

Effects of the Spatial and Socio-Demographic Attributes of the Residential Environment on Life Satisfaction: A Case Study of Jeddah, Saudi Arabia

Khalid N. Mandeli & Mohamed M. H. Maatouk*

*Department of Urban and Regional Planning,
 Faculty of Architecture and Planning, King Abdulaziz University, Jeddah 21589, Saudi Arabia*

*Corresponding author: mmaatouk@kau.edu.sa

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ABSTRACT

Despite extensive research on the association between life satisfaction and city-level economic, socio-demographic, and management variables, few studies have explored the spatial and socio-economic aspects of neighbourhood environments, particularly in developing countries. This study aims to fill this gap by investigating the determinants of life satisfaction, with a focus on the impact of various neighbourhood environment aspects on residential satisfaction and overall subjective well-being in Jeddah, Saudi Arabia. A comprehensive residential satisfaction survey was conducted in 2020, involving 405 randomly selected households from 14 neighbourhoods. Using an ordinal logistic regression model, the study analyzed the perceived significance of physical and socio-demographic attributes in residential areas. The findings reveal 24 key determinants of both overall life satisfaction and residential satisfaction, classified into four primary dimensions: demographic attributes, housing characteristics, the physical environment of the neighbourhood, and the social environment. Additionally, the study established a significant association and mutual relationship between life satisfaction and residential satisfaction. This research contributes to the theoretical debate and empirical research on life satisfaction by highlighting the crucial role of the residential environment in predicting overall subjective well-being. It underscores the importance of integrating life satisfaction into policies aimed at enhancing the residential environment. The implications of this study suggest that urban planners and policymakers need to prioritize improving neighbourhood conditions to enhance the quality of life for residents, particularly in developing urban contexts. By addressing these determinants, cities can foster environments that promote higher life satisfaction and well-being among their inhabitants.

Keywords: Life satisfaction; subjective wellbeing; residential satisfaction; Jeddah; Saudi Arabia

INTRODUCTION

Emerging economies have experienced rapid economic growth and population expansion, resulting in significant social and structural transformations in cities. However, despite better living conditions and economic development, many contemporary residential areas have seen a decline in physical and social environmental quality, as well as public amenities and services. This has led to decreased overall life satisfaction among residents and undermined urban policies aimed at enhancing societal progress and quality of life (Mandeli 2018; Li et al. 2019; Thabet et al. 2023).

The literature on life satisfaction presents conflicting views on the relationship between income and life

satisfaction. Some researchers (e.g., Ngamaba et al. 2020) find a positive association, while others (e.g., Xie and Zhou 2014) suggest a negative one, especially in developing countries. Income inequality exacerbates the adverse effects of economic expectations on subjective well-being. Recent research confirms that economic development does not necessarily maximize life satisfaction, and although living in affluent cities may decrease life satisfaction for some, many still wish to reside in these cities (Proto and Rustichini 2014).

Psychological literature proposes two theoretical frameworks to explain life satisfaction: bottom-up and top-down theories. Bottom-up theory links overall life satisfaction to satisfaction with various life domains, with objective conditions and preferences indicating overall

satisfaction (Headey 2014). In contrast, top-down theory views life satisfaction as an immutable trait determined by dispositional factors such as genetics and personality traits, arguing that it cannot guide public policy-making (Malvaso and Kang 2022).

The debate on these theories and the association between income and subjective well-being raises questions about the determinants of life satisfaction. Life satisfaction is crucial for subjective well-being, and its determinants, including health, safety, social status, economic level, social milieu, environmental context, and housing condition, need exploration to formulate effective urban policies (Maddux 2018). Early research recognized residential satisfaction as a key determinant of life quality, emphasizing the importance of neighborhood satisfaction in improving life satisfaction (Aigbavboa and Thwala, 2018; Mouratidis and Yiannakou 2022).

While many studies have examined life satisfaction in relation to city-level variables, few have considered the spatial and socio-economic aspects of neighborhood environments, especially in developing countries (Cao 2016; Ma et al. 2018; Al-Khraif et al. 2019; Mouratidis and Yiannakou 2022). To address this gap, this study uses Jeddah as a case study to explore the determinants of life satisfaction in cities of emerging economies.

This article contributes to theoretical debates on life satisfaction and the role of the residential environment. It builds on earlier foundations (Maatouk et al. 2008; Mandeli 2018) to address the impact of modernist planning, economic growth, and socio-demographic transformation on residential quality in emerging cities. The study addresses the following questions:

1. How do inhabitants in Jeddah perceive the quality of their residential areas?
2. Which physical and socio-demographic attributes are most important in determining residential satisfaction and overall subjective well-being?
3. How should policymakers promote urban policies that enhance residential satisfaction?

Using a bottom-up theory of satisfaction, this study explores the impact of subjective and objective neighborhood variables on satisfaction and well-being. Data from a residential satisfaction survey conducted in Jeddah in 2020 was analyzed using an ordinal logistic regression model to evaluate the impact of demographic, social, physical, and housing variables on life satisfaction. The study highlights the importance of integrating life satisfaction into policies aimed at improving residential environments.

This study makes two contributions to the literature on residential satisfaction. Firstly, it considers both

objective and subjective qualities of neighborhoods, including social life, safety, and security, on residential satisfaction and well-being. Secondly, it addresses the debate between top-down and bottom-up theories by examining which indicators of residential areas are most significant in determining life satisfaction. Using a holistic theoretical framework and empirical data from Jeddah, the study employs an ordinal logistic regression model to statistically evaluate the variation in the perceived impact of physical and socio-demographic attributes on satisfaction and well-being.

LITERATURE REVIEW

TOP-DOWN VS BOTTOM-UP THEORIES OF LIFE SATISFACTION

Life satisfaction, often synonymous with overall happiness and quality of life, has been studied for nearly a century. Researchers have explored its determinants, including demographic attributes like income, gender, and marital status (Maddux 2018; Ackerman 2018). Theoretical and empirical studies have examined life satisfaction's multifaceted nature (Ma et al. 2018; Al-Khraif 2019; Mouratidis & Yiannakou 2022; Thabet et al. 2023).

Two main theoretical approaches explain life satisfaction:

1. **Top-down Theory:** This theory posits that personality and temperamental factors primarily determine life satisfaction. Advocates argue that genetic predispositions account for up to 50% of the variance in current life satisfaction and 80% in long-term variance (Headey 2014; Malvaso & Kang 2022). Critics suggest this approach offers limited insight for public policy development (Lucas 2004).
2. **Bottom-up Theory:** This perspective asserts that life satisfaction results from satisfaction across various life domains, including health, living standards, housing, employment, income, social integration, and leisure. It emphasizes the impact of environmental contexts and events on individual satisfaction (Ma et al. 2018; Ackerman 2018; Mouratidis 2021; Thabet et al. 2022).

RESIDENTIAL SATISFACTION AS A KEY INDICATOR OF LIFE SATISFACTION

Residential satisfaction, defined as the perceived gap between desired and actual neighborhood conditions, is a significant predictor of life satisfaction. It involves both

objective attributes (housing conditions, public services, geographical location) and subjective attributes (neighborhood density, safety, social interaction) (Aigbavboa & Thwala 2018; Gocer et al. 2023; Thabet et al. 2023). Studies indicate that subjective evaluations, such as neighborhood design and social cohesion, have a greater impact on residential and overall life satisfaction than objective factors (Cao 2016; Ma et al. 2018; Mouratidis & Yiannakou 2022; Thabet et al. 2023).

CONCEPTUAL FRAMEWORK OF RESEARCH

Recent research adopts a holistic approach, considering both subjective and objective neighborhood variables in understanding life satisfaction (Headey, 2014; Ma et al. 2018; Thabet et al. 2022). The tripartite model of residential satisfaction suggests that satisfaction is influenced by housing quality, neighborhood state, and social environment (Canter, 2012; Li & Wu, 2013). Socio-demographic factors like age, gender, and marital status significantly correlate with residential satisfaction (Mridha, 2020; Becker & Trautmann, 2022; Blanchflower & Oswald, 2004). Housing quality and neighborhood characteristics also play crucial roles (Addo, 2016; Li et al. 2019).

Subjective measures, including social ties and safety, strongly correlate with life satisfaction (Sirgy & Cornwell 2002; Liu et al. 2017; Donga & Qimb 2017). Both subjective and objective assessments of residential attributes significantly impact overall life satisfaction, varying by socio-demographic characteristics and cultural preferences (Ma et al. 2018; Li et al. 2019; Thabet et al. 2023). Our conceptual framework is based on the bottom-up theory, suggesting that improvements in multiple life domains can enhance overall life satisfaction. It integrates the tripartite model to capture the effects of socio-demographic characteristics, neighborhood quality, and socio-environmental attributes on residential satisfaction.

METHODOLOGY

CONTEXT OF THE STUDY

Jeddah, the second-largest city in Saudi Arabia, has experienced significant transformations due to rapid urbanization and demographic growth since the 1970s. These changes have intensified following substantial government investments in infrastructure (Addasa and Rishbeth 2018). The diverse nature of individual districts and the deteriorating state of buildings and public amenities in residential areas have led original residents to relocate, attracting others seeking lower rental prices. This

demographic shift has increased the presence of strangers and passers-by in outdoor areas, heightening perceptions of vulnerability to criminal and anti-social behavior. These neighborhood changes pose challenges to general life satisfaction, underscoring the need to understand residents' preferences and attitudes towards their city and residential environments.

DATA COLLECTION

An empirical survey conducted in Jeddah in January 2020 aimed to explore residents' satisfaction with the residential environment and examine how satisfaction with various features of residential environments affects overall subjective well-being. The participants were residents of high-density, medium-density, and low-density residential districts, allowing for the examination of the impact of socio-demographic composition and spatial attributes on residents in different districts. Jeddah is divided into districts, the basic administrative unit and smallest spatial area, with population and census data available through urban observatories in local municipalities.

SAMPLING PROCEDURE

The 60 residential neighborhoods in Jeddah were divided into three groups based on population density: high, medium, and low. Fourteen residential neighborhoods were then randomly selected from these groups to represent the variation in population densities across Jeddah. The number of participants in the sample was proportionate to the population size of each neighborhood, ensuring a balanced distribution of sampling sites, as illustrated in Figure 1. Quota sampling was used to select participants (householders) for the field survey, with data collected through structured interviews. These interviews were conducted in front of mosques in each neighborhood after prayer times. The survey began with a pilot phase in late December 2019, followed by the main survey in January 2020, lasting three weeks. Quota sampling is similar to stratified sampling, where the researcher considers a particular group of subjects with specific socio-demographic attributes in proportion to what exists in the entire population (Futri et al. 2022).

SAMPLE SIZE DETERMINATION

Following the rules of statistical theory explained by Singh and Masuku (2014), the sample size of residents was

determined to be at least 384 participants. In total, 600 questionnaires were issued in proportion to the total population of each neighborhood, resulting in 405 valid responses. The final selection of actual sampling units (households) aimed to generate a representative sample of the residents from the three types of districts.

VARIABLES AND MEASUREMENT

Based on our theoretical framework, which integrates the tripartite model to capture the effects of socio-demographic characteristics, neighborhood quality (housing features and physical environment), and socio-environmental attributes on residential satisfaction, we identified a set of variables as indicators of the overall quality of life. These included two dependent variables—residential satisfaction and overall life satisfaction—and four groups of independent variables: socio-demographic attributes, housing features, physical environment, and social environment.

1. Dependent Variables (DVs):

- Residential satisfaction
- Overall life satisfaction

2. Independent Variables (IVs):

- Socio-demographic attributes: age, nationality, education, family income, marital status, and employment.
- Housing features: housing type, location, type, and length of tenure.
- Physical environment variables: population density, physical surroundings, neighborhood facilities, infrastructure, air quality, access to recreation areas and parks, distance to shopping, and the convenience of commuting to work.
- Social environment attributes: socio-economic settings of a neighborhood, the intensity of social ties such as family, friends, and relatives, and safety and security measures.

Participants were asked to register their satisfaction with these variables on a five-point Likert scale, with one indicating ‘extremely dissatisfied’ and five indicating ‘very satisfied’.

DATA ANALYSIS

Two statistical techniques were used to analyze the data:

1. Descriptive Statistics: To summarize the basic features of the data and provide simple summaries about the sample and measures.

2. Ordinal Logistic Regression Model: To examine the relationship between the independent variables and the dependent variables, particularly focusing on how different aspects of the residential environment impact overall life satisfaction and residential satisfaction.

DESCRIPTIVE STATISTICS

Table 1 summarizes the descriptive statistics of all the variables used in our analysis. The outcome variables measured by the survey questions were self-rated life satisfaction. Participants were asked to evaluate how satisfied they were with their residential environment and life as a whole. As indicated in the table, 84.4% of the participants were satisfied with their lives, and 77.7% were satisfied with the quality of their residential environment. The percentage of participants who reported their life satisfaction and residential satisfaction as ‘neutral’ was 10.9% and 15.3%, respectively. The percentage of participants who reported that their life satisfaction and residential satisfaction were very low was approximately 4.7% and 6.9%, respectively. Notably, the level of satisfaction in the indicators of the physical environment was lower than that in other indicators, ranging between 42% and 59.5%, except for the indicator of the distance to shopping services.

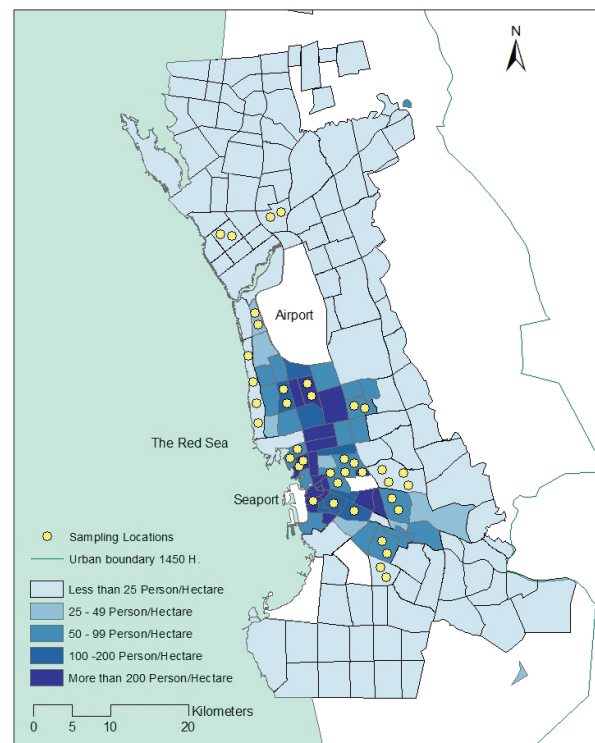


FIGURE 1. Distribution of sampling locations in the study area (Jeddah City).

TABLE 1. Descriptive summaries of variables in the analysis

Variable names	Description	Proportions/ means (sd)
Dependent variables		
Residential satisfaction (%)	1= Very dissatisfied	1.7
	2= Dissatisfied	5.2
	3= Neutral	15.3
	4= Satisfied	44.9
	5= Very satisfied	32.8
Overall life satisfaction (%)	1= Very dissatisfied	2.0
	2= Dissatisfied	2.7
	3= Neutral	10.9
	4= Satisfied	41.7
	5= Very satisfied	42.7
A. Demographic attributes		
Age	Age per years	42.1 (11.7)
Family income (SR)	Family monthly income in Saudi Riyals.	16,390 (11,876)
Income category (%)	1000- 14000	53.1
	15000 - 28000	32.3
	29000- 42000	10.4
	43000- 85000	4.2
Marital status (%)	Married	81.2
Employment (%)	Employed	84.2
Education (%)	Middle and high education	93.3
Nationality (%)	Saudi	84.7
Job satisfaction (%)	Satisfaction with job.	80.7
Income Satisfaction (%)	Satisfaction with family income.	76.0
Home satisfaction (%)	Satisfaction with home	83.5
B. Housing features		
Housing tenure (%)	Owners	58.5
Housing type (%)	Villa	36.0
	Duplex house	6.0
	Public house	9.4
	Apartment	48.6
Tenure length (years)	Length of tenure per years	12.6 (10.6)
C. Physical environment		
Trip to work (%)	Convenience of trip to and from work	59.5
School distance (%)	Convenience of distance from children's school	56.5
Shopping distance (%)	Convenience of distance from shopping services	79.3
Assessment of parks (%)	Good assessment of quality of parks	46.9
Assessment of recreation (%)	Good assessment of recreation services	42.0
Assessment of roads (%)	Good assessment of quality of roads	48.1
Building's satisfaction (%)	Satisfaction with quality of buildings	59.3
Air satisfaction (%)	Satisfaction with quality of air	52.6
Sanitation satisfaction (%)	Satisfaction with quality of sanitation	44.0
Cleanness satisfaction (%)	Satisfaction with level of cleanness	52.8
Population density (%)	High	27.9
	Medium	7.4
	Low	64.7
D. Social environment		
Social life (family) satisfaction (%)	Satisfaction of social relation with family	86.9
Social life (friends) satisfaction (%)	Satisfaction of social relation with friends	79.8
Feeling safety (%)	Feel safe in the neighborhood	95.3

STATISTICAL MODEL

The ordinal logistic regression model was deemed appropriate for analyzing the ordinal data of the life satisfaction questionnaire. Logistic regression requires that data have proportional odds, with each independent variable. The model also requires predictor variables to be independent, not derived from matched data, and not highly correlated. The proportional odds must be linearly related to the predictor variables (Ma et al. 2018). The ordinal regression model is recommended for measuring grouped continuous variables that generate discrete life satisfaction variables and for describing the direction of relationships between predictors of life satisfaction and multiple-domain satisfaction (Lelisho et al. 2022).

The cumulative probability of the dependent variables falling in the *j*th category or below $P(y_{ik,j} \leq j)$ is related to an array of independent variables through the following logit-link model, which articulates the logistic ordinal regression function:

$$\log_e \frac{P(y_{ik,j} \leq j)}{1 - P(y_{ik,j} \leq j)} = \alpha_j - (B_1 X_1 + B_2 X_2 + B_3 X_3 + \dots + B_n X_n) \tag{1}$$

Where

y is the dependent variable, called the observed ordinal responses.

x is the independent variable, called the predictor variable.

B is the logit coefficient (cumulative log odds ratio for a unit increase in the predictor variable).

$P(y_{ik,j} \leq j)$ represents the predicted cumulative probability of the satisfaction level, which is a response falling in a category less than or equal to the *j*th category (*j* = 1, 2, 3, 4).

$y_{ik,j}$ represents the level of satisfaction of individual *i* living in district *k*.

α_j represents the intercept or the threshold.

It was necessary for the model to pass three basic statistical tests—the test of model fit, deviance and parallel lines—to accept its results. Significance should be achieved to reject the null hypothesis in the first test; however, in the remaining two tests, the null hypothesis should be accepted. Furthermore, the analysis of correlations and variance inflation factor (VIF) was implemented, which showed no multicollinearity problems, and all indicators could be included in the model. Initially, all the variables were included in the model, and a dropping process was started for the variables that did not achieve statistical significance; as they were dropped successively, one variable after another, and the resulting effect on the significance level of the remaining variables in the model was observed. Thus, it was possible to create several models and determine the largest number of significant variables. Table 2 shows the results of the four models, where the dependent variable overall life satisfaction was used in the first and second models, and the dependent variable residential satisfaction was used in the third and fourth models.

TABLE 2. Odds ratio from the logistic model of overall life satisfaction and residential satisfaction in Jeddah.

Variable name	Model 1	Model 2	Model 3	Model 4
	Life satisfaction		Residential satisfaction	
Age of householder (years)	1.546**	1.177*	1.692**	1.725**
Family income (by 1000 SR)	1.029	1.030	1.082*	1.089**
Income category (ref. = 43000- 85000)				
1000- 14000	0.212	0.361	0.085	0.078*
15000- 28000	0.318	0.415	0.170	0.143
29000- 42000	0.597*	0.557	0.872	0.753
Marital status (ref. = Divorced)				
Single	8.102*	13.789*	1.576	1.409
Married	11.630*	10.781*	1.082	1.314
Widow	8.687	8.280	6.700	5.950
Job satisfaction (ref. = Very satisfied)				
Satisfied	0.930	0.852	0.888	0.814
Neutral	0.808	0.669	0.862	0.769
Dissatisfied	0.507	0.435	0.423	0.385
Very dissatisfied	3.705*	4.656	1.618	0.940

Variable name	Model 1	Model 2	Model 3	Model 4
	Life satisfaction		Residential satisfaction	
Income Satisfaction (ref. = Very satisfied)				
Satisfied	0.636	0.628	1.012	1.047
Neutral	0.704	0.729	1.373	1.409
Dissatisfied	0.398	0.437	2.447	2.254
Very dissatisfied	7.046*	5.958*	0.526	0.456
Home satisfaction (ref. = Very satisfied)				
Satisfied	0.898	0.957	0.504*	0.540*
Neutral	0.596	0.685	0.864	0.765
Dissatisfied	0.592	0.604	0.307*	0.260*
Very dissatisfied	0.010**	0.022*	2.553	3.415
Neighborhood/Life satisfaction (ref. = Very satisfied)				
Satisfied	0.052***	0.072***	0.075***	0.072***
Neutral	0.041***	0.043***	0.021***	0.018***
Dissatisfied	0.017***	0.020***	0.008***	0.008***
Very dissatisfied	0.011***	0.013***	0.002***	0.002***
Housing type (ref. = Villa)				
Duplex house	0.908	0.999	0.670	0.702
Apartment	0.409	0.399	0.910	0.858
Public house	0.229*	0.366*	0.435*	0.423*
School distance (ref. = Very satisfied)				
Satisfied	0.533	0.660	0.769	0.659
Neutral	0.435*	0.439*	0.800	0.683
Dissatisfied	0.994	0.917	0.277**	0.217**
Very dissatisfied	3.227	2.631	0.074*	0.060*
Shopping distance (ref. = Very satisfied)				
Satisfied	1.423	1.527	0.437*	0.462*
Neutral	0.525	0.668	1.325	1.194
Dissatisfied	0.407	0.537	1.180	1.004
Very dissatisfied	1.402	0.736	0.444	0.396
Parks' assessment (ref. = Very satisfied)				
Satisfied	0.307*	0.259*	1.067	1.098
Neutral	0.842	0.668	0.400	0.349*
Dissatisfied	1.674	0.983	0.582	0.479
Very dissatisfied	1.409	0.970	0.323	0.243*
Recreation assessment (ref. = Very satisfied)				
Satisfied	1.214	1.358	1.081	1.011
Neutral	0.573	0.669	1.660	1.668
Dissatisfied	0.196*	0.326*	2.699*	2.667*
Very dissatisfied	0.123*	0.145*	2.737	2.876
Building's satisfaction (ref. = Very satisfied)				
Satisfied	0.769	1.015	1.276	1.192
Neutral	0.508	0.684	2.549*	1.932
Dissatisfied	0.282*	0.389	1.489	1.347
Very dissatisfied	1.968	1.179	1.554	1.475
Sanitation (ref. = Very satisfied)				
Satisfied	0.186**	0.208**	2.927*	2.584*
Neutral	0.693	0.754	3.116*	2.484
Dissatisfied	0.148***	0.172***	3.427*	2.744*
Very dissatisfied	0.192**	0.198**	3.914*	3.409*
Cleanness (ref. = Very satisfied)				
Satisfied	1.551		0.190**	0.293*
Neutral	0.597		0.429	0.632
Dissatisfied	1.015		0.195*	0.324*
Very dissatisfied	0.394		0.154*	0.218*
Population density (person/Hectare)	0.991*	0.992*	0.993*	0.993*

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Variable name	Model 1	Model 2	Model 3	Model 4
	Life satisfaction		Residential satisfaction	
Population density (ref. = High density)				
Low density	9.013*	6.949*	10.773*	8.962*
Medium density	3.067	3.139*	2.881	3.414*
Social life (family) (ref. = Very satisfied)				
Satisfied	1.389	1.285	0.562	0.595
Neutral	1.752	1.527	0.985	1.028
Dissatisfied	0.617	0.623	0.476	0.535
Very dissatisfied	9.754*	3.076*	0.121	0.109*
Social life (friends) (ref. = Very satisfied)				
Satisfied	0.309**	0.362**	1.225	1.393
Neutral	0.330*	0.363*	0.611	0.770
Dissatisfied	0.511	0.627	4.179*	4.069*
Very dissatisfied	0.044*	0.057*	0.594	0.681
Safety (ref. = No)				
Yes	7.399**	8.419**	2.557*	2.221*
Neighborhood location (ref. = North)				
Middle	0.990		0.747	0.856
South	0.824		0.260*	0.409
Trip to work (ref. = Very satisfied)				
Satisfied	0.756	0.790	0.765	
Neutral	0.368*	0.432*	0.909	
Dissatisfied	0.598	0.651	0.602	
Very dissatisfied	0.266	0.301	0.499	
Air satisfaction (ref. = Very satisfied)				
Satisfied	0.455	0.483	1.708	
Neutral	0.454	0.450	1.421	
Dissatisfied	0.321*	0.354*	1.721	
Very dissatisfied	0.167*	0.121*	2.562	
Roads' assessment (ref. = Very satisfied)				
Satisfied	1.186		0.592	
Neutral	1.466		0.617	
Dissatisfied	1.855		0.721	
Very dissatisfied	0.424		0.375	
Employment (ref. = Unemployed)				
Employed	8.374	8.398		
Retired	10.026	11.553		
Student	11.251	7.429		
Housing tenure (ref. = Tenant)				
Owner	1.778	1.883*		
Tenure length (years)	0.964*	0.965*		
Education (ref. = High)				
Low	1.050			
Middle	1.365			
Nationality (ref. = Non-Saudi)				
Saudi	1.173			
Model fit χ^2	476.525	453.884	320.288	308.237
(Sig.)	(0.000)	(0.000)	(0.000)	(0.000)
Deviance χ^2	524.655	547.296	606.883	618.934
(Sig.)	(1.000)	(1.000)	(1.000)	(1.000)
Nagelkerke R ²	0.755	0.736	0.608	0.593
Test of Parallel Lines χ^2	209.394	228.048	258.136	155.344
(Sig.)	(1.000)	(0.543)	(0.640)	(1.000)

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

DISCUSSION

Most studies on life satisfaction have focused on the association between life satisfaction and economic, socio-demographic, and management variables at the city level, with few studies examining the influence of the combined effects of the built and social environment on residential satisfaction and overall subjective well-being, particularly in developing countries (Al-Khraif et al. 2018, Al-Khraif et al. 2019, Thabet et al. 2023). This study addresses this gap by developing a holistic conceptual framework that explores the association between objective and subjective life satisfaction in different residential areas in Jeddah, a case study that mirrors cities in emerging economies. The study shows that life satisfaction levels are linked to the spatial distributions and characteristics of the residential environment. It investigates the impacts of subjective evaluations of various neighborhood aspects and socio-demographic attributes on life satisfaction, highlighting the composite impact of these multiple domains.

An ordinal logistic regression model was employed to explore the variation in the perceived impact of four major components of neighborhood attributes that affect an individual's residential satisfaction in Jeddah. These include demographic attributes, housing attributes, the physical condition of the neighborhood, and the social environment. Our findings show that there are 24 key determinants of both overall life satisfaction and residential satisfaction. These variables were classified into four groups. The first group comprises ten variables, all of which achieved statistical significance (p -value < 0.05) in the four models presented in Table 2. These variables include the age of the householder, satisfaction with home, housing type, convenience of school distance, recreation, sanitation, cleanliness, population density, social life (friends), and safety. The second group consists of two variables, satisfaction with parks and social life (family), both of which achieved statistical significance in three models. The third group consists of nine variables that achieved statistical significance in two models. These variables are family income, marital status, income satisfaction, shopping distance, convenience of a trip to work, air quality, tenure length, income category, and surrounding buildings. The fourth group includes three variables: job satisfaction, neighborhood location, and housing tenure, all of which achieved statistical significance in only one model. Furthermore, our findings confirm a strong and highly significant mutual relationship between life satisfaction and residential satisfaction, as evidenced by their coefficients in all four models presented in Table 2 (p -value < 0.001). This outcome aligns with the findings of many other researchers (e.g., Ma et al. 2018, Mouratidis

2021).

Regarding the impact of socio-demographics, our results showed that age is a key factor in predicting residential satisfaction. In all four models, the age of the householder exhibited high statistical significance, and its odds ratio is greater than one, as presented in Table 2. This finding suggests a positive association between the age of the householder and both life and residential satisfaction. Thus, older respondents exhibited higher levels of satisfaction compared to younger respondents, which can be attributed to their religiosity and eagerness to engage in social interactions with their neighbors. This finding aligns with previous research conducted by Baird et al. (2010), Stone et al. (2010), and Becker and Trautmann (2022). Similarly, a positive association was observed between family income and residential satisfaction, as indicated by an odds ratio (exponential of the coefficient) greater than one.

Furthermore, when interpreting the odds ratio results for marital status, with the divorced group as the reference group as presented in Table 2, we observe that the married group exhibited 11 times higher satisfaction (odds ratio: 11.630) compared to the divorced group. Similarly, the widow group displayed 8 times higher satisfaction (odds ratio: 8.687), and the single group showed 8 times higher satisfaction (odds ratio: 8.102) compared to the divorced group. These findings indicate that the married group reported the highest level of satisfaction, while the divorced group reported the lowest level of satisfaction. This pattern may be attributed to the family stability commonly associated with married couples, particularly within Arab culture.

Our data also offers insights into the potential socio-demographic differences among households in residential areas. As stressed in the literature (e.g., Donga and Qinb 2017), this variance in demographic characteristics should be used as a criterion for city managers and their professionals, as well as private agencies, to improve the condition of residential areas and promote the quality of housing projects and the provision of public amenities.

Our findings also highlight the importance of the physical aspects of residential areas (neighborhood characteristics), such as population density, location, sanitation, cleanliness, distance to school and shopping, recreation, and air quality, as key determinants of residential satisfaction.

According to our findings, individuals living in low-density neighborhoods were more satisfied than those in high- and medium-density areas. The low-density neighborhoods were concentrated in the northern area of Jeddah, where luxury residential areas and distinguished services, such as the most famous mega-malls, commercial markets, and the Northern Corniche—the most important

open space in Jeddah—are concentrated in the city. Moreover, the most important seasons for entertainment and tourism in the city were held in this area. In high-density residential areas dissatisfaction with inhabitants was mainly attributed to neighborhood stressors and the perception of unsafety caused by the socially mixed nature of the neighborhood and the presence of strangers. In medium-density neighborhoods, we found a higher level of residential satisfaction due to the active social life owing to the lower intensity of heterogeneity in the population compared with high-density neighborhoods.

Although our results reveal a broad array of objective and subjective perceived conditions that can be identified as factors that influence residential satisfaction, safety factors, homogeneity of residents, and high residential density can be considered as the major aspects of residential environment that affect satisfaction. This result is consistent with the results of previous studies (Eben-Saleh 2002, Donga and Qinq 2017, Mouratidis and Yiannakou 2022) which suggest that the huge size of a residential area and the fragmentation of its fabric, together with its high density and socially mixed nature, are important factors that contribute to residential dissatisfaction. The ambiguous qualities of its outdoor spaces led to the loss of a sense of security and community among residents and degraded the perceived quality of life. Therefore, policymakers should pay more attention to these issues, and new policies should be designed to address diversity and safety measures. To compare the results of the current study with other local studies, three recent studies can be introduced. These local studies measure or identify indicators or determinants of life satisfaction in Saudi Arabia, addressing the limited published research on this subject. Notably, most existing studies focus on Riyadh, highlighting the significance of the current study on Jeddah to fill this important knowledge gap. The first study (Al-Khraif et al. 2019) analyzed variables impacting life satisfaction among Saudi retirees across five administrative regions in Saudi Arabia. Key variables identified include income, housing, family connections, and leisure time, all of which are considered in our study.

The second study (Al-Khraif et al. 2018) examined life satisfaction determinants in slum areas of Riyadh using a stratified sample from seven random areas. The study found that employment, income, length of residence, and availability of public water supplies significantly affect residents' satisfaction. These determinants are also included in our study.

The third study (Thabet et al. 2023) aimed to improve housing project planning in Riyadh by assessing housing satisfaction among householders in four public housing projects. The survey used forty-three indicators across six dimensions: demographic characteristics, housing, social environment, physical environment, accessibility of services, and efficiency of services. Our variables' structure aligns closely with these dimensions.

CONCLUSION

This study is valuable due to the scarcity of empirical studies on the effects of the built environment on overall subjective well-being in cities of emerging economies such as Jeddah. The study focuses on the impact of multiple objective and subjective attributes of the built environment on satisfaction and overall quality of life, identifying demographic attributes, safety, social interaction, neighborhood characteristics, and housing attributes as key determinants of residential satisfaction. The study also incorporates a multidimensional conceptual model to explain how respondents perceive various attributes of their neighborhoods holistically. As stressed in the literature (e.g., Gocer et al. 2023), the study emphasizes the need for a multidimensional framework that goes beyond disciplinary differences.

Residential satisfaction and overall subjective quality can be influenced by the planning and design of the built environment, as indicated by the study's findings. Policymakers need to understand the needs of communities and the impact of interventions on community well-being to improve their lives and ensure social acceptance of the outcomes of their interventions. This can be achieved through conducting surveys to gather residents' assessments and measuring their satisfaction with their residential environment (Cao 2016, Omoniyi et al. 2022, Thabet et al. 2023).

Numerous scholars (e.g., Bougouffa and Permana 2018, Brown et al. 2018, Karacaoglu, Krawczyk, and King 2019) advocate community involvement in policy-making for effective public policies. Communal responsibilities and togetherness are crucial for fostering resident engagement in neighborhood regulation. Special focus is warranted for community participation in managing outdoor spaces. Scholars across disciplines (e.g., Liu et al. 2022, Nowzari et al. 2023) propose territoriality and mixed-use approaches to counteract anonymity, anxiety, and perceived personal danger due to large residential areas, ethnic composition, and outsider presence.

Realization of the above-mentioned principles and arguments can lead to desirable outcomes, such as enhancing natural surveillance, enforcing control of neighborhood outdoor areas, and promoting a sense of attachment and community. This study demonstrates that, to improve residential satisfaction, public agencies, private developers, and other relevant stakeholders should explore the objective and subjective domains that can help raise the quality of the residential environment. As stressed in the literature (e.g., Liaoa et al. 2018, Mouratidis and Yiannakou 2022), ensuring well-connected neighborhood streets, creating safe pedestrian networks (Zainala et al.

2023), attractive public spaces, convenient transportation, and suitable public facilities for all groups of residents should be ensured to enhance the image of the neighborhoods, retain safety measures, and establish a platform for residents to walk, socialize, and cooperate with each other.

While our current study primarily aims to identify the determinants of life satisfaction to inform housing policies in Jeddah, we recognize the value in proposing a comprehensive model based on these determinants for architects, urban planners, policymakers, and housing developers. Such a model would be beneficial for addressing Jeddah's specific socio-economic and cultural factors and for improving the overall quality of life across different districts and housing types.

We outline a roadmap for developing this model in future research, which involves six main steps:

1. Studying International Best Practices: Analyzing successful housing models and policies from other cities worldwide.
2. Analyzing Local Housing Policies: Examining existing housing policies in the Kingdom of Saudi Arabia.
3. Measuring Stakeholder Needs: Conducting surveys and consultations with residents, policymakers, and developers to gather comprehensive data on their needs and preferences.
4. Creating an Initial Model: Developing a preliminary model based on collected data and best practices.
5. Identifying Obstacles and Opportunities: Testing the model to identify potential challenges and opportunities for implementation.
6. Refining the Model: Making necessary adjustments based on feedback and testing results to finalize a model that meets stakeholder ambitions.

By following this roadmap, future research can develop a robust model that effectively addresses the unique needs and aspirations of Jeddah's residents, ultimately enhancing life satisfaction and well-being across various communities within the city.

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DECLARATION OF COMPETING INTEREST

None.

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