HOMELESSNESS IN HIGHER EDUCATION: A STUDY OF AFRICAN GRADUATE STUDENTS OF THE UNIVERSITY OF DELAWARE

by

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ABSTRACT

Housing insecurity is a pressing challenge in higher education, affecting students' academic performance, health, and overall well-being. Housing insecurity, which encompasses homelessness and limited or uncertain access to stable, safe, and affordable housing, is particularly pronounced at the University of Delaware (UD) where on-campus dormitories can only house 38% of the undergraduate students. Despite the shortage of on-campus accommodation, UD maintains a policy of not building additional dormitories and only maintaining the existing ones. As the majority of UD students rely on off-campus accommodation, the City of Newark grapples with high rental costs and a shortage of affordable housing. Therefore, the majority of UD students, including the African graduate students, are at risk of experiencing housing insecurity. Based on the findings from the survey of African graduate students, 19% indicated that they had experienced housing insecurity, which impacted their health and academic performance during their time at UD. Furthermore, over 80% of the respondents indicated that they spend above 30% of their income on housing-related costs, and 79% indicated that they had experienced financial strain from housing-related costs. Highlighting these challenges, the study explores affordable housing options as exemplified in other institutions. The significance of this study is to address a research gap on homelessness in higher education, particularly among African graduate students.

Chapter 1

INTRODUCTION

Background

African graduate students studying in the United States face unique challenges associated with housing insecurity and homelessness. Many of them experience financial strain due to the high costs of schooling abroad (Altbach, 1985). Compounded by the low purchasing power and the depreciation of African currencies compared to the US dollar, African students navigate both cultural and academic challenges associated with schooling abroad while adjusting to foreign environments (Nebedum-Ezeh, 1997). With the shortage of affordable housing in Newark Delaware (the City of Newark, Comprehensive Development Plan V 2.0, p. 47, 2022), University of Delaware students, including African graduate students, are at risk of experiencing housing insecurity.

Statement of the Problem

Across the United States, housing insecurity and homelessness are pressing challenges faced by many students in higher education (Hallett & Freas, 2018). As housing significantly shapes one's quality of life and health (Flomberg, 2021), housing insecurity could affect students' academic performance (Broton & Goldrick-Rab, 2016), as well as their health and overall well-being (Jones, 2019). While higher institutions present an opportunity for youths to secure a stable living environment, homelessness creates turmoil in their lives and makes it challenging for them to excel

(Gupton, 2017). Broton (2020) emphasized that the lack of secure and affordable housing is a significant worry for many college students. Considering that housing related-costs constitute substantially to the expenses encountered by international students, including African graduate students, a lack of affordable housing contributes to their financial strain (Nebedum-Ezeh, 1997).

Importance of the Study

Despite the profound impact of housing insecurity on students' lives, only a few policymakers and higher education leaders have recognized the extent of its complexities on college students (Hallett & Freas, 2018). Rather, the government's focus on student homelessness has been limited to kindergarten and high school students. Therefore, little attention or support has been given to addressing homelessness in higher education (Hallett, 2010).

For example, during the 2019 Delaware state bond hearing, the UD President requested over $30 million for a campus expansion project, despite concerns raised by lawmakers about the shortage of student housing. However, he disagreed with these concerns and dismissed any claim of inadequate student housing (Newark Post, 2019), despite UD admitting in its Master Plan that the housing needs for graduate students are poorly understood and largely absent on campus and that UD relies heavily on the City of Newark to provide student housing (University of Delaware, 2017).

To further emphasize the importance of this research and highlight the existing research gap, Broton & Goldrick-Rab (2018) noted that there has not been a comprehensive national study conducted by the federal government or private

organizations to measure the impact of food and housing insecurity on students in higher education.

With the aim to address this gap, this research contributes to the efforts focused on addressing housing insecurity in higher education, particularly as it affects African graduate students.

Chapter 2

LITERATURE REVIEW

While housing insecurity and homelessness are underlined by poverty and lack of affordable housing (Gupton, 2017), how they are viewed and defined impacts the potential policy attention they receive and determines who can be considered homeless (Larkin et al., 2019, p. 20).

Cox et al. (2019) defined housing insecurity as limited or uncertain access to stable, safe, and affordable housing. However, the U.S. Department of Housing and Urban Development (HUD) expanded the definition of housing insecurity to encompass all housing-related challenges, including loss of housing and unavailability of safe, affordable, and quality housing (HUD USER, 2018). Additionally, the Centers for Disease Control and Prevention (CDC) described homelessness as sleeping in emergency shelters and places not conducive for human habitation such as encampments, vehicles, overcrowded rooms, or open spaces (U.S. Centers for Disease Control and Prevention, 2023).

Similarly, Somerville (2013) expanded the concept of housing insecurity to mean all forms of housing deprivation. He clarified that a homeless person experiences several dimensions of deprivation such as a lack of bodily comfort or warmth, a lack of love or joy, a lack of privacy, a lack of purpose, and a lack of rootedness in the world. Therefore, homelessness must be viewed from a multidimensional perspective that cuts across physiological, spiritual, territorial, and ontological deprivation. These further strengthened the position that housing

insecurity and homelessness go beyond lack of housing. Even though the term "homeless" is often used to define a person's identity, Crutchfield & Meyer-Adams (2019, p. 3) clarified that it is more accurate to view homelessness as a complex experience or situation, rather than a personal characteristic since the experience is shaped by a multifaceted array of social, cultural, and economic factors, rather than being a defining trait of an individual.

While student homelessness is not defined specifically, the McKinney-Vento Homeless Assistance Act broadly defined homeless children and youth as individuals lacking a fixed, regular, and adequate nighttime residence. This includes the categories of youth who:

i. share accommodation due to loss of housing or economic hardship,

ii. reside in temporary accommodations like motels, hotels, or emergency shelters,

iii. live in unconventional settings such as cars, parks, or abandoned buildings.

In addition, the Act's definition of homeless children and youth included migratory children who face similar circumstances (McKinney-Vento Definition – National Center for Homeless Education, n.d.).

Highlighting the severity of housing insecurity and homelessness, the "Homelessness by Country" report by the World Population Review (2024) underscored the profoundness of the homelessness problem in the United States. According to the report, the US grapples with a substantial homelessness problem that even surpassed the rates in some developing nations, despite being a prominent global

player. For reference, the Point-in-Time (PIT) count of the homeless population in the US in 2023 revealed that: approximately 653,100 people experienced either sheltered or unsheltered homelessness on a single night, and many of them sought refuge in makeshift tents, particularly at night and during winter (U.S. Department of Housing and Urban Development, 2024).

Furthermore, the data from the 2011 Survey of Income and Program Participation (SIPP) revealed that approximately 14% of adults in the United States experienced housing insecurity characterized by difficulties in paying utility bills and rent or mortgage (Broton, 2020). It was estimated that more than twenty million individuals may experience homelessness at some point in their lives. However, individuals are not the only ones susceptible to homelessness, families are also at risk of experiencing homelessness. For instance, while families constituted a mere 1% of the homeless population in the United States during the 1980s, the proportion of families experiencing homelessness surged to approximately 37% by 2014 (Bertulis-Fernandes, 2023).

However, there is limited and up-to-date information on the number of homeless students in higher education, unlike the national homelessness data. The 2020 Hope Center's report revealed that community college students reported a significant homelessness prevalence of 17%. While 48% of students in two-year colleges and four-year institutions faced housing insecurity, 14% experienced homelessness (The Hope Center, 2021).

From these definitions of housing insecurity, it is evident that its scope extends beyond a lack of shelter, rather, it encompasses all other forms of deprivation. This

suggests that housing insecurity is a multifaceted issue, underscoring an interplay of economic, social, and personal contributory factors.

Some Causes of Housing Insecurity in Higher Education

Experts identified several factors that contribute to the prevalence of housing insecurity in higher education. While financial loss due to the COVID-19 pandemic contributed immensely to the student homelessness problem (Soika, 2021), Rollo (2022) explained that homelessness could happen to anyone, irrespective of their financial status. She highlighted that health concerns such as disability and illness could also cause homelessness especially when they affect one's ability to work and afford house rents and medical fees.

However, Larkin et al. (2019) opined that poverty and homelessness are deeply interconnected, as individuals facing financial hardship often struggle to afford basic necessities such as housing, food, childcare, healthcare, and education. This financial strain forces them to make difficult decisions, often resulting in prioritizing immediate needs over housing stability due to limited resources. For many people, housing costs consume a significant portion of their income, making them vulnerable to the risk of homelessness.

In the case of students, challenges such as insufficient student funding and high rentals are some of the causes of homelessness. These challenges may often lead to students being unable to pay their house rent, which may lead to eviction. Sometimes, the students in this situation may resort to living in an overcrowded space or opt to forgo housing altogether in order to allocate funds to other expenses (Wilking et al., 2023). Gupton (2017) remarked that homelessness represents more than just a housing

shortage; rather, it exemplifies the convergence of various forms of marginalization within inequitable systems.

Understanding that homelessness depicts a lack of basic human needs, Aratani (2009) viewed economic insecurity and family instability as some of the causes of homelessness, especially among the youth. Broton & Goldrick-Rab (2016), on the other hand, alluded that material hardship may inhibit college attainment and cause housing insecurity.

Furthermore, Broton & Goldrick-Rab (2018) explained that housing insecurity and homelessness crises stem primarily from two key factors: a nationwide shortage of affordable housing and the insufficient scope of housing assistance programs. While housing insecurity embodies different characteristics, its effects are multifaceted and could affect all categories of people including the students in higher education. However, despite the significance of these issues, higher education has largely overlooked the consequences of food and housing insecurity. For reference, no comprehensive national studies on students in higher education, conducted either by the federal government or private organizations, have included measures of food and housing insecurity.

Potential Consequence of Housing Insecurity in Higher Education

Homelessness and housing insecurity have huge consequences and negative impacts on students. Nationwide, homeless students frequently graduate at lower rates than their housed counterparts, limiting their prospects for stable employment which may increase their chances of experiencing housing instability in adulthood (DiPierro & Mitchell, 2022). Furthermore, the Centers for Disease Control and Prevention (CDC) identified homelessness as a high-risk factor for infectious diseases. Homeless

youth are at risk of experiencing multiple health-related challenges such as post-traumatic stress disorder, depression, suicidal thoughts, and substance use disorders. These issues often occur together and are made worse by factors like family problems, school difficulties, mental health issues, and the general lack of safety associated with homelessness (Rent, 2023). Bertulis-Fernandes (2023) further highlighted that homelessness deprives individuals of their humanity and dignity which may result in violence, compromised health, and premature mortality.

Considering some of the challenges homeless youth face, pursuing a college degree may seem impractical, impossible, or highly unlikely (Gupton, 2017). Bishop et al. (2021) explained that the growing rate of student homelessness has impacted the functionality of the youth liaisons who are responsible for the academic success and well-being of homeless students. The youth liaisons are unable to meet the rising demand of students experiencing homelessness.

In a capitalist society, homelessness is often viewed as a personal failure rather than a systemic issue. This perspective allows society to shift the blame from the system to the individual, ignoring the structural flaws that contribute to homelessness (Belcher & DeForge, 2012). However, one of the most concerning consequences of this stigmatization is that homeless individuals are aware of being judged and blamed. This awareness may decrease their self-esteem and cause them to internalize the stigma by believing they are indeed to blame for their circumstances. Consequently, this self-stigma can perpetuate a cycle of shame and hopelessness, making it even more challenging for individuals to escape homelessness (Belcher & DeForge, 2012).

Understanding the University of Delaware and Newark's Housing Situation

Housing insecurity has persisted for many decades at the University of Delaware. In the 1950s, the university constructed on-campus dormitories that could accommodate up to 60% of the undergraduate student body. However, from 1972 to 1991, no new dormitories were built despite a growing student population. This has resulted in an estimated 4,400 additional students seeking housing in Newark neighborhoods (Newark Post, 2023).

Currently, the issue of inadequate affordable housing is particularly pronounced at the University of Delaware where undergraduate dormitories can only house 38% of the undergraduate student population (Newark Post, 2023) even though there were 18,618 undergraduate student enrollment and 4,285 graduate student enrollments as of the Fall of 2023 (Facts & Figures | University of Delaware, n.d.). Despite this housing shortage, the University's approach to address student housing is to renovate its current housing inventory rather than build additional on-campus residential accommodations. The University claims to optimize existing resources rather than increase the number of dormitory rooms (the City of Newark, Comprehensive Development Plan V 2.0, p. 47, 2022).

As both undergraduate and graduate students rely mostly on off-campus accommodation, the increase in the UD's off-campus student population has correspondingly influenced the surrounding communities within Newark. It is estimated that out of the approximately 14,500 available rental units in Newark, 10,700 units are occupied by UD students residing off campus (Urban Partners, n.d.). However, for the City of Newark to meet the UD student population's housing

demand, an additional 50 units of affordable housing need to be built annually if the student enrollment rate remains constant (Rental Housing Needs Assessment Study | Newark, DE - Official Website, 2017). Furthermore, the strain on Newark's rental housing supply may have intensified as UD reduced its on-campus housing stock by 1,900 beds and added 3,300 students to the off-campus rental markets between 2014 and 2019 (Brooke & Josh, 2019). For reference, UD demolished its 2.5-acre apartment complex which was once allotted for graduate students and students with families. Even though some Newark officials considered the site as an ideal place to build student housing which could help ameliorate the shortage of both on-campus and off-campus housing units, “UD has no plans to rebuild on the site”, said Chris Williams, UD’s associate provost for sustainability (Newark Post Online, 2024).

As UD continues to reduce its housing stock, the demand for off-campus accommodation continues to increase, leading to a hike in the rental price of rental units in Newark. The following table compares the median rent in Newark with other cities in Delaware.

Table 1 Newark Median Rent Comparison

2022 Update	Newark	United States	Delaware	Wilmington, Delaware	New Castle County	Dover, Delaware
Median Rent (2012)	$1,008	$889	$975	$890	$1,003	$955
Median Rent (2019)	$1,308	$1,062	$1,130	$1,001	$1,163	$1,038
% of renters with monthly gross rent ≥ 30% of household income. (2012)	67.9%	52.1%	53.0%	57.2%	51.5%	53.6%
% of renters with monthly gross rent ≥ 30% of household income. (2019)	60.0%	49.6%	49.1%	52.2%	46.9%	58.9%

Source: The City of Newark Comprehensive Development Plan V 2.0, p. 51, 2022).

Table 1 indicates that Newark's median rent is 10% to 20% higher than other cities in Delaware, and more than 60% of Newark renters spend above 30% of their income on rent. While Newark experienced a 7.9% reduction in the median rent between 2012 and 2019, it still has the highest median rent as shown in Table 1 (the City of Newark, Comprehensive Development Plan V 2.0, p. 51, 2022). The housing situation in Newark and the University of Delaware indicate two significant housing insecurity dimensions: insufficient availability of affordable housing and high rental prices of housing. Given the shortage of affordable housing units in Newark and the non-existent campus dormitories for graduate students, many students, including African graduates, could be at risk of experiencing homelessness. Particularly, as the University's focus is not to provide additional on-campus dormitories.

International Students Enrollment Trend

An estimated 948,519 international students enrolled in U.S. colleges and universities for the 2021-22 academic year, and 42,518 or 4.5% of them were from sub-Saharan Africa.

Figure 1 Sub-Saharan African Students Enrollment 2021-2022

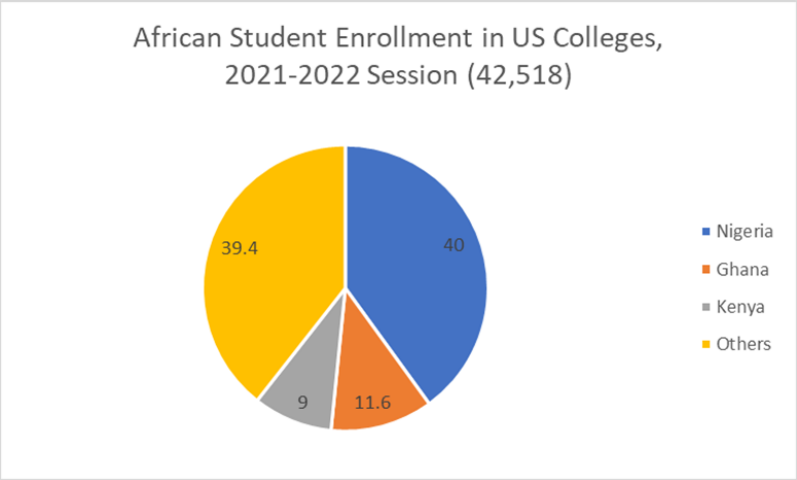
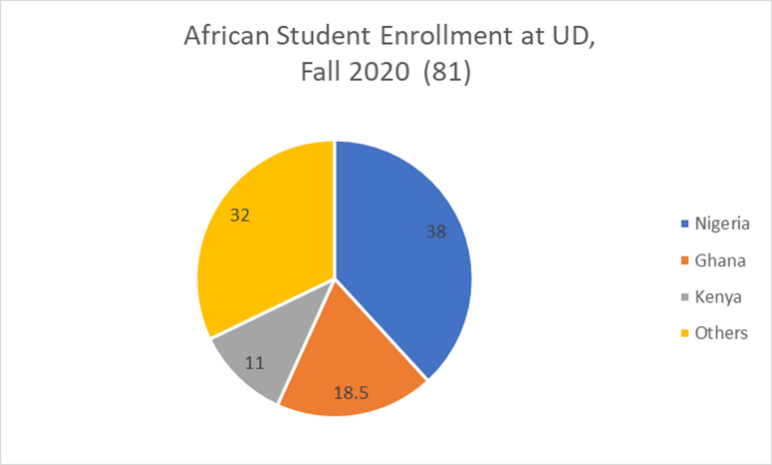


Figure 1 shows that Nigerians, with 14,438 student enrollments, constituted the highest number of African student enrollment in the US. Ghana ranked second with 4,916 students, and Kenya ranked third with 3,799 students. Other notable countries with significant student enrollment included Ethiopia, Rwanda, the Democratic Republic of the Congo, South Africa, Zimbabwe, and Cote d'Ivoire. Each had over 1,000 students. Overall, there were students from over 50 sub-Saharan African nations who enrolled in colleges in the U.S. during the 2021-22 academic year (National Center for Education Statistics, n.d.).

Based on the most recent available data on the University of Delaware's Center for Global Programs & Services (CGPS) website, 1,942 international students enrolled at the University of Delaware in 2020. 81 or 4.1% of them were from Africa. Notably, Nigeria has the highest African student enrollment at 31, followed by Ghana at 15 and Kenya with 9 student enrollments, as shown in Figure 2 below (Global Facts & Figures | University of Delaware, n.d.).

Figure 2 UD African Student Enrollment Fall 2023



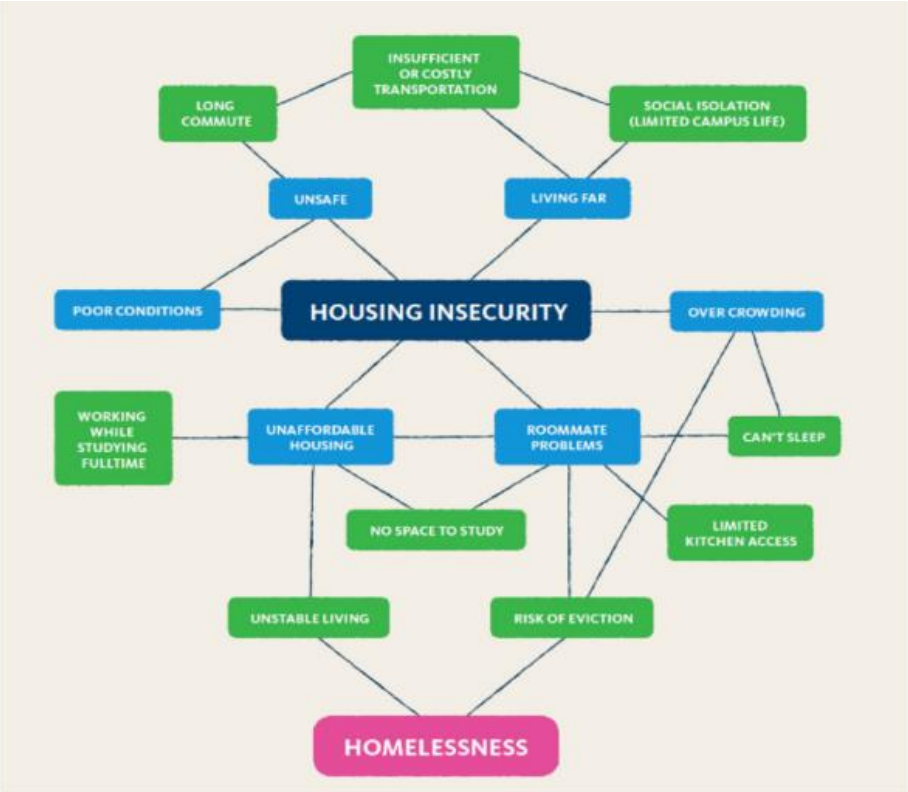
Figures 1 and 2 indicate that African students' enrollment follows a similar pattern nationally and at UD, with Nigeria having the highest enrollment rate, followed by Ghana, then Kenya. Based on validation by the CGPS, about 179 African graduate students enrolled to UD as of Fall 2023. This indicates that African student enrollment increased by over 100% between the Fall of 2020 and the Fall of 2023. However, despite the growing population of international students at the University of Delaware, they may experience a shortage of affordable housing based on the current housing situation at UD and the City of Newark. Nebedum-Ezeh (1997) emphasized

that accommodation costs are substantial expenses encountered by international students. Furthermore, a lack of affordable housing adds to the overall financial strain endured by both the students and their sponsoring entities.

Conceptual Framework

The framework below depicts the interconnectivity of higher education housing insecurity dimensions such as lack of affordable housing, unsafe accommodation, long-distant commute to school, and financial strain emanating from housing-related costs.

Figure 3 Housing Insecurity Conceptual Framework



Source: Martinez et al., (2021)

Notes: Issues related to housing insecurity are presented in green. Situations stemming from housing issues are presented in blue. Homelessness is presented in pink and is the most severe case of housing insecurity (Martinez et al., 2021).

Figure 3 illustrates the complex web of connections between students' housing situations and their direct or indirect experiences with housing insecurity. Unaffordable housing leads to a chain of consequences, including housing insecurity, difficulties with studying and sleeping, which may ultimately exacerbate mental stress. The high cost of housing may force students to take on multiple jobs or excessive work hours, further adding to their stress levels. In some cases, students may struggle to cover housing costs, which may result to homelessness condition such as living in an unstable living arrangement or doubling up with friends or sleeping in a car. To

cope with the possible financial burden associated with the high cost of rental units around the campus, students often live far from campus. This may lead to lengthy and expensive commutes and social isolation, which further contribute to stress. Social isolation, as a result of limited financial resources, may prevent students from participating in campus events or extracurricular activities. The persistent mental stress stemming from these challenges may significantly impact students' academic performance and over all wellbeing (Martinez et al., 2021).

Theoretical Framework

Individual Deficit or Agency Theory

This theory attributes homelessness to individual shortcomings, failures, or personal inadequacies. As housing is seen as an individual's responsibility, being homeless usually results to feelings of guilt and blame. This often leads to victim-blaming, drawing on historical stereotypes of homelessness associated with deviant behaviors like alcoholism or vagrancy (Neale, 1997). Unfortunately, the tenet of this theory is widely accepted because it tends to resonate most with people who hold positions of privilege or those who are resistant to change. This is because they have a vested interest in maintaining and legitimizing the existing social order (Lee et al., 1992). The inadequate attention given to homelessness in higher education depicts the Individual Deficit Theory. For example, many lawmakers and higher education leaders make little effort to address the problem even as student housing insecurity continues to be a growing concern (Hallett & Freas, 2018). Furthermore, despite the widespread problem of student homelessness, limited research has focused on the diverse impact of homelessness on students (Miller, 2011).

Building on the individual deficit theory, Belcher & DeForge (2012) shed light on how homelessness often becomes synonymous with personal failure rather than a systemic issue in capitalist societies like the United States. This narrative conveniently shifts blame from structural flaws to individual shortcomings, perpetuating a cycle of societal indifference.

Structural Analysis Theory of Homelessness

Alternatively, structural analysis theory of homelessness identifies that the underlying causes of homelessness extend beyond individual circumstances and encompass broader social and economic factors. According to this framework, an effective response necessitates intervention on a societal level. This could entail initiatives such as providing subsidies to the housing market or directly offering temporary or permanent accommodations (Neale, 1997).

Summary

This chapter synthesized different scholarly definitions of housing insecurity and homelessness, highlighting the multifaceted nature of the problem. While the conceptual framework further illustrates the multifaceted nature of housing insecurity, the theoretical framework of Individual Deficit or Agency Theory adds depth to its understanding. This chapter serves as a guide, underscoring the complexities of housing insecurity.

Chapter 3

METHODOLOGY

The chapter explains the research design, including the respondents' selection method, and the systematic approach undertaken to address the research question stated as follows:

Research Question

RQ: To what extent, if any, does the housing situation in Newark impact housing insecurity among African students at the University of Delaware?

Research Hypotheses

H1: The African graduate students' perception of the availability of low-income housing in Newark significantly impacts their perception of housing affordability.

H2: The African graduate students' proportion of income spent on housing costs has a significant impact on their perception of housing affordability.

H3: The African graduate students' monthly income has a significant impact on their perception of housing affordability.

H4: The affordability of security deposits paid by African graduate students has a significant impact on their perception of housing affordability.

H5: The experience of homelessness faced by African graduate students has a significant impact on their academic performance and mental health.

Research Design

The research adopted a natural experiment design to investigate the relationship between African graduate students' perspective of affordable housing availability and other variables such as housing-related costs and homelessness experience. This approach allowed for the observation of naturally occurring variations without influencing the behavior or attitudes of the subjects (Moffatt, 2021). The research also analyzed respondents' responses on their perception of predictors of housing insecurity such as unaffordable housing, housing safety, housing quality, and housing costs. Using SPSS as a tool, the design helped measure the impact of housing insecurity on African graduate students' academic performance and general well-being.

Population Sampling Method

The study targeted all the African graduate students enrolled at the University of Delaware as of Fall 2023. The Center for Global Programs & Services (CGPS) confirmed that a total of 179 African graduate students enrolled at UD as of Fall of 2023. Considering the small population, a convenience sampling method was utilized which aimed at surveying any available African graduate students. Due to the University policy which restricts CGPS from providing the email contacts of students, the respondents were contacted via their UD emails and with the help of their campus Registered Student Organizations (RSO). However, only 61 African graduate students voluntarily participated in the survey, representing 34% of their total population.

Data Collection Instruments

The study employed the use of primary source data. A questionnaire was developed for data collection on various housing-related factors, such as affordability, safety, quality, discrimination, housing cost, and experiences with homelessness. The questionnaire consisted of closed-ended questions, Likert-scale response options, and inquiries on demographic information. The survey instrument used for the data collection is provided in Appendix A.

Variables and Operational Information

Each variable was operationally defined to ensure clarity and consistency in measurement. Most of the variables in the study encompass various dimensions of housing insecurity as explained in the literature review. For example, the "housing cost" variable pertains to the African graduate students' perception of housing-related expenses such as rent. In this case, participants were asked to rate the affordability of their current housing options in Newark in relation to their monthly income. Similarly, using a Likert scale, the "housing safety" variable measures the participant's satisfaction with the safety of their accommodation. The list of the variables and how they are operationalized in the survey is outlined as follows in Table 2.

Table 2 Variable Operationalization

S/N	Variables	Operationalization
1	Housing Affordability	The respondents' rating of their accommodation affordability.

2	Security Deposits	The respondents’ rating of accommodation affordability based on security deposit costs.
3	Low-income Housing	The respondents' rating of the availability of low-income housing in Newark in Fall 2023.
4	Financial Strain	The respondents’ experience, or lack thereof, of financial hardship from housing-related costs, while being graduate students at UD.
5	House Costs vs. Income	The respondents' estimated percentage of monthly income spent on housing costs in Fall 2023.
6	Housing Quality	The respondents' satisfaction rating with the quality of their housing.
7	Housing Safety	The respondents' perception regarding the safety of their accommodation.
8	Housing Discrimination	The respondents' rating of the level of discrimination faced in housing-related matters as graduate students at UD.

9	Homelessness Experience	The respondents' experience of homelessness or housing insecurity as graduate students at UD.
10	Homelessness Impact	The respondents’ experience with housing insecurity and its impact on their academic and mental well-being.
11	House Type	The respondents’ type of housing.
12	Roommates Availability	Inquires whether respondents share accommodation with roommates.
13	Roommates Quantity	Inquires the number of roommates respondents share accommodation with.
14	Unofficial Cohabitants	The number of other individuals sharing the respondents' accommodation, excluding the registered roommates.
15	Housing UD Proximity	The respondents' housing proximity to the UD campus.
16	Commute Mode	The respondent’s means of transportation to the UD campus.

17	Transportation Satisfaction	The respondents' satisfaction rating with their mode of transportation to the UD campus.
18	Zip code	The respondents’ residential zip code in Newark.
19	Gender	The respondents’ gender identity.
20	Marital Status	The respondents’ marital status.
21	Dependents	The number of dependents residing with the respondents.
22	Academic Program	The respondents’ academic program: masters or PhD.
23	Income Source	The respondents' source of income in the Fall of 2023.
24	Monthly Income	The respondents' average monthly income from all sources in the Fall of 2023.

25	Enrollment Length	The respondents' program enrollment duration: 1 year, 2 years, etc.
26	Program	The respondents' program of study: Stem, Social Sciences, etc.

Data Collection Procedure

The participants were invited to complete the survey electronically using Google Forms, an online survey platform. The survey link was distributed via the participants' University of Delaware emails. Fulfilling the requirements of the University of Delaware Institutional Review Board (UD IRB), participants were assured of the confidentiality of their responses. In addition, their consents were obtained before their participation. The recruitment for the survey began on the 21st of December 2023, and ended on the 29th of January, after achieving a 34% response rate.

Data Analysis Technique

The responses were coded in Excel before being uploaded to SPSS for analysis. Descriptive statistics, including frequencies and percentages, were then calculated on SPSS to highlight the demographic characteristics of the participants. In addition, inferential statistics, such as cross-tabulations and Linear Regression were employed to examine relationships between the dependent and the independent variables.

Summary

The methodology outlined in this chapter provided a framework for investigating the perception and impact of housing insecurity among African students at the University of Delaware. Employing the natural experiment design, this study aims to contribute valuable insights to the field of housing insecurity research.

Chapter 4

DATA ANALYSIS

This chapter analyzes and interprets the collected data of the 61 respondents who were enrolled UD African graduate students as of Fall of 2023. As outlined in Chapter 3, the data analysis process involves examining responses to a structured questionnaire, encompassing housing insecurity dimensions such as housing affordability, safety, quality, discrimination, and availability.

Out of the 179 students contacted, 61 of them participated in the survey. This chapter presents the outcome of the gathered data through tables, and inferential statistics, drawing a relationship pattern between housing-related factors and the lived experiences of the respondents.

Data Presentation

The following tables highlight the SPSS analysis of the graduate African students' survey responses, starting with their demographic information.

Table 3 Frequency Distribution of the Respondents' Gender

Gender	%
Male	67.8
Female	32.2
Total	100

Table 3 presents the percentage distribution of the respondents' gender. Out of 59 participants, 40 individuals (67.8%) identified as male, 19 individuals (32.2%) identified as female. Notably, 2 individuals didn't reveal their gender identity and were classified as missing values in the analysis. The findings reveal a predominance of male respondents among the African graduate students who enrolled at UD as of Fall 2023.

Table 4 Frequency Distribution of the Respondents' Academic Program

Academic Program	%
Masters	54.4
PhD	45.6
Total	100

Table 4 displays the frequency distribution of the respondents' academic programs. Among the participants, 31 individuals (54.4%) were enrolled in master's programs, and 26 individuals (45.6%) were enrolled in PhD programs. Notably, 4 respondents didn't disclose their academic programs and they were classified as missing values. This distribution depicts a balanced representation of the surveyed students' academic programs, with master's programs being slightly more prevalent.

Table 5 Frequency Distribution of the Respondents' Program Enrollment Length

Enrollment Length	%
1 year	19.3

2 years	35.1
3 years	12.3
4 years	1.8
Less than a year	31.6
Total	100

Table 5 reveals the following findings: eleven respondents (19.3%) had enrolled in UD for up to a year as of Fall 2023, 20 respondents (35.1%) indicated an enrollment duration of 2 years, 7 respondents (12.3%) reported an enrollment duration of 3 years and only 1 respondent (1.8%) reported a 4-year enrollment length. Additionally, 18 respondents (31.6%) stated their enrollment duration as less than a year. Overall, the distribution highlights the diverse program enrollments among the participants, with a substantial portion having either a 2-year or less than a year enrollment duration. However, 4 respondents opted not to disclose their enrollment length.

Table 6 Frequency Distribution of the Respondents' Monthly Income

Monthly Income	%
Less than $1K	21.8
$1,001 - $2,000	36.4
$2,001 - $3,000	34.5
Above $3k	7.3
Total	100

Table 6 illustrates the frequency distribution of the respondents' monthly income. It encompasses responses from 55 participants, excluding 6 individuals who opted not to disclose their monthly income. The information on the 55 respondent's monthly income is as follows: twelve respondents (21.8%) reported monthly income of less than $1,000, 20 respondents (36.4%) indicated monthly income ranging between $1,001 and $2,000, 19 respondents (34.5%) reported monthly income within the range of $2,001 to $3,000, and 4 respondents (7.3%) reported monthly income of $3,000 and above. Table 5 indicates that about 70% of the participants earn between $1,000 and $3,000 monthly. The following table highlights the percentage of the respondents' monthly income that goes into housing-related costs.

Table 7 Frequency Distribution of the Respondent's Income Spent on Housing Costs

Housing Costs	%
30% or less	15
31% - 50%	38.3
50% or more	46.7
Total	100

Table 7 shows the following findings: nine respondents (15%) reported that 30% or less of their income is spent on housing expenses, 23 respondents (37.7%) indicated that housing costs consume between 31% and 50% of their income, 28 respondents (45.9%) reported that 50% or more of their income goes towards housing costs, and 1 individual (1.6%) opted not to disclose their housing cost. This

distribution signifies that about 85% of the respondents spend more than 30% of their income on housing costs. The following table illustrates whether participants have experienced financial hardship due to housing costs.

Table 8 Frequency Distribution of Financial Hardship as a Result of Housing Costs

Financial Strain	%
Yes	79.3
No	20.7
Total	100

Table 8 presents the frequency distribution of respondents' experiences of financial hardship resulting from housing costs while being graduate students. Out of 58 participants, 46 respondents (79.3%) indicated that they had experienced financial hardship due to housing costs, while 12 respondents (20.7%) indicated no experience. Overall, this indicates that a significant proportion of the respondents experienced financial strain from housing-related costs. However, 3 respondents opted not to disclose their experience.

As outlined by the U.S. Department of Housing and Urban Development (HUD), housing insecurity encompasses a broad spectrum of challenges related to housing, such as the loss of housing and the lack of access to safe, affordable, and high-quality housing (HUD USER, 2018). The following set of distribution tables highlights the participants' perceptions of housing insecurity dimensions such as housing affordability, safety, costs, and quality.

Table 9 Frequency Distribution of Respondents' Rating of Housing Affordability

Housing Affordability	%
Very Unaffordable	31.1
Unaffordable	19.7
Neutral	32.8
Affordable	13.1
Very Affordable	3.3
Total	100

Table 9 illustrates the frequency distribution of the respondents' ratings of their housing affordability. Of the 61 respondents, 19 individuals (31.1%) rated their housing as very unaffordable, 12 (19.7%) rated it as unaffordable, 20 (32.8%) rated it as neutral, 8 (13.1%) rated it as affordable, and 2 (3.3%) rated it as very affordable. While a significant portion falls within the neutral category, about 50% rated their housing as either unaffordable or very unaffordable. These findings reveal that housing affordability is a concern for about half of the participants.

Table 10 Frequency Distribution of Respondents' Rating of Housing Quality

Housing Quality	%
Very Unsatisfied	10

Unsatisfied	33.3
Neutral	26.7
Satisfied	21.7
Very Satisfied	8.3
Total	100

Table 10 presents the frequency distribution of the respondents' satisfaction ratings of their housing quality. Based on the responses from 60 participants, excluding an individual who declined to provide a rating, 6 individuals (10%) rated their housing quality as Very Unsatisfied, and 20 individuals (33.3%) rated it as Unsatisfied. Additionally, 16 individuals (26.7%) chose the Neutral rating, 13 respondents (21.7%) rated their housing quality as Satisfied, and 5 respondents (8.3%) rated it as Very Satisfied.

This distribution shows diverse levels of the respondents' satisfaction with their housing quality. Notably, the Unsatisfied category received the highest rating, with 33.3% of respondents expressing dissatisfaction with their housing quality. The following table highlights the respondents' ratings of their housing safety.

Table 11 Frequency Distribution of Respondents' Rating Housing Safety

Housing Safety	%
Unsafe	6.6
Neutral	29.5

Safe	23
Very Safe	41
Total	100

Table 11 presents the frequency distribution of respondents' ratings of their housing safety. Among the 61 respondents, 4 individuals (6.6%) rated their housing safety as Unsafe. While 18 individuals (29.5%) chose the Neutral rating, 14 respondents (23.0%) rated their housing safety as Safe, and the majority, 25 respondents (41.0%), rated it as Very Safe. Similarly, this distribution illustrates varying perceptions of housing safety among the respondents, with a significant proportion feeling very safe in their housing environment. The following table highlights the respondents' responses on their experience with housing insecurity or homelessness.

Table 12 Frequency Distribution of Respondents' Homelessness Experience

Homelessness Experience	%
Not homeless	78.2
Doubling-up	16.4
Over-crowdedness & doubling-up	1.8
Over-crowdedness	1.8
Homeless	1.8
Total	100

Table 12 presents the frequency distribution of respondents' homelessness experiences based on the data gathered from 55 participants as 6 individuals declined to disclose their homelessness experience and were not included in the analysis. Of the 55 participants, 43 respondents (78.2%) reported no experience of homelessness, and 9 respondents (16.4%) reported having experienced homelessness by sharing housing with others due to economic hardship. While 1 respondent (1.8%) reported having experienced homelessness by living in overcrowded space or sharing housing with others, 1 respondent (1.8%) reported homelessness experience by living in overcrowded conditions. Similarly, 1 respondent (1.8%) reported outright homelessness without any form of housing. While this distribution offers insights into the varied experiences of homelessness within the group, the following table indicates the impacts of the experience on the participant's academic performance, and mental health.

Table 13 Frequency Distribution of Respondents' Homelessness Experience Impact

Homelessness Impact	%
No Impact	76.6
Health	6.4
Academic	4.3
Academic & Health	12.8
Total	100

Table 12 presents the frequency distribution of the respondents' perceived impact of their homelessness experience. Derived from 47 participants, the data reveals that 36 individuals (76.6%) reported no impact from housing insecurity. Conversely, 3 respondents (6.4%) identified health implications resulting from their housing insecurity experience, and 2 respondents (4.3%) expressed that homelessness impacted their academic performances. Notably, 6 respondents (12.8%) reported that housing insecurity has had concurrent effects on their academic and health. This distribution provides valuable insights into the diverse and complex impacts of housing insecurity on the participants.

Overall, the above set of distribution tables suggests that housing affordability and housing costs are the primary indicators of housing insecurity among the respondents, and housing safety appeared to be the least prevalent indication.

Variables Crosstabulation

The following set of tables analyzes the demographic information of the respondents regarding their experience with homelessness while being graduate students at the University of Delaware.

Figure 4 Crosstabulation of Homelessness Experience & Gender

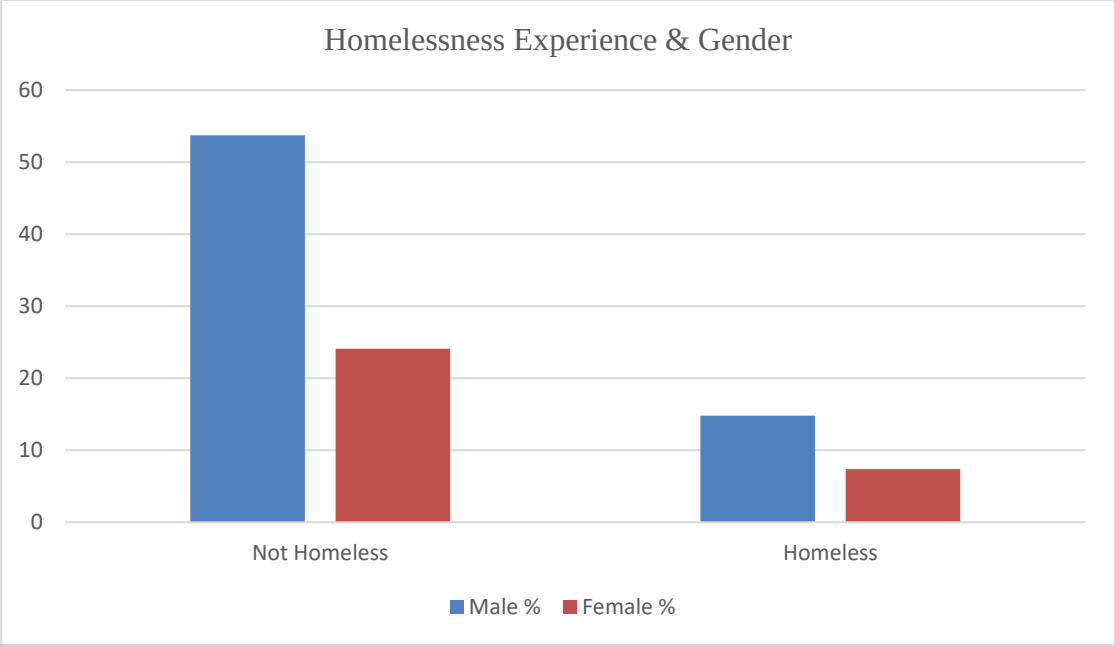


Figure 4 shows the distribution of respondents based on their gender and homelessness experience during their graduate studies at the University of Delaware as of the Fall of 2023. Of the total respondents, 68.5% reported no experience of homelessness, consisting of 53.7% males and 24.1% females. Conversely, 22.2% of the total participants reported to have experienced homelessness. This consisted of 14.8% males and 7.4% females. Their experience of homelessness included doubling up, living in an overcrowded space, or living on the street.

Figure 5 Crosstabulation of Financial Strain & Gender

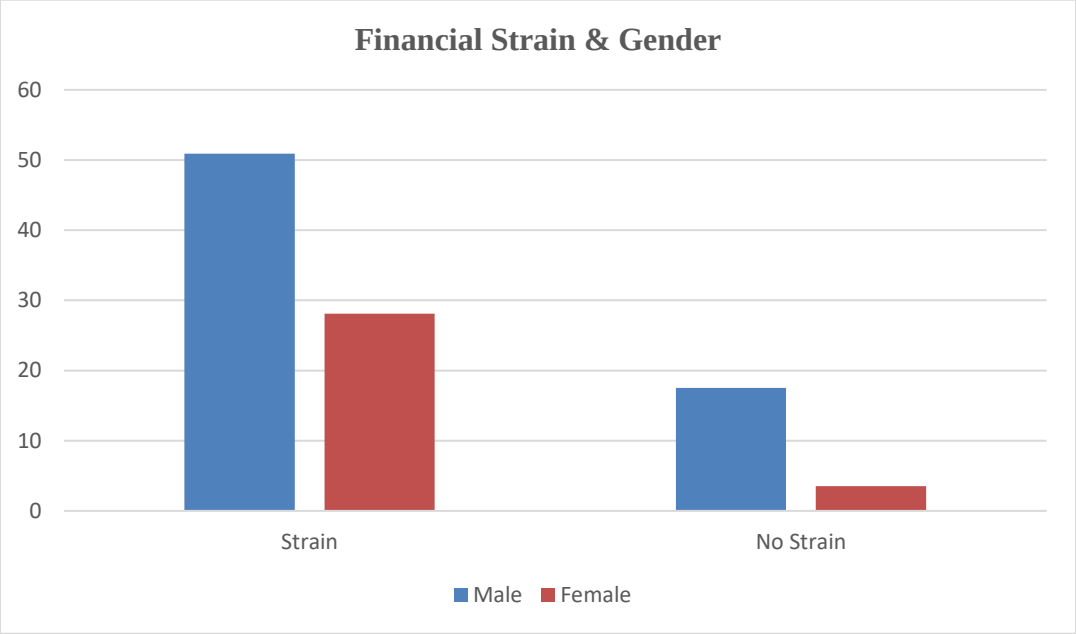


Figure 5 examines the distribution of respondents based on their gender and their experience of financial strain from housing-related costs during their graduate studies at the University of Delaware. Overall, 79% of the total respondents reported having experienced financial strain from housing-related costs. Notably, 50.9% were male and 28.1% were female. Conversely, 21% of the participants reported having never experienced financial strain. Among them, 17.5% were male respondents and 3.5% were female.

Figure 6 Crosstabulation of % of Income Spent on Housing Costs & Gender

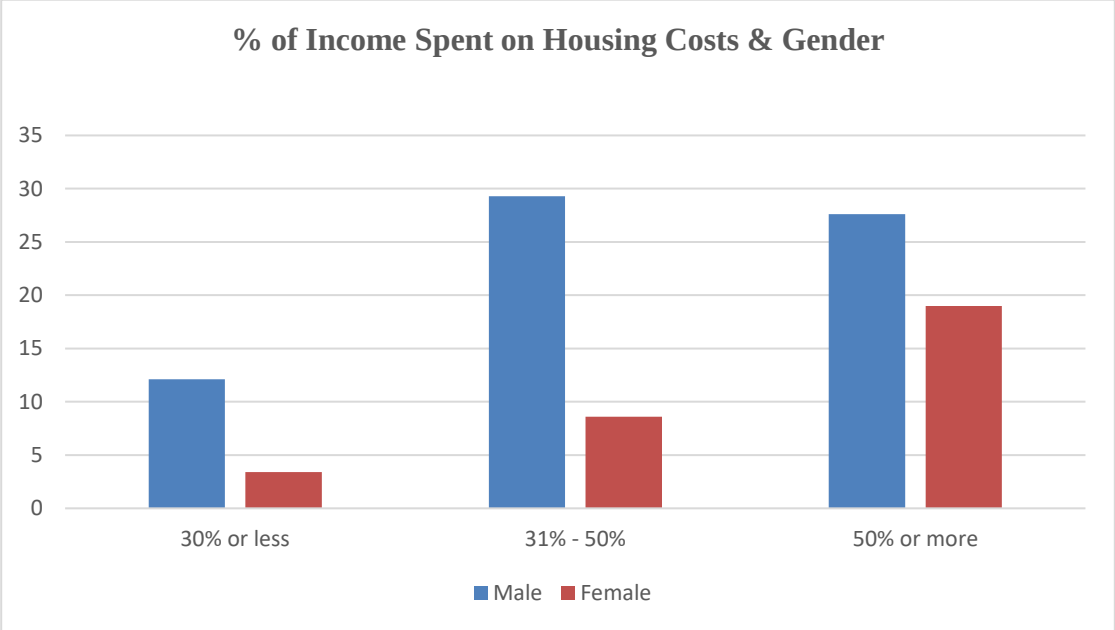


Figure 6 shows that 15.4% of the respondents, consisting of 12.1% male and 3.4% female, spent 30% or less of their income on housing-related costs. Furthermore, 37.9% of the respondents, consisting of 29.3% males and 8.6% females, spent between 31% and 50% of their monthly income on housing-related costs. Finally, 46.6% of the respondents, consisting of 27.6% males and 19% females, spent above 50% of their monthly income on housing-related costs. The overall findings indicate a notable financial burden associated with housing costs among African graduate students, especially among the male.

Figure 7 Figure 7: Crosstabulation of % of Income Spent on Housing Costs & Financial Strain

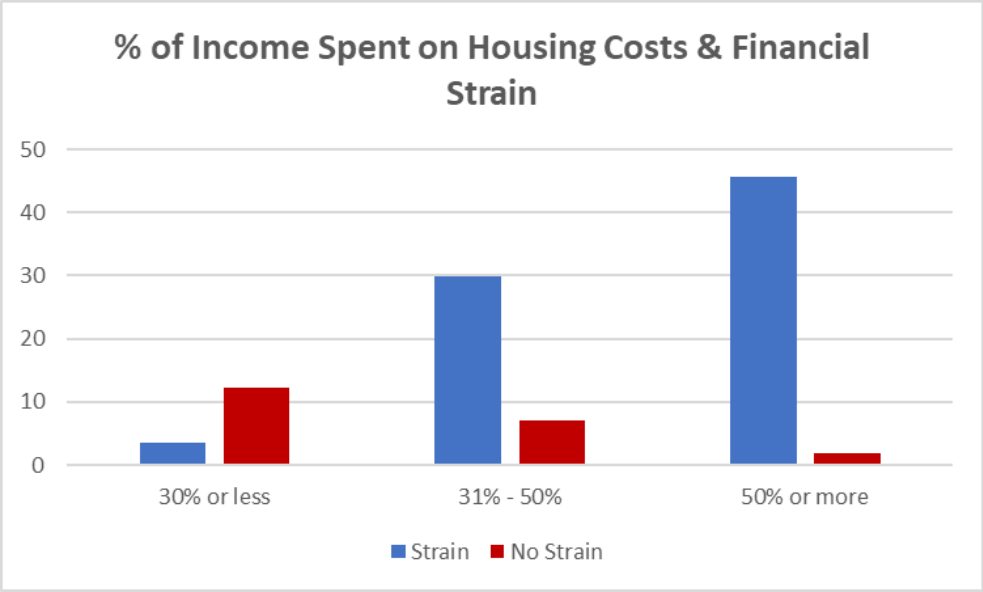


Figure 7 shows the relationship between the respondents' enrollment length and their experience of financial strain. Among the respondents, 78.1% experienced financial strain and their monthly income spent on housing-related costs are as follows: 3.5% spent around 30% of their income, 29% spent between 31% and 50%, and 45.6% spent above 50% of their monthly income on housing-related costs.

Conversely, among the respondents, 21.9% did not experience financial strain and this includes, 12.3% who spent less than 30% of their monthly income on housing-related costs, 7% who spent between 31% and 50%, and 1.8% who spent above 50% of their monthly income on housing-related costs.

Overall, Figure 7 indicates that the experience of financial strain is more prevalent among the respondents who spent above 50% of their monthly income on housing-related costs.

Figure 8 Crosstabulation of Monthly Income & Program Classifications

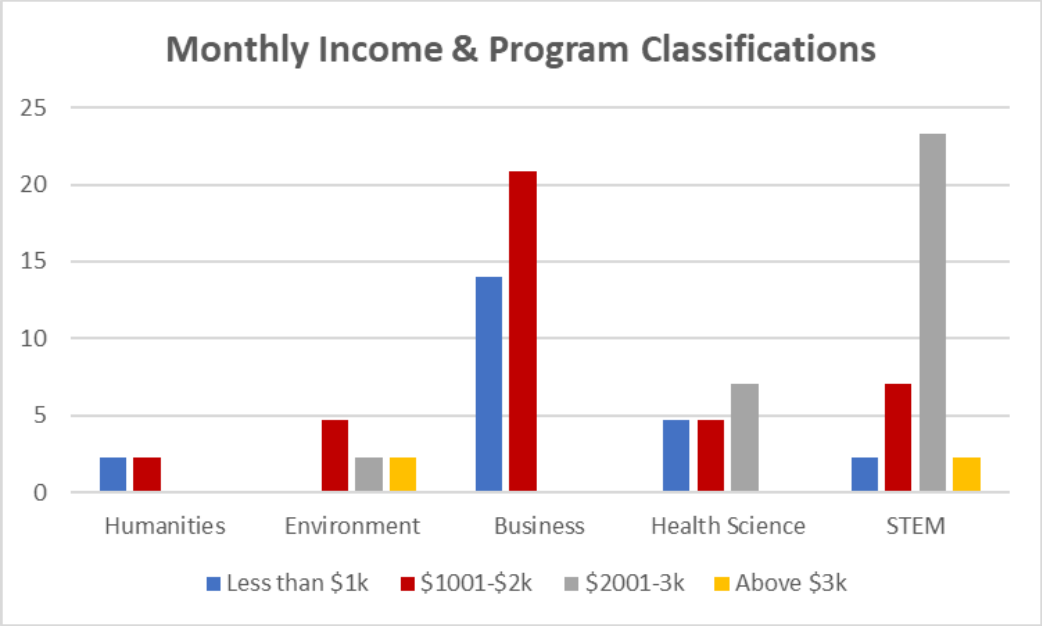


Figure 8 illustrates the relationship between the respondents' monthly income and their program classifications. For instance, 2.3% of the respondents in the Humanities classification which includes programs such as the Master of Public Policy and Master of Public Administration, earned less than $1,000 monthly, and no respondents in this classification earned above $2,000 monthly. Similarly, no respondents in the Business classification earned above $2,000 monthly, however, 14% of them earned less than $1,000 monthly. Programs in the Business classification include Economics, Communication, and Business Analytics & Information Management.

In contrast, 23.3% of the respondents in the STEM classification earned between $2,001 and $3,000 monthly, while 2.3% earned above $3,000 monthly.

Similarly, 2.3% of the respondents were in the Environment program classifications and they earned above $3,000 monthly.

Overall, Figure 8 shows that the majority of the respondents earned between $1,001 and $2,000 monthly income, however, the students in the STEM program earned higher than most of the students in other program classifications.

Figure 9 Crosstabulation of Academic Program and Homelessness Experience

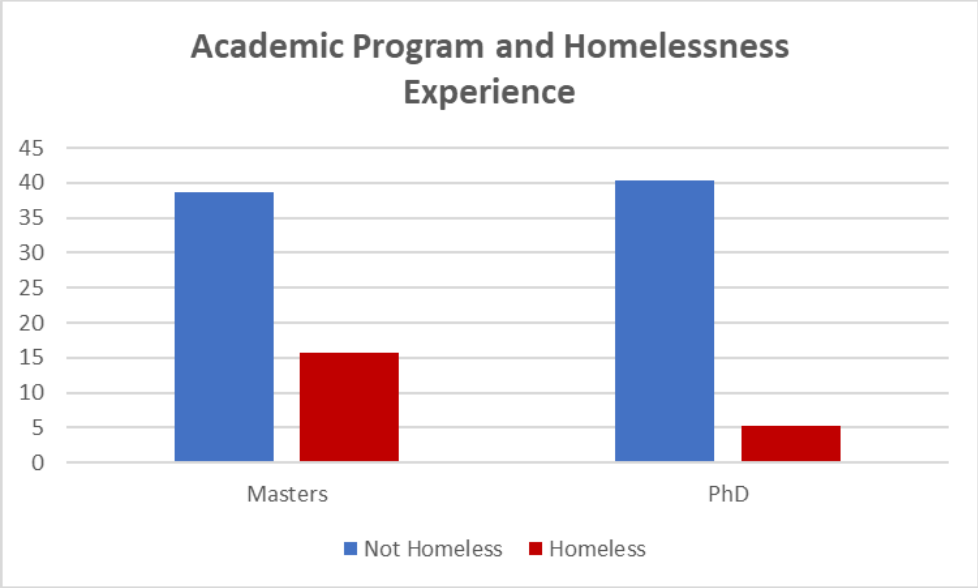


Figure 9 illustrates the relationship between the respondents' academic programs and their homelessness experience. Among the respondents, 54.4% were in the Master's program and this includes 38.6% who had never experienced homelessness and 15.8% who had experienced homelessness. In contrast, 45.6% were in the PhD program, with 40.3% not having experienced homelessness and 5.3%

having experienced homelessness. Figure 9 shows that homelessness experience is more prevalent among the respondents in the master's program.

While the crosstabulations illustrated some relationship patterns among the variables, the findings did not suggest any statistical significance. To ascertain the actual statistical significance of these variables, a Linear Regression analysis was done to determine the statistical relationships between the respondents' perception of housing affordability and other variables such as security deposit affordability, the proportion of monthly income spent on housing costs, and the respondents' perception of availability of low-income housing in Newark. The subsequent subsection investigates the research hypotheses and identifies homelessness patterns by regressing housing affordability with independent variables outlined as follows.

Hypotheses Testing

The following set of analyses tests the research hypotheses using the Linear Regression analysis. As explained by Tummins & Watson (1975), regression analysis helps to examine the relationship between an independent variable and a dependent variable where often, the independent variable estimates the expected value of the dependent value.

Hypothesis 1: H1: The African graduate students' perception of the availability of low-income housing in Newark significantly impacts their perception of housing affordability.

Hypothesis 2: H2: High-income proportion spent on housing costs has a significant impact on the African graduate students' perception of housing affordability.

Findings based on hypotheses 1 & 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.444[a]	0.197	0.164	0.457
a. Predictors: (Constant), Housing Costs, Low-income Housing				

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.470	2	1.235	5.905	.005[b]
	Residual	10.040	48	0.209		
	Total	12.510	50			
a. Dependent Variable: Housing Affordability b. Predictors: (Constant), Housing Costs, Low-income Housing						

Coefficients[a]

Model				Standardized Coefficients Beta	T	Sig.
1	(Constant)	0.586	0.096		6.119	0.000
	Low-income Housing	0.513	0.218	0.308	2.348	0.023
	Housing Costs	-0.374	0.131	-0.376	-2.865	0.006
a. Dependent Variable: Housing Affordability						

Analysis and Interpretation of Hypotheses 1 & 2

Hypothesis	Regression Weights	Beta Coefficient	R^2	F	t-value	p-value	Hypotheses Supported
H1	LIH → HA	0.513	0.197	5.905	2.348	0.023	Yes
H2	HC → HA	-0.374	0.197	5.905	-2.865	0.006	Yes

The ANOVA table for the two hypotheses shows ($F(2, 48) = 5.905$, $p = .005$), indicating a statistical significance of the overall regression model. As for the Coefficient table, the independent variable- Low-income Housing ($\beta = 0.513$, $t(48) = 2.348$, $p = 0.023$) indicates that the respondents' perception of the availability of low-income housing has a statistically significant positive impact on the perception of housing affordability among the African graduate students. On the other hand, the second independent variable (Housing Costs) indicates a negative statistical significance ($\beta = -0.374$, $t(48) = -2.865$, $p = 0.006$). This means that as the proportion of income going into housing costs decreases (less than 50%), housing affordability increases. Both results support the hypothesis.

Hypotheses three and four examine the relationship between the African graduate students' monthly income and security deposits' affordability on their perception of housing affordability.

Hypothesis 3: H3: The African graduate students' monthly income has a significant impact on their perception of housing affordability.

Hypothesis 4: H4: The affordability of the security deposits paid by the African graduate students has a significant impact on their perception of housing affordability.

Findings based on Hypotheses 3 & 4

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.610[a]	0.372	0.350	0.406
a Predictors: (Constant), Monthly Income, Security Deposits				

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.667	2	2.834	17.159	.000b
	Residual	9.578	58	0.165		
	Total	15.246	60			

a Dependent Variable: Housing Affordability.
b. Predictors: (Constant), Monthly Income, Security Deposits

Coefficients[a]

Model				Standardized Coefficients Beta	t	Sig.
1	(Constant)	0.229	0.070		3.292	0.002
	Security Deposits	0.471	0.120	0.437	3.926	0.000
	Monthly Income	0.308	0.115	0.298	2.681	0.010
a. Dependent Variable: Housing Affordability						

Analysis and Interpretation of Hypotheses 3 & 4

Hypothesis	Regression Weights	Beta Coefficient	R^2	F	t-value	p-value	Hypotheses Supported
H3	SD → HA	0.471	0.372	17.159	3.926	0.000	Yes
H4	MI → HA	0.308	0.372	17.159	2.681	0.010	Yes

The ANOVA table indicates a highly significant overall regression model ($F(2, 58) = 17.159$, $p < .001$). This suggests that the predictors collectively explain a significant proportion of the variance in the perception of housing affordability among African graduate students.

The Coefficient table of the third hypothesis shows that the independent variable (Monthly Income) demonstrates a positive statistically significant impact on the perception of housing affordability ($\beta = 0.308$, $t(58) = 2.681$, $p = 0.010$). This suggests that a higher monthly income earned by African graduate students is associated with a more positive perception of housing affordability. Both results support the hypothesis. Similarly, the coefficient table of the fourth hypothesis indicates that the predictor (Security Deposits) has a statistically significant positive impact on housing affordability perception ($\beta = 0.471$, $t(58) = 3.926$, $p < .001$). This suggests that when security deposits are more affordable for African graduate students, their perception of housing affordability improves.

Having established that cost-related factors have significant impacts on housing affordability, which is one of the determinants of homelessness, the final hypothesis tests the statistical significance of homelessness experience on the academic performance and mental health of African graduate students.

Hypothesis 5: H5: The experience of homelessness faced by African graduate students has a significant impact on their academic performance and mental health.

Findings based on Hypothesis 5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.626[a]	0.392	0.382	0.305

a. Predictors: (Constant), Homelessness Experience

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.533	1	3.533	38.021	.000[b]
	Residual	5.483	59	0.093		
	Total	9.016	60			

a. Dependent Variable: Homelessness Impact
b. Predictors: (Constant), Homelessness Experience

Coefficients[a]

Model				Standardized Coefficients Beta	t	Sig.
1	(Constant)	0.061	0.044		1.406	0.165
	Homelessness Experience	0.605	0.098	0.626	6.166	0.000

a. Dependent Variable: Homelessness Impact

Analysis and Interpretation of Hypothesis 5

Hypothesis	Regression Weights	Beta Coefficient	R^2	F	t-value	p-value	Hypotheses Supported
H5	HE → HI	0.605	0.392	38.021	6.166	0.000	Yes

The ANOVA table shows that the regression model is statistically significant ($F(1, 59) = 38.021$, $p < .001$). This indicates that the independent variable (Homelessness Experience) significantly predicts the variance in the dependent variable. The Coefficient table shows that Homelessness Experience has a statistically significant positive impact on the dependent variable, Homelessness Impact ($\beta = 0.605$, $t(58) = 6.166$, $p < .001$). This implies that the higher the level of homelessness experienced, the greater the impact on the academic and mental health of the participants.

Summary

The findings in this chapter reveal the following: most of the respondents identified as male, enrolled in master's programs, and had an average program enrollment length of 2 years. In terms of monthly income, most respondents earned between $1,001 and $3,000 per month, with a significant portion spending more than 30% of their monthly income on housing costs. Additionally, a notable proportion of respondents reported ever experienced financial hardship due to housing costs.

In addition, the data shows that 19% of the participants indicated that they had experienced housing insecurity and its consequent effects on their academic performance and mental health. The statistical p-value of .000 demonstrates the

significance of this relationship, which is consistent with Broton and Goldrick-Rab's (2016) finding about housing insecurity affecting students' academic performance. Furthermore, the research findings also align with Jones' (2019) findings regarding housing insecurity having ramifications on students' mental health and overall well-being.

Chapter 5

CONCLUSION

As housing insecurity persistently challenges students in higher education in the US, this study investigated the impact of this challenge among African graduate students at the University of Delaware. The findings revealed that approximately 19% of the respondents experienced housing insecurity while being graduate students at UD. This finding is similar to the Hope Center's report of 2020 which revealed that 17% of community college students reported homelessness prevalence (The Hope Center, 2021). While the findings of this study cannot be generalized to all UD African graduate students, the consistency between the study's findings and the Hope Center's report cannot be ignored. Similarly, the findings of this study regarding the impact of housing insecurity on the respondents' academic performance are consistent with Broton & Goldrick-Rab's (2016) explanation. Furthermore, Jones' (2019) analysis regarding the health impact of housing insecurity is consistent with this study. For reference, 6.4% of the respondents indicated that housing insecurity affected their mental health, while 12.8% indicated a concurrent effect on their mental health and academic performance.

In addition, Altbach's (1985) and Nebedum-Ezeh's (1997) findings regarding the high number of African students who experienced financial strain due to housing-related expenses are consistent with the findings in this study. As illustrated in Table 7, 79.3% of the respondents reported that they had experienced financial strain from housing-related costs while being graduate students at UD.

Furthermore, the study revealed a significant correlation between the participants' perceptions of the availability of low-income housing in Newark and housing affordability. In addition, the study revealed the significant relationship between the affordability of security deposits and housing affordability, as perceived by the respondents. These findings underscore the prevalence of housing affordability as a major concern among the respondents, which are consistent with Broton's (2020) explanation highlighted in the literature review.

Homelessness in higher education is a multifaceted problem whose implications affect not just the homeless but society as a whole. For African graduate students, the high proportion of their monthly income allocated to housing-related costs and issues of housing affordability cause them financial strain, as indicated in the survey responses. The consistency of this study's findings with the existing literature on housing insecurity further strengthens the reliability of the research.

Policy Recommendations

Considering the profoundness of the problem of housing insecurity in higher education, universities may consider addressing the issues through the implementation of a student housing project or investigating alternative approaches to provide affordable housing and mitigate housing insecurity (Carter et al., 2005). Some potential alternative approaches are explained as follows:

On-Campus Housing

According to HUD, research findings consistently indicate a correlation between students who reside on-campus and higher graduation rates, especially when the environment is intentionally structured to promote student learning and

involvement. One of the factors contributing to this correlation is that living on campus may incentivize students to commit to a full-time program, and as a result, improve their academic performance. Additionally, living on campus fosters a sense of deeper engagement with both academic studies and the campus community (HUD USER, n.d.). This highlights the importance of on-campus housing.

As a strategy to address housing insecurity, especially for international students, the University of Michigan offers various housing options, such as townhouse-style apartments, for their international students. For reference, the school's Northwood IV and V apartments offer a vibrant international community for students with families. Furthermore, the University of Michigan provides on-campus apartments reserved for students classified as upper-level students, and they include international students, graduate students, or students with families. International students usually find these options affordable compared to other housing options in the area (University of Michigan International Center, n.d.).

Similarly, the Columbus State Community College plans to provide a 160-unit affordable apartment complex and reserve 20 units exclusively for its students (Columbus State Community College Campus News, 2024).

Exploring similar on-campus housing initiatives adopted by the University of Michigan and the Columbus State Community College presents unique opportunities for the University of Delaware to address the shortage of student affordable housing and potentially improve students' academic performance.

Accessory Dwelling Units

Another policy option to help address housing insecurity is the provision of Accessory Dwelling Units (ADU). ADUs are like smaller houses or apartments that

are usually located in the backyard or attached to the main house. The American Planning Association (APA) emphasized that both attached and detached ADUs can potentially increase affordable housing options within communities (American Planning Association, n.d.), particularly in Newark where affordable housing and student housing are intrinsically linked (Newark Post Online, 2023).

Acknowledging the importance of ADUs, Calo (2022) emphasized that ADUs offer a distinctive remedy in addressing affordable housing shortages because they expand the housing options within communities and neighborhoods. However, this expansion can only be achieved if it is supported by local authorities through flexible zoning regulations. Permitting homeowners to transform detached garages and basements into separate apartment units provides them with the opportunity to generate rental income and contributes to the augmentation of available housing within existing areas. While some lawmakers disagreed with having ADUs in Newark, arguing that it would disrupt communities and bring more students into residential neighborhoods, ADU proponents argued that it could help alleviate the problem of affordable housing shortage in Newark (Newark Post Online, 2022).

Inclusionary Zoning

Inclusionary zoning is a policy whereby local governments either mandate or offer incentives to real estate developers to include a portion of affordable housing units within new housing projects. It is seen as a strategy to ensure affordable housing is provided for households across various income brackets. Inclusionary zoning is a countermeasure to exclusionary zoning policy which restricts housing supply within a jurisdiction and contributes to increasing housing costs (Ikeda and Washington, 2015). The U.S. Department of Housing and Urban Development (HUD) considers

inclusionary zoning a policy option to address student housing insecurity, by allowing low-income housing to be built alongside market-rate housing within the same neighborhoods (HUD USER, n.d.).

As explained by Wilking et al. (2023), housing costs consume a significant portion of students' income, leaving them vulnerable to the risk of homelessness. As a way of encouraging developers to build affordable housing for students, California State offered incentives such as density bonuses to developers who allocate 20% of their housing units to low-income college students and 15% to low-income residents (Goetz & Sakai, 2021). Therefore, inclusionary zoning presents an opportunity for the City of Newark to allow affordable housing options alongside market-rate housing, which may significantly reduce the proportion of students' income that goes into housing costs.

3D Printed Houses

3D printing, otherwise known as Additive Fabrication, is a construction method that uses Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM) to automate the process of structural building (Everett et al., 2022). 3D printed homes are created using these technologies which allow structures to be built layer by layer, beginning with creating a detailed CAD plan which is then converted into a printable file. Ultimately, the printer constructs the walls according to the design, and once printed, the walls are kept moisturized to prevent cracks (Symonenko, 2023).

Although 3D printing technology is a relatively recent innovation in the construction sector, it has experienced remarkable growth over the past 30 years due to its inherent advantages. Its advantages include faster construction time, reduced

labor and material waste, topology optimization, high levels of mechanization, the absence of modeling requirements, ease of personalized customization, the ability to construct complex structures, and the creation of uniquely shaped architectural designs (Moghayedi et al., 2024). Everett et al., (2022) highlight the advantages of 3D-printed homes over the traditional method in the table below.

Table 14 Cost Comparison of Traditional and 3D-Printed Homes

Highlights
Homes can be printed within 24 hours and just for $4,000. These are post-disaster shelters, but this shows the versatility and affordability of 3D printed homes can bring.
Depending on the printing company cost savings range from 15% to 50%.
3D printing can reduce costs by 20-40%.
With the right printing material design, most of the printing compound can be locally sourced with little shipping requirement from a central stocking location.
Countries that depend heavily on migrant labour can save up to 50-80% on labour costs from 3D printing. A reduction of waste was reported between 30-60%.
The savings from 3D printing can be up to 35% in overall costs and a reduction of 91% in total man-hours.

Source: Everett et al., (2022)

Everett et al., (2022) noted that since the cost of construction is factored into rental prices, 3D printing helps reduce labor costs and increase the production rate of buildings. Ultimately, this may help to increase housing supply and lower rental or sale prices.

Similarly, 3D printing offers the University of Delaware and the City of Newark a unique opportunity to construct affordable student housing at a reduced cost.

This reduction, ranging between 15%-50%, when compared to the traditional building method, may help alleviate potential housing insecurity experienced by the students.

Modular Construction

Modular construction, also known as offsite construction or prefabrication, entails manufacturing structural components of a building in an offsite factory and later assembling them as a standardized structure on a construction site (Bertram et al., 2019). Similar to 3D-printed houses, Generalova et al., (2016) explained that modular construction can potentially lower construction costs and enhance construction productivity. For reference, it is estimated that modular construction has a potential to reduce housing construction costs by $22 billion annually in the United States and Europe by 2030 (Generalova et al., 2016).

As highlighted by Kim & Kim (2016), modular construction has the following advantages, especially when considering mobility and space management:

- The system can be easily expanded or reduced to fit different spaces.
- Standardized modular elements can be stacked or combined effortlessly.
- The lightweight design makes the modules easy to move and set up.
- The simple structure allows for quick reconstruction or relocation.

Therefore, modular construction presents an opportunity for the University of Delaware and the City of Newark to address the shortage of affordable housing units by building modular housing units that can be easily deployed, scaled, and relocated as needed. Given that production costs significantly impact the affordability of rental units, the modular construction approach could help provide a cost-effective and

efficient solution to meet the diverse housing needs of the UD student population, including African graduate students.

Limitations of Study

While this research aims to advance the frontiers of research regarding housing insecurity in higher education, particularly its effects on African graduate students, certain limitations strict the data collection process and the generalizability of the findings. These limitations include:

Sample Size

The study is limited to only 61 respondents out of the 179 African graduates enrolled at the University of Delaware as of Fall of 2023. Given that the convenience sampling method was used in recruiting the respondents, the findings may not fully represent the experiences of all the African graduate students at the University of Delaware.

Limited Data and Information

There is limited literature and research on African graduate students' homelessness experience in the United States.

Self-Reporting Bias

The data collected relies on self-reported information from the participants. This may be subject to biases or inaccuracies as participants may underreport or overreport certain experiences or perceptions which may potentially skew the overall results.

Generalizability

The findings of the study are specific to the context of the University of Delaware's African graduate students and may not be generalizable to other institutions or populations. Notably, factors such as geographic location, institutional policies, and cultural norms may influence housing insecurity differently in other settings.

Despite these limitations, this research aims to provide valuable insights into the housing challenges faced by African graduate students and contribute to the existing efforts aimed at addressing housing insecurity in higher education.

Summary

Based on these findings, the research highlights the need for policymakers and higher education leaders to address the affordable housing shortage, as well as the high rental costs of the existing housing in Newark. However, even though housing affordability remains a primary concern for students, the term "student housing" may not fully encompass the diverse categories within the student population. These categories include students who are parents, low-income workers, immigrants, and young adults. While being a student may be a common thread among them, it does not define their entire identity or life experiences. Therefore, the diversity of the student groups needs to be considered when addressing their housing needs. For example, students who have families may require childcare services, immigrants may require other needs such as language assistance and employment resources. While recognizing that all students may have overlapping needs such as easy access to housing units on campus, study spaces, and internet access, it would be important to recognize the

diversity of the student population when addressing their housing needs (Carter et al., 2005).

Drawing insights from successful strategies employed in schools such as the University of Michigan, UD can equally address the problem of housing insecurity by providing additional on-campus housing for students, encompassing international students, graduate students, and students with families. Similarly, Columbus State Community College's strategy of providing affordable housing units would be a good policy strategy for UD to explore.

Furthermore, as identified by the U.S. Department of Housing and Urban Development (HUD), inclusionary zoning is an effective policy option to address student housing insecurity. By providing incentives such as density bonuses to developers, the City of Newark could encourage developers to allocate a certain proportion of their units as affordable housing units for students. Similarly, the City of Newark could remove the impediments to Accessory Dwelling Units (ADU) to help ameliorate the problem of affordable housing shortage in Newark. As rental cost is highly influenced by construction cost, it is important to acknowledge that 3D painting housing and modular construction offer opportunities for UD and the City of Newark to build affordable housing units while reducing production costs.

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Appendix A

QUESTIONNAIRE

Principal Investigator: Abdulrasheed Dawodu

Dear Participant,

My name is Abdulrasheed Dawodu, I am a graduate student at the Biden School of Public Policy and Administration, University of Delaware. I am conducting a study in fulfillment of my program requirement for a Master of Arts in Urban Affairs and Public Policy. The purpose of my research is to help understand the housing situation of African students at the University of Delaware.

The survey is being sent to all African students who are currently enrolled in a graduate program at the University of Delaware as of the Fall of 2023. As part of this study, I kindly request your participation, and it involves answering a list of interview questions which would take about 6 minutes of your time. Your response will be kept completely confidential.
All responses will be combined in an aggregate format.
Participation in this survey is voluntary, and you have the right to refuse participation or to skip any question you do not wish to answer. You can also withdraw from the survey at any time without any negative consequences.

Your participation poses no risk to you or your international student status.
If you have any questions about the survey, please feel free to contact me at 302-409-2325 or dawodu@udel.edu.

By choosing the 'Yes' option below, you indicate your consent to participate in the survey, and you con rm that you are 18 years or older.

Thank you.

Sincerely,

Abdulrasheed Dawodu

Informed Consent

1. I agree to participate in the research survey.

Check all that apply.

- [ ] Yes, I agree to participate.
- [ ] No, I do not wish to participate.

2. On a scale of 1 to 5, how would you rate the affordability of your current accommodation?

Mark only one oval per row.

	1 (Not Affordable)	2	3	4	5 (Affordable)	Don't Know/Refused
'	◯	◯	◯	◯	◯	◯

3. How affordable would you rate the housing options in Newark as of Fall of 2023 based on the requirements set in rental agreements such as security deposits?

Mark only one oval per row.

	1 (Not Affordable)	2	3	4	5 (Affordable)	Don't Know/Refused
'	◯	◯	◯	◯	◯	◯

4. On a scale of 1 to 5, how would you rate the availability of low-income housing in Newark as of Fall of 2023?

Mark only one oval per row.

	1 (Not Available)	2	3	4	5 (Available)	Refused/Don't know
'	◯	◯	◯	◯	◯	◯

5. Have housing costs caused financial strain for you while you have been a graduate student at UD?

Mark only one oval.

- Yes
- No
- Don't know/Refused.

6. Approximately what percentage of your monthly income goes towards housing costs in the Fall of 2023? *Mark only one oval.*

- 30% or less
- 31% - 50%
- 50% or more
- Refused/ Don't know

7. On a scale of 1 to 5, how satisfied are you with the quality of your current housing?

Mark only one oval per row.

	1 (Not Satisfied)	Column 2	Column 3	Column 4	5 (Satisfied)	Don't know/Refused
'						

8. On a scale of 1 to 5, how do you perceive the safety of your current accommodation?

Mark only one oval per row.

	1 (Not Safe)	2	3	4	5 (Safe)	Don't Know/Refused
'						

9. On a scale of 1 to 5, what level of discrimination have you faced in housing-related matters while you have been a graduate student at UD?

Mark only one oval per row.

	1 (No Discrimination)	Column 2	Column 3	Column 4	5 (Most Discrimination)	Don't know/ Refused
'						

10. Have you ever experienced homelessness or housing insecurity as a graduate student at UD, such as:

Check all that apply.

- [ ] Not having any place to sleep.
- [ ] Sleeping in an overcrowded room beyond the room's capacity.
- [ ] Living with family or friends to share housing costs (doubling up).
- [ ] Resort to sleeping in a vehicle or an abandoned building or an open space.
- [ ] No, I never experienced housing insecurity at UD. (Please proceed to question 13) Don't Know/Refused

11. (**If you chose Yes to any of the options in question 11)** Has any of your experiences of housing insecurity or homelessness ever affected you in any of the following ways while you have been a graduate student at UD?

Check all that apply.

- [ ] Affected your academic performance.
- [ ] Affected your mental health.
- [ ] Made you have suicidal thoughts.
- [ ] Don't know/Refused.

12. What type of housing do you currently reside in?

Mark only one oval.

- ◯ Studio Apartment
- ◯ 1-bedroom apartment
- ◯ 2 or more-bedroom apartments
- ◯ A house
- ◯ Don't know/Refused.
- ◯ Other: _____

13. Do you currently share accommodations with roommates?

Mark only one oval.

- ◯ Yes
- ◯ No (Please proceed to question 17)
- ◯ Don't Know/Refused

14. How many roommates do you currently have?

_____

15. How many other individuals share your living space apart from your registered roommates?

Mark only one oval.

- 0
- 1
- 2
- 3
- 4
- Don't Know/Refused

16. Which of the following best describes your current housing proximity to the UD Campus?

Mark only one oval.

- Less than 1 mile
- 1 mile - 3 miles
- Above 3 miles
- Don't Know/Refused

17. What is your primary means of commuting to the UD campus in the Fall of 2023?

Mark only one oval.

- ◯ Walking
- ◯ Bicycling
- ◯ Personal car
- ◯ Ridesharing as a passenger
- ◯ Public transportation
- ◯ Don't Know/Refused
- ◯ Other: _____

18. On a scale of 1 to 5, please rate your satisfaction with your mode of transportation of commuting to the UD campus from your apartment/house.

Mark only one oval per row.

	1 (Not Satisfied)	2	3	4	5 (Satisfied)	Don't Know/Refused
'	◯	◯	◯	◯	◯	◯

19. What is your zip code?

_____

20. Please state your gender identity

_____

21. What is your marital status?

Mark only one oval.

- ◯ Single
- ◯ Married
- ◯ Divorced
- ◯ Widowed
- ◯ Don't Know/Refused

22. How many dependents are currently living with you?

_____

23. What is your current academic status?

Mark only one oval.

- ◯ Master's student
- ◯ Ph.D. Student
- ◯ Don't Know/Refused

24. What are the sources of your income in the Fall of 2023? (Please select all that apply)

Check all that apply.

- ☐ Employment
- ☐ Scholarships/School funding
- ☐ Family Support
- ☐ Don’t know/Refused
- ☐ Other: _____

25. What is your average monthly income from all sources in the Fall of 2023?

Mark only one oval.

- ◯ Less than $1,000
- ◯ $1,001 - $2,000
- ◯ $2,001 - $3,000
- ◯ Above 3,000
- ◯ Don't know/Refused.

26. How many years have you been enrolled in your academic program, including this academic year?

Mark only one oval.

- ◯ Less than 1 year
- ◯ 1 year
- ◯ 2 years
- ◯ 3 years
- ◯ 4 years and above
- ◯ Don't Know/Refused

27. Please state your program of study.

_____

Appendix B

IRB/HUMAN SUBJECTS APPROVAL

Institutional Review Board
210H Hullihen Hall
Newark, DE 19716
Phone: 302-831-2137
Fax: 302-831-2828

DATE: December 20, 2023

TO: Abdulrasheed Dawodu, Masters
FROM: University of Delaware IRB

STUDY TITLE: [2128261-1] Understanding UD African Students' Housing Situation as of Fall of 2023.
SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
EFFECTIVE DATE: December 20, 2023

REVIEW CATEGORY:Exemption category # *(2i)*

Thank you for your New Project submission to the University of Delaware Institutional Review Board (UD IRB). According to the pertinent regulations, the UD IRB has determined this project is EXEMPT from most federal policy requirements for the protection of human subjects. The privacy of subjects and the confidentiality of participants must be safeguarded as prescribed in the reviewed protocol form.

This exempt determination is valid for the research study as described by the documents in this submission. Proposed revisions to previously approved procedures

and documents that may affect this exempt determination must be reviewed and approved by this office prior to initiation. The UD amendment form must be used to request the review of changes that may substantially change the study design or data collected.

Unanticipated problems and serious adverse events involving risk to participants must be reported to this office in a timely fashion according with the UD requirements for reportable events.

A copy of this correspondence will be kept on file by our office. If you have any questions, please contact the UD IRB Office at (302) 831-2137 or via email at hsrb-research@udel.edu. Please include the study title and reference number in all correspondence with this office.