators were isolated, the educational attainment of the head of household had a significant effect on crowding. As a result, public housing schemes in Lagos, particularly those developed by the LSDPC should take this into account. Therefore, it is suggested that social policies in the domain of education should be incorporated into LSDPC's housing development programmes in order to control the crowding levels in its residential apartments.

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