A Multiple Liner Regression Analysis of Rental Affordability Determinants for Middle-Income Group in Dhaka

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ABSTRACT

This study investigates the impact of socioeconomic factors on rental housing affordability for middle-income households in Dhaka, Bangladesh. With a rapidly growing middle class and a significant housing crisis, particularly in urban areas, the research examines key determinants influencing rental affordability. The methodology consists of data collection through discussions, questionnaires, and observations, followed by analysis of factors affecting rental affordability. The analysis includes a reliability assessment, correlation analysis, and multiple regression to identify significant predictors of rental affordability. Policy recommendations are provided to improve housing affordability, focusing on enhancing transportation infrastructure, ensuring better-maintained housing, and targeting vulnerable groups such as younger and low-income residents. The study lays the groundwork for future research and policy development aimed at improving rental housing conditions in Dhaka, contributing to enhanced socioeconomic resilience and overall living standards.

Keywords: Housing, Affordable housing, Rental affordability, Middle-income groups, Linear regression**.**

INTRODUCTION

The concept of housing is complex and multifaceted, encompassing both physical structures and the process of providing accommodation (Ruonavaara, 2017). Housing serves as shelter or accommodation for individuals, families, or groups, including various types of dwellings such as houses, apartments, and condominiums (Rashid, 2021). It fulfills a fundamental human need, offering shelter, security, social status, and privacy in a healthy and comfortable environment. Moreover, housing lays the foundation for employment and income generation. It is the constitutional duty of a state, through planned economic development, to ensure decent housing for all, thereby improving living standards and enhancing cultural life (Government of Bangladesh, 2016).

According to the United Nations and the Office of the United Nations High Commissioner for Human Rights (1991), housing is not just a commodity; it is a fundamental human right. Affordable housing is one way to address this need. It refers to housing units that are financially accessible to low- and moderate-income individuals and families, which is vital for a city's well-being (Al Amin and Islam, 2023). Rental housing also plays an important role in addressing housing needs. The National Housing Policy (2016) in Bangladesh highlights an intention by the National Housing Authority (NHA) to create rental housing options as part of broader social housing initiatives, particularly for those in need.

There is no clear definition is not available in Bangladesh, though middle class is growing rapidly, with over 34 million people currently in this category (earning $2-$3 per day). By 2025, this share is expected to reach 25% (around 44 million), and by 2030, 33% (about 60 million) (Mujeri, 2024). The average income for middle-income groups in Bangladesh ranges from $2 to $4 per day. When calculated using purchasing power parity (PPP), the standard monthly income of a four-member middle-class family is between Tk 70,000 and Tk 150,000, with around 30% of the population falling into this category (Billah, 2020). Additionally, according to The Financial Express (2020), families with an income between Tk 35,000 and Tk 70,000 are termed "vulnerable non-poor", generally they are known as middle income group in Dhaka. Islam (2021) estimates that around 25-

30% of the population belongs to this group. These families often fall into a gap where their income disqualifies them from receiving subsidies for the poor, yet they cannot afford the rising cost of private rentals.

Though the expansion of the middle class is often seen as a sign of development, the housing crisis for middle-income groups remains a significant challenge, particularly in Dhaka (Jahan, Abul Kalam, and Bangladesh Institute of Planners, 2012). Dhaka, ranked as the sixth most populous city in the world, has a population density of 33,591 people per square kilometer, and a metro area population of approximately 2.25 million (Asjad, 2023). Overpopulation has resulted in a range of urban problems, including waste disposal, public transport, access to safe water, electricity, and security. or middle-income households, these challenges are compounded by the scarcity of suitable housing that fits their budget. (The Financial Express, 2023). Consequently, many are forced to turn to subletting or move to smaller, substandard accommodations, which affects their quality of life—according to the Bangladesh Bureau of Statistics (BBS), subletting as a "common adaptation strategy among the low, medium, and limited income groups," which is prevalent in urban areas. According to the Bangladesh Sample Vital Statistics of BBS, sublet holders rose to 3.3% in 2022, from 2.4% in 2021, while sublet providers increased from 0.5% to 0.7% during the same period (Population and Migration, 2023).

These families face significant challenges in housing affordability. Furthermore, the rising cost of living has made it difficult for middle-income families to maintain their socioeconomic stability. Factors such as rising rental prices, lack of affordable housing, and inadequate supply of middle-income housing units contribute to this growing affordability crisis (Mujeri, 2024). Middle-income households in Dhaka face significant barriers to housing affordability due to various socioeconomic factors, such as income, occupation, family size, and proximity to services (Ahmed, 2024). According to the Household Income and Expenditure Survey (HIES) 2022, the income shares of the top 10% and bottom 20% of the population have increased, while the income shares of those in between have decreased (KABIR, 2024).

Middle-income households in Dhaka face significant challenges in finding affordable rental housing due to a range of socioeconomic factors, including limited income, occupation stability, household size, and lack of proximity to essential services. Rising rental prices, insufficient supply of affordable family-sized units, and inadequate public transport and amenities compound the problem, resulting in limited housing options and reduced quality of life for middle-income families. Addressing the socioeconomic determinants of rental affordability is crucial for ensuring stable housing options for middle-income households in Dhaka and improving their socioeconomic resilience. While there has been considerable research on topics such as low-cost housing (Choguill 1988; Hussain et al., 2015; Karim, Jahan and Islam, 2023), climate change (Rashid, Gani and Sarker, 2013; Alam and Mullick, 2014; Rana and Ilina, 2021), sustainable housing Islam (1996; Shoaib et al., 2024), and slum development (Rashid 2009; Ahmed, 2014; Patel et al., 2019) and so on, there has been limited focus on rental housing affordability, particularly regarding the influence of socioeconomic factors. This study aims to address this gap.

The aim of this research is to analyze the impact of factorson rental housing affordability for middle-income groups in Dhaka, using multiple linear regression analysis, and to propose policy recommendations that can enhance accessibility to affordable housing and improve overall living standards for this segment of the population.

Addressing these factors will provide insights to guide policymakers in creating targeted interventions to improve rental housing affordability for middle-income households in Dhaka. This involves identifying key affordability determinants, understanding their impact, and recommending practical solutions to ensure better access to affordable housing, thereby enhancing quality of life and socioeconomic resilience.

Aim and Objectives

Research Aim

To investigate the key determinants of rental affordability for the middle-income group in Dhaka using linear regression analysis.

Research Objectives:

1. To identify the key socioeconomic determinants affecting rental housing affordability for middle-income households in Dhaka.

2. To develop a linear regression model to predict rental affordability based on identified determinants.

3. To develop policy recommendations aimed at improving rental housing affordability for middle-income families.

LITERATURE REVIEW

Affordable Housing Global

There no universally acceptable definition of affordable housing that exists among academicians and practitioners (Mia and Zull, 2019). Affordable housing and housing affordability have become central issues in global housing policy debates over the last decades. The term "housing needs" has largely been replaced by "housing affordability" in discussions about adequate housing provision (Galster and Lee, 2020). There is no universally accepted definition of affordability or affordable housing, as the definitions vary based on economic and social contexts. Despite the lack of a precise definition, these concepts generally involve two key elements: housing costs and household income (Bieri, 2014).

Table 1: Summarizes Different Perspectives and Policy Strategies from Various Countries Regarding Housing Affordability (Chowdhury and Chiu, 2013)

Country	Definition of Affordable Housing
Australia	Housing costs ≤ 30% of income. "30/40 rule" for lowest 40% income.
United States	Housing costs ≤ 30% of income.
United Kingdom	No set definition. Local authorities define affordability based on local income and housing costs. Includes social-rented and intermediate housing.
Canada	Spending >30% of income on housing considered an affordability issue, especially for those below "norm rent income."
New Zealand	Focus on residual income left after housing costs for other necessities.
General Developed Countries	Common benchmark is spending ≤30% of income on housing costs.

Table 2: Summarizing The Affordable Housing Policies, Strategies, And Challenges For Multiple Countries (Chowdhury, 2018)

Country	Affordable Housing Strategies/Programs
Hong Kong	- Massive public housing with producer subsidy approach
	- Housing Authority and Housing Society manage housing
	- Effective land supply policy for moderate-income households
Singapore	- Large public housing program with high homeownership rate
	- Central Provident Fund (CPF) for affordable financing

	- Subsidized mortgage rates for public home buyers
China	- Economic and Suitable Housing for low/middle-income households
	- Public housing as occupational benefit turned affordable housing
	- Affordable housing supply system built upon 1990s reform
Malaysia	- Government intervention in housing market
	- Public and private sector involvement in affordable housing
	- 83,910 low-medium-cost units built (2001-2005)
Philippines	- Government initiatives for low- and middle-income groups
	- Direct production of housing and end-user financing
Sri Lanka	- Vision for affordable housing through National Housing Development Authority
	- Initiatives like One Hundred Thousand and One Million Housing Programs
India (Haryana & Maharashtra)	- Policy requiring private developers to allocate plots/flats for EWS households
Bangladesh	- Site and service schemes for low-income people
Nigeria	- National policy mentions "housing for all"
General Developing Countries	- Lack of effective affordable housing policies

Table 3: Rental Costs Based On Household Income Levels, Along With The Housing Type And Size. (Pieal, 2024)

Household Income (Tk)	Housing Type	Rent Range (Tk)	Size (sq. ft.)
≤ 20,000	Shanty houses	3,000 – 5,000	Not specified
21,000 – 30,000	Sublet	6,000 – 10,000	Not specified
31,000 – 40,000	Small apartments	11,000 – 14,000	6,00-9,00
41,000 – 50,000	Flats	15,000 – 20,000	1,100 – 1,150
51,000 – 80,000	Flats	21,000 – 30,000	1,150 – 1,200
80,000 – 1 lakh	Flats	31,000 – 40,000	1,200 – 1,500
> 1 lakh	Upmarket flats	40,000 or more	> 1,500

Measuring Housing Affordability Approaches

The Housing Cost Approach (the housing expenditure-to-income ratio approach) considers housing affordable if it costs no more than 25%-30% of monthly income. Non-Housing Cost Approach (residual income approach)

considers whether a household can meet non-housing expenses after paying for housing (Malta Sustainability Forum, 2023).

Table 4: Measuring Housing Affordability Approaches (Chowdhury And Chiu, 2013; Stone, 2006)

Approach Name	Description
Housing Cost Approach	Uses a standard of no more than 25%-30% of monthly income on housing expenditures.
Non-Housing Cost Approach	Measures disposable income after housing costs; examines whether it maintains an acceptable standard of living.

Factors affecting middle-income housing affordability

Socioeconomic Factors

Table 5: Socioeconomic Factors Affecting Middle-Income Housing Rental Affordability

Variables	Reference
Age group	(Bujang, Zarin and Jumadi, 2010)
Education level	(Bujang, Zarin and Jumadi, 2010), (Lim, 2016)
Income	(Bujang, Zarin and Jumadi, 2010), (Canter and Rees, 1982), (Mohit, Ibrahim and Rashid, 2009)
Gender	(Canter and Rees, 1982), (Kellekci and Berköz, 2006)
Marital status	(Kellekci and Berköz, 2006), (Lane and Kinsey, 1980), (Mohit, Ibrahim and Rashid, 2009)
Occupation	(Teck-Hong, 2011), (Lane and Kinsey, 1980), (Mohit, Ibrahim and Rashid, 2009)
Household size	(Canter and Rees, 1982), (Teck-Hong, 2011)
Tenure status (rent or sublet)	(Thomsen and Eikemo, 2010), (Lane and Kinsey, 1980)
House ownership	(Canter and Rees, 1982), (Thomsen and Eikemo, 2010)
Length of stay	(Canter and Rees, 1982), (Lane and Kinsey, 1980)

Physical Factors

Table 6: Physical Factors Affecting Middle-Income Housing Rental Affordability

Variables	Reference
Number of rooms	(Thomsen and Eikemo, 2010), (Canter and Rees, 1982)
Proximity to workplace	(Thomsen and Eikemo, 2010), (Mohit, Ibrahim and Rashid, 2009), (Mohit and Nazyddah, 2011)

Proximity to city center	(Thomsen and Eikemo, 2010), (Mohit, Ibrahim and Rashid, 2009), (Mohit and Nazyddah, 2011)
Proximity to schools	(Thomsen and Eikemo, 2010), (Mohit, Ibrahim and Rashid, 2009), (Mohit and Nazyddah, 2011)
Proximity to healthcare	(Thomsen and Eikemo, 2010), (Mohit, Ibrahim and Rashid, 2009), (Mohit and Nazyddah, 2011)
Access to public transport	(Thomsen and Eikemo, 2010), (Mohit, Ibrahim and Rashid, 2009), (Mohit and Nazyddah, 2011)
Access to amenities,	(Thomsen and Eikemo, 2010), (Mohit, Ibrahim and Rashid, 2009), (Mohit and Nazyddah, 2011)
Housing type	(Thomsen and Eikemo, 2010), (Mohit, Ibrahim and Rashid, 2009), (Mohit and Nazyddah, 2011)
Satisfaction with house odor	(Mohit, Ibrahim and Rashid, 2009), (Mohit and Nazyddah, 2011)
Location suitability for living	(Mohit, Ibrahim and Rashid, 2009), (Mohit and Nazyddah, 2011)

Urban Economic Theories: The Bid-Rent Theory & The Location Theory

The Bid-Rent Theory is a fundamental concept in urban economics that explains how land use and rent prices are influenced by location, particularly in relation to the central business district (CBD). The Bid-Rent Theory suggests that land value decreases as the distance from the CBD increases. This is because businesses and individuals are willing to pay more for locations that offer greater accessibility to economic activities and services (Clay & Valdez, 2017). In the context of Bangladesh, understanding the application of Bid-Rent Theory can provide insights into urban land use patterns and economic activities. This theory is particularly relevant in rapidly urbanizing areas where land use decisions are critical for sustainable development. The theory also provides a framework for analyzing housing market dynamics, including the impact of discrimination and socioeconomic factors on rent prices. This is particularly relevant in diverse urban settings where different groups may face varying levels of accessibility and affordability (Galster, 2016; Clay & Valdez, 2017). The theory can also highlight socioeconomic disparities in urban areas, as different groups may have varying abilities to pay for accessibility. This can lead to segregation and unequal access to services (Galster, 2016).

The relationship between proximity to amenities and rent is a significant aspect of location theory, influencing both residential and commercial real estate markets. Proximity to amenities such as public transport, schools, parks, and entertainment venues can significantly affect rental prices, as these factors enhance the desirability of a location. This desirability is often reflected in higher rents, as tenants are willing to pay a premium for convenience and quality of life (Almagro & Domínguez-Iino, 2024; Almagro & Domínguez-Iino, 2022). The concept of the "15-minute city" emphasizes the importance of having essential amenities within a short distance, which enhances residents' quality of life and increases their willingness to pay higher rents. In Greater Manchester, for instance, proximity to tram stops, bars, schools, and the city center are significant drivers of rental prices, as identified through advanced machine learning models (Cajias & Wins, 2023). In urban office markets, such as Oslo and Stockholm, proximity to public transport and central business districts significantly impacts office rents. The presence of amenities like restaurants and parks also contributes to higher rental values, as they create vibrant and attractive work environments (Anundsen & Hagen, 2021). The valuation of amenities can vary with housing market cycles. In Ireland, the price effects of amenities were found to be greater than rent effects, suggesting that during economic booms, buyers are more inclined to "lock in" access to desirable amenities, whereas during downturns, the relative price of amenities becomes counter-cyclical (Lyons, 2013). In cities with significant short-term rental activity, such as those in Spain, the increased valuation of amenities

has been a key driver of housing price and rent increases, independent of the short-term rental market itself (Paz & Saiz, 2022). The relationship between proximity to amenities and rent in Dhaka, Bangladesh, can be understood through the lens of location theory, which emphasizes the significance of location in determining land and property values (Bird & Venables, 2019).

(Brown, 2005). In Dhaka, a rapidly growing city with a scarcity of high-quality urban land, the proximity to amenities such as transportation networks, commercial centers, and environmental features significantly influences rent levels. This is consistent with the broader theoretical framework that suggests rents are highest where economic activity is most intense and profitable, as land consumers are willing to pay more for locations that maximize their utility and profitability.

Socioeconomic phases of middle-income groups in Bangladesh

Mujeri (2019) pointed out that the middle-class concept in Bangladesh is somewhat vague and corresponds to different lifestyles; it may be hard to see how this heterogeneous group would position itself in society. Historically, the middle class in Bangladesh was a social and cultural entity that emerged during the colonial era, defined by values such as education, civic engagement, and refinement. This class played a significant role in setting the national agenda, including leading movements for independence, democracy, and social progress. Today, the middle class is primarily characterized by economic factors like disposable income and consumer behavior, which drives a consumer revolution (PPRC, 2019). However, unlike the earlier value-driven middle class, the current middle class lacks cultural cohesion and struggles to form a unified social identity (British Library, 2021). These economic, social, and urban dynamics, including income inequality, productivity growth, and urbanization (JICA, 2021; World Bank Open Data, 2024, Haider, 2024), pose challenges to middle-income families in finding affordable housing options (Al Amin and Islam, 2023).

The middle class of Bangladesh undergone three socioeconomic phases:

Phase One: Age of Shared Growth (1972-1990)

High population growth and rural-to-urban migration, particularly to Dhaka, increased demand for housing, resulting in overcrowded and informal settlements (Mortuza, 1992). Housing for middle-income households was scarce, and this period marked the beginning of challenges in accessing adequate, affordable housing.

Phase Two: Age of Expanded Participation (1990-2010)

From the 1990s onward, Bangladesh witnessed significant changes due to globalization, economic reforms, and the rapid growth of the Ready-Made Garments (RMG) sector (Kurpad, 2014). The middle class began to expand, but housing affordability became a pressing issue. Rising land prices, a lack of planned urban housing projects, and inadequate infrastructure compounded the housing crisis for middle-income families. Many middle-income households were forced to settle for substandard housing or enter into informal rental agreements, which provided limited security and inadequate living conditions (Global Cornell, 2022).

Phase Three: Age of Productivity Recovery (2010–Present)

Since 2010, Bangladesh has experienced stronger economic growth driven by infrastructure development, expansion of the service sector, and continued growth in exports (JICA, 2021). However, the rising cost of urban housing has created significant challenges for middle-income families seeking rental or owned homes. Productivity growth has increased household incomes for many, but the rapid urbanization and soaring real estate prices have led to a severe shortage of affordable housing options for middle-income households, particularly in Dhaka. With limited government intervention in the housing sector, private developers have focused on high-end properties, leaving a gap in affordable housing supply (Mansur, 2023). The high cost of land, inadequate urban planning, and the absence of effective housing policies have exacerbated the affordability crisis for middle-income families (Al Amin and Islam, 2023).

The history of middle-income group in Bangladesh highlights the critical base from economy, culture to production. But when it comes to housing, The urban housing market in Bangladesh has largely focused on high-

income buyers, with little emphasis on affordable housing for middle-income groups. The age of the household head, family size, and income levels are critical factors in determining rental affordability (Yuan et al., 2017). Younger families or families with larger household sizes face greater challenges in securing affordable housing, as their income levels and savings often do not align with the rising cost of urban rent. However, these crucial demographic factors have long been neglected for years. Furthermore, national housing policies have failed to address the unique socioeconomic realities of middle-income families. There has been a lack of comprehensive research and well-defined strategies focusing on the availability of affordable housing for this segment. In addition, physical features of housing and neighborhood characteristics have been overlooked for years when addressing middle-income housing needs. Addressing the housing affordability crisis for middle-income families in Bangladesh requires a more inclusive approach that takes into account socioeconomic dynamics, such as family size and income stability, as well as physical housing features and neighborhood characteristics.

Dhaka's housing market

Dhaka's housing market grapples with a complex interplay of demand, supply, affordability, and regulatory challenges, impacting various income groups (Ahmed et al., 2014). The market is characterised by a significant gap between housing demand and supply, with the supply falling short of meeting the needs of the growing population (Rahman, 2023). The private sector plays a dominant role in shaping the housing landscape of Dhaka, with real estate developers primarily catering to the upper and middle-income segments, often overlooking the needs of the lower-income groups. This focus on profit-driven projects results in a scarcity of affordable housing options, particularly for middle and lower-middle-income households (BIGD, 2017). Affordability remains a critical issue in Dhaka's housing market, with high land prices and construction costs exacerbating the problem. Limited access to housing finance and high interest rates further impede homeownership for middle-income families (Chowdhury, 2018). Consequently, a large portion of the population relies on the rental market, allocating a significant portion of their income to housing (Amin & Islam, 2025).

Several factors contribute to the challenges in Dhaka's housing market. Land scarcity and improper land utilisation pose constraints on housing development. Weaknesses in regulatory and institutional frameworks, coupled with inefficient enforcement of policies and regulations, hinder effective urban planning and governance (Chowdhury, 2018). Infrastructure shortages, including inadequate utilities and transportation networks, further compound the problems. Moreover, corruption and illegal activities by real estate developers and government officials exacerbate the issues in the housing market (Badhan & Siddika, 2019). To address these challenges, several strategies and policy interventions have been proposed. Micro-apartments have emerged as a potential solution for alleviating the housing dilemma faced by middle-income people in Dhaka, offering a more affordable housing choice in the face of land scarcity and rising housing prices (Rahman, 2023).

Dhaka's rental housing market is significantly influenced by high demand, affordability concerns, and regulatory challenges. A substantial portion of the city's population resides in rented accommodations, with approximately three-fourths of households being tenants (Zaman, 2019). The existing mismatch between the demand for and availability of rental units allows landlords to charge arbitrary rents, contributing to substantial increases in tenancy rents. Dhaka has one of the highest rent-to-income ratios in Asia, forcing many renters to allocate more than 30% of their monthly income toward house rent. This high cost often forces tenants to compromise on essential living standards, reducing expenditures on items such as food and education (The Daily Observer, 2018). The primary drivers of the rental market in Dhaka include significant migration to the city for socio-economic opportunities, which increases pressure on the rental housing market. Additionally, limited opportunities for homeownership further boost the demand for rental units. The annual demand for housing greatly exceeds the number of houses added each year, and the rental housing market remains largely shaped by the private sector (Badhan & Siddika, 2019).

However, regulatory and institutional shortcomings contribute to the ongoing challenges. Weak enforcement of housing regulations has allowed tenancy rents to rise unchecked, and many rental agreements lack formal contracts. Inefficient institutional structures also impede the smooth functioning of the rental market, while the absence of public rental housing options further burdens the private sector (Sharmeen & Houston, 2019). As a result, tenants are often forced to compromise on their standard of living due to high rents, with housing costs

frequently exceeding the standard threshold of affordability. Landlords exploit the growing demand for rented homes, perpetuating the issue (Chowdhury, 2018; Gomes, 2015).

METHODOLOGY

Theoretical Framework

Within the general framework of correlational research, causal-comparative studies represent a subtype that finds a middle ground between predicting relationships and exploring causality (Groat and Wang, 2002). In the context of housing affordability, causal-comparative research can be particularly effective in understanding differences in outcomes, such as housing affordability, across groups with varying characteristics, like income levels or family sizes other socioeconomic factors. By identifying and comparing these differences, we can infer potential causes while acknowledging that true experimental manipulation is not feasible. This approach allows for more nuanced insights into how various factors, including the physical features of housing units and neighborhood characteristics, contribute to the housing affordability challenges middle-income households face in Dhaka.

Data Source

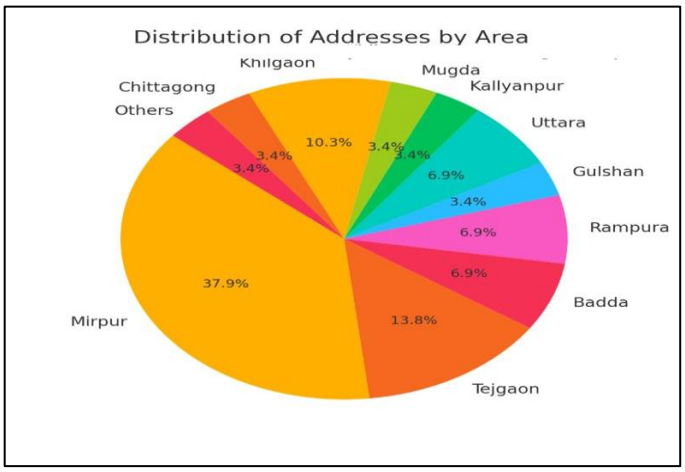

Figure 1: Random Sampling Survey of 104 Urban Residents in Dhaka

The study on middle-income housing affordability in Dhaka, Bangladesh, draws from a total sample of 104 individuals selected through random sampling from various urban areas. The targeted locations include neighborhoods that exhibit diverse socioeconomic characteristics, providing insights into the challenges faced by middle-income households in different urban settings. The locations selected for the survey are Mirpur, Tejgaon, Badda, Rampura, Gulshan, Uttara, Kallyanpur, Mugda, and Khilgaon.

Table 7: Distribution Of Survey Respondents By Area

Area Name	Address Count
Mirpur	35
Tejgaon	14
Badda	10
Rampura	4
Gulshan	4

Uttara	4
Kallyanpur	7
Mugda	10
Khilgaon	3
Others	13
Total	104

Data Collection

For data collection, a combination of methods was employed (Groat and Wang, 2002), including open-ended discussions and structured questionnaires. Each of the 104 family apartments was visited by the data collector, who documented the physical features of the apartment, including bedrooms, kitchens, toilets, dining, and living spaces. Detailed notes and photographs of these features were taken to ensure a comprehensive understanding of the living conditions. Additionally, 34 out of the 104 families were observed for a prolonged period of three months. This longitudinal observation aimed to gain a deeper insight into middle-income households' day-to-day challenges and housing experiences, including their adaptability to living conditions and any emerging issues related to affordability and space utilization.

Sampling and population

Random stratified sampling was employed throughout the study, focusing on 104 individuals from the middle-income group. Random stratified sampling divides a population into subgroups (strata) based on characteristics and then randomly selects participants from each subgroup (Singh and Mangat, 1996). This study's random stratified sampling was likely chosen to ensure that all middle-income population subgroups living in well-planned and unplanned areas were adequately represented. Middle-income individuals prefer neighborhoods like Dhanmondi, Gulshan, Baridhara, and Uttara due to their well-planned layout, infrastructure, and amenities. However, these areas are often expensive. Consequently, middle-income people often find more affordable but unplanned areas, such as Rampura, Bashaboo, Goran, Mirpur, Badda, Madartek, and Jigatola, to be more suitable (Islam and Zahur, 2016). In this study, we focused on unplanned areas, with most respondents falling within the income range of 30,000 to 50,000 BDT (40.38%). Previous literature indicates that most respondents belong to the middle-income group.

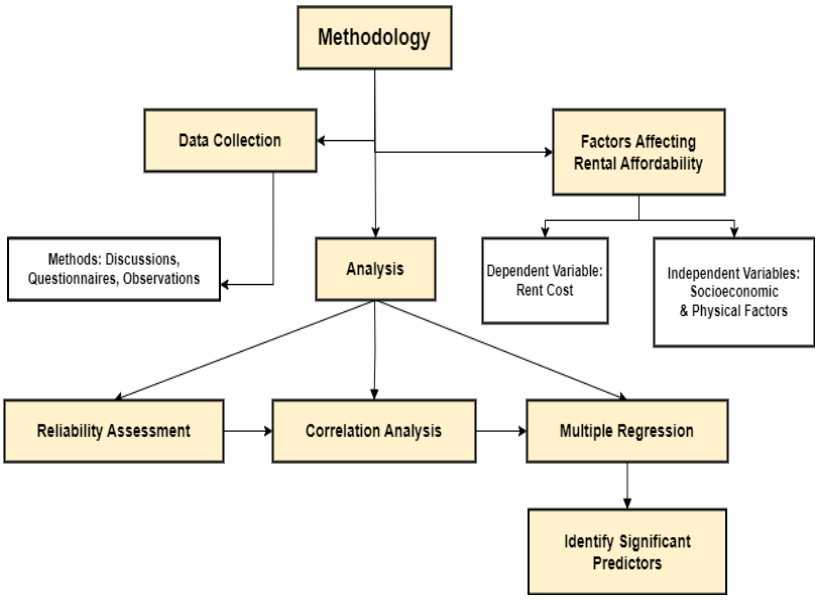

Figure 2: Methodology of the research

Exploring Factors Affecting Rental Affordability

This study aims to investigate the multifaceted determinants of rental affordability. This study seeks to generate significant insights into the complex interplay of factors shaping rental affordability by analyzing socioeconomic and physical variables.

Variables

Dependent Variable: Rental affordability (reported rent cost).

Independent Variables:

Socioeconomic variables: Age group, Education level, Income, Rent cost, Gender, Marital status, Occupation, Household size, Number of rooms, Tenure status (rent or ownership), House ownership, and Length of stay.

Physical variables: Proximity to the workplace, Proximity to the city center, Proximity to schools, Proximity to healthcare, Access to public transport, Access to amenities, Number of rooms, Housing type, Satisfaction with house odor, Location suitability for living.

The analysis began with a reliability assessment using Cronbach's alpha to ensure consistent measurement of the constructs. Next, a correlation analysis was conducted to evaluate the interrelationships between the independent variables, identifying potential multicollinearity. A multiple regression analysis was then performed to determine significant predictors of rental affordability, with reported rent cost as the dependent variable. Key regression assumptions, such as linearity, normality, and independence of errors, were tested. This approach provided insights into the key factors influencing rental costs, enhancing understanding of the rental market dynamics.

Analysis Tool

The survey data was compiled using Excel 2021, and the statistical analysis, particularly the regression and correlation sections, was conducted using SPSS version 26.

DATA ANALYSIS AND RESULT

Table 8: Summary Table of The Rent Expenditure By Age Groups

Age Group	Total Respondents	% of Total	Range of Rent Amounts	Most Common Rent
18-25	9	8.7%	5000 - 32000	14000, 18000
26-35	28	26.9%	4000 - 28000	8000, 15000, 17000
36-45	28	26.9%	9000 - 29000	15000, 20000, 22500
45 or Older	39	37.5%	8000 - 35000	15000, 18000, 25000
Total	104	100%		

This crosstabulation reveals important insights into accommodation preferences, financial capabilities, and the housing choices of different age demographics. The survey analyzed rent spending among 104 respondents across four age groups (18-25, 26-35, 36-45, 45 or older), revealing rent amounts from 4000 BDT to 35000 BDT. Younger respondents (18-25, 8.7%) paid lower rent, while the 45 or older group (37.5%) had higher expenditures, including exclusive high values like 35000 BDT, suggesting greater financial stability or housing needs. Middle-aged groups (26-35, 36-45) had diverse spending patterns, with common values like 8000 BDT and 12500 BDT. Rent spending increased with age, reflecting differing financial capacities and accommodation preferences.

Reliability Test

Cronbach's alpha is a way of assessing reliability by comparing the amount of shared variance, or covariance, among the items making up an instrument to the amount of overall variance (Cronbach, 1951). First, two reliability tests were conducted, where an analysis was performed on 35 determinants to measure Determinants of Residential Quality and Rental Affordability for Middle-Income Households in Dhaka, likely using a combination of proximity metrics and Likert-scale items. In the first analysis, which included 35 items, the scale demonstrated suboptimal internal consistency, with a Cronbach's Alpha of 0.637. After removing one item (likely the question about proximity to the city center, as it is absent in the second analysis), the revised 34-item scale showed a marginal improvement in reliability ($\alpha = 0.692$), though it still fell short of the widely accepted threshold of 0.7 for unstandardized scores. Notably, the standardized Cronbach's Alpha values (0.842 and 0.851 for 35 and 34 items, respectively) were significantly higher, suggesting inconsistencies in the scaling or measurement of items—for instance, some questions assessed objective proximity (e.g., distance to schools or workplaces), while others focused on subjective satisfaction (e.g., cleanliness of corridors or noise levels). Removing 3 additional items (down from 35 to 32) likely addressed poorly performing questions (e.g., misfitting items or those with low inter-item correlations). This adjustment resolved earlier reliability concerns, where Alpha was suboptimal at 0.637–0.692. The scale is now reliable enough for exploratory use, but caution is needed when interpreting results due to mixed item types.

The updated reliability statistics indicate significant improvement after refining the scale. With 32 items retained, the unstandardized Cronbach's Alpha now reaches 0.736, exceeding the conventional threshold of 0.7, which suggests acceptable internal consistency for the scale. The standardized Cronbach's Alpha remains strong at 0.853, reinforcing that the scale's reliability improves when accounting for differences in item scaling (e.g., Likert-type satisfaction items vs. proximity-based metrics).

Table 9: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.736	0.853	32

Table 10: Determinants Of Rental Affordability

SL	Determinants	Description
A.	Public Transport	How easily accessible is public transport from your location?
B.	Schools	How far is the nearest school from your residence?
C.	Healthcare Facilities	How far is the nearest healthcare facility from your residence?
D.	Persons In House	Total number of people currently living in your house
E.	Sanitation	How would you rate the sanitation condition in your residential area?
F.	Commuting Cost	How much does it cost for commuting to and from your residence?
G.	Workplace	How far is your workplace from your residence?
H.	Urban Facilities	How far are essential urban facilities (e.g., shopping centers) from your home?
I.	Security	How safe are children from accidents in your residential complex?
J.	Accident Prevention	How well are accident prevention measures implemented for children in your complex?
K.	Lighting	How well-lighted are the rooms?

L.	Stairs	What is the condition of stairs and corridors (clean, width, accessibility) in your building?
M.	Car's Parking	How many cars can be parked in your building's parking area?
N.	Living Area	How spacious is the living area?
O.	Dining Space	How much space is available for dining?
P.	Kitchen Space	How spacious is the kitchen?
Q.	Bedrooms	How many bedrooms are available?
R.	Ventilation	How well-ventilated is your house?
S.	Cleanliness	How clean is the corridor in your building?
T.	Safe Staircases	How safe are the staircases in your residential building?
U.	Lift	How accessible and functional is the lift in your residential building?
V.	Service	How efficient is the waste collection service in your residential complex?
W.	Play Areas	Are there enough public play areas for children in your community?
X.	Noise Levels	How quiet or noisy is your neighborhood?
Y.	Monthly Charges	What are the charges and cleaning arrangements in your neighborhood?
Z.	City Center	How far is your residence from the nearest city center?
AA.	Hospital	How far is the nearest hospital from your residence?
BB.	Maintenance	How well-maintained are the common areas by the landlord?
CC.	Emergency Services	Is there access to emergency repair services available 24/7?
DD.	Electricity	Is there a reliable backup electricity system in your residence?
EE.	Design	How well-designed is your building?

Correlation

Spearman's rank correlation coefficient or Spearman's ρ, named after Charles Spearman. Spearman's correlation assesses monotonic relationships (whether linear or not). If there are no repeated data values, a perfect Spearman correlation of +1 or −1 occurs when each of the variables is a perfect monotone function of the other (Spearman, 1904). We perform Spearman's correlation over other correlation methods (like Pearson's correlation) when we want to measure the strength and direction of a monotonic relationship between two variables. Moreover, Spearman's correlation is ideal for ordinal (Stevens, 1946).

Table 11: Spearman's Rho Correlation Coefficients Among A Variety Of Variables Related To Housing Conditions, Satisfaction With Residential Facilities, And Neighborhood Attributes.

Pair	Correlation
A - B	0.282**
A - EE	-0.196*

B - C	0.264**
C - I	-0.261**
D - B	-0.220*
D - D	0.224*
D - E	0.261**
D - I	0.237*
E - G	0.310**
E - H	0.404**
E - I	0.423**
F - I	0.428**
G - L	0.320**
H - H	0.310**
I - J	0.444**
J - K	0.308**
L - M	0.363**
M - J	0.489**
N - J	0.489**
O - P	0.373**
P - Q	0.272**
Q - K	0.394**
R - D	0.428**
S - J	0.335**
T - L	0.349**
U - L	0.406**
V - G	0.493**
W - E	0.411**
X - CC	0.335**
Y - J	0.483**
Z - C	0.516**

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

The Spearman's rho correlation table presents the relationships between various residential, environmental, and affordability-related variables in a housing context. Each variable, such as access to public transport, proximity to schools, or Residential Quality of sanitation, is compared against others to determine how closely they are related. The strength of these relationships is measured through correlation coefficients, where positive values indicate that as one factor improves, the other tends to improve as well. Conversely, negative values suggest an inverse relationship.

Significance markers are also present in the table: correlations marked with an asterisk (*) are significant at the 0.05 level, meaning there is less than a 5% probability that the result is due to chance. Double asterisks (**) indicate a stronger level of significance at the 0.01 level, reducing the likelihood of chance to below 1%. Blank or missing values imply either no significant correlation or insufficient data to establish a meaningful relationship.

Several key patterns emerge from this data. Firstly, accessibility-related variables show moderate to strong positive correlations. For example, access to public transport correlates positively with proximity to schools (r = .282**), and proximity to schools also correlates with proximity to healthcare facilities (r = .264**). This suggests that well-connected neighborhoods tend to offer multiple conveniences clustered together.

The data also highlight how financial and logistical concerns affect Rental Affordability. Commuting costs, for example, show a strong positive correlation with the distance to workplaces (r = .516**), implying that the farther individuals live from their jobs, the more they spend on transportation. This insight could be particularly useful for urban planners aiming to reduce commuting burdens.

Residential Quality in living conditions reveals deeper interconnections. Variables such as sanitation, space lighting, and corridor cleanliness tend to correlate strongly with one another. For instance, Residential Quality of sanitation shows significant positive relationships with space lighting (r = .404**) and the Residential Quality of stairs and corridors (r = .423**). This pattern suggests that improving one aspect of a residential building's maintenance or design often enhances overall Residential Quality for residents.

Location factors, such as distance to urban facilities, also reveal correlations with safety and infrastructure. A notable example is the significant correlation between distance to urban facilities and Residential Quality of security measures for children (r = .335**), indicating that better-located residential complexes tend to offer superior safety features.

Additionally, household infrastructure shows interconnected Residential Quality patterns. Residential Quality of kitchen space, bedroom space, and living area are all strongly correlated, implying that residents who are happy with one aspect of their home environment tend to rate other areas highly as well. For example, Residential Quality of kitchen space strongly correlates with bedroom Residential Quality (r = .277**), suggesting a broader perception of housing quality rather than isolated appreciation for specific rooms.

Maintenance services and infrastructure provisions significantly impact overall Residential Quality. Elements like the maintenance of common areas, emergency repair availability, and backup electricity provision show strong correlations with various aspects of Residential Quality. For instance, Residential Quality related to backup electricity provision has a significant positive correlation with the entrance design of the building (r = .517**), highlighting how infrastructure reliability can influence perceptions of overall housing quality.

Broadly speaking, the table illustrates that Residential Quality and Rental Affordability are multifaceted and interconnected. Factors such as accessibility, infrastructure quality, maintenance services, and spatial design contribute collectively to residents' experiences. The data suggest that improvements in one area—whether sanitation, lighting, or maintenance—can have a ripple effect, positively influencing overall Residential Quality and Rental Affordability. For policymakers, building managers, and urban planners, this table underscores the importance of a holistic approach to housing quality and infrastructure development, where enhancing multiple factors simultaneously can yield the greatest improvements in residents' quality of life.

Multiple Liner Regression

Multiple regression analysis is a statistical technique used to model the relationship between a dependent variable and two or more independent variables. This method allows researchers to understand how several factors simultaneously influence an outcome, providing a more comprehensive view than simple linear regression, which only considers one predictor.

$$Y=\beta0+\beta1X1+\beta2X2+...+\betanXn+\epsilon$$

Where:

1. YYY is the dependent variable,
2. X1,X2,...XnX_1, X_2, ... X_nX1,X2,...Xn are the independent variables,
3. β0\beta_0β0 is the intercept,
4. β1,β2,...βn\beta_1, \beta_2, ... \beta_nβ1,β2,...βn are the coefficients of the predictors,
5. ϵ\epsilonϵ is the error term.

Each coefficient (β\betaβ) represents the change in the dependent variable for a one-unit change in the respective independent variable, holding all other variables constant. The dependent variable in this analysis is the "money spent on rent," and the predictors (independent variables) include a range of factors that might affect how much individuals or households pay for their living space.

Assumption 01: Linear Relationship (Figure 03)

The scatterplot illustrates the relationship between the Regression Standardized Predicted Value (on the x-axis) and the amount of money spent on rent (on the y-axis). This plot demonstrates a positive linear relationship between the two variables. As the standardized predicted values increase, the amount spent on rent also tends to rise. This pattern is indicative of a linear relationship, where higher predicted values correlate with higher rent expenditures. The straight line in the plot, which represents the regression line, shows a clear upward slope, further reinforcing the presence of a linear relationship. Overall, the scatterplot reveals a moderately strong positive linear relationship, where increasing predicted values are associated with an increase in the amount spent on rent.

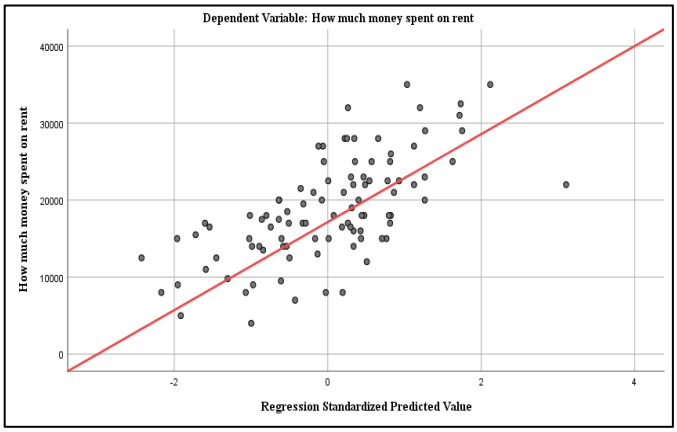

Figure 3: Analysis of the Linear Relationship Between Predicted Values and Rent Expenditure

Assumption 02: Autocorrelations

The Durbin-Watson value of 1.691 tests for autocorrelation in the residuals (errors of the prediction). The acceptable range for the Durbin-Watson test is 1.5 to 2.5, where a Durbin-Watson value closer to 2 indicates a

lower level of autocorrelation (Turner, 2019). Since 1.691 is close to 2, this suggests that there is no strong autocorrelation in the residuals, meaning the model is likely making independent predictions without systematic bias over time.

Assumption 03: Homoscedasticity (Figure 04)

The scatterplot provided represents the relationship between the Regression Standardized Predicted Value (x-axis) and the Regression Standardized Residual (y-axis).

1) Random Distribution of Residuals: The residuals are distributed randomly around the horizontal line at zero. This is an indication that the regression model does not exhibit any systematic errors, and the residuals are not following a specific pattern. This randomness suggests that the model is appropriate for the data, without significant bias in the predictions.

2) Even Spread of Residuals: The residuals appear to be evenly spread across the range of predicted values, meaning the variance of the residuals is consistent. This implies that the assumption of homoscedasticity (constant variance of residuals) holds, which is a key assumption for linear regression.

3) Centered Around Zero: The residuals are mostly centered around zero, showing that, on average, the model's predictions are accurate.

Assumption 04: Normal Distribution

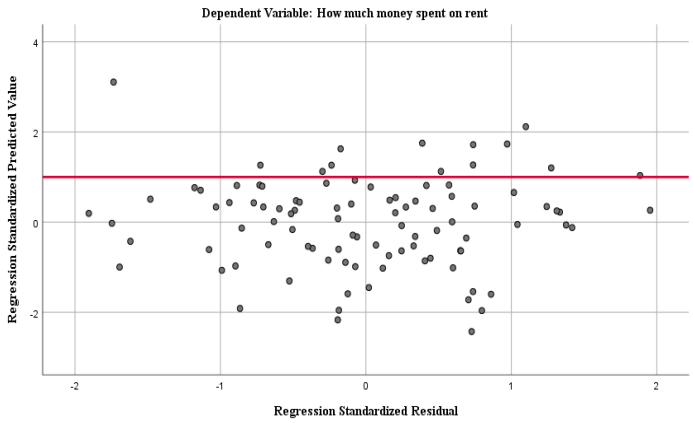

Figure 4: Residual Plot Analysis: Evaluating the Regression Model

1) Histogram of Regression (Figure 05): The histogram displays a roughly normal distribution of residuals, as evidenced by the bell-shaped curve (fitted by the red line). This suggests that the errors in the regression model are approximately normally distributed, which is an assumption of linear regression. The mean of the residuals is close to zero (2.81E-16), indicating no systematic bias in the model. The standard deviation (0.835) reflects the spread of the residuals, showing the typical error made by the model.

2) Normal P-P Plot (Figure 06): In the Normal P-P plot, the points should ideally lie close to the red diagonal line, which represents the expected cumulative probability if the residuals were perfectly normal. From this plot, it can be seen that the points largely follow the line, with only slight deviations near the extremes. Since the majority of the points closely align with the red line, this suggests that the residuals are normally distributed.

Assumption 05: Multicollinearity (Table 14)

VIF values are mostly under 5, which suggests that multicollinearity is not a significant issue in your model. Generally, a VIF above 4 or tolerance below 0.25 indicates that multicollinearity might exist, and further investigation is required. When VIF is higher than 10 or tolerance is lower than 0.1, there is significant multicollinearity that needs to be corrected (G. James et al., 2021). However, some variables show relatively higher values, which may be worth further checking for potential multicollinearity.

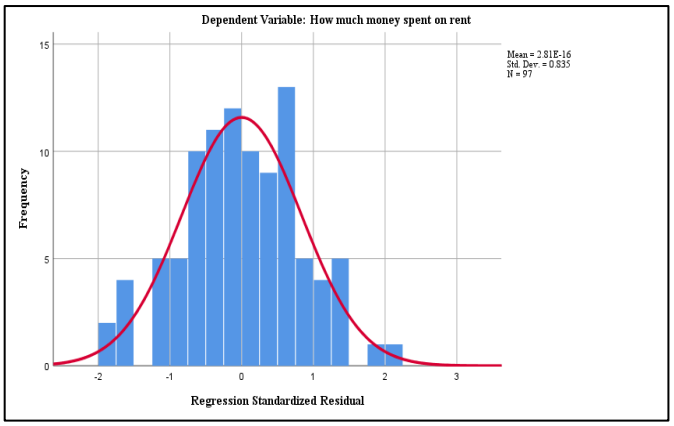

Figure 5: This histogram shows the distribution of residuals

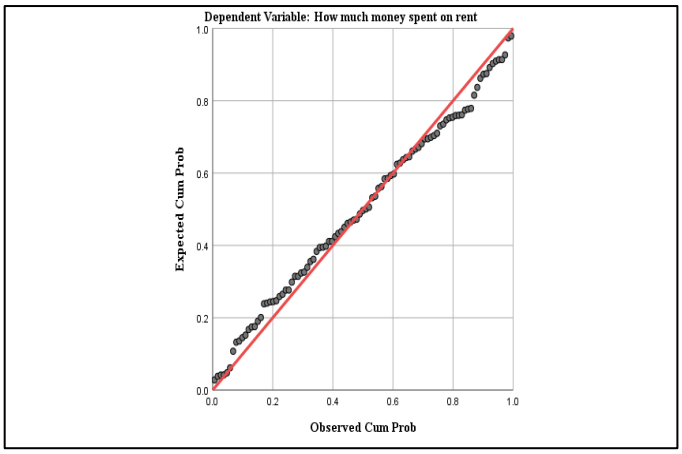

Figure 6: Normal P-P Plot of Regression Standardized Residuals

Model Summary

The model is explaining around 43% of the variation in the amount of money spent on rent. The predictors (various factors related to satisfaction with housing and amenities) contribute to predicting rent spent, but the model's predictive power could likely be improved with either more relevant predictors or a different modeling approach. The Durbin-Watson statistic indicates that autocorrelation is not a major issue in the residuals.

A. R (0.658): This represents the correlation between the observed and predicted values of the dependent variable. A value of 0.658 suggests a moderate positive correlation.

B. R Square (0.433): This shows that 43.3% of the variation in the rent spent is explained by the independent variables in the model. This is a decent proportion, but there is still a significant amount of unexplained variance.

Table 12: Multiple Regression Analysis Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
0.658	0.433	0.188	6064.848	1.691

ANOVA

The F-statistic of 1.767 suggests that the model, as a whole, has some explanatory power but isn't a perfect fit. The p-value of 0.029 confirms that the model is statistically significant at the 5% level, indicating that the predictors collectively help explain variation in rent expenditure.

Table 13: Anova Table For Multiple Regression Analysis

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1884514771.805	29	64983267.993	1.767	.029
Residual	2464419661.185	67	36782383.003		
Total	4348934432.990	96			

Factors Influencing Rent Expenditure

The regression model elucidates key determinants influencing rental expenditure, identifying both positive and negative associations among housing attributes. Statistically significant predictors ($p < 0.05$) include satisfaction with stairway/corridor conditions, kitchen spaciousness, ventilation quality, and backup electricity reliability. The results are interpreted as follows:

Positive Associations with Rent Expenditure

1) Stairway/Corridor Conditions (cleanliness, width, accessibility): A one-unit improvement in resident satisfaction with these features corresponds to a 2,323.33 Taka increase in rent ($\beta = 2323.333$, $p = 0.009$). This suggests that properties with well-maintained communal stairways and corridors command higher rental prices.

2) Kitchen Spaciousness A one-unit improvement in resident satisfaction with kitchen space is associated with a 2,144.07 Taka rise in rent ($\beta = 2144.074$, $p = 0.045$), indicating that tenants may prioritize larger or more functional kitchen areas.

Negative Associations with Rent Expenditure

1) Ventilation Quality: A one-unit decline in satisfaction with ventilation (i.e., poorer perceived ventilation quality) is associated with a 2,494.04 Taka decrease in rent expenditure ($\beta = -2494.037$, $p = 0.034$). This indicates that tenants are willing to pay less for properties with inadequate ventilation systems, aligning with intuitive expectations. Poor ventilation likely reduces the perceived value of a property, leading to lower rental prices.

2) Backup Electricity Reliability: A one-unit decline in satisfaction with backup electricity reliability (i.e., less reliable power backup systems) correlates with a 2,173.98 Taka decrease in rent ($\beta = -2173.981$, $p = 0.029$). This suggests that unreliable electricity infrastructure negatively impacts rental costs, as tenants may discount rent for properties lacking dependable backup power, reflecting the importance of utilities in housing valuation.

Table 14: Multiple Regression Analysis of Factors Influencing Rent Expenditure

Model	Unstandardized Coefficients		Sig.	VIF
	B	Std. Error		
Transport	16.797	178.599	.925	1.942
Person	341.895	523.961	.516	1.726
Sanitation	434.212	1244.272	.728	2.494
Comt. Cost	636.993	963.042	.511	2.370
Dis Work	***-59.490***	***948.777***	***.950***	***1.910***

Dist. Urban Faclts	1182.297	995.444	.239	2.185
Child Security	-1024.255	847.994	.231	2.200
Child Accident	-726.752	869.835	.406	1.918
Light	-1258.932	707.822	.080	1.714
Stair Corri	***2323.333***	***859.930***	***.009***	***2.788***
Parking	-644.125	1165.058	.582	3.053
Living	1908.964	1452.090	.193	3.366
Dining	176.733	999.578	.860	2.118
Kitchen	***2144.074***	***1266.930***	***.045***	***2.912***
Bedroom	488.331	1041.677	.641	2.564
Ventilation	***-2494.037***	***1149.739***	***.034***	***2.612***
Clean Corridor	945.787	1001.157	.348	2.933
Stair	-1327.044	803.299	.103	2.986
Lift	-991.617	1067.728	.356	2.172
Garbage	597.488	1052.584	.572	2.463
Public Play Area	-834.470	1003.517	.409	2.902
Noise	888.811	1232.953	.473	2.398
Month Clean	1542.175	944.646	.107	3.009
Near City Cntr	590.948	1062.397	.580	2.364
Hospital	1558.299	1295.419	.233	3.194
Maintenance	-1016.691	1096.515	.357	2.658
Emergency	1962.328	1093.079	.077	3.321
Backup Electricity	***-2173.981***	***972.505***	***.029***	***2.359***
Design	478.664	1236.420	.700	3.381

Overall, most of the predictors in the table here do not show a significant relationship with rent expenditure. This implies that factors such as the number of people in the household, sanitation, commuting costs, and the presence of certain amenities do not significantly influence how much renters are paying. However, some predictors, like **Light (**How well-lighted are the rooms?) **(p = 0.080)** and **Emergency (**Is there access to emergency repair services available 24/7?) **(p = 0.077)**, are close to the significance threshold, suggesting that while their impact is minor, they may still play a small role in rent expenditure.

DISCUSSION

The analysis presented provides valuable insights into the residential quality, rental affordability, and accommodation preferences of households in Dhaka, focusing on various determinants across different age groups and socio-economic factors. This multifaceted investigation offers a comprehensive view of how various

aspects of housing quality are interrelated and how they influence residents' rental expenditures and perceptions of affordability.

Housing Preferences and Age Demographics

The cross-tabulation of rent spending across age groups revealed important trends in housing preferences and financial capacities. The younger group (18-25 years) generally paid lower rents, which could be attributed to limited financial independence or the search for more affordable housing options. Conversely, older individuals (45 or older) exhibited higher rent expenditures, which may indicate greater financial stability or more significant housing needs, such as larger or better-located properties. These patterns align with common expectations in housing markets, where younger individuals often face constraints due to lower income levels, while older individuals may have more financial flexibility to invest in higher-quality housing.

The middle-aged groups (26-35 and 36-45) exhibited more diverse spending patterns, reflecting a wider range of financial situations and housing choices. While the common rent values of 8000 BDT and 12500 BDT are somewhat indicative of median rental rates in Dhaka's housing market, this group's varied spending suggests a mixture of lifestyle choices, family needs, and perhaps proximity to work or schools.

Reliability and Validity of Measures

The reliability test conducted using Cronbach's Alpha indicates that while the initial scale (35 items) demonstrated suboptimal internal consistency, refinement of the scale (removal of specific items) improved reliability, with a final Cronbach's Alpha of 0.736. This suggests that the measurement tool, after adjustments, is suitable for exploratory use. The improvement in reliability supports the idea that a well-constructed, properly tested scale can provide a more accurate representation of residents' perceptions of housing quality and rental affordability.

However, the discrepancy between unstandardized and standardized Cronbach's Alpha values points to inconsistencies in the way items were scaled. This highlights a crucial issue in survey design: questions measuring objective factors (e.g., proximity to public transport or schools) and subjective factors (e.g., satisfaction with cleanliness or security) may require different treatment or weighting. Therefore, while the reliability of the tool is now acceptable, further refinements could still be made to ensure the consistency of responses across different item types.

Correlation Insights

The Spearman's rank correlation results provide additional depth by highlighting how various residential and environmental factors correlate with one another. The strong positive correlation between access to public transport and proximity to schools ($r = .282^{**}$) suggests that neighborhoods with better transportation options tend to be better connected in terms of essential services, making them more attractive for families. Similarly, the positive relationship between sanitation quality and space lighting ($r = .404^{**}$) indicates that improvements in basic maintenance often correspond to better overall perceptions of housing quality.

The analysis also reveals the significant impact of commuting costs on rental affordability. The strong correlation between commuting costs and distance to workplaces ($r = .516^{**}$) suggests that individuals who live farther from their workplaces face higher transportation costs, which in turn affects their overall rental affordability. Urban planners can use this information to target areas with high commuting costs and improve transportation infrastructure to alleviate some of these financial burdens.

Residential Quality and Infrastructure

The relationships between various aspects of residential quality (e.g., sanitation, space, lighting, and safety) point to an interconnected web of factors that influence residents' overall satisfaction with their housing. For instance, the strong correlation between the cleanliness of corridors and the safety of staircases ($r = .423^{**}$) suggests that the physical maintenance and safety of common areas are often perceived as a package, with improvements in one area reflecting positively on other areas. This finding underscores the importance of a holistic approach to

housing management, where all aspects of the residential environment are addressed simultaneously to improve the overall quality of life for residents.

Maintenance services also emerged as a critical factor influencing residents' perceptions of housing quality. Variables such as the maintenance of common areas, emergency repair availability, and backup electricity provision were found to significantly correlate with other residential quality factors. These results point to the fact that well-maintained infrastructure directly impacts tenants' comfort and satisfaction, with potential implications for policy and urban development strategies.

Multiple Linear Regression

The multiple linear regression model reinforces the understanding that various independent variables—such as distance to public transport, access to healthcare, and residential quality—play a significant role in determining rent expenditure. The model's assumptions were generally met, indicating that the linear regression approach is appropriate for this analysis. The Durbin-Watson statistic of 1.691 indicates no strong autocorrelation, ensuring that the predictions are independent of one another. Moreover, the homoscedasticity assumption was met, suggesting that the variance in the residuals remains consistent, which further supports the validity of the regression model.

However, while the regression model showed a strong positive linear relationship between rent expenditure and predicted values, further exploration of interaction effects or non-linear relationships may provide a more nuanced understanding of how various factors jointly affect rental prices and housing affordability. For example, certain location-based factors (like proximity to the city center) could have a compounding effect on rent expenditure, which may not be captured in a linear model.

POLICY RECOMMENDATIONS

To improve housing affordability and quality in Dhaka, several policy interventions are needed. First, affordable housing programs should be targeted at younger renters (18-25 years) through rent subsidies or low-interest loans. Mixed-income housing developments can cater to diverse financial needs across middle-aged groups (26-45 years). Enhancing public transportation accessibility will reduce commuting costs and make housing more affordable, especially in areas with better transport links. Maintenance incentives for property owners can improve residents' satisfaction by ensuring the upkeep of common areas.

Additionally, urban planning should focus on reducing commuting distances by developing mixed-use zones. Rent control policies and housing subsidies are needed to address socio-economic disparities, ensuring housing is accessible to low-income groups. Improved data collection and more reliable housing surveys can guide future policies, while strengthening regulatory frameworks for housing quality would ensure consistent standards.

The study also highlights key factors that influence rent expenditure, such as the condition of stairs and corridors, kitchen space, and ventilation. Policymakers should incentivize property developers to invest in improving these aspects of residential quality. In particular, improving the condition of common areas like stairs and corridors and ensuring better kitchen facilities can justify higher rent prices while increasing tenant satisfaction. Conversely, dissatisfaction with ventilation and backup electricity systems correlates with higher rent costs. Ensuring reliable ventilation and backup electricity can help prevent residents from incurring additional costs, improving housing quality overall.

LIMITATION

In multiple regression, using a small sample (104) from a large population (34 million) presents several limitations. First, there is low statistical power, making it harder to detect true relationships and increasing the risk of errors. The model may also suffer from overfitting, where it captures noise instead of real patterns. Regression estimates can be unreliable, with results varying greatly due to small sample sizes. Additionally, small samples may lead to bias, and multicollinearity can be harder to detect, distorting results. Lastly, with

many predictors, the model may become overly complex, resulting in inflated coefficients and misleading conclusions.

While this study has limitations, this study represents the first attempt to explore rental affordability in such a context, aiming to develop a comprehensive scale for measuring it. In doing so, it seeks to establish a correlation between key variables and apply regression analysis to identify potential causal relationships. The goal is to lay the foundation for future research by providing a framework that can be refined and expanded upon in subsequent studies. This initial effort will offer valuable insights into the factors affecting rental affordability and serve as a stepping stone for more precise, targeted analysis in the future.

CONCLUSION

This study provides valuable insights into the relationship between housing quality, rental affordability, and socio-economic factors in Dhaka, Bangladesh. The findings suggest that housing policies and urban planning efforts should focus on enhancing infrastructure, particularly transportation and sanitation, to alleviate financial burdens on residents. Improved access to public transport and better-maintained common areas could reduce commuting costs and increase satisfaction with housing conditions, thus improving affordability.

The analysis also highlights the importance of considering the interconnected nature of residential factors. For example, improvements in sanitation or safety often correspond with better overall perceptions of housing quality. This suggests that addressing one aspect of housing quality can lead to broader improvements in other areas, benefiting residents as a whole. From a policy perspective, this study recommends focusing on low-income groups and younger residents, who may face disproportionate challenges in accessing affordable and quality housing. Additionally, a more nuanced understanding of how proximity to work or schools impacts rental expenditures could help inform future urban development and transport policies. The reliability of the measurement tool used in this study, though acceptable after refinements, suggests that further testing and scale development could enhance the precision of future research in this area. The multiple linear regression model used in this study provided valuable insights into the factors that influence rent expenditures, yet further investigation into non-linear relationships and interaction effects could offer a deeper understanding of the complex dynamics at play in Dhaka's housing market.

This study underscores the need for a comprehensive, multi-faceted approach to improving housing affordability and quality in Dhaka, considering the diverse needs of different demographic groups and the interdependence of various housing quality factors. Future research should focus on refining the measurement tools and exploring additional variables that could influence housing dynamics in urban settings like Dhaka.

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