Journal of Architecture and Planning , Vol. 37 (4) , pp. 389-411, Riyadh (2025/1447H)

doi:10.33948/JAP-KSU-37-4-4

Utilizing User-Centered Design Approaches to Enhance the Design of Private Outdoor Living Spaces: Case Study of Taif City

Reem Farouq Alsabban **Mona Sanat Zebar Alotaibi**

Interior design departments, College of Art & Design , University of Jeddah, Jeddah, KSA

rfalsaban@uj.edu.sa *Moonotb2349@gmail.com*

(Received 16/2/2025; accepted for publication 4/9/2025.)

Abstract: This study critically examines the application of user-centered design (UCD) as a methodological framework for enhancing the design of outdoor living spaces within residential buildings, with a particular emphasis on optimizing user quality and well-being. The study adopts a descriptive-analytical approach, outlining strategies for the effective implementation of the UCD Approach in the context of outdoor living spaces. This framework is employed to investigate the challenges associated with applying UCD in residential housing within the city of Taif, and proposes potential solutions, drawing upon established global standards. The objective is to develop context-specific, practical criteria that can be implemented within the local housing context of Taif. The study applies the UCD Approach to the design of outdoor living spaces, resulting in a model that guides designers in improving these spaces. This model aims to enhance the functionality of outdoor areas while more effectively meeting the diverse needs and preferences of residents. The research concludes with several key recommendations, notably the adoption of user-centered design as the foundational principle for the development of outdoor living spaces. This approach is essential not only for addressing human needs but also for fostering a deeper connection between residents and their natural environment.

Keywords: User-Centered Design, Outdoor living Space, well-being, Quality of Life, Human Behavior.

1. Introduction

Private outdoor living spaces are essential components of architectural design, providing environments for relaxation, recreation, and connection with nature. Their design requires thoughtful consideration to create comfortable, functional areas that cater to the diverse physical, emotional, and social needs of residents. Well-designed outdoor spaces can support a wide range of activities while enhancing overall well-being and user engagement.

In Saudi Arabia, Vision 2030 emphasizes the importance of improving the quality of life for individuals and communities. In line with this national agenda, there has been growing support for enhancing residential environments. The COVID-19 pandemic in 2020, along with the resulting isolation measures, further underscored the urgent need for improved residential and outdoor living spaces. As Bettaieb and Alsabban (2021) highlight, there is a critical need for further research into the quality standards of post-pandemic residential environments. Designing such spaces should prioritize user-centric architecture, reinforce family cohesion, and support residents' spiritual, psychological, social, and cultural needs, while remaining sensitive to local customs and traditions.

This study focuses on the city of Taif in Saudi Arabia, historically known as "The Resort of Kings." Taif is distinguished by its moderate climate and diverse terrain, ranging from fertile plains to mountainous highlands, which are home to farms, orchards, and gardens (Dagestani, 1981). This

geographical diversity has historically influenced the design of residential buildings, particularly in terms of building materials, spatial organization, and the integration of internal and external spaces. Descriptions by travelers such as Burckhardt, Didier, and Flippy from the post-Islamic periods through to the era of Saudi governance (Al-Abbadi, 2022) reflect these architectural characteristics and the prominence of outdoor elements in traditional Taif homes. This literary and historical evidence highlights the evolution of urban design in the city and the increasing importance of outdoor living spaces as a defining feature of residential architecture.

Today, outdoor living spaces are considered a key requirement in contemporary housing design, making it essential to optimize their function and relevance within the home. As these spaces are ultimately inhabited and experienced by users, there is a growing need to understand users' behaviors, preferences, and cultural expectations. This shift has led to the emergence of User-Centered Design (UCD) as a critical methodology in architectural practice. UCD emphasizes the involvement of users at every stage of the design process, enabling solutions that are tailored to their specific needs, habits, and environments (Bettaieb & Alsabban, 2021).

Recognizing the profound impact of the built environment on human well-being, this study investigates the application of a user-centered design Approach to outdoor living spaces in residential buildings in Taif.

1.2 Research Problem

Research indicates that people spend approximately 80% of their time indoors, where the environment can positively or negatively affect their mood (Channon, 2023). Many studies emphasize the link between buildings and happiness, noting that surroundings interact with individuals, consciously or unconsciously (Wahl & Oswald, 2010) However, the influence of the environment on well-being, particularly feelings of happiness or dissatisfaction, is often underestimated (Knudstrup, 2011) High-quality design plays a critical role in mental health and happiness, impacting productivity, mindset, and alertness through the reflective nature of the surrounding environment (Channon, 2023).

Hakky (2013) argues that common criticisms of villa gardens in Saudi Arabia, including limited size, lack of privacy, and harsh climate, are overstated and can be addressed through thoughtful design. Gardens support multiple uses, serve as important extensions of indoor space, and can adapt to changing social behaviors. The challenges are not inherent but solvable through better planning and design.

In Taif, observations suggest that despite the favorable weather throughout the year, villa residents may not fully utilize their private outdoor-living spaces in a way that aligns with their needs and the intended purpose of these areas. (Mamdooh, 2022).

This raises the research question: How can private outdoor living spaces be designed using a user-centered approach?

1.3 Research Objective

Developing a user-centered design approach to enhance the design of private outdoor living spaces

1.4 Research Question

How can a user-centered design approach be applied to develop a contextual model for private outdoor living spaces in the Taif region?

1.5 Research Importance

The findings of this study and the established standards represent a key advancement in supporting designers and planners to create innovative solutions that address users' needs in outdoor living spaces.

2. Literature Review:

2.1 Concept of User-Centered Design (UCD):

The term user-centered design (UCD), or Humen Centered Design (HCD) as referred to in some studies, refers to a design approach that involves end users in creating solutions tailored to their physical and psychological needs. It encompasses all aspects of the physical environment, serving as a method to address user requirements during the design process or to enhance existing conditions, resulting in a model applicable to individuals and focused on developing products and spaces for human users, such as buildings, communities, services, and products, no matter their age or ability (ElSayed et al., 2017)

This approach ensures that the end-user's needs are met. It is based on integrating the user into the design process from the beginning to the end as much as possible to effectively solve their problems in a way that aligns with their needs, regardless of their age or physical abilities. Designers must be aware of human characteristics and understand them by observing behavior to improve design quality and products, enhancing user experience and satisfaction (Samancioglu, 2017).

Table (1). Comparative Overview of Key Studies on UCD

Reference	Focus Area	Key Findings/Proposals
Stoyanov, G. et al. (2023)	Architectural principles and innovations focused on human-centered design in the context of COVID-19	Architectural innovation in human-centered design is critical, especially amid the challenges posed by the COVID-19 pandemic, which increased users' awareness of the connection between housing, health, and flexible, adaptable designs.
AS Elsaadany, A. S., & Abelhamid, A. (2022)	Complementary effect between design and user behavior	Designing urban spaces to meet psychological and physiological needs improves quality of life, enhances social well-being, and promotes residents' interaction with their built environment.
Sherine Seba Tablit (2017)	Reuse of space and human behavior	There is a clear relationship between the reuse of interior space and human behavior, highlighting the need to consider interior designs to improve human experience and foster positive interaction.
El Sayad, Z. M., et al. (2017)	Using interactive architecture and integrating it with human-centered design	Interactive architecture has great potential to achieve the benefits of human-centered design, improving the quality of architectural spaces and enhancing the user experience.
Rania Mohammed Ali Taha (2010)	Interaction between architecture and its residents	Housing design plays a significant role in shaping social interactions and impacts individuals' mental and physical health, underscoring the mutual relationship between environment and society in planning.

2.2 The relationship between human behavior and UCD (User-Centered Design) in Architecture:

User-centered architecture prioritizes users' needs, happiness, and sense of belonging by designing spaces that offer comfort, beauty, and functionality to support individual activities. Architects and designers strive to create environments that minimize physical effort, enhance mobility, and foster social bonds through spaces that promote interaction, collaboration, and shared experiences, such as public areas within buildings. These spaces also honor users' cultural traditions and values, placing the individual at the core of the design process to not only provide shelter but also elevate overall quality of life. This involves ensuring safety, privacy, and seamless integration of indoor and outdoor living spaces (Ayse, 2025).

Additionally, user-centered design guidelines are essential for architects and designers as they align with users' aspirations and ideas, shaping concepts to maximize the potential of spaces. These guidelines serve as both practical tools and key elements in achieving optimal user-centered design in architecture, facilitated by thoughtful space creation. (Demirbilek O & Sener B, 2003).

Adas (1998) emphasizes that human behavior is shaped by four key dimensions: human, spatial, temporal, and social. These dimensions offer a valuable framework for guiding environmental design. In private outdoor living spaces, especially in culturally specific contexts like Taif city, applying this framework allows designers to create environments that align with users' needs, behaviors, and cultural values. Through user-centered design, spatial elements can be shaped to support comfort, privacy, and meaningful interaction, making design a powerful tool for enhancing everyday life.

According to Lawson (2001) and Hall (1966), understanding the relationship between human behavior and personal space can be facilitated by dividing it into four zones (intimate, personal, social, and public), which can help improve social interactions and cultural diversity within personal spaces. Also, respecting boundaries creates a safer and more appreciated environment.

2.3 Reusing Space Design According to Human Behavior:

Understanding the relationship between design and human behavior is crucial, as it enables

designers to use inspiring elements that stimulate human perception within spaces, which, in turn, affect a person's emotions (Al-Bazzaz, 2001). This design process begins with analyzing the user's problem, followed by analysis, evaluation, and ultimately, reaching a solution and making appropriate decisions to meet the user's needs, thereby creating a reciprocal relationship between behavior and architectural space (Lawson, 1997).

2.4 Interior Designer's Role in Promoting Positive Human Behavior:

There is a strong link between the impact of interior design on human behavior and promoting flexibility and positive emotions through human sensory stimuli (visual, auditory, tactile, and olfactory) (Naz et al., 2017). For instance:

- Lighting influences productivity and mental well-being.
- Colors affect mood—bringing happiness or sadness.
- Size influences feelings of space and openness or confinement.

Furthermore, Visual sensation creates emotions and plays a vital role in creating desirable atmospheres for individuals, ranging from calm to active. According to Hendy and Zahra (2018), visual sensation also achieves balance in spaces and improves mental health. Natural lighting strongly shapes comfort within a space, boosting activity or increasing feelings of privacy. Therefore, understanding the function and type of the space is crucial for determining the appropriate lighting to match the user's desired behavior.

Calvo (2014) and Ramadan (2019) mention key points on the Importance of Outdoor-living Spaces and Their Impact on Human Behavior:

- **Improving Mental Health:** Proximity to nature, such as the presence of green spaces, enhances overall well-being, increases happiness, and reduces stress and anxiety.
- **Boosting Productivity:** Connecting with the external environment creates a stimulating setting for creativity and focus, leading to increased productivity.
- **Strengthening Social Bonds:** Outdoor living spaces encourage interpersonal communication by providing gathering places, enhancing social relationships.
- **Expressing Cultural Identity:** Outdoor-living spaces reflect belonging to community values and culture by aligning with local customs and values, which are part of the user's identity

2.5. Human characteristics by physical approach:

Studying human characteristics is crucial for understanding how users interact with the design and surrounding space. Incorrect postures can harm users and lead to health issues, so using appropriate measurements for the human body contributes to creating a comfortable and healthy environment, reducing future risks. The relationship between humans and their surroundings, whether at home, in courtyards, or in workplaces, should be studied to increase productivity and improve well-being (Ritter et al., 2014).

2.6 Human characteristics by behavioral aspects

Over the centuries, behavioral aspects have influenced design decisions. To meet user needs, a designer must deeply study their behavior and desires, as illustrated by Maslow's Hierarchy of Needs, which outlines human needs in a hierarchy (McLeod,2007). This model has helped create environments that promote safety and beauty together. Additionally, individual differences among users must be considered to achieve a design that satisfies a broader range of users (Samancioglu, 2017).

3. Research Methodology

This research was carried out in two main parts: an analytical study and an applied study.

The analytical study employed a descriptive qualitative approach to explore the requirements of private outdoor living spaces and identify how these spaces should be prioritized. It aimed to address the core problem of the current study by examining existing spatial conditions and collecting qualitative data related to user needs and preferences in outdoor areas.

The applied study employed a case study approach, a widely used method in social research for exploring specific subjects, such as places or groups of people. This method is particularly useful for evaluating different dimensions of a research problem. According to Thies (2002), case studies involve multiple observations within a single case.

Similarly, John Gerring (2006) defines the case study as an intensive examination of a single unit, used to gain insight into broader categories or similar cases.

Three residential models were selected as case studies, all located in the city of Taif. The selection was based on factors such as Age of Resident, architectural style, and the presence of private outdoor living areas. Semi-structured interviews were conducted with the residents of the selected houses to gather insights and data on their use of outdoor spaces. These interviews helped support the evaluation process and contributed to shaping the design recommendations.

The figure below illustrates the process for achieving the specific "user-centered design standards for outdoor living spaces in Taif" (Figure 1).

Moreover, a user-centered design model for outdoor-living spaces has been developed, based on several stages, including standards derived from previous studies and international standards. These standards have been tailored to fit the study area, "Taif," covering various design aspects, from climate and environment to the cultural and social needs of users, as shown in Figure 2. These standards include:

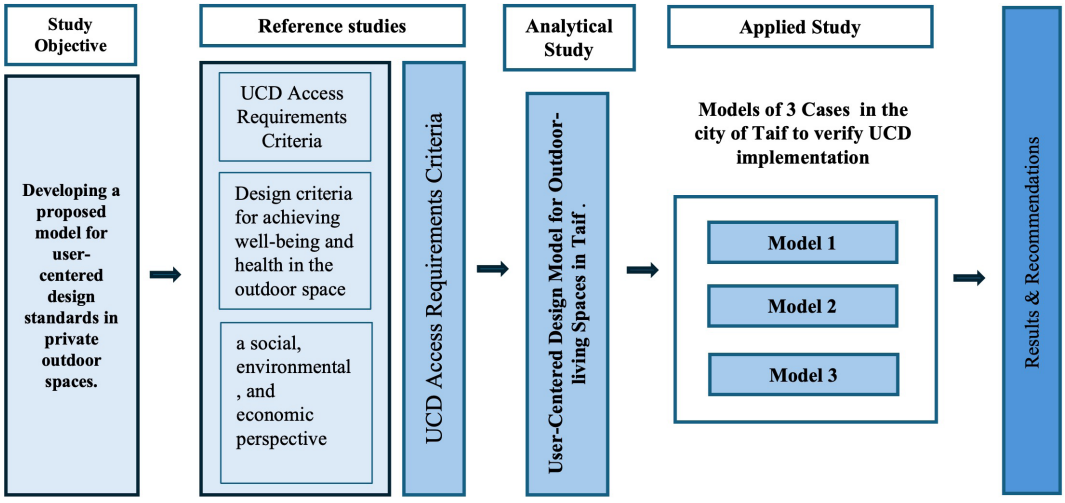


Figure (1). Shows How to access the special standards (for user-centered design standards in the external spaces of the Taif region).

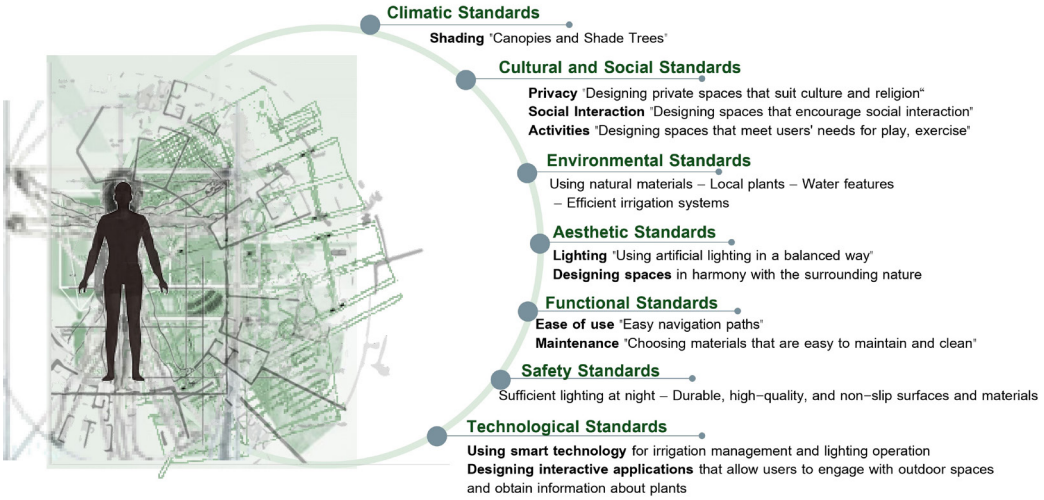


Figure (2). Model of user-centered design standards in outdoor-living spaces in the Taif region) designed by the researchers.

- **Climatic Standards** (Shading with umbrellas and shade trees)
- **Cultural and Social Standards** (Privacy; designing private spaces that align with culture and religion; Social Interaction designing spaces that encourage social interaction; Activities designing spaces that meet users' needs for play, sports, or reading)
- **Environmental Standards** (Use of natural materials, local plants, water features, effective irrigation systems)
- **Aesthetic Standards** (Lighting, balanced use of artificial lighting, Designing spaces that blend with the surrounding nature)
- **Functional Standards** (Ease of use, easy-to-navigate pathways; Maintenance, choosing materials that are easy to clean and maintain)
- Safety Standards (Adequate nighttime lighting, Durable, non-slippery surfaces and materials)
- **Technological Standards** (Use of smart technology for managing irrigation and lighting; Interactive apps that allow users to engage with the outdoor-living space and access information about plants)

4. User–Centered Design Method

User-centered design has a specific methodology that includes several foundations to address design problems, primarily relying on brainstorming to help designers generate effective ideas (Abras et al.,2004). It also involves engaging the end user in this process. The International Organization for Standardization (ISO:2024) has classified these methodologies to ensure the proper implementation of human-centered design. the ISO 6 principles of human-centered design emphasize, includes:

- Understanding the end user and their surrounding environment.
- Involving the user throughout the development and design stages.
- Improving the design through evaluation.
- Iterating the process.
- Addressing the design based on the overall user experience.

This methodology helps develop systems and designs that better align with user needs.

5. User-centered design in Built environments

User-centered built environments are fundamentally focused on effectively meeting user needs. The concept of buildings has evolved beyond merely providing shelter; it now encompasses creating spaces that connect beauty, comfort, and functionality. This approach fosters social connections within the community and enhances the quality of human life by respecting the user's culture and traditions (Demirbilek, 2003).

Several guidelines are included to achieve user-centered design, such as: studying colors and acoustics, creating spaces that promote physical and mental health, designing areas that inspire creative thinking through a connection with nature, and focusing on acoustic and visual privacy to ensure user security. Additionally, it is important to provide natural ventilation to improve individual quality of life, while also addressing psychological, physical, and cognitive needs that adapt to the user (L. Gee, 2006).

According to El Sayad (2017), there is also a significant emphasis on incorporating features in spaces to facilitate movement for individuals with varying physical abilities. Thus, awareness of the importance of this approach and its connection to surrounding environments has become essential for interior designers and architects. User-centered architecture enhances the needs, happiness, and sense of belonging of users by creating spaces that provide comfort, beauty, and functionality to support individual activities. Designers aim to create spaces that reduce physical effort, facilitate movement, and strengthen social connections by establishing areas that encourage interaction, collaboration, and the exchange of experiences, such as the design of public spaces within buildings. Additionally, they create spaces that respect the traditions and culture of the user, placing the individual at the heart of the design process, not just for shelter but for improving overall quality of life (Ayse, 2025). This includes providing safety, privacy, and integrating outdoor-living spaces with indoor ones (Demirbilek O, Sener B, 2003)

User-centered design guidelines are vital for architects and designers because of their ability to meet users' desires and ideas, shaping concepts to develop the potential of spaces. These guidelines not only serve as tools for designers but also as features

to achieve ideal user-centered design approaches in architecture, supported by space creation (L. Gee, 2006). They include the following:

- **Colors, Acoustics, and Lighting in Space:**

The use of colors in the surrounding environment has a clear impact on the psychology, emotions, mind, and behavior of users. If fully harnessed within the space, this feature provides a solution to design problems, as it directly affects the space. (Wells et al., 1979).

Lighting affects the user's experience of the space, as they perceive it based on how light integrates within it, such as incorporating scenery and elements by placing lighting in the space to allow it to be analyzed as material, color, or space. (McAuliffe,2016)

Additionally, we increasingly need organized acoustic environments and control over unwanted noise from activities around the user, whether inside or outside the space, depending on the space or finishes. Several aspects must be considered when designing a space according to user-centered design to achieve organized acoustics, such as room acoustics, vibration control, sound insulation, building service noise, and the presence of echoes in the space (Ecophan, 2002)

- **Health**

In healthy spaces, there is a blend of physical well-being and sustainable well-being, along with environmental principles and workplace environment principles. This is achieved through lighting, sound, environmental considerations, and color.

- **Stimuli**

Spaces that stimulate creative thinking attract users significantly. Stimulating spaces are created through six elements: surprise, visual access through transparency, texture and color, sensory cues, connection to nature, and diverse forms (L. Gee, 2006).

- **Adaptability**

In our built environments, users must adapt to changing activities on a daily basis. These classifications include (suitable spaces, flexible spaces, welcoming spaces, user ownership, sufficient spaces, spaces with adaptable focal points, and technical tools (Farghaly, 2017). These features have given levels to architecture focused on user-centered design, where these levels are classified in varying degrees based on how they are used. The primary level is based on user needs, such as physical, cognitive, psychological, social, and emotional needs. This is followed by the level that focuses on verbal and non-verbal user needs, such as understanding desires, meanings, and needs (Farghaly,2017). Examples of user-centered design levels integrated with architecture include:

- Privacy: Includes visual and auditory privacy to give residents a sense of comfort and security within their spaces. (Altman,1975)
- Ventilation and Natural Lighting: Create healthy and comfortable environments for residents. (Lechner, 2014).
- Integration of Design: Strong connections between outdoor and indoor spaces, such as balconies, gardens, or courtyards, to improve the quality of life for individuals. (Kellert, 2008).
- Adaptable Spaces: Spaces that can adjust to users' activities and spaces that can be reconfigured (Till, 2009). These include:
  - A step-free entrance to the space, which helps protect the elderly, children, and individuals with disabilities from falling.
  - Door handles that are easy to open, benefiting users with weak wrist strength.
  - Within the space, features such as a raised-height step for washing machines or dishwashers, along with kitchen areas that include seating spaces.
  - External environments, such as covered seating stations, non-slip walkways, and dedicated spaces for easier passage.
  - For communities that embrace walking, designs integrate users' homes with their workplaces and commercial areas by providing safe pathways for bicycles and sidewalks separate from car lanes (Farghaly,2017).

Designers must integrate user-centered design principles with the end user's needs in architecture, considering their beliefs, values, motivations, behaviors, and respect for culture and social standards. This awareness has led to a strong recognition of the connections between user-centered designed environments by interior designers, as they provide users with comfort and health, promote mental and physical well-being, and offer flexible spaces that encourage social interaction (L. Gee, 2006).

6. Levels of User-centered design

The research has concluded with the principle of "Integrating User-Centered Design Levels with Space and Redesigning It," as shown in Figure 3.

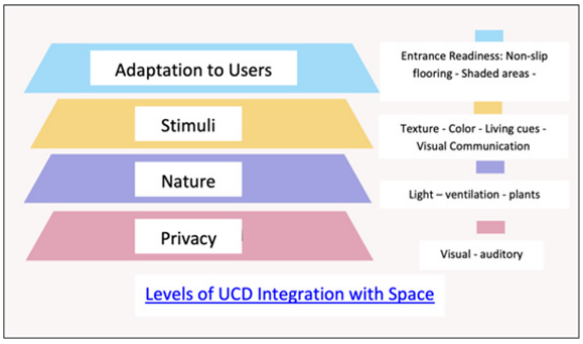


Figure (3). Levels of User-centered design.

In conclusion, "User-Centered Design" is not just a design method, but a comprehensive philosophy aimed at improving the quality of life for individuals. It represents a development process for people by understanding their needs and aspirations in designing services, communities, and buildings, creating spaces that enhance comfort, health, and social interaction. It is a more humane and sustainable approach, providing a powerful tool to promote well-being and create communities that support physical and mental well-being.

Additionally, a model was created to explain the requirements for achieving UCD, as shown in the following figure (4).

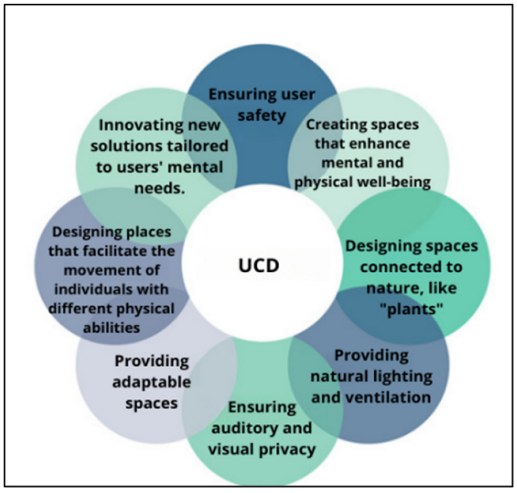


Figure (4). shows the requirements for accessing the UCD in the outdoor-living-living space (researchers's design)

In the following table, we present the conclusions reached for the requirements to achieve (UCD), which will be applied and validated:

Table (2). Requirements for Achieving (UCD) in built environments (BE) perspective

UCD in BE
Safety
Healthy Spaces
Connection to Nature
Proper Lighting
Adequate Ventilation
Privacy
Adaptable Environments Spaces
Spaces for everyone
Innovative Solutions

7. The relationship between well-being and design

Achieving well-being requires a deep understanding of the impact of spaces on individuals. To achieve this, it is preferable to integrate certain features into both indoor and outdoor living spaces during the design process, such as natural lighting, which affects various systems within the human body, including physical health, mental states, mood fluctuations, and the biological clock linked to sleep and insomnia (Channon, 2023). Therefore, incorporating natural light to create spaces that focus on human health can aid in recovery. Additionally, the presence of indoor greenery improves the quality of pure, pollutant-free ventilation (Habtour, 2016).

According to various studies (Channon, 2023; Knudstrup, 2011), the spaces surrounding individuals should support a healthy environment by reconsidering how to design these areas and providing more user-centered spaces that enhance social interaction. This, in turn, reflects on the quality of life of every individual. Certain features should also be included in spaces, such as sound insulation or the reduction of unwanted noises, as these can disrupt individual productivity and negatively affect health. Increased noise can sometimes lead to heightened anxiety, disrupt sleep patterns, and raise blood pressure. Therefore, the use of materials that reduce echo and provide sound insulation should be considered.

Green spaces are important as they significantly enhance individual quality of life, much like in ancient residences that harmonized

Table (3). Requirements for Achieving (UCD)+ achieving well-being in outdoor-living spaces

	Safety	Healthy Spaces	Connection to Nature	Proper Lighting	Adequate Ventilation	Privacy	Adaptable Environments Spaces	Spaces for everyone	Innovative Solutions	Appropriate geometric dimensions	Presence of a water source	Level progression
UCD in BE												
Wellbeing												

with the surrounding nature. Well-being, health, and happiness are linked to spending more time in green spaces that promote thermal comfort (Dolan & Metcalfe, 2012). Various points were highlighted to maximize benefits during time spent in outdoor-living spaces, such as planting and gardening, designing spaces to enhance social interaction through seating areas, and suitable lighting. Attention should also be given to the impact of colors and their careful selection, as they have a profound effect on emotions and human behavior (Wang, 2010; Beatley, 2013).

Moreover, Harrison (2018) explains that the application of the wellness design concept is vital for improving user well-being and creating healthy environments that enhance both mental and physical health. It is essential to provide spaces that support recovery and fitness, such as exercise areas and bedrooms, while also reducing safety risks and ensuring accessibility for everyone, regardless of physical abilities, through the design of user-friendly spaces. This design concept encompasses three features: physical, practical, and emotional attributes. It is not merely an architectural trend; rather, it is an approach that includes creating healthier environments to enhance individual well-being (Gold, 2022).

Additionally, the importance of selecting suitable materials that reduce health risks must be considered. According to several studies (Ramadan & Kamel Ahmed, 2019; Ulrich et al., 2004), Using natural and non-toxic materials such as porcelain, wood, and ceramic is essential to provide a comfortable and safe environment for users. The choice of materials has a strong impact on quality of life, so the selection of finishes should not only focus on aesthetics but also on health benefits that improve individual life. This is part of a comprehensive design strategy aimed at creating a balanced environment. Thus, conscious decisions must be made regarding finishing materials that ultimately contribute to a healthier and more sustainable architectural environment.

Design that promotes human health and well-being is crucial for creating user-centered spaces. This approach requires the integration of all these elements to create an environment that serves individuals and provides them with comfort and health. This includes improving the functions of spaces and enhancing the user experience by creating flexible environments that meet individual needs (Calvo,2014). To clarify further, User-Centered Design (UCD) is a tool used to achieve happiness and well-being.

Table (3) summarizes the design criteria required to achieve well-being and health in outdoor-living spaces, which will be applied and ensured:

8. Outdoor-living spaces from a social, environmental, and economic perspective

For centuries, outdoor-living spaces have played a crucial role in homes, serving the family by accommodating various activities and providing opportunities to enjoy nature.

Their importance lies in balancing the residents' need for private spaces with an open connection to the sky (Wen, B., et al., 2023). These spaces are characterized by spatial composition, the formation of the courtyard, and the movement within it, ensuring connectivity between areas through movement paths that harmonize with the site's topography while maintaining the privacy of the homeowners (Abdul Hadi, 2018).

Al-Zamil (2018) explains that the functional aspect of outdoor-living spaces, which serves the

family's and community's needs, should not be overlooked. Despite variations in shape and size, these spaces serve similar environmental, economic, and physiological purposes, thereby enhancing family life by creating spaces for work, trade, and agricultural areas that provide a source of food. The relationship between the features and elements of the outdoor-living spaces, such as pergolas, walls, and multiple levels, is significant, regardless of the size and social class of the residents, from royal gardens to traders' gardens and workers' gardens. The efficiency of outdoor-living spaces also depends on proper planning, determining how the space is used, and adding areas for seating, greenery, and other activities that meet the homeowners' needs in the most aesthetically pleasing way (Baara et al., 2010)

Outdoor-living spaces are important for their social, environmental, and economic benefits. According to Waziri (2002), the best courtyard is a square shape with a slight extension, where lower wall height (shallow depth) increases ventilation and natural light, while less shading is needed. This shape provides optimal climate solutions for all regions by offering the best natural lighting and ventilation for the internal spaces surrounding the courtyard, creating a comfortable microclimate by drawing in cool air and directing it indoors.

In other courtyards and outdoor-living spaces, climate solutions can be provided through external treatments such as water features or the addition of trees to balance humidity levels, provide shade, and control unwanted wind and its speed, while cooling the air. Shading elements such as domes, pergolas, or tents can also be used (Abu Zaarour et al., 2013).

According to several studies (Goudarzi & Mostafaeipour, 2017; Aboelata, 2021),

Natural ventilation systems created by outdoor-living spaces are an eco-friendly and cost-effective element that improves thermal comfort for users of the indoor spaces and reduces energy consumption by lowering the airflow temperature. Additionally, utilizing elements in outdoor-living spaces that help control heat, such as shading areas, using light colors, and adding water features and trees (either on rooftops or vertically), improves the building's energy efficiency. Conversely, poor outdoor-living space design poses challenges in controlling energy consumption, with solar glare leading to heat accumulation in the building and increasing the need for mechanical cooling systems (Ranđelović,2022).

Courtyards come in many shapes, not limited to one model; they include U-shapes, L-shapes, closed or semi-closed courtyards, and courtyards open on opposite sides, taking the surrounding environment into account (Abass, et al.,2016). The internal divisions of these courtyards are typically of three types:

those designated for family use, for guests, or for animals (Hariri,1987). Little (2014) explains that, regardless of their shape, structure, and elements, courtyards are closely linked to the health and well-being of those who use them. They promote positive behaviors, reduce anxiety and depression, and improve mental health by fostering positive emotions. Natural elements like sunlight and plant colors enhance mental and physical health simultaneously.

Table 4 summarizes the requirements identified in this chapter for achieving architectural standards in outdoor spaces:

9. The design criteria required to achieve well-being and health in outdoor-living spaces in Taif city

The trends in housing in the city of Taif through different periods, a comparison is

made in several aspects such as space dimensions, room names, and which spaces persisted or disappeared.

First, the traditional house was generally built vertically, ranging from two to five floors (Johnson et al., 1981). Key areas on the ground floor included spaces for receiving male guests, such as the maqad (seating area), iwan (covered hall), and diwan (main courtyard open to the sky), along with service spaces like the lavatory (kanif) and a place for preparing beverages like coffee and storage (Al-Zahrani et al,.2018). In some houses, a commercial area was introduced, though this was not common during that period. The first floor was dedicated to women's reception areas, living spaces for the household, the markab (stairwell), and jalla (an extension of the outer courtyard from the ground floor), along with the kharja (outer room) (Gaube et al.,1999). Some homes had separate rooms for nuclear families living within the same house. Traditional houses in Taif also had a roof, with the jalla continuing to the top floor. The more floors a house had, the more rooms it contained. Over time, Taif's housing adapted to economic changes and urban growth, marking the transitional

Table (4). Requirements for Achieving (UCD)+ well-being and health in outdoor spaces+ social, environmental, and economic perspective in outdoor-living spaces.

	Safety	Healthy Spaces	Connection to Nature	Proper Lighting	Adequate Ventilation	Privacy	Adaptable Environments Spaces	Spaces for everyone	Innovative Solutions	Appropriate geometric dimensions	Presence of a water source	Level progression	Stimulate the senses	Healthy furniture	Healthy materials
UCD in BE															
wellness															
a social, environmental, and economic perspective															

period (Al-Baqmi, 2021).

Second, according to Al-Naim (2008), the transitional period house emerged due to the Saudi government's efforts to boost urban settlement in Taif, such as dividing land outside the city walls and providing incentives for citizens, along with modern building materials. This made it easier to transition from traditional to modern homes or even demolish and rebuild. Houses were still built vertically, with the ground floor often used for commercial purposes. The staircase, left uncovered, served a similar climatic function as the diwan. Living spaces on the first and second floors resembled those in traditional homes, with the addition of an external balcony. New service rooms were introduced in the roof area. However, many spaces from traditional homes, like the iwan, maqad, diwan, and kharja, were lost (Al-Baqmi, 2021). On the other hand, courtyards persisted in some one-story homes and multi-story villas used by nuclear families. These homes were highly like traditional houses, with modern adaptations like the main reception hall replacing the diwan, and the living room being connected to the salon as a modern version of the siffa (seating area) and traditional majlis. Nuclear families also gained private spaces, often on separate floors. New spaces were introduced during this period, thanks to government's development and improvement projects (Barfa'a, 2032).

Third, the modern period house saw continued change driven by economic growth, the influx of skills from diverse environments, and the increased availability of advanced materials. New building regulations governed the exterior designs (facades), while functional changes were made to certain spaces (Shahri,2008). As noted by Barfa'a (2032) and Al-Baqmi (2021), the household design included dining rooms, salons, private offices for the head of the household, separate areas for receiving women, and a kitchen connected to the dining room. Men's living rooms were connected to a balcony and a separate dining room (maqalat). The ground floor was mostly dedicated to guest spaces, while the upper floors were reserved for bedroom suites with open living areas in between. Greater emphasis was placed on outdoor-living spaces, such as courtyards, balconies, and front terraces. The pace of change was slow until a building code was introduced during the contemporary period, ensuring that engineers supervised the construction process to minimize defects and promote high-quality housing projects.

Fourth, the contemporary period house in Taif resulted from the development of various sectors in Saudi Arabia and the launch of the housing program under Vision 2030, initiated by Crown Prince Mohammed bin Salman, to achieve sustainable urban development in the Kingdom (Bahmam,2018). There was a noticeable difference

in the layout of contemporary houses compared to traditional ones, which now resemble Western-style homes. Al-Baqmi (2021) explains that the ground floor featured an open plan with visual continuity from the entrance to the guest area and kitchen, sometimes extending to the men's reception room. The first floor was dedicated to bedrooms, while the top floor included a roof space with a maid's room. Despite the increase in the number of floors, the overall space was reduced compared to previous periods due to housing regulations and the provision of ready-made house designs, which limited the homeowner's control over the

10. Case Studies in Taif City

10.1. Case study 1:

An outdoor-living space in Taif City, built in 2008, was selected for analysis and redesign using a user-centered design Approach. The goal is to create a comfortable environment that meets the needs and requirements of its residents. Several tools were used for the case study, including AutoCAD for 2D plans, Enscape and Revit for rendering 3D visuals of the redesigned outdoor-living space (courtyard), and Photoshop to enhance images and plans.

10.1.1. Space Description

The northern front outdoor-living space (courtyard) measures 29.28 × 9 meters.

The eastern side outdoor-living space measures 28.13 × 22.1 meters.

The western side outdoor-living space measures 35 × 8.71 meters.

The southern rear outdoor-living space measures 29 × 5 meters.

As shown in Figure 5, the outdoor-living area is large but neglected, failing to meet the family's needs.

Interviews with the homeowners were conducted to understand their requirements and preferences, considering their physical and psychological capabilities. This was done to create designs that meet their needs and improve their quality of life based on a user-centered design approach. Specifically, the Error Principle was employed these issues. The goal was to create a space with various social, environmental, psychological, and economic benefits, as mentioned in previous chapters. Lastly, the space serves as a family gathering area and a place for social interactions.

Figure (5). A picture of the external space of the case study taken from Google Earth on September 10, 2024

10.1.2. Residents' Characteristics and Preferences

The family is an extended family consisting of grandparents, their children, and grandchildren of various ages. They prefer to use the front yard for parking spaces, with minimal seating or services to avoid obstructing the driveway. One of the primary environmental issues is that the western-facing indoor spaces heat up, causing furniture damage and high air conditioning costs. The lack of privacy due to a neighboring house to the south is a significant reason for not using the outdoor-living space.

There are no designated areas for children's play. There were no seating areas, shaded spaces, or designated areas for outdoor living activities, such as barbecue spaces or other suitable places for various activities and social interactions. It has been observed that there was no vegetation cover, despite the ample space. One reason cited by the users was water wastage in maintaining the area, leading to a lack of water supply. Additionally, it was noted that the outdoor-living space was underutilized during rain or in winter.

The homeowners' key issues and information about the problem were collected and proposed appropriate solutions. The outdoor-living space were studied and analyzed, as seen in Figure (6), and a preliminary model using Photoshop was created, showing the initial distribution of activities based on user-centered design approach, as shown in Figure (7).

The services were distributed to scale, ensuring alignment with the human scale and prioritizing user well-being through the incorporation of green spaces for health benefits, provision of fresh air, and maintenance of thermal comfort. The seating areas were arranged to target all family members. AutoCAD was used to clarify the design, as seen in

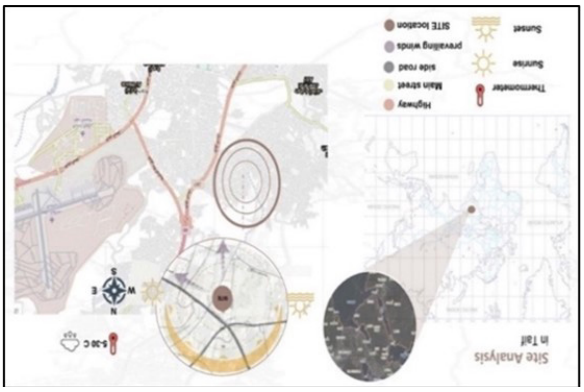


Figure (6). Outdoor-living Space Site Analysis (designed by the researchers)

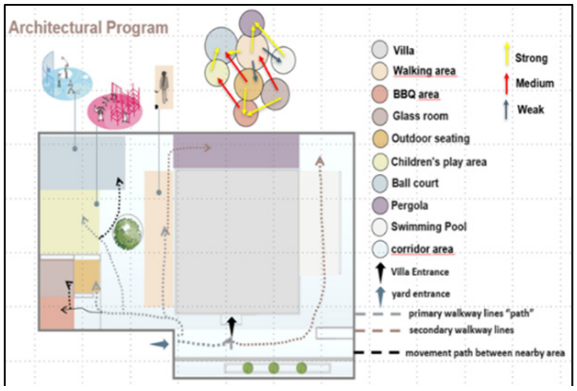


Figure (7). A preliminary model for the distribution of activities in the external space (designed by the researchers)

Figure 8. AutoCAD was used to clarify the design, as seen in Figure 8.

materials have been used with properties beneficial to users' health and with high durability. Five interconnected materials were used, as shown in Figure 9: Polished Concrete, Concrete, Wood, Rocks, and Solid Foam.

Attention was also given to stimulating the senses in the outdoor-living space, such as the tactile sense with grassy plants and pebbles, the olfactory sense with aromatic herbs, and the auditory sense with the sound of moving water. Furthermore, she created balance and linked the elements by planting vegetation along the walls to create a sense of spaciousness. A striking tree with wide shadows, specifically a red Poinciana tree, was placed as a focal point to enhance the perspective and create a greater sense of space. A balance was achieved by integrating plants and structural elements and

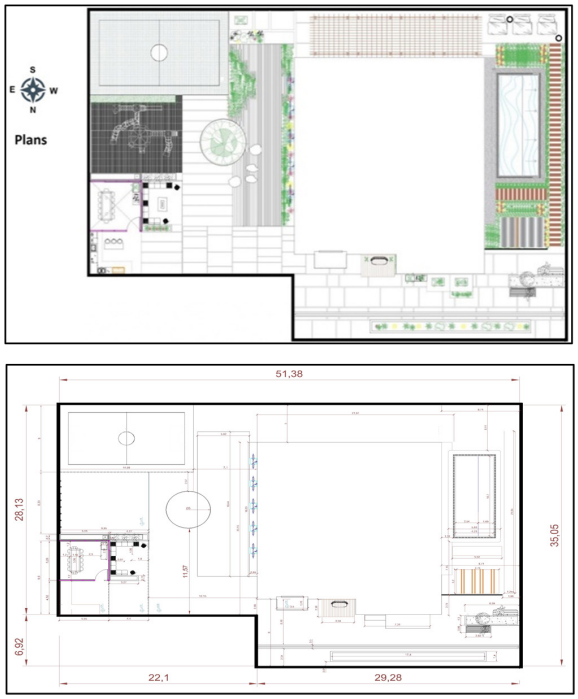


Figure (8). Distribution of area and services according to standards (designed by the researchers)

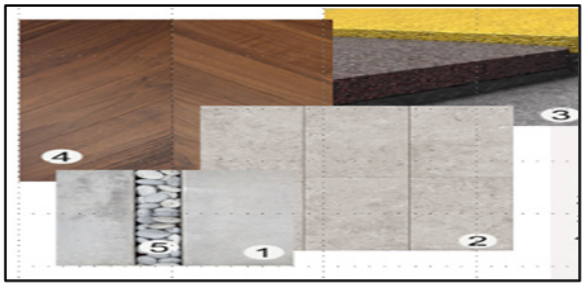


Figure (9). used materials (designed by the researchers)

layering different levels and areas of the space harmoniously, even on the walls.

- There was a focus on providing privacy and addressing the surrounding climate by adding solar screens on the western side of the courtyard to reduce heat, along with a swimming area to create cool, fresh air after it passes through the space, reducing heat, as shown in Figure 10.
- To ensure privacy on the southern side, wooden pergolas were installed. Since Taif is a rainy city for much of the year, a gutter was added to collect rainwater, which is stored in an ECO-tank, to irrigate plants, promoting sustainability and natural resource conservation.

• A tree was placed as a focal point to enhance the perspective and create a greater sense of space. A balance has been achieved by integrating plants and structural elements and layering different levels and areas of the space harmoniously, even on the walls.

Figure (10). Area in raw materials (designed by the researchers)

10.1.3 Space Analysis:

Table (5) explains the before and after space analysis.

Inkscape and Revit software were used to create three-dimensional images of the outdoor-living space (the courtyard) in its approximate form. The design adhered to user-centered design standards for the outdoor-living spaces specific to the Taif area, as well as applying the User-Centered Design (UCD) Approach in the outdoor-living space, as seen in Figure 4.

Additionally, renovating the pathways and replacing the flooring materials with sustainable, natural "concrete," as mentioned earlier was used in favor of the project. These materials extend around the space in various shapes and sizes, arranged in a balanced and comfortable manner among the herbaceous plants to access different areas of the courtyard. Additionally, wood was integrated to create a natural continuity effect and give the space a natural identity.

Artificial lighting was used in a concealed and subtle manner under the stairs leading to the seating area and the glass house. The lighting used on the walls and the hanging lights above the dining table vary in intensity, highlighting different services in an attractive and dramatic way with multiple light sources, providing good visibility during the evening and ensuring safe navigation between spaces. Natural colors surrounded the outdoor-living area, interlinked with the shades in the furniture and pathways to create a balanced visual change in space.

The green colors of nature provide a sense of relaxation and foster psychological peace.

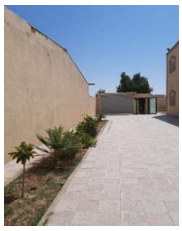
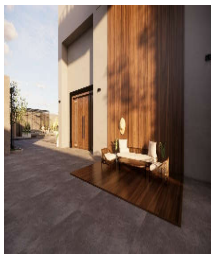
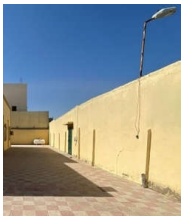
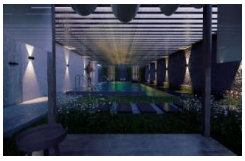
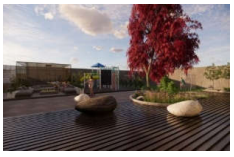
Plants were prominently displayed and thoughtfully incorporated into space, such as climbing plants on the southern and western facades to create a stunning display and enhance the area's beauty. A focal point was created with a red "Bougainvillea" tree, whose leaves and shade dominate the space. Various types of plants and trees with aromatic scents were integrated to break the monotony of the space and create a sanctuary that evokes comfort while providing a more natural appearance.

Water surfaces were added to the area to regulate the relationship between the indoor and outdoor-living spaces in terms of cooling and reducing the heat from sunlight on the western facade, ensuring thermal comfort. The design was made on two levels to allow water to flow slowly, creating a soothing sound in the space.

For improved ventilation, climbing plants were placed to help absorb carbon and purify the air, providing better insulation for the western facade. Sun breakers were added to mitigate airflow, and shaded areas were created to protect from harsh sunlight. The combination of "plants and water" reduces and protects against glare.

Regarding furniture, a natural wood dining table was designed to add warmth to the space and serve as an extension of nature. Additionally, seating was placed in front of the fireplace, focusing on beauty and durability, capable of withstanding sunlight while allowing cushions to be moved indoors when not needed outside. The colors were chosen to harmonize with the space, relying on lighter shades as they are best suited for sun exposure, as darker colors tend to fade over time.

Table (5). Space Analysis Before and After

Before	After	Explanation
		A comfortable seating area was added to the front space while ensuring sufficient parking space, as requested by the residents. The planted area was maintained, but the flooring material was replaced with concrete due to its durability, weight-bearing capacity, and non-slip properties.
	  	Solar screens were installed on the western side of the courtyard to reduce the heat from sunlight. Climbing plants, grass, and a water feature were added to cool the area. Various seating options were placed, including some shaded areas and others designed for relaxation by the water feature, to enhance social interaction during activities such as reading or swimming.
		A dedicated walking path was added in the eastern courtyard, distinguished by a different material from the concrete. Stone seating was placed under the Poinciana tree as an extension of the natural surroundings. Planters and a drainage system connected to the ECO-tank were installed, along with a children's play area and soccer field near the family seating areas.
	  	Elevated sections of the courtyard featured a seating area and fireplace crafted from natural materials. Another level was raised to separate spaces, where a cooking and barbecue area was added, along with a glass room for dining or shelter during rainy seasons, allowing users to enjoy nature while being protected.

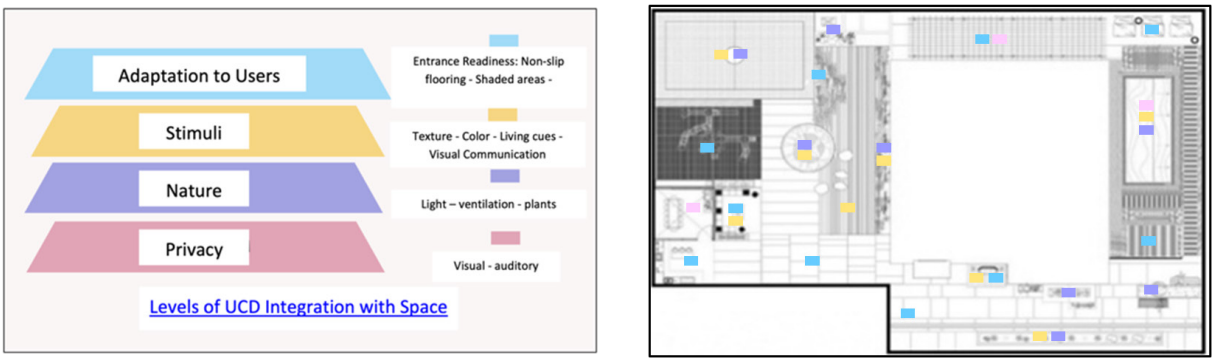


Figure (11). Application of UCD levels in the Outdoor-living space

10.1.4 UCD Levels in the outdoor-living Space

The User-Centered Design (UCD) levels were integrated into the outdoor-living space, as seen in Figure 12.

Figure (12). Application of user-centered design standards in the external spaces of Taif City (Case study 1) designed by the researchers

10.1.5. Application of User-Centered Design Approach in the Outdoor-Living- living Space

The user-centered design Approach has been applied to the outdoor-living space, as illustrated in figures (13-19)

Based on the case study 1, the same space was applied by adjusting the needs of other families according to the age group of the residents, and we came up with the following Cases:

10.2. Case study 2

In this case the users of the space are a family consisting of a mother and her teens. Selecting a space for young people and their mothers requires a thorough analysis of various aspects that cater to their needs in two stages. The first stage focuses on understanding the needs of young people, including

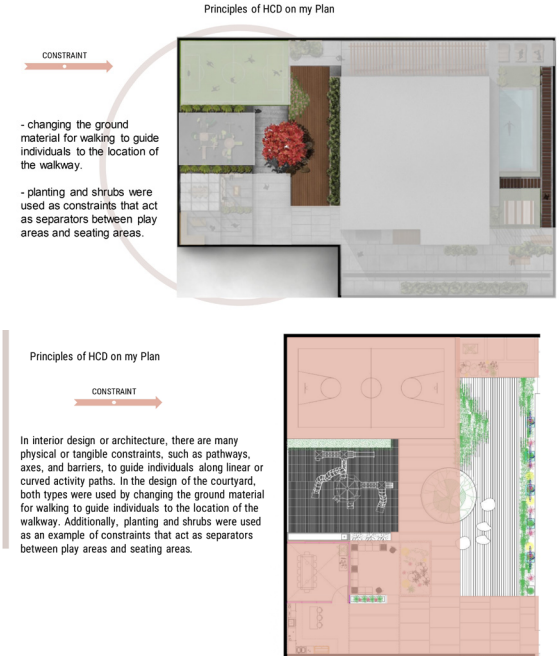


Figure (13). Application of user-centered design standards(Constraint) in the external spaces of Taif City (Case study 1) designed by the researchers

Figure (14). Application of user-centered design standard (Visibility) in the external spaces of Taif City (Case study 1) designed by the researchers

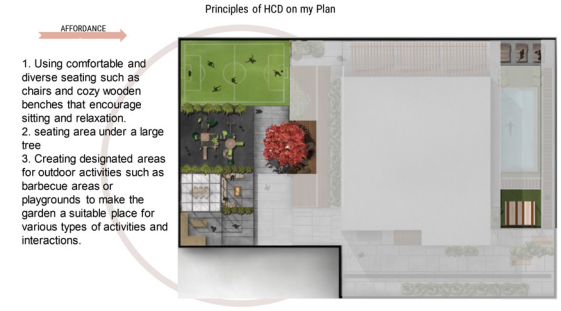


Figure (15). Application of user-centered design standards(Affordance) in the external spaces of Taif City (Case study 1) designed by the researchers

Figure (16). Application of user-centered design standard (Visibility) in the external spaces of Taif City (Case study 1) designed by the researchers

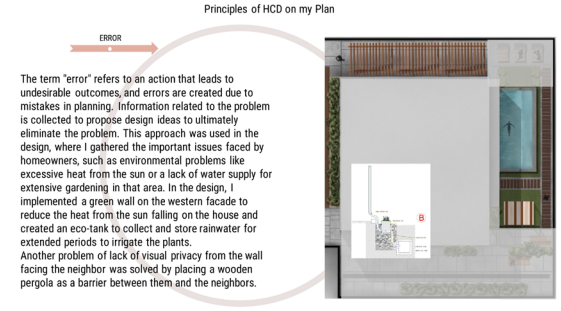


Figure (17). Application of user-centered design standard (Visibility) in the external spaces of Taif City (Case study 1) designed by the researchers

Figure (18). Application of user-centered design standards in the external spaces of Taif City(Case study 2)designed by the researchers

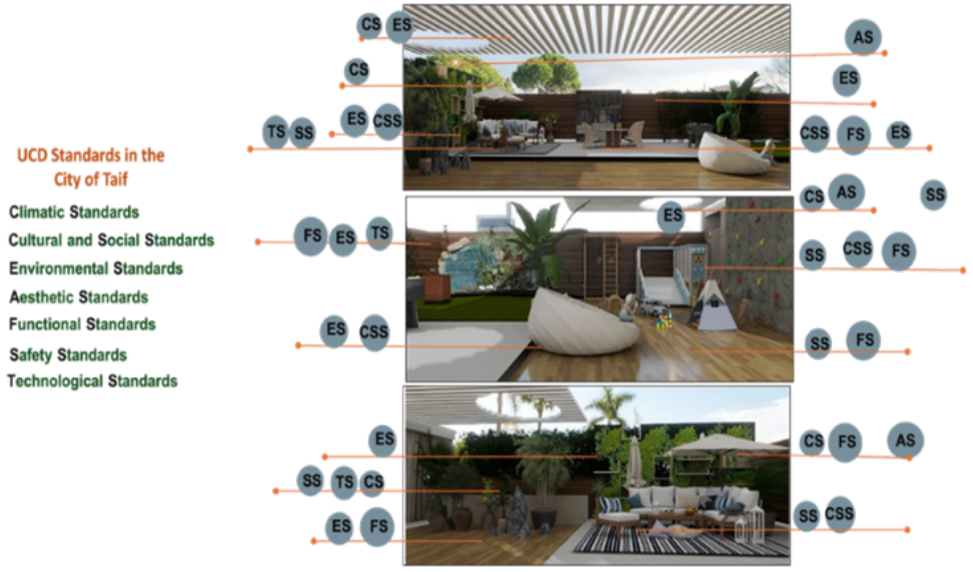


Figure (19). Application of user-centered design standards in the external spaces of Taif City (Case study 3) designed by the researchers

their favorite activities like sports, entertainment, and socializing, to inform the design of the space. Strengthening family ties: Examine how the space is designed to strengthen bonds between young people and their mother, such as allocating areas for discussions or joint activities

10.3. Case study 3

The family consists of a mother, father and their children, as it requires in-depth study that meets their needs in particular due to the age difference between them, such as: Designing a space that keeps children safe, such as the presence of safe barriers and comfortable floors, allocating play areas and relaxation areas while monitoring children, as well as designing a space for various uses for multiple purposes that serve parents and children at the same time.

11. Discussion & implication

The case studies demonstrated the importance of incorporating user needs when designing residential outdoor spaces, such as residents' ages, health status, interests, family size, time allocated for rest, play, or socializing, among other considerations. The results showed that these needs vary from one family to another. The UCD Standards for outdoor spaces, derived from previous studies, were applied and summarized as follows: (Climatic Standards, Climate Standards, Cultural and Social Standards, Environmental Standards, Aesthetic Standards, Functional Standards, Safety Standards, and Technological Standards). Their applicability was measured for three different family models. To confirm this, they were highlighted to guide designers throughout the entire design process, from the initial phase to the final phase. The required user-centric design levels for outdoor living spaces were also considered to better clarify the concept and provide the best possible solutions for end users, enabling them to be utilized in a manner that suits each family's space.

12. Conclusion

In conclusion, user-centered design in outdoor-living spaces is a creative problem-solving approach that begins with the end user and results in solutions tailored to their specific needs. The process involves generating ideas, building prototypes, and working closely with users step by step to achieve the best use of outdoor-living elements. This approach enables designers to achieve an ideal design point based on user needs, resulting in practical solutions that enhance the overall user experience.

The developed framework is expected to offer valuable support to both designers and planners, enabling the creation of innovative solutions that meet the needs of users in outdoor-living spaces. It was applied through a case study in the city of Taif and could serve as a starting point for future research in other regions. The framework emphasizes putting the user at the center of the design process, which contributes to creating more sustainable and meaningful spaces. Further research is recommended to explore the impact of these designs and to assess the effectiveness of the proposed methods.

13. References

Abass, Fatma. Ismail, Lokman. & Solla, Mohmed."A review of courtyard house: history evolution forms, and functions". ARPN Journal of Engineering and Applied Sciences, 11(4), (2016).

Aboelata, Amir."Assessment of green roof benefits on buildings' energy-saving by cooling outdoor spaces in different urban densities in arid cities". Energy, 219, (2021).

Abras, C., Maloney-Krichmar, D., & Preece, J. "User-Centered Design". In Bainbridge, W. Encyclopedia of Human-Computer Interaction. Thousand Oaks: Sage Publications, pp. 1-4. (2004).

Altman, Irwin. The environment and social behavior: privacy, personal space, territory crowding. Brooks/Cole Publishing Company. (1975).

Al-Zamil, Fawzi. ("Interior Courtyard and Its Impact on the Well-Being of Inhabitants". International Design Journal, 8(1), 71-86. 2018).

Beatley, Timothy & Newman, Peter. "Biophilic cities are sustainable, resilient cities". Sustainability, 5(8), 3328-3345. (2013).

Bettaieb, Donia & Alsabban, Reem. "Emerging living styles post-COVID-19: housing flexibility as a fundamental requirement for apartments in Jeddah", Archnet-IJAR, Vol. 15 No. 1, pp. 28-50. https://doi.org/10.1108/ARCH-07-2020-0144(2021).

Calvo, Rafael & Peters, Dorian. Positive Computing: Technology for Wellbeing and Human Potential. Cambridge, Massachusetts: MIT Press . (2014).

Channon, Ben. "Happy by design: A guide to architecture and mental wellbeing", Routledge. (2023).

Chen ,Yu. "Simulation Study on the Effect of Courtyard Design on Natural Ventilation: The Case Study of a Beauty Centre in Germany." pp. 155-166. doi: 10.1007/978-3-031-27462-6_15. (2023).

Demirbas, Ozgen & Demirkan, Halime. Privacy Dimensions: A Case Study in Interior

Architecture". Design Studies, 24(3), 255–270, (2000).

Dolan, Paul., & Metcalfe, Robert. "Measuring subjective wellbeing: Recommendations on measures for use by national governments". Journal of Social Policy, 41(2), 409-427. (2012).

Ecophan ,Saint-Gobain Don't Limit Your Senses: Sound and the Learning Environment. Saint-Gobain Ecophan AB, Hyllinge.(2002)

El Sayad,Zeyad.Farghaly,Tarek& Hamada, Sara. "Integrating Human-Centered Design Methods in Early Design Stage: Using Interactive Architecture as a Tool". Journal of Al-Azhar University Engineering Sector, 12(44), 947-960. (2017).

Farghaly, Tarek "Integrating Human-Centered Design Methods in Early Design Stage: Using Interactive Architecture as a Tool." Journal of Al-Azhar University Engineering Sector, Egypts Presidential Specialized Council for Education and Scientific Research.(2017).

Gaube, Hinez..Taif: Development, Structure and Architecture in a Rising Arab City. (Ghazi Shanik, Translator). Riyadh: King Abdulaziz Public Library . (1999).

Gee, Lori. Human-Centered Design Guidelines, Learning Spaces. EDUCAUSE. (2006).

Gerring, John. "Case study research: Principles and practices". Cambridge University Press. (2006).

Gold, Jamie. Wellness by Design: A Room-by-room Guide to Optimizing Your Home for Health, Fitness, and Happiness. Tiller Press. (2020).

Goudarzi, Hossein & Mostafaeipour,Ali. "Energy Saving Evaluation of Passive Systems for Residential Buildings in Hot and Dry Regions". Renewable and Sustainable Energy Reviews, 68, 432-446. (2017).

Habtour, Rebecca .Designing happiness: Architecture and urban design for joy and well-being. University of Maryland, College Park. (2016)

Hakky, Rafee. Garden of the Saudi Villa: Its Drawbacks and Prospects. J. Archit. Plan, 25, 51-68.2013)).

Hall, Edward. The Hidden Dimension. Anchor Books, a Doubleday Anchor Book, USA: Library of Congress. (1966).

Hariri, Majdi. "Housing in Central Makkah: influence of Hajj" (Doctoral dissertation, Newcastle University). (1986).

Harrison, Victoria. Happy by design: How to create a home that boosts your health & happiness. Hachette UK. (2018).

The International Organization for Standardization. (n.d.). 6 principles of human-centered design. Retrieved September 3, 2024, from http://www.iso.org/iso/catalogue_detail.htm?csnum=52075

Kellert Stephen. Biophilic design: the theory, science, and practice of bringing buildings to life. John Wiley & Sons. (2008).

Knudstrup, Mary-ann."The relationship between architectural design and subjective well-being". In: Fundación Caser para la Dependencia and Fundación Pilares para la Autonomía Personal, International Conference Innovations in nursing homes for people in situations of dependency: Architectural Design and Care Model, Madrid, Spain. (December 2011)

Lawson, Bryan. History Architectural Design Profile Language of Space. UK: Architectural Press. (2001).

Lawson, Bryan. How Designers Think, pp. 34-35. Routledge (1997).

Lechner Norbert. Heating, cooling, lighting: sustainable design methods for architects. John Wiley & Sons. (2014).

Little, Jo. "Nature, wellbeing and the transformational self". The Geographical Journal, 182(2), 121-128 . (2014).

Mamdooh, Alwetaishi "Energy performance in residential buildings: Evaluation of the potential of building designed environmental parameter,Ain Shams Engineering Journal,Volume 13, Issue 4,101708,ISSN 2090-4479, .(2022).

McAuliffe, Marisha, The Perception of Light: understanding architectural lighting design. London: Oxford Global Press, (2016)

McLeod, Saul. "Maslow's Hierarchy of Needs". Simply Psychology, 1(1-18). (2007).

Naz, Asma., Kopper, Regis., McMahan, Ryan & Nadin, Mihai. "Emotional Qualities of VR Space". In IEEE Virtual Reality (VR). (2017, March).

Ranđelović, Dusan . Vasov, Miomir . Dimitrijević Jovanović, Dragana., Kostadinović, Danka., & Ćurčić, Alwksandra. " Impacts of Courtyard Envelope Design as an Important Architectural Parameter for Energy Savings". In ICUP: 4th International Conference on Urban Planning: Proceedings (pp. 9-16). University of Niš: Faculty of Civil Engineering and Architecture.2022)).

Retno Wulandari, Francy Rivansuna Fifintari, Triwara Buddhisatyarini. "Empowerment of Urban Communities in Utilizing Small Courtyards with Hydroponic Technology." Community Empowerment, 7(8), 1294-1303. doi: 10.31603/ce.6243. (2022).

Retno Wulandari, Francy Rivansuna Fifintari, Triwara Buddhisatyarini. "Empowerment of Urban Communities in Utilizing Small Courtyards with Hydroponic Technology." Community Empowerment, 7(8), 1294-1303. doi: 10.31603/ce.6243. (2022).

Ritter, Frank. Baxter, Gordan & Churchill, Elizabeth. "Foundations for Designing User-Centered Systems: What System Designers Need to Know about People". Springer-Verlag London. (2014).

Samancioglu, Nur. Human-Centered Design & Methodology: What Interior Designers Need to Know about Human-Centered Design and Methods. POLITECNICO DI MILANOFACULTY OF DESIGN (2017).

Thies, Cameron. "A pragmatic guide to qualitative historical analysis in the study of international relations". International Studies Perspectives, 3(4), 351-372. (2002).

Till, Jermy.Architecture depends.Cambridge: MIT Press. .(2009).

Ulrich, Rojer. Zimring, Craig. "The Role of the Physical Environment in the Hospital of the 21st Century". Report to the Center for Health Design. Concord, CA: The Center for Healthcare Design . (2004).

Wang, Xiaozhan. "The research on the evaluation index system of livable rural areas in China—by the case of rural areas in Henan Province". Agriculture and Agricultural Science Procedia, 1, 456-461. (2010).

Wells Ward. Need, Andrew , and Crowell, Nan. "Color connotations: A study of color block testing," Journal of Interior Design Education and Research, pp. 5(2), 6, (1979).

Wen, Baohua. Xu ,Feng."Phenomenon of Courtyards Being Roofed and Its Significance for Building Energy Efficiency". Energy and Buildings, 295, 113282. (2023)

Arabic references:

Abass, Fatma. Lokman, Hakim Ismail, Mohmed, Solla. "A Review of Courtyard Houses: History, Evolution, Forms, and Functions." ARPN Journal of Engineering and Applied Sciences (2015).

Abdul Hadi, Sahar. "The Social and Technological Dimensions and Their Impact on the Formation of Urban Spaces in Cities (Case Study of Public Spaces in Public Housing)". Journal of Urban Research, p. 41. (2018).

Abu Zaarour, Raund. "The Impact of Interior Design on the Success of the Content of Internal and External Architectural Spaces: Detached Residential Buildings (Villas) in Nablus as a Model". (Unpublished master's Thesis). An-Najah National University, Nablus. Retrieved from http://search.mandumah.com/Record/1227235. (2013).

Adas,Abdulrahman. Educational Psychology. Amman: Dar Al Fikr for Publishing and Printing. (1998).

Adnan, Hanaa. "Innovative Design Ideas for Utilizing Roofs in Housing in the Kingdom of Saudi Arabia." Published in Journal of Reading and Knowledge, Part 1, 226, August, pp. 15-38. (2020).

Al-Abbadi, Samar. Features of the emergence and development of the city of Taif through the writings of Western travelers during the period (1229-1343 AH / 1814-1924 AD), Taif History Center.p264-265. (2022)

Al-Baqmi, Mishari. "The Development of the Residential Environment in the City of Taif: Towards Future Features of the Urban Fabric". Imam Abdulrahman Bin Faisal University,Collage of Architecture and Planning. (2021).

Al-Bazzaz, Azzam. Design: Facts and Hypotheses. 1st ed. Beirut: Arab Foundation for Studies and Publishing; Dar Al-Faris for Publishing and Distribution, Jordan. (2001).

Al-Naim, Mashary. "Identity in transitional context: open-ended local architecture in Saudi Arabia". International Journal of Architectural Research, 2(2), 125-146. (2008).

Al-Zahrani, Ahmed. "Al-Kaaki Palace in Al-Salamah District, Taif City: A Historical and Civilizational Study". Journal of Architecture, Arts and Humanities, Issue 12, 1-18. (2018).

Baara, Shafiq, & Ratrout, Haitham. "The Garden in Islamic Architecture: An Analytical Study of Its Symbolic Meaning and Architectural Function". (Unpublished MA Thesis). An-Najah National University, Nablus. (2010).

Bahmam, Ali. "Housing in the Saudi Arabia's (2030) Vision". Journal of Architecture and Planning, 30(2), 301-314 (2018).

Hendy, Amany. Zahra, Nehal. "The Role of Interior Design for Enhancing Positive Emotions within The House". International Journal of Innovation and Applied Studies. (2018).

Johnson, Tudor., Ingraham, Micheal., Rihani, Baseem., & Shatla, Ibrahim.. "The comprehensive archaeological survey of the lands of the Kingdom of Saudi Arabia - preliminary report on the survey of the northwestern region: with a brief overview of the survey of the northern region". Atlal, vol5. (1981).

Ramadan, Amal and Kamel Ahmed, Ehab "Spatial Design Stimuli to Promote Wellness through Buildings" Design. International Journal of Architecture, Engineering and Construction, 8 (4). pp. 1-12. ISSN 1911-112019)

Journal of Architecture and Planning , Vol. 37 (4) , Riyadh (2025/1447H)
doi:10.33948/JAP-KSU-37-4-4

استخدام أساليب التصميم التي تركز على المستخدم لتحسين تصميم المساحات المعيشية الخارجية الخاصة: دراسة حالة مدينة الطائف

ريم فاروق الصبان **منى صنت العتيبي**

قسم التصميم الداخلي، كليه التصاميم والفنون، جامعه جدة، جدة، المملكة العربية السعودية.

rfalsaban@uj.edu.sa *Moonotb2349@gmail.com*

قدم للنشر في ١٧/ ٨/ ١٤٤٦ هـ ؛ وقبل للنشر في ١٢/ ٣/ ١٤٤٧ هـ.

ملخص البحث. تستكشف هذه الدراسة مفهوم التصميم المتمحور حول المستخدم (UCD)كمنهجية لتحسين تصميم مساحات المعيشة الخارجية في المباني السكنية، مع التركيز على جودة المستخدم ورفاهيته. ويؤكد على إشراك المستخدمين في عملية التصميم وفهم متطلباتهم واحتياجاتهم في المراحل جميعها، وهو ما يساهم في تلبية تلك الاحتياجات. تعتمد المنهجية على إطار وصفي تحليلي، بما في ذلك استراتيجيات تطبيق مبادئ (UCD) في مساحات المعيشة الخارجية؛ للاستفادة منها في التحقق من وجود مشاكل في تطبيق(UCD) في الإسكان بالطائف .حددت الدراسة هذه المشكلات من خلال المسوحات والحلول المقترحة للتنمية بناء على معايير (UCD)العالمية، بهدف تحقيق المعايير والحلول القابلة للتطبيق للإسكان المحلي في الطائف. تم تطبيق مبادئ (UCD) على مساحات المعيشة الخارجية في الطائف، وتطوير نموذج يمكن للمصممين استخدامه لتحسين تصميم مساحات المعيشة الخارجية. يهدف هذا النموذج إلى تعزيز الاستخدام الفعال لهذه المساحات وتلبية احتياجات السكان بشكل أفضل. واختتم البحث بتوصيات عدة، أهمها: ضرورة اعتبار التصميم المتمحور حول المستخدم أساساً لتصميم مساحات المعيشة الخارجية لخدمة احتياجات الإنسان وتعزيز ارتباطها بالطبيعة.

الكلمات المفتاحية: DCU ، مساحة المعيشة الخارجية، الرفاهية، جودة الحياة، السلوك الإنساني.