JSA Journal of Salutogenic Architecture

Original Scientific Paper **Journal of Salutogenic Architecture**

2025, Volume 4, Issue 1, pages 69–89; https://doi.org/10.38027/jsalutogenic_vol4no1_5

Enhancing the Quality of Life through Design: Guidelines to Fostering Place Attachment in Bahraini Buildings

[1] **Noor Saleh Alalawi**, [2] **Islam Hamdi Elghonaimy**

[1] Department of Architecture and Interior Design, College of Engineering, University of Bahrain, Bahrain
nalalawi@uob.edu.bh
https://orcid.org/0009-0003-8308-8481

[2] Department of Architecture and Interior Design, College of Engineering, University of Bahrain, Bahrain
eelghonaimy@uob.edu.bh
https://orcid.org/0000-0002-1044-249X

Abstract

Designers' primary objective is to propose solutions that enhance occupants' quality of life. Therefore, fostering place attachment is key to attracting users and significantly contributes to achieving this objective. The new typology of the EduCare building – a multifunctional building that blends education, healthcare, and wellness spaces and is considered a new trend in sustainable building typology in Bahrain - reflects this concept. This paper investigates the architectural factors that impact place attachment in buildings in Bahrain using a sample of 194 participants. A quantitative questionnaire is utilized to systematically measure and quantify the public's perceptions and preferences. Regression and frequency analyses are used to visualize the impact of different architectural factors on place attachment sustainability. The findings highlight the significance of biophilic elements, social interaction spaces, shared facilities, and comfort in enhancing building place attachment. The presented recommendations provide valuable insights for designers and stakeholders in designing multi-functional buildings to improve users' experiences and foster place attachment.

Keywords*:* place attachment, quality of life, sustainability, phenomenology, well-being.

Article History:
Received: 10 February 2025
Revised: 05 July 2025
Accepted: 29 July 2025
Available online: 5 August 2025

This article is an open-access publication distributed under the terms and conditions of the Creative Commons Attribution 4.0 International (CC BY) license.

The article is published with open access at: www.jsalutogenic.com
© 2025 by the Author(s)

1. Introduction

1.1 Background and Context

Place attachment in buildings is a key contributor to enhancing occupants' quality of life. It is the bond between human beings and their environments that has increasingly gained the scientific community's attention during the past few decades. The concept is applied across diverse fields in efforts to respond to critical contemporary challenges, such as globalization (Hernández et al., 2020). The users' sense of place attachment is a key element in the quality of life and well-being (Friesinger et al., 2022). It helps alleviate feelings of isolation, uncertainty, and loneliness. Thus, it significantly enhances the quality of life in places, buildings, neighbourhoods, and cities. Understanding people's attachment to places can also ensure successful planning and architectural design (Manzo & Perkins, 2006). Moreover, the impacts of climate conditions have direct consequences on the users' sense of place attachment and quality of life. Moreover, the primary literature review noticed a gap in the studies of enhancing the quality of life through design in Bahraini Buildings.

Therefore, it is vital to understand ways to strengthen place attachment to support climate change adaptation and mitigation, and maintain the health and well-being of communities (Jayakody et al., 2024). In the same context, the authorities in Bahrain have repeatedly presented dedication to enhancing the quality of life of residents and visitors through various platforms, such as the

Government Plan, the Economic Vision 2030, and the National Health Plan (Balqees et., al., 2024; Elghonaimy, 2019; SCH, 2016). This aligns with the United Nation's 2030 global agenda, particularly the third goal of sustainable development: "Ensuring healthy lives and promoting well-being for all at all ages" (AlSaeed, 2021; UN, 2024). As of 2023, Manama, the capital of Bahrain, ranks 144th out of a total of 241 cities based on the Mercer Quality of Living Survey (Alalawi & Elghonaimy, 2024; Mercer, 2023). This established survey is renowned for ranking different cities across five continents based on their quality of life (Bakhouche & Buheji, 2019). Table 1 presents the ranks of different cities within the Gulf Cooperation Council (GCC) Countries, highlighting Manama as the 6th out of 8 cities. Dubai holds the first rank within the GCC, whilst Riyadh is the 8th with the lowest score for the quality of life. Figure 1 depicts a graphical representation of the City Rankings.

Table 1. The Mercer Quality of Living Survey City Rankings for 2023 (Mercer, 2023).

GCC Country	**Bahrain**	**Qatar**	**Saudi Arabia**		**Kuwait**	**Oman**	**United Arab Emirates**	
City	Manama	Doha	Jeddah	Riyadh	Kuwait City	Muscat	Dubai	Abu Dhabi
Global City Rank	144	117	171	172	141	118	79	84
GCC City Rank	6	3	7	8	5	4	1	2

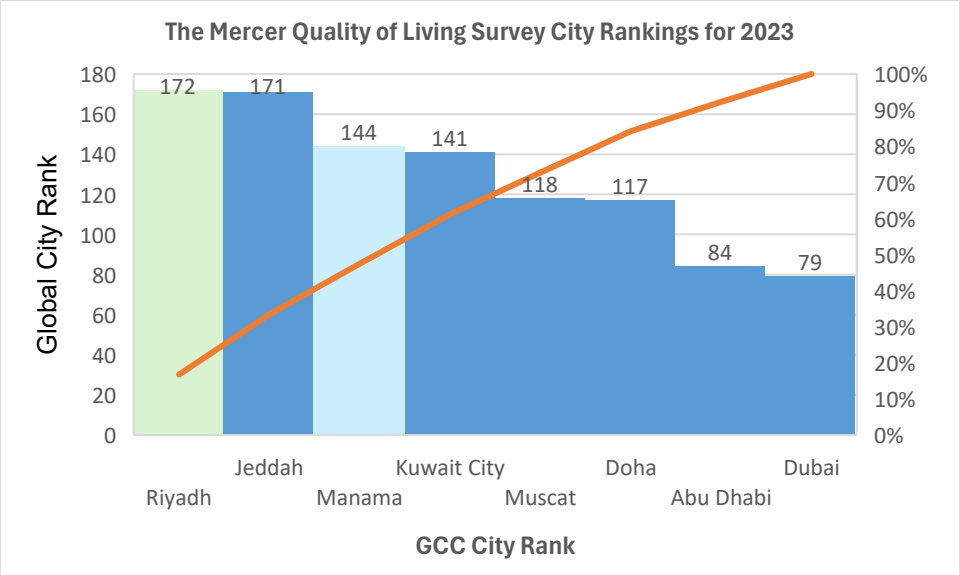


Figure 1. The Mercer Quality of Living Survey City Rankings for 2023.

1.2 Problem Statement, Research Gap, and Objectives

Given the current quality of life indices, exploring how place attachment can be fostered in multi-functional buildings can contribute to improved living conditions and well-being. Additionally, the utilization of multi-functional buildings is growing in Bahrain. Based on the primary investigation, limited studies on place attachment are currently available in the GCC region, particularly in Bahrain, emphasizing the need for research (Ujang et al., 2024).

Therefore, this research selected the dilemma of dynamic changes in the evolving world around us and the increased adoption of flexible, multi-functional buildings that promote social interaction and sustainability as a point of discussion. This paper investigates the architectural factors that impact place attachment in buildings in Bahrain. It tries to understand how this building typology has the potential

to increase human and environmental well-being and the overall quality of life. Moreover, it seeks to understand how these multi-functional buildings integrate various functions through time and space. Therefore, the aim of the study is as follows:

To investigate the architectural factors that impact place attachment in buildings in Bahrain to guide designers and stakeholders in designing a new sustainable multi-functional building typology in the new urban district of Dilmunia, Bahrain.

The study adopts a quantitative assessment of place attachment, using a questionnaire to explore the public's perceptions and preferences. Descriptive statistics are employed to summarize the results, and regression analysis and frequency analysis are used to visualize the impact of different architectural factors on place attachment and guide the design of a new sustainable building typology in Bahrain, combining informal healthcare, education, and wellness facilities.

1.3 Significance and Structure of the Paper

The paper is divided into five parts, as illustrated in Figure 1. The first part presents an overview of the definitions of place attachment, the architectural factors influencing it, and its application within buildings in Bahrain. The second part discusses the methodological process, whilst the third and fourth parts outline and analyze the collected data. The final part highlights the derived recommendations to guide the design of a new sustainable building typology in Bahrain.

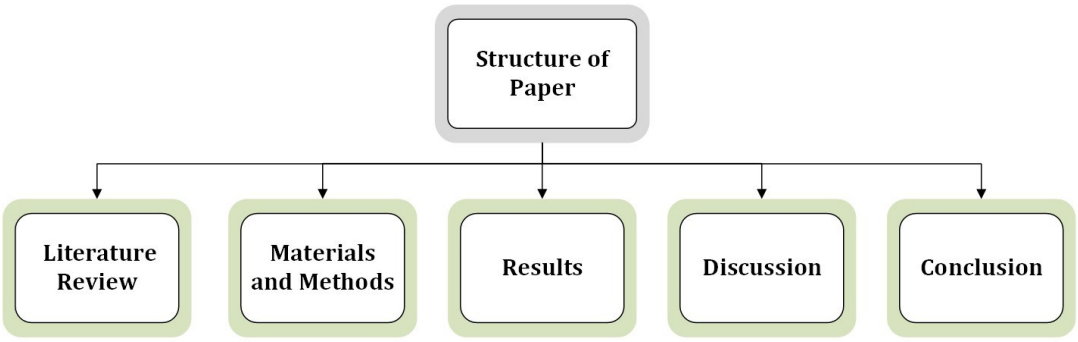


Figure 2. Structure of the Paper (Researchers).

The findings highlight the significance of biophilic elements, social interaction spaces, shared facilities, and comfort in enhancing building place attachment. The presented recommendations provide valuable insights for designers and stakeholders in the design of multi-functional buildings. These buildings will improve users' experience, promote sustainable behaviour, and thus enhance occupants' well-being and quality of life.

2. Literature Review

2.1 Place Attachment

Place attachment is a complex psychological phenomenon subject to various social, economic, and environmental factors (Seamon, 2020). The generally accepted definition of place attachment is the emotional and cognitive bonds between a person and a place (Hernández et al., 2020). Occasionally, place attachment is also called 'people's sense of place', fundamental to lived experiences and well-being (Jayakody et al., 2024). Scannell and Gifford (2010) define "Place Attachment" through a tripartite, three-dimensional framework, as illustrated in Figure 3 (adapted from Scannell & Gifford, 2010). In the framework, the three dimensions of the concept are referred to as person, process, and place. The person dimension is associated with the individual and collective perspectives and experiences of places. The process dimension refers to the psychological aspects of place attachment or the interactions in specific locations, including affect, cognition, and behaviour. They represent the emotional connections to places, personal memories, and experiences, and the expression of

attachment through actions. The final dimension of place is considered the most important, as it examines the nature of the place and the physical environment at three scales: the scale of a building, neighbourhood, or city. Ilovan and Markuszewska argue that the dimensions of place attachment are spatial, temporal, and social, referring to the relationship and interactions between people through time and space (Ilovan and Markuszewska, 2022).

Existing literature highlights different methodologies for measuring place attachment. The dichotomy of place attachment theories reflects the various perspectives of phenomenological and environmental-behaviour standpoints. The phenomenological models of place attachment emphasize qualitative aspects related to lived experiences, whilst environmental-behaviour models focus more on human geography and quantitative elements and measurable factors that impact place attachment. There is a significant emphasis on quantitative measures in literature, which focuses on 'why' and 'how' people are attached to places (Lewicka, 2011; Ilovan & Markuszewska, 2022). Place attachment is typically measured using Likert scales (Boley, et al., 2021). Many experts shed light on the value of qualitative explorations to measure place attachment, especially when they involve the narratives of individuals (Razem, 2020). Historically, research on place attachment focused on the social aspects of attachment. However, later research indicated the importance of the physical aspects of attachment. The predictors of place attachment can be categorized into three categories: socio-demographic predictors, social predictors, and physical predictors (Lewicka, 2011; Shahabadi & Adeli, 2024). The socio-demographic predictors refer to the individuals' demographic information, such as age, occupation, education, and length of stay in a particular area. The social predictors mainly address community ties and the sense of security. As for the physical predictors, the factors affecting place attachment are endless, including urban, natural, and architectural elements. This research will focus on the physical predictors of place attachment as it seeks to understand it from an architectural perspective.

Furthermore, Shahabadi and Adeli suggest that the indicators of place attachment vary across the home, neighbourhood, and city scales (Shahabadi & Adeli, 2024). This study will focus on buildings at the neighbourhood scale. The following section discusses the architectural factors in the literature that influence place attachment.

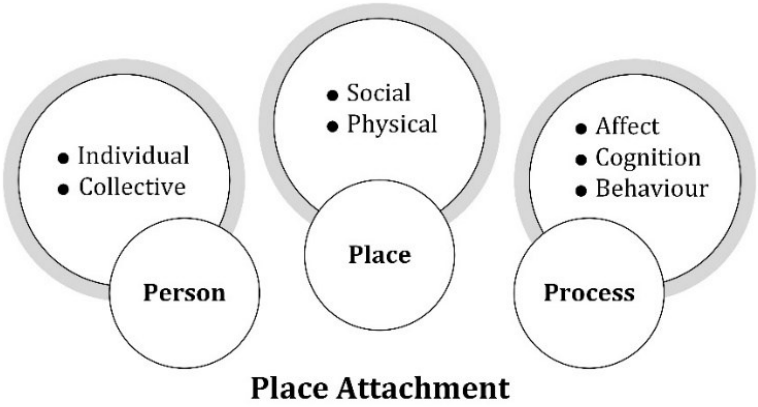


Figure 3. Scannell and Gifford's Tripartite Framework of Place Attachment (Researchers).

2.2 Architectural Factors Influencing Place Attachment

Based on the above-mentioned predictors of place attachment, this section focuses on the physical and social attributes or the tangible and intangible architectural factors that influence people's attachment to places. Scannell and Gifford (2010) state that people establish attachments to places that facilitate strong social connections and interactions. Density, proximity, accessibility, and the presence of facilities are considered some of the most important physical characteristics of places that impact interactions and place attachment in commercial office spaces (Inalhan et al., 2021). Waxman (2008)

identifies eight physical factors that influence place attachment in multi-functional buildings in gernal and in coffee shops in particular: cleanliness, pleasant smells, adequate lighting, comfortable furniture, views, acoustics and music, natural light, and appealing décor. A recent study highlighted the importance of place function in enhancing place attachment, as places where people go to perform specific activities with different social experiences, engender a sense of security and stronger attachment, as opposed to places of economic consumption. Additionally, places with a shared purpose, local consumption, and green space show higher place attachment (Zahnow, 2023).

Cole et al.'s (2021) work examines the links between physical design strategies in green buildings and the psychological process of place attachment to suggest key design strategies that support place attachment. They outline four strategies to enhance place attachment: biophilic design and connections to nature, visible environmentalism, places that facilitate pro-environmental behaviours, and indoor environmental quality, which supports comfort. Roös (2022) also emphasizes the importance of integrating cultural and traditional elements in architectural design to increase place attachment and promote connections to places. Boyd and Harada (2022) also argue that place attachment reflects a figurative sense of familiarity in spaces, stressing its importance in enhancing well-being. Figure 4 illustrates the physical and social factors outlined in the existing literature that impact place attachment. These architectural factors will be adopted in this study. The following section presents a brief overview and background on multi-functional buildings in Bahrain to set the scene and provide context for the research.

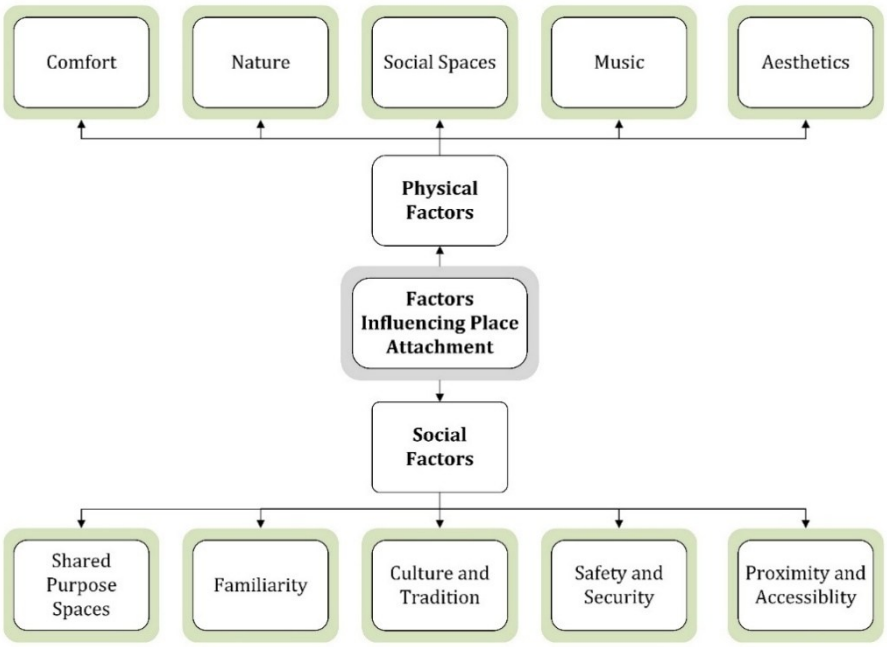


Figure 4. Physical and Social Factors Influencing place attachment, as outlined in the literature (Researchers).

2.3 Place Attachment in Multi-functional Buildings in Bahrain

Rapid technological advancements, demographic growth, economic transitions, and rising environmental and climatic challenges have stressed the significance of architecture and urban design in adapting to and adapting to the evolving changes worldwide. Adaptable, flexible, transformative, and hybrid spaces have become increasingly common, and multi-functional buildings have become more relevant than ever. Multi-functional buildings accommodate various life needs and complexities, offering flexibility synonymous with sustainability and well-being (Aqeel, 2024). Worldwide, the vision of multi-functional spaces is publicized in sustainable development, as it transfers diverse environmental, social, and economic effectiveness that contribute to architectural and urban

sustainability and resilience. Multi-functional buildings, open spaces, and urban spaces can increase social interaction and contribute to the overall quality of life (Zivkovic et al., 2019; Ghafouri & Weber, 2019). Marques et al. (2020) add that multi-functional green spaces strengthen place attachment and are integral to improving human and environmental well-being. Research on 'third spaces', social spaces away from the home and work environment, has also gained increased attention (Vaux & Langlais, 2023). These places could be multi-functional and promote cultural and social sustainability through place attachment (Al-Shami et al., 2024).

In Bahrain, the development of multi-functional buildings is gaining popularity within the architectural industry. The country's land use plan for 2030 indicates that approximately 4,150 hectares of land are allocated to mixed-use developments, equivalent to 4.44% of the country's total area. Mixed-use lands are considered the seventh largest typology out of 30, highlighting their significance in the overall future planning of Bahrain (UPDA, 2016). Bahrain has many multi-functional projects and spaces ranging from traditional souqs and contemporary malls to multi-functional urban areas. The transformation in the cultural and traditional dynamics of modern life and place attachment has pushed locals and visitors of Bahrain to expend more additional time in multi-functional third spaces, emphasizing the relevance and significance of this building typology today. The following section discusses the materials and methods to investigate the architectural factors that impact place attachment in different buildings in Bahrain.

3. Materials and Methods

This paper employs a quantitative methodology to investigate the architectural factors that impact place attachment. The methodology is divided into five stages. The first stage consists of the definition and the scope, including the selection of the building typology for the research and the questionnaire inclusion criteria. This is followed by the instrument design, which includes the design of the questionnaire. The third stage is data collection, followed by data analysis, which eventually leads to the proposal of design guidelines to enhance the attachment of buildings in Bahrain. Figure 5 outlines the methodology structure in detail.

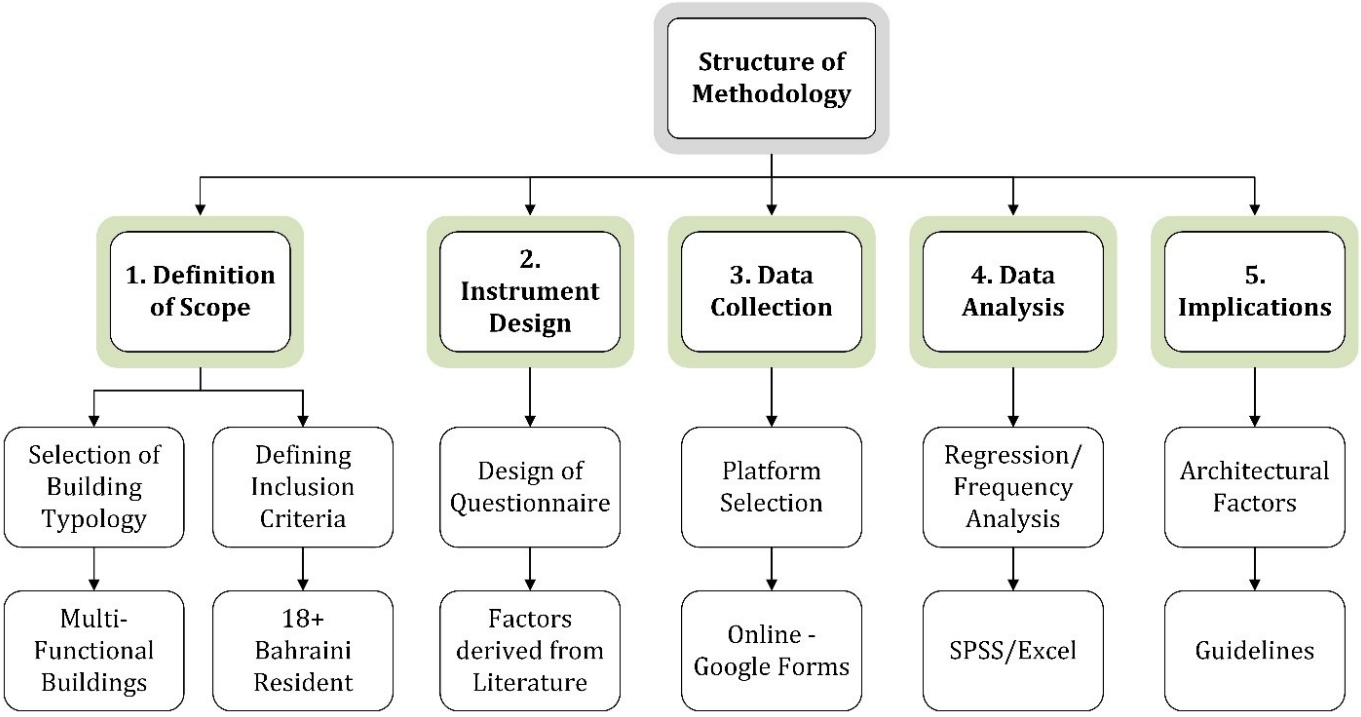


Figure 5. Structure of the research methodology (Researchers).

Different building typologies have been selected for the study due to the increased adoption of multi-functional buildings in sustainable development and within Bahrain's land use strategy. As indicated in the previous literature, this particular building typology has the potential to facilitate social interaction, thereby enhancing place attachment and promoting occupant well-being. A questionnaire was sent out to Bahraini residents above the age of 18 years to investigate the architectural factors that impact place attachment in buildings. The questionnaire was administered online via Google Forms and designed to include social and physical architectural factors that impact place attachment, as derived from the existing literature, discussed in Section 2.2. The questionnaire was distributed in English and Arabic to attract a wider audience and is organized in three parts. The first focuses on demographic information such as the gender, age, and place of residence of the participants. The second part focuses on the nature of visits to different types of third-place spaces.

The last part investigates the specific factors that impact the place attachment of participants. The questions in part 1 are multiple-choice, and the Likert scale was used for parts 2 and 3 to measure the results quantitatively. The collected data were then subjected to statistical analysis, which will be discussed in the next section. Descriptive statistics were employed to summarize and present the questionnaire data, whilst a regression analysis was performed using the SPSS statistical software to analyze the relationship between different factors and their impact on place attachment. Multiple linear regression is adopted since the goal of the analysis is to identify strength associations among variables instead of modelling ordinal thresholds, and the Likert scale data is aggregated into scales (Şimşek, 2023). The following section presents the results and key findings of the questionnaire.

4. Results

A total of 194 participants completed the online questionnaire. Table 2 outlines the group's demographics in detail, whilst Figure 6 illustrates the dataset. The sample size aligns with recommendations in social science research for multiple regression analysis where the number of predictors is moderate (Faber & Fonseca, 2014). The internal consistency of the questionnaire was assessed using Cronbach's alpha. The sample comprised 47% male participants and 53% females. The age groups of the participants varied. However, the highest percentage (34%) belonged to the 25-34 category. The rest of the participants are categorized in the 18-24 age group (23%), the 35-44 age group (19%), the 45-54 age group (13%), and the 55+ age group (22%). Regarding the place of residence, most participants (47%) selected the Capital Governorate, whilst 35% selected the Northern Governorate, 11% selected the Muharraq Governorate, and only 7% selected the Southern Governorate. These results highlight that most participants reside in or close to the capital.

Table 2. Demographics.

Variable	Category	n	%
Gender	Male	92	47
	Female	102	53
Age Group	18-24	23	12
	25-34	66	34
	35-44	37	19
	45-54	25	13
	55+	43	22
Place of Residence	Capital Governorate	91	47
	Northern Governorate	67	35
	Southern Governorate	14	7
	Muharraq Governorate	22	11

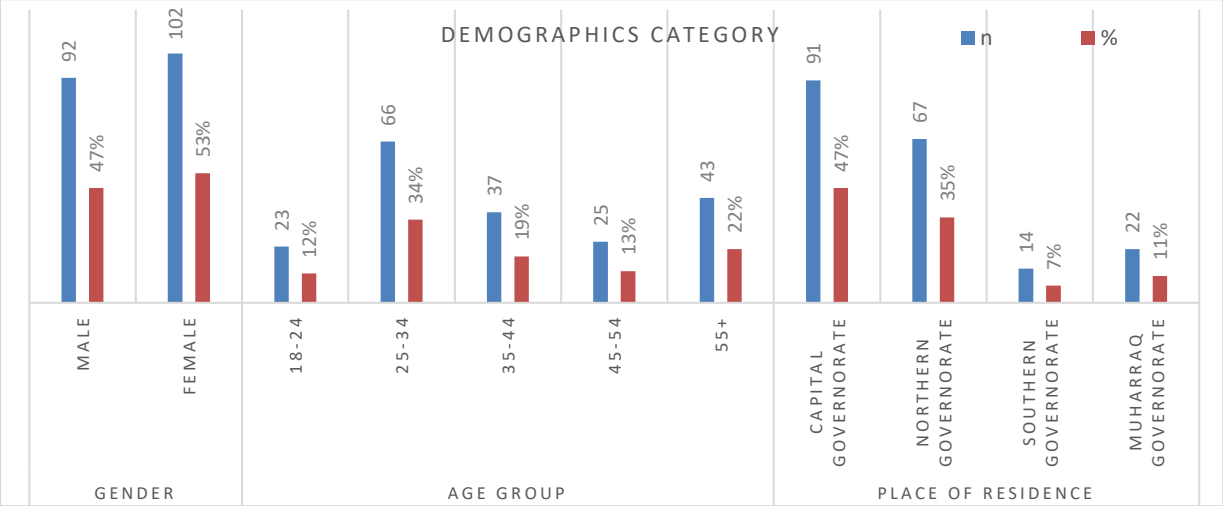


Figure 6. Demographics Category.

The participants were required to answer a set of questions on the frequency of visits to different buildings. Table 3 and Figure 7 present the detailed results regarding the frequency of visits to seven different types of buildings and spaces, including coffee shops, outdoor parks, wellness centers, malls, clinics, co-working spaces, and educational facilities. The mean scores calculated from the results indicate that many of the building types were visited once a week, including coffee shops (3.74) and malls (3.61), which are visited the most, on a weekly basis. Outdoor recreational parks (3.03), wellness centers (3.16), clinics (2.91), and educational facilities (3.19) are mostly visited on a monthly basis, whilst co-working spaces are the least visited, with a mean score of 2.64.

Table 3. Frequency of visits to different building types.

Question	Variable	Response	n	%	Mean	SD
How often do you visit the following buildings?	Coffee Shops	5-Daily	63	33	3.74	1.21
		4-Once a Week	64	33		
		3-Once a Month	35	18		
		2-Once a year	18	9		
		1-Never	14	7		
	Outdoor Parks/recreational spaces	5-Daily	13	7	3.03	1.09
		4-Once a Week	61	31		
		3-Once a Month	56	29		
		2-Once a year	47	24		
		1-Never	17	9		
	Wellness Centers (spa/salon/fitness)	5-Daily	31	16	3.16	1.29
		4-Once a Week	57	29		
		3-Once a Month	47	24		
		2-Once a year	31	16		
		1-Never	28	15		
	Malls	5-Daily	38	20	3.61	0.97
		4-Once a Week	70	36		
		3-Once a Month	62	32		
		2-Once a year	21	11		
		1-Never	3	1		

Clinics (health/beauty)	5-Daily	19	10	2.91	1.22
	4-Once a Week	47	24		
	3-Once a Month	57	29		
	2-Once a year	39	20		
	1-Never	32	17		
Co-working Spaces	5-Daily	20	10	2.64	1.42
	4-Once a Week	40	21		
	3-Once a Month	43	22		
	2-Once a year	24	13		
	1-Never	65	34		
Educational Facilities	5-Daily	44	23	3.19	1.40
	4-Once a Week	45	23		
	3-Once a Month	41	21		
	2-Once a year	31	16		
	1-Never	33	17		

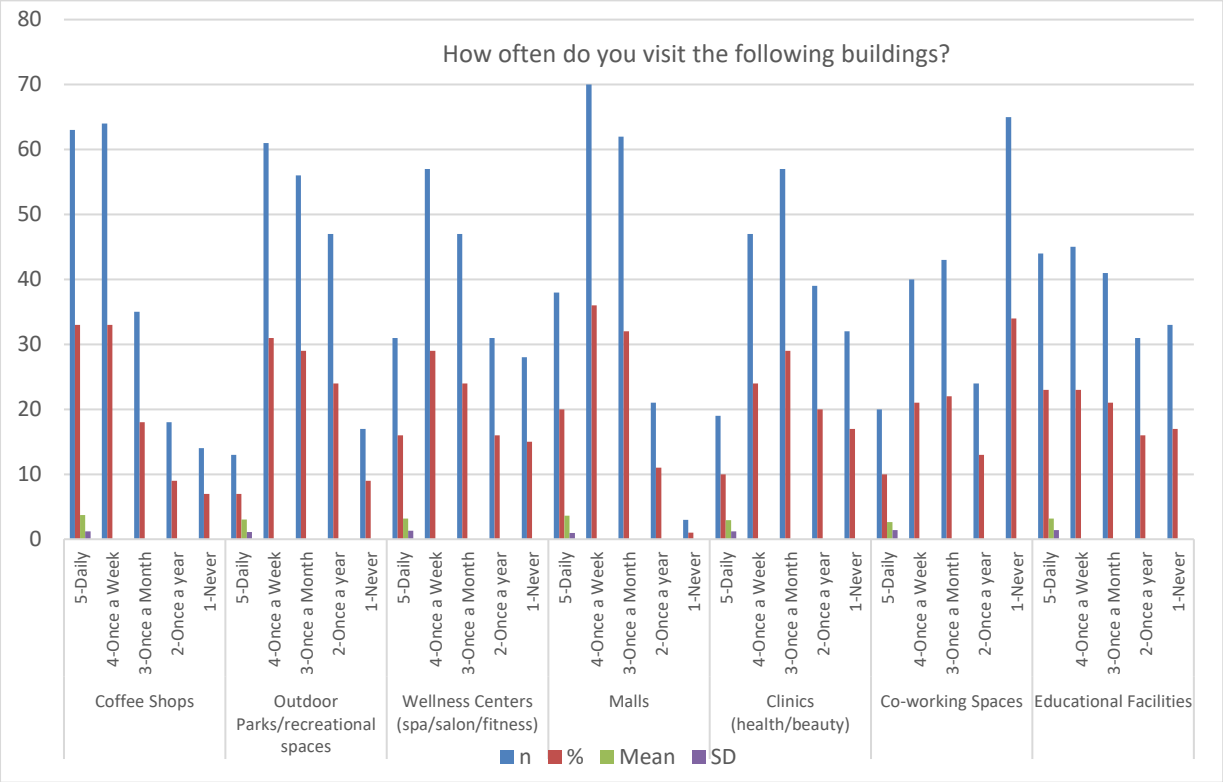


Figure 7. The 1st question about the frequency of visits to different building types

To investigate the factors that impact place attachment, the participants were asked to indicate how much different social and physical factors contributed to their place attachment to the seven different places mentioned in the first part of the questionnaire. The results revealed that the majority of participants agreed that comfort has the most significant influence on their place attachment to the selected building typologies, with a mean score of 4.4. This is followed by proximity and accessibility (4.35), safety and security (4.28), and the availability of multiple services (4.20). Surprisingly, music and cultural and traditional identity scored the least, implying that they have the least impact on place attachment. Table 4 and Figure 8 present the results in detail, highlighting the factors that scored the highest and lowest concerning their impact on place attachment.

Table 4. Factors contributing to participants' place attachment.

Question	Variable	Response	n	%	Mean	SD
How much do the following factors contribute to your attachment to the above-mentioned places?	Building Aesthetics	5-Extremely	101	52	4.08	1.15
		4-Very Much	35	18		
		3-Moderately	36	19		
		2-Slightly	16	8		
		1-Not at All	6	3		
	Social Spaces and a Sense of Community	5-Extremely	111	57	4.18	1.11
		4-Very Much	31	16		
		3-Moderately	33	17		
		2-Slightly	14	7		
		1-Not at All	5	3		
	Proximity and Accessibility	5-Extremely	131	68	4.35	1.08
		4-Very Much	23	12		
		3-Moderately	22	11		
		2-Slightly	13	7		
		1-Not at All	5	2		
	Presence of Natural Elements	5-Extremely	117	61	4.19	1.18
		4-Very Much	28	14		
		3-Moderately	23	12		
		2-Slightly	20	10		
		1-Not at All	6	3		
	Safety and Security	5-Extremely	123	63	4.28	1.09
		4-Very Much	25	13		
		3-Moderately	29	15		
		2-Slightly	12	6		
		1-Not at All	5	3		
	Comfort	5-Extremely	132	68	4.40	0.98
		4-Very Much	22	11		
		3-Moderately	28	15		
		2-Slightly	10	5		
		1-Not at All	2	1		
	Familiarity and Personal Experiences	5-Extremely	108	56	4.10	1.19
		4-Very Much	28	14		
		3-Moderately	35	18		
		2-Slightly	15	8		
		1-Not at All	8	4		
	Availability of Multiple Services	5-Extremely	111	57	4.20	1.10
		4-Very Much	35	18		
		3-Moderately	26	13		
		2-Slightly	19	10		
		1-Not at All	3	2		
	Cultural and Traditional Identity	5-Extremely	100	52	3.84	1.36
		4-Very Much	17	8		
		3-Moderately	33	17		
		2-Slightly	33	17		
		1-Not at All	11	6		
	Music	5-Extremely	104	53	3.79	1.52
		4-Very Much	21	11		
		3-Moderately	23	12		
		2-Slightly	17	9		
		1-Not at All	29	15		

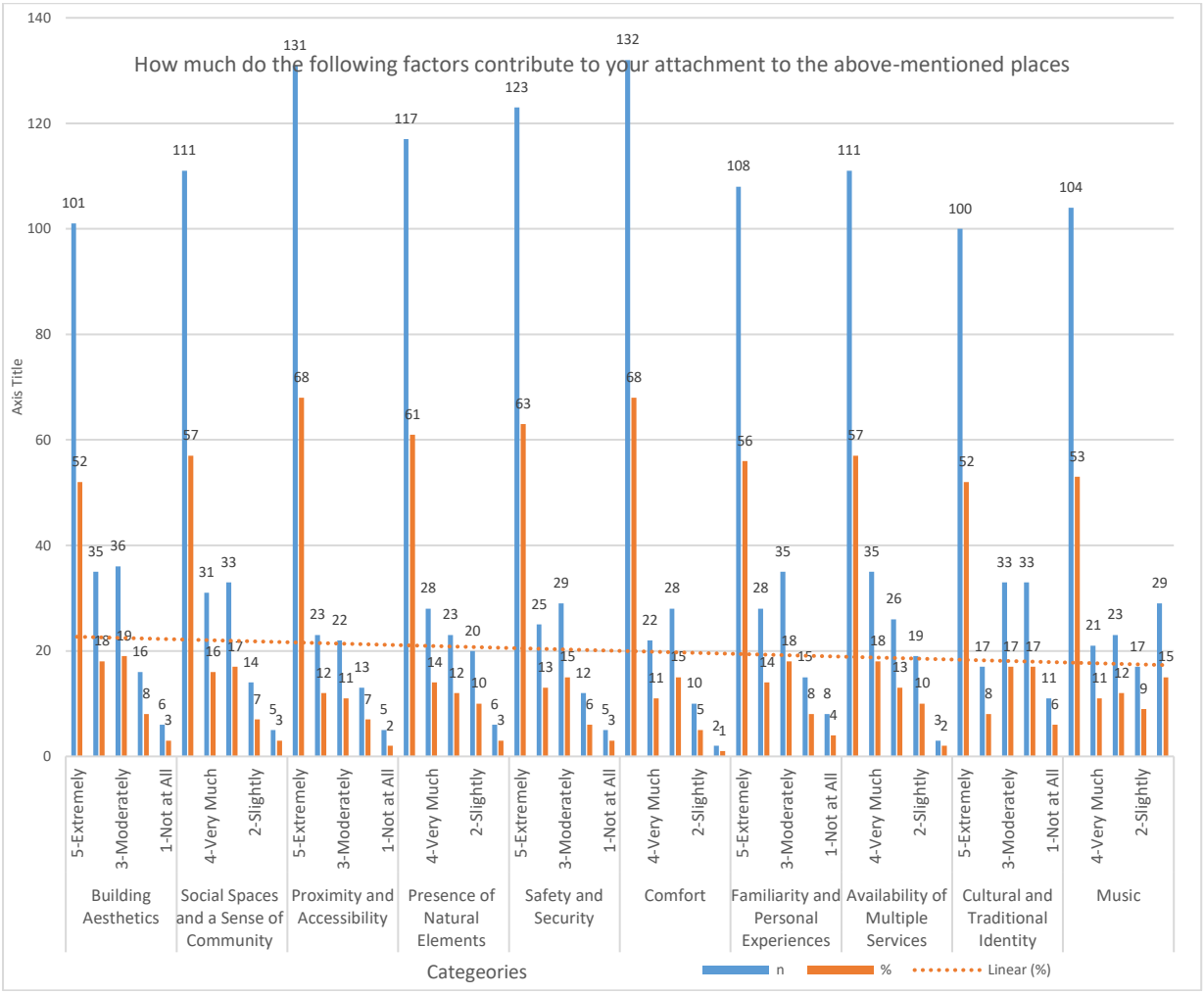


Figure 8. The 2nd question about factors contributing to participants' place attachment.

The final part of the questionnaire included an optional open-ended question asking the participants whether they had any suggestions to enhance place attachment in multi-functional buildings in Bahrain. Some participants added that sea views, natural lighting, sufficient parking, use of color, providing free transport services, use of technology, and simplistic designs can also contribute to and enhance place attachment. The following section delves into the data analysis and the research implications.

5. Discussion

5.1 Factors Influencing Frequency of Visits

To determine the effects of gender, age, and place of residence on place attachment, a data analysis was conducted using the Statistical Package for Social Sciences (SPSS) and the Statistical Package from Microsoft Excel. Given the presence of more than one independent variable, multiple linear regression was conducted with a 95% confidence interval. VIF scores confirmed no multicollinearity among predictors. Table 5 outlines the coefficients, standard errors, t values, and p values of the variables to determine their effects on the frequency of visits for the different building typologies. The results indicate that age and gender are statistically significant and impact the frequency of visits to coffee shops, wellness centers, malls, and co-working spaces. This is in line with previous studies on place attachment (Ghasemieshkaftaki et al., 2025). As for outdoor parks, gender is the only statistically significant variable, whilst age is statistically significant in the frequency of visits to clinics and educational facilities.

Table 5. Associations between gender, age, and place of residence on the frequency of visits to different building typologies.

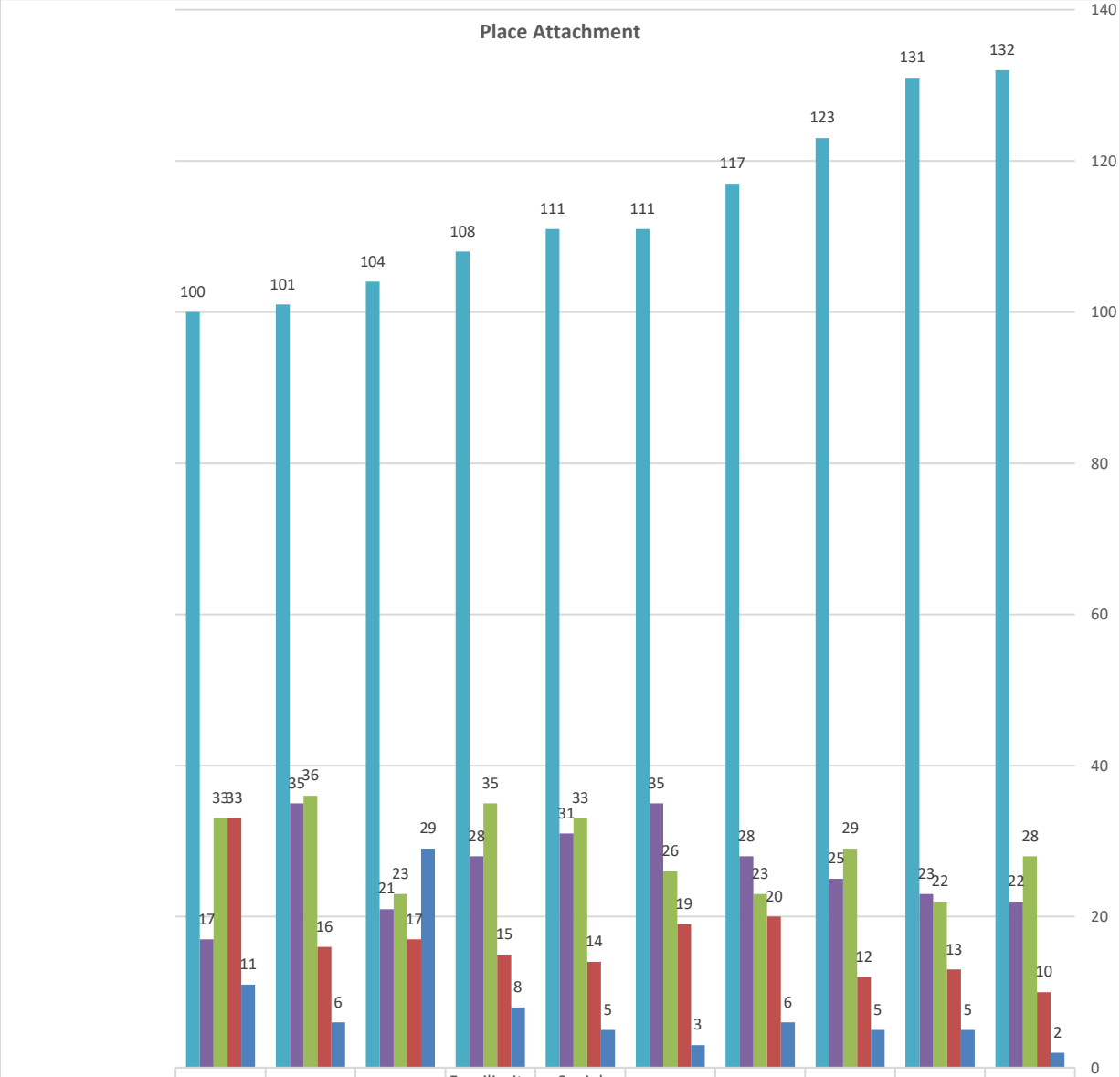
Building Typology	Variable	Coefficient	Std. Error	*t* Value	*p* Value
Coffee Shops	Intercept	5.90	0.27	21.6	0.00
	Gender	-0.61	0.15	-4.20	0.00
	Age Group	-0.43	0.05	-8.03	0.00
	Place of Residence	0.04	0.07	0.56	0.58
Outdoor Parks /Recreational Areas	Intercept	4.42	0.29	15.44	0.00
	Gender	-0.63	0.15	-4.12	0.00
	Age Group	-0.13	0.06	-2.30	0.02
	Place of Residence	-0.02	0.07	-0.32	0.75
Wellness Centers	Intercept	4.94	0.32	15.32	0.00
	Gender	-0.51	0.17	-2.95	0.00
	Age Group	-0.35	0.06	-5.54	0.00
	Place of Residence	0.03	0.08	0.34	0.74
Malls	Intercept	5.09	0.25	20.5	0.00
	Gender	-0.44	0.13	-3.34	0.00
	Age Group	-0.21	0.05	-4.30	0.00
	Place of Residence	-0.10	0.06	-1.50	0.14
Clinics	Intercept	4.00	0.32	12.33	0.00
	Gender	-0.28	0.17	-1.62	0.11
	Age Group	-0.27	0.06	-4.23	0.00
	Place of Residence	0.08	0.08	0.93	0.35
Co-Working Spaces	Intercept	4.25	0.37	11.4	0.00
	Gender	-0.70	0.20	-3.52	0.00
	Age Group	-0.22	0.07	-2.95	0.00
	Place of Residence	0.06	0.10	0.63	0.53
Educational Facilities	Intercept	5.03	0.35	14.4	0.00
	Gender	-0.31	0.19	-1.67	0.10
	Age Group	-0.44	0.07	-6.44	0.00
	Place of Residence	-0.02	0.09	-0.25	0.81

5.2 Factors Impacting Place Attachment

Frequency analysis is performed on the Likert scale data to analyze which of the ten architectural factors impacts the participants most. Table 6 and Figure 9 present the data according to the rank of the factors, which has been concluded based on the highest counts of the highest score, which is 5 (significantly) in this case.

Table 6. The rank of architectural factors on place attachment.

Rank	Factor	1 (not at all)	2 (slightly)	3 (moderately)	4 (very much)	5 (extremely)
1	Comfort	2	10	28	22	132
2	Proximity and Accessibility	5	13	22	23	131
3	Safety and Security	5	12	29	25	123
4	Presence of Natural Elements	6	20	23	28	117
5	Availability of Multiple Services	3	19	26	35	111
6	Social Spaces and a Sense of Community	5	14	33	31	111
7	Familiarity and Personal Experiences	8	15	35	28	108
8	Music	29	17	23	21	104
9	Building Aesthetics	6	16	36	35	101
10	Cultural and Traditional Identity	11	33	33	17	100



The Factor	Cultural and Traditional Identity	Building Aesthetics	Music	Familiarity and Personal Experiences	Social Spaces and a Sense of Community	Availability of Multiple Services	Presence of Natural Elements	Safety and Security	Proximity and Accessibility	Comfort
1 (not at all)	11	6	29	8	5	3	6	5	5	2
2 (slightly)	33	16	17	15	14	19	20	12	13	10
3 (moderately)	33	36	23	35	33	26	23	29	22	28
4 (very much)	17	35	21	28	31	35	28	25	23	22
5 (extremely)	100	101	104	108	111	111	117	123	131	132

Figure 9. The rank of architectural factors on place attachment.

A stacked bar chart is utilized to visualize the score distribution for each architectural factor to identify the most influential factor based on the participants' perceptions, as illustrated in Figure 10. The physical factor of comfort, which includes comfortable furniture, materials, and lighting, is considered the most influential based on the dataset, suggesting that it significantly enhances place attachment. Proximity, convenience, safety, and security also scored very high. The factors with the least impact on place attachment are music and building aesthetics, with cultural and traditional identity being the least influential. The high comfort and proximity scores observed may be partially influenced by the socio-cultural context of Bahrain, where feelings of comfort are tied to family bonds and the closeness

of the community. Thus, cultural factors may predict how proximity is perceived and should be considered in interpreting the findings.

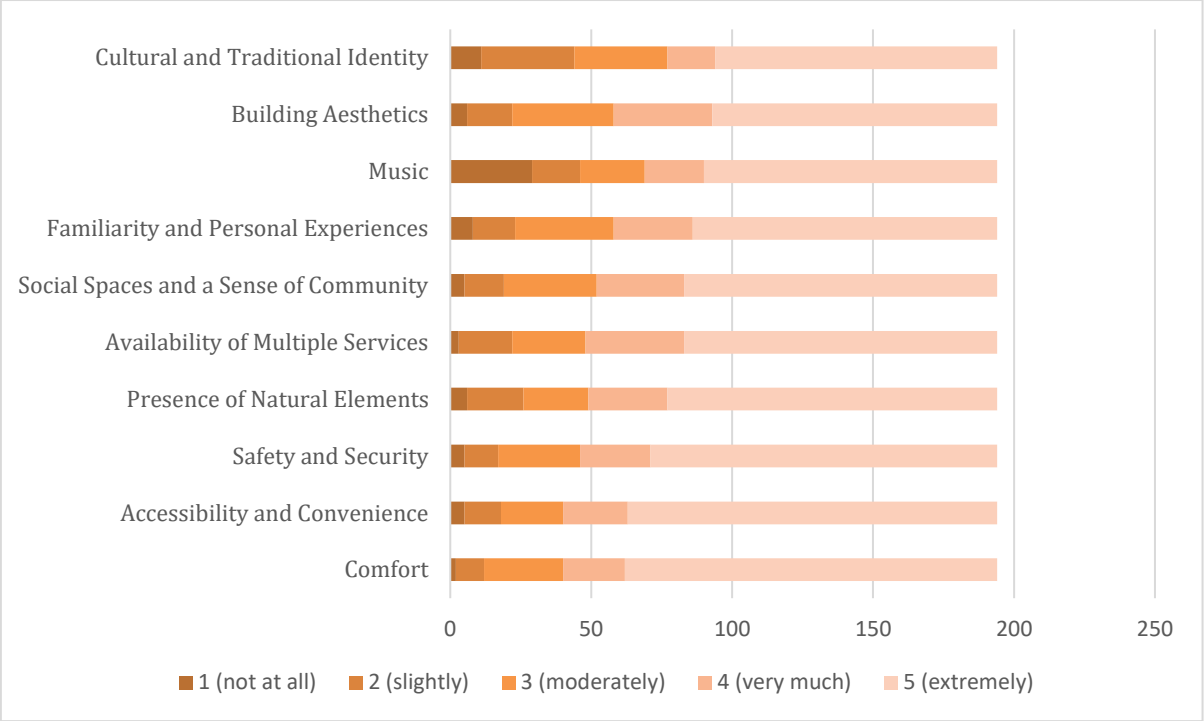


Figure 10. Visualization of the frequency analysis, presenting the score distribution for each architectural factor and its impact on place attachment (Researchers).

5.3 Proposed Guidelines to Enhance Place Attachment in Bahraini Buildings

Based on the regression and frequency analysis findings, Figure 11 presents proposed guidelines for enhancing place attachment in buildings in Bahrain, highlighting the importance of architectural and design considerations at all macro and micro levels. The macro level is associated with the project site and context, highlighting safety, security, and accessibility as key factors in strengthening place attachment. To promote feelings of safety and security, adequate lighting in all building spaces is vital, in addition to the presence of signage and the integration of technologies such as surveillance systems and alarms (Cole et al., 2021). Clear safety policies and trained staff can also increase the perceptions of safety and security. Well-designed access points to the site and building can provide visitors with convenience and ease of visiting, increasing their attachment to places over time. The location of the building is close to other services, and transportation aids in site accessibility and can increase attachment.

When considering the design of the building, the incorporation of multiple services and including everyday and occasional spaces in the layout can also expand the diversity of spaces, attract more visitors, and increase the amount of time spent in the building, thus enhancing the place attachment of users (Lebrusán & Gómez, 2022). The provision of spaces to include natural elements such as blue and green spaces, daylighting, and views can significantly boost the well-being of occupants, giving them a sense of attachment to their environment (Cole et al., 2021).

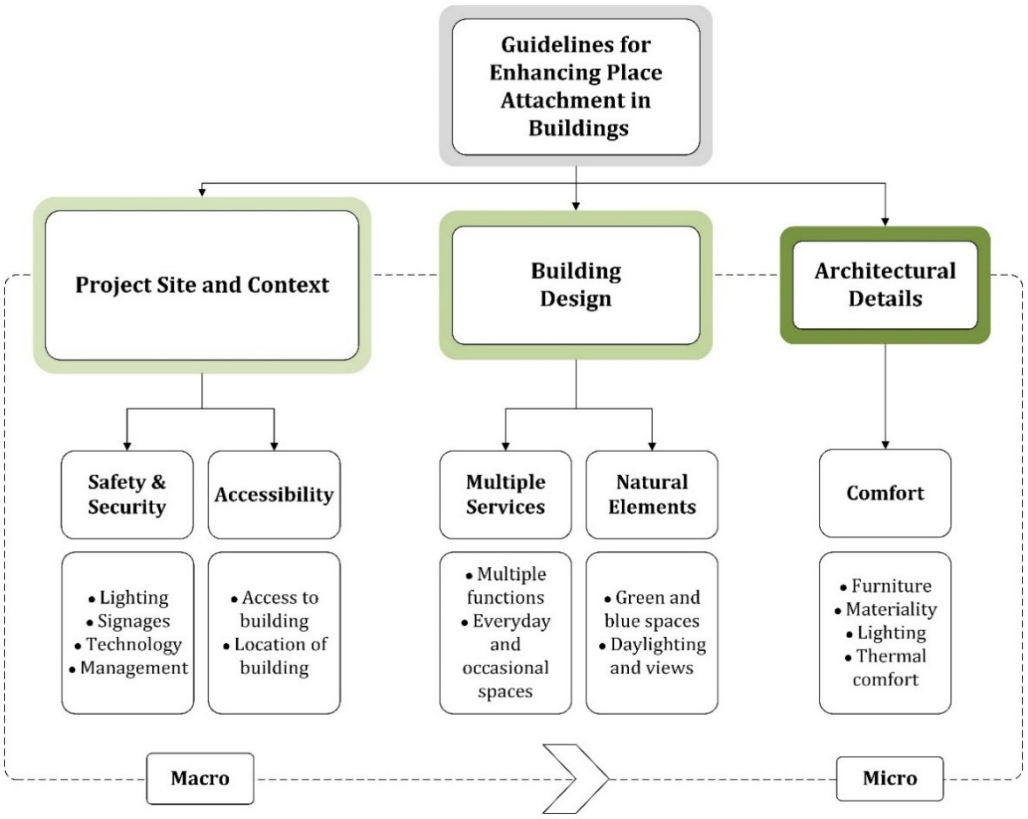


Figure 11. Proposed guidelines for enhancing place attachment in buildings in Bahrain (Researchers).

6. Conclusion

Summary of Key Findings

This study investigated the frequency of visits to different building typologies in Bahrain and explored the physical and social architectural factors that impact place attachment through an online questionnaire. The findings highlight that coffee shops, malls, educational facilities, and wellness centers are among the most visited building types daily and weekly. The results also emphasize comfort, accessibility, safety and security, natural elements, and multiple services. These key architectural factors must be prioritized in designing a new sustainable building typology that promotes well-being and quality of life through place attachment. Based on the findings from the study, guidelines for enhancing place attachment are proposed at three different scales (from macro to micro) as follows:

- the site scale - the building scale, - and the scale of detail.

Limitations and Recommendations for Future Research

Although the proposed guidelines consider socio-cultural factors, future research can explore how socio-economic factors can shape perceptions and mediate place attachment. The sample size limits the study, and further research can focus on more qualitative data on place attachment that can add richness to the dataset. Additionally, the design of specific building types can be studied to analyze the design elements that influence place attachment in particular projects. Future research can also further validate the instrument design through confirmatory factor analysis and measuring place attachment through different socio-economic groups. Nonetheless, the guidelines provide valuable insights to designers and stakeholders for designing a new building typology in Bahrain that improves users' experience and place attachment, thereby enhancing occupants' well-being and quality of life.

Acknowledgements
This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. It is part of the course-work in the P.h.D program in the Department of Architecture and Interior Design in the College of Engineering, University of Bahrain.

Funding
This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflicts of Interest
The authors declares no conflicts of interest.

Data Availability Statement
The original contributions presented in the study are included in the article and further inquiries can be directed to the corresponding author.

Institutional Review Board Statement
Not applicable.

CRediT Author Statement
Conceptualization, N.S.A and I.H.E; Data curation, N.S.A and I.H.E; Formal analysis, N.S.A and I.H.E; Investigation, N.S.A and I.H.E; Methodology, N.S.A and I.H.E; Project administration, N.S.A and I.H.E; Resources, N.S.A and I.H.E; Software, N.S.A and I.H.E; Supervision, N.S.A and I.H.E; Validation, N.S.A and I.H.E; Visualization, N.S.A and I.H.E; Writing, N.S.A and I.H.E; Writing - review & editing, N.S.A and I.H.E. All authors have reviewed and approved the final version of the manuscript.

References

Alalawi , N. & Elghonaimy, I. (2024). Analysing the Social Impacts of Urbanization on Traditional and Contemporary Trading Environments: The Case of Bahrain . *Journal of Contemporary Urban Affairs,* 8(1), 79–101. https://doi.org/10.25034/ijcua.2024.v8n1-5

AlSaeed, S., (2021). The role of theme parks in creating sustainable development. *BAU Journal - Creative Sustainable Development*, 3(1), 1-11. https://doi.org/10.54729/2789-8334.1048

Al-Shami, H. W., Al-Alwan, H. A., & Abdulkareem, T. A. (2024). Cultural sustainability in urban third places: Assessing the impact of 'Co-operation in Science and Technology' in cultural third places. *Ain Shams Engineering Journal*, 15(3), 102465. https://doi.org/10.1016/j.asej.2023.102465

Aqeel, A., (2024), Understanding the Parameters of Influence in Public Space Design, *In Proceeding of the international Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETSIS 2024) (*Vol: 1), IEEE. http://doi.org/10.1109/ICETSIS61505.2024.10459434, Bahrain

Balqees, A., Eldardiri, D., Elghonaimy, I. (2024). Urban Regeneration A Strategy of Nature-based Sustainable Developments: A Case Of Nabih Saleh Neighborhood Public Spaces, *In 6th Sustainability and Resilience Conference: Integration of Nature-Based Solutions in Industrial and Developmental Transitions, (SRC'24),* http://dx.doi.org/10.12785/src/1571093221, https://srcdi.uob.edu.bh/program/, Sakhir, Bahrain.

Bakhouche, M., & Buheji, M. (2019). Measuring Quality of Life. *International Journal of Youth Economy*, 3(2), 75-87. http://dx.doi.org/10.18576/ijye/030202

Boley, B. B., Strzelecka, M., Yeager, E. P., Ribeiro, M. A., Aleshinloye, K. D., Woosnam, K. M., & Mimbs, B. P. (2021). Measuring place attachment with the Abbreviated Place Attachment Scale (APAS). *Journal of Environmental Psychology*, 74, 101577. https://doi.org/10.1016/j.jenvp.2021.101577

Boyd, C. P., & Harada, T. (2022). Finding home: Affective geographies of regional youth (im)mobilities. *Area*, 54(1), 78-87. https://doi.org/10.1111/area.12749

Cole, L. B., Coleman, S., & Scannell, L. (2021). Place attachment in green buildings: Making the connections. *Journal of Environmental Psychology*, 74, 101558. https://doi.org/10.1016/j.jenvp.2021.101558

Elghonaimy, I. H. (2019). Alliancing between the documentation and the renovation of historical buildings in accelerating economic growth in Bahrain, In *Proceeding of the 2nd SMART CITIES SYMPOSIUM (SCS2019 IET)*, https://ieeexplore.ieee.org/document/9124957

Faber, J., & Fonseca, L. M. (2014). How Sample Size Influences Research Outcomes. Dental Press *Journal of Orthodontics*, 19(4), 27–29. NCBI. https://doi.org/ 10.1590/2176-9451.19.4.027-029.ebo

Friesinger, J. G., Haugland, S. H., & Vederhus, J.-K. (2022). The significance of the social and material environment to place attachment and quality of life: findings from a large population-based health survey. *Health Qual Life Outcomes*, 20(1), 135. https://doi.org/10.1186/s12955-022-02045-2

Ghafouri, A., & Weber, C. (2019). Multifunctional Urban Spaces a Solution to Increase the Quality of Urban Life in Dense Cities. *Manzar*, 12(51), 34-45. https://doi.org/10.22034/manzar.2020.214183.2023

Ghasemieshkaftaki, M., Dupre, K., Campbell, J., & Fernando, R. (2025). Enhancing Place Attachment Through Developing Public Open Places: A Cross-Cultural Study in Gold Coast, Australia. *Architecture*, 5(1), 10–10. https://doi.org/10.3390/architecture5010010

Hernández, B., Hidalgo, M. C., & Ruiz, C. (2020). Theoretical and methodological aspects of research on place attachment. In L. Manzo, P. Devine-Wright, & 2 (Ed.), Place Attachment: Advances in Theory, *Methods and Applications*. London: Routledge. https://doi.org/10.4324/9780429274442

Ilovan, O.-R., & Markuszewska, I. (2022). Introduction: Place Attachment – Theory and Practice. In O.-R. Ilovan, & I. Markuszewska, *Preserving and Constructing Place Attachment in Europe* (Vol. 131, pp. 1-29). Springer, Cham. https://doi.org/10.1007/978-3-031-09775-1_1

Inalhan, G., Yang, E., & Weber, C. (2021). Place Attachment Theory. In R. Appel-Meulenbroek, & V. Danivska, *A Handbook of Theories on Designing Alignment between People and the Office Environment*. London: Routledge. https://doi.org/10.1201/9781003128830-16

Jayakody, D., Adams, V., Pecl, G., & Lester, E. (2024). When does place attachment lead to climate change adaptation and when does it not? A quantitative review and thematic analysis. *Environmental Science & Policy*, 160, 103866. https://doi.org/10.1016/j.envsci.2024.103866

Lebrusán, I., & Gómez, M. V. (2022). The Importance of Place Attachment in the Understanding of Ageing in Place: "The Stones Know Me". *Int. J. Environ. Res. Public Health*, 19(24), 17052. https://doi.org/10.3390/ijerph192417052

Lewicka, M. (2011). Place attachment: How far have we come in the last 40 years? *Journal of Environmental Psychology*, 31, 207-230. https://doi.org/10.1016/j.jenvp.2010.10.001

Manzo, L. C., & Perkins, D. D. (2006). Finding Common Ground: The Importance of Place Attachment to Community Participation and Planning. *Journal of Planning Literature*, 20(4), 335-350. https://doi.org/10.1177/0885412205286160

Marques, B., Mcintosh, J., & Chanse, V. (2020). Improving Community Health and Wellbeing Through Multifunctional Green Infrastructure in Cities Undergoing Densification. *Acta Horticulturae et Regiotecturae*, 23(2), 101-107. https://doi.org/10.2478/ahr-2020-0020

Mercer. (2023). Quality of Living City Ranking 2023. Retrieved from Mercer: https://www.mercer.com/insights/total-rewards/talent-mobility-insights/quality-of-living-city-ranking/#:~:text=Mercer%E2%80%99s%20Quality%20of%20Living%20data%20assesses

Razem, M. (2020). Place Attachment and Sustainable Communities. *Architecture_MPS*, 17(1), 3. https://doi.org/10.14324/111.444.amps.2020v17i1.003

Roös, P. B. (2022). Experience of Place, Space and Attachment [Pattern 3]. In P. B. Roös, A Biophilic *Pattern Language for Cities* (pp. 53-67). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031-19071-1_5

Scannell, L., & Gifford, R. (2010). Defining place attachment: A tripartite organizing framework. *Journal of Environmental Psychology*, 30, 1-10. https://doi.org/10.1016/j.jenvp.2009.09.006

Seamon, D. (2020). Place attachment and phenomenology: the dynamic complexity of place. In L. Manzo, & P. Devine-Wright, *Place Attachment: Advances in Theory, Methods and Applications* (pp. 29-44). Milton: Taylor & Francis Group. https://doi.org/10.4324/9780429274442

Shahabadi, M. R., & Adeli, Z. (2024). Identifying the factors affecting the place attachment in three scales: home, neighborhood, and city. *Motaleate Shahri*, 13(51), 73-86. Available at: https://urbstudies.uok.ac.ir/article_63050_637a93bdedac7c7e2089a8ab2f46426c.pdf?lang=en

Şimşek, A. S. (2023). The power and type I error of Wilcoxon-Mann-Whitney, Welch's t, and student's t tests for Likert-type data. *International Journal of Assessment Tools in Education*, 10(1), 114–128. https://doi.org/10.21449/ijate.1183622

Ujang, N., Yang, W., & Shi, L. (2024). A SYSTEMATIC LITERATURE REVIEW OF PLACE ATTACHMENT IN ENVIRONMENTS, CITIES AND LANDSCAPES. *New Design Ideas*, 8(2), 389-411. https://doi.org/10.62476/ndi82389

Vaux, D. E., & Langlais, M. R. (2023). Reframing Third Places: Environmental Changes of Merging Places During COVID-19. *Journal of Interior Design*, 48(1), 12-28. https://doi.org/10.1111/joid.12232

Waxman, L. (2008). The Coffee Shop: Social and Physical Factors Influencing Place Attachment. *Journal of Interior Design*, 31(3), 35-53. https://doi.org/10.1111/j.1939-1668.2006.tb00530.x

Zahnow, R. (2023). Place type or place function: What matters for place attachment? *American Journal of Community Psychology*, 73(3-4), 446-460. https://doi.org/10.1002/ajcp.12722

Zivkovic, J., Lalović, K., Milojevic, M., & Nikezic, A. (2019). Multifunctional public open spaces for sustainable cities: Concept and application. *Facta Universitatis*, 17(2), 205-219. https://doi.org/10.2298/FUACE190327012Z