



Sustainable Architecture in Service of the Homeless: Structural Analysis and Psychological Impact of Prefabricated Housing to Improve Quality of Life

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Abstract

Providing suitable housing for low-income groups, particularly the homeless, is a major challenge for governments. The housing crisis and lack of sufficient shelter, especially during cold seasons, lead to numerous social and humanitarian consequences. Prefabricated homes have gained attention as an effective and sustainable solution due to their rapid construction, lower costs, and use of recycled and local materials. However, many of these housing options do not align with the psychological and social needs of the homeless. This study focuses on sustainable architecture to explore the structural, psychological, and social impacts of prefabricated housing. The aim is to provide solutions for designing housing that, in addition to meeting basic needs, aligns with the psychological and social characteristics of homeless individuals. Considering factors such as lighting, form, color, ventilation, and visual appeal in these homes can improve living conditions and enhance a sense of security. This paper adopts an innovative approach to examine the relationship between environmental psychology and architectural creativity in designing prefabricated housing. This research was conducted qualitatively, with data collected through literature reviews, questionnaires, and interviews. The results indicate that architectural design tailored to the psychological and social needs of the homeless can improve the quality of residential spaces and enhance their mental and social well-being.

Keywords: Sustainable Architecture, Homelessness, Prefabricated Housing, Structure, Psychological Impact, Social Impact.

1- Introduction

In the modern era, homelessness and the housing crisis have become some of the most significant social and economic challenges. Governments and various organizations are actively seeking effective solutions to address this issue, with prefabricated homes emerging as a prominent option. These types of housing are recognized for their rapid construction, lower costs, and the potential use of recycled materials, offering a sustainable and economical approach to housing the homeless. Prefabricated homes, or "prefabs," are constructed from pre-made components that are assembled on-site. This method significantly differs from traditional construction, where houses are built on-site from scratch. Prefabricated structures have notable environmental benefits, as their waste management approaches are more efficient than those of traditional buildings. Additionally, they require significantly fewer natural resources, which is a critical advantage. Prefabricated homes are also well-insulated, resulting in much lower energy consumption compared to conventional buildings. However, despite their technical and economic appeal, many of these housing units fail to address the psychological and social needs of the homeless and, therefore, cannot effectively enhance their quality of life.

This article analyzes the structural and design aspects of prefabricated housing while exploring its psychological and social impacts. It establishes a connection between sustainable architecture and the psychological needs of the homeless, offering solutions to improve living conditions and enhance their sense of security and social welfare. The aim is to improve the mental and social well-being of homeless individuals and the quality of residential spaces through innovative architectural design. The foundational belief of this research is that creative design solutions, focusing on light, form, color, ventilation, and visual appeal, can directly enhance the quality of life for the homeless and serve as a model for future housing designs.

2- Research Background

In the context of the present study, similar research has been conducted, including *the impact of trauma-informed design on psychological well-being in homeless shelters. This article introduces a trauma-informed design that integrates aspects of interior design, environmental psychology, and clinical psychology. The goal of this approach is to create spaces that are sensitive to the needs of individuals who have experienced trauma [6].

This study included 61 residents from two homeless shelters in North Carolina, who participated in both pre-surveys and post-surveys to assess their psychological experiences before and after the redesign of their bedrooms. Among the 43 residents who completed both surveys, a statistically significant improvement was observed in three key psychological factors: readiness, hope, and safety. This indicates that the redesign had a positive impact on their mental health aspects. Overall, the results of this study provide preliminary evidence that trauma-informed design can significantly enhance the mental well-being of residents in homeless shelters and highlight the importance of thoughtful environmental design in supporting vulnerable populations. (Rawan Ajin, Dana Ajin, Jennifer P. Wisdom, Jeffrey A. Green, Tina Lepage, Charlotte Asjulin, Tasha Melvin, Tracy E. Hagan, Kelly F. Hunter, Ava Peters, Rex Mercer, Mira Branko, November 3, 2022).

Another discussion titled *Sustainable Architecture: Addressing Poverty and Homelessness*, the integration of sustainability with social equity is examined, particularly how architectural practices can address issues such as poverty and homelessness while also promoting environmental stewardship. This article argues that vocational education is crucial because it can significantly improve the conditions of individuals affected by poverty and homelessness. Engaging and responsive educational facilities can enhance the learning experience, leading to positive outcomes for both individuals and society. This study proposes a comprehensive plan for a vocational training center that repurposes existing buildings. The aim of this approach is not only to provide education and shelter but also to offer training and job opportunities for the impoverished. The reuse of buildings is presented as a sustainable architectural approach that can aid community rebuilding efforts. This method is depicted to improve the overall living conditions of the community while simultaneously addressing the needs of the poor. The study revealed that sustainable architecture can play a crucial role in tackling homelessness and poverty through education, community engagement, and environmental responsibility. (Rafael Longoria, June 16, 2022).

In another study titled *The Effects of Housing on the Physical and Mental Health of Homeless Individuals: A Systematic Review*, a systematic review examines intervention studies that report on the effects of housing on the physical and mental health of homeless individuals. It highlights that housing improves certain aspects of health among homeless populations affected by human immunodeficiency virus (HIV), anxiety, and depression. These interventions primarily target homeless individuals suffering from mental illnesses, providing them with affordable housing and access to supportive services. The findings of this article indicate that housing interventions, particularly permanent supportive housing, can lead to improvements in the physical and mental health of homeless individuals. This is especially true for those suffering from conditions such as anxiety and depression, highlighting that stable housing can serve as a vital component for enhancing the health of homeless individuals. (Hbat Onapa, Christopher F. Sharpley, Vicky Bitsika, Mary MacMillan, Katie McLore, Lee Smith, Linda L. Agnew, August 22, 2021). Therefore, it can be claimed that despite numerous studies on sustainable architecture and homelessness, this paper is the first to analyze the structure and the psychological-social impacts of prefabricated housing. It aims to provide innovative and creative solutions for designing these spaces with the goal of improving the quality of life for the homeless.

3- Methodology

In this paper, a library-based data collection method was utilized, drawing on previous studies related to sustainable architecture and psychological science in the context of designing prefabricated housing for the homeless. Additionally, semi-structured interviews were conducted with experts and specialists actively involved in the design of prefabricated housing to gather their experiences and insights in this field.

Stages of Research Execution:

1. **Library Data Collection:** This involves reviewing existing documents, relevant specialized journals and articles, and examining websites to complete the theoretical framework of the research. The focus is on exploring the theoretical foundations and empirical background in the field of sustainable architecture, as well as the psychological impacts of prefabricated housing for the homeless.
2. **Formulating Hypotheses:** Using the information obtained from library studies and empirical background, hypotheses were developed regarding the psychological and structural impacts of prefabricated housing for the homeless.
3. **Conducting Semi-Structured Interviews:** Interviews were conducted with relevant experts and specialists, and qualitative data were collected based on the theoretical framework of the research to gain deeper insights into sustainable architecture and the design of prefabricated housing.
4. **Data Analysis:** The analysis of the obtained findings was conducted using the deductive method to examine the hypotheses and achieve the research results.
5. **Recommendations:** Based on the obtained results, suggestions have been made to improve the design of prefabricated housing for the homeless. These recommendations aim to enhance their quality of life, assist in selecting the most suitable type of structure, and increase their psychological well-being.

4-Discussion

Sustainable architecture, as a modern approach in design and construction, has emerged with the aim of reducing negative environmental impacts and preserving natural resources. This architectural style focuses on the efficient use of energy, reducing waste and pollutants, and utilizing renewable resources. In this context, environmentally friendly principles and materials are employed to create structures and spaces with minimal harmful effects on the environment, ensuring that natural resources are used responsibly. Sustainable design, as an integral part of this approach, seeks to minimize environmental damage at all stages of design, from products and spaces to systems and cities. The primary goal of this approach is to reduce resource consumption, minimize waste, and create environments where humans, nature, and architecture

coexist in harmony. This design reflects a profound perspective on architecture, grounded in three fundamental principles: quality-oriented thinking, future-focused planning, and respect for the environment. In essence, sustainable architecture, as a subset of sustainable design, focuses on three main foundations: 1- Resource Conservation: This principle focuses on the proper utilization of renewable energy sources and reducing dependence on fossil fuels, emphasizing the intelligent management of natural resources. 2- Design for Lifecycle Return: In this aspect, designers are responsible for choosing materials that create minimal environmental pollution and are recyclable, ensuring sustainable use. 3- Human-Centered Design: The most important principle of sustainable architecture, and the central focus of this article, is to design in a way that meets human needs while simultaneously preserving the interconnected elements of the ecosystem, as their survival guarantees the survival of humanity. This article utilizes concepts of sustainable architecture and sustainable design, considering psychological and therapeutic aspects, to propose solutions for designing prefabricated housing for the homeless. The primary goal is to create spaces that are not only environmentally sustainable but also have a positive psychological impact on their residents. Given the challenges of homelessness and the urgent need for accessible and affordable shelter, prefabricated housing can offer an effective and rapid solution. Prefab housing refers to building units where various components are manufactured separately in a factory and then transported to the project site for installation or assembly. These types of homes possess significant features that make them an ideal solution for addressing housing issues, particularly for homeless individuals. 1- Speed of Construction and Installation: Due to the industrial production and prefabricated nature of the building components, the construction and installation time of these types of housing is significantly shorter than traditional construction methods. This is a major advantage, particularly in emergency situations, such as homelessness crises.

2- Lower Costs: By utilizing mass production and reducing on-site labor costs, the construction costs of prefabricated housing are lower compared to traditional methods, which is especially crucial for vulnerable communities and the homeless. 3- Controlled Quality: Since the components of the housing are produced in a factory environment, higher quality control and consistent use of standard materials are possible. This ensures that prefabricated housing maintains a suitable level of safety and durability. 4- Flexibility in Design: The design of prefabricated housing can be tailored to meet the psychological and social needs of individuals. For instance, communal and private spaces can be arranged in a way that provides residents with a sense of security, comfort, and tranquility. 5- Environmentally Friendly: Many prefabricated houses are built following sustainable architectural principles and using eco-friendly materials. Moreover, the use of such housing helps reduce construction waste and energy consumption throughout the building process and maintenance. 6- Portability and Mobility: These structures can be easily relocated and installed in various locations. This feature is particularly valuable for temporary housing or in emergency situations.

Types of Prefabricated Homes

1. **Modular Homes:** Modular homes are composed of individual sections or "modules" that are manufactured in a factory. Once constructed, these modules are transported to the project site, where they are assembled and completed. A notable feature of modular homes is their flexibility in design and high potential for customization. With high-quality factory construction and rapid installation, modular homes have become an attractive option for individuals and housing projects. In terms of appearance and functionality, they are quite similar to traditional homes and can be designed in various styles to meet the specific needs of each customer.
2. **Panel Houses:** Panel houses are constructed using large panels, such as walls and floors, that are manufactured in a factory. Once produced, these panels are transported to the project site and assembled. The main advantage of this type of housing is the rapid construction process and the potential for mass production in large-scale housing projects. Due to the use of prefabricated panels, the on-site construction time is significantly reduced, which helps to control costs. These houses are primarily used in large residential projects where construction speed and precision are of great importance.
3. **Manufactured Homes:** Manufactured homes, also known as mobile homes, are built on a permanent chassis, allowing them to be moved. These types of homes are generally more affordable than modular and panel homes but require more careful planning for location and necessary infrastructure. Due to their mobility, manufactured homes can be used in situations where relocation or site change is required. These homes are often considered a more economical option in housing projects.

There are clear and significant differences in the comparison between domestic and international prefab housing models, which have been thoroughly examined. The international models studied include 1- Prefabricated housing designs in Scandinavian countries (such as Sweden and Norway). 2- Modern and sustainable prefab homes in Japan. These models were designed and implemented with the explicit aim of enhancing the social and psychological well-being of the homeless. They feature standard and suitable spaces for psychotherapy and personal improvement. Not only do these designs prioritize energy efficiency and environmental sustainability, but they also consider the psychological needs of residents, creating an environment conducive to improving quality of life and mental well-being. In contrast, although the use of prefab housing is rapidly expanding in Iran, psychological considerations in their design are still in their infancy. In projects such as "Mehr Housing" and similar initiatives, the main focus has been on increasing construction capacity and providing housing, with less emphasis on the psychological aspects and quality of life for residents. This approach highlights the need for a reconsideration of prefab housing design in Iran to give more serious attention to the psychological and social dimensions of residents' lives, thereby improving the quality of life in these homes.

Therefore, based on the analyses conducted, it is recommended that the design of domestic prefab housing be inspired by successful international models. This approach could significantly enhance the quality of domestic housing and improve the living conditions of residents, especially in cases where psychological support is needed. Although prefab housing has been proposed as a solution for reducing homelessness due to its lower costs and rapid construction, for these homes to be effective not only economically but also in enhancing the quality of life, creative design and attention to psychological principles are essential. In this regard, five key factors need to be considered: color, light, water, ventilation, form, and visual appeal.

Psychological Effects of Homelessness	Color	psychological effect of color	Application
Anxiety	Red	Anger-Anxiety-Disturbing	Not recommended
Fear			
Panic			
Restlessness	Blue	Calming, Soothing, Orderly	Bedroom
Lack of motivation			Bathroom Office space
Depression	Yellow	Mental and Emotional Awareness Positive energy Hopefulness	Kitchen
Lack of concentration			Office Living space
Social isolation	Green	Spirituality- Positive energy- Healing	Kitchen
			Bedroom Office space

Table1: The Psychology of Primary Colors and Their Application in Prefabricated Housing

1- **Color in Architecture:** Colors have the power to transform spaces. Selecting colors based on their psychological effects can enhance the quality of life and boost productivity. For example, blue can evoke a sense of calm and is suitable for rest areas, while red can add energy and dynamism to a workspace.

2- **Light in Architecture:** Light, whether natural or artificial, has a significant impact on the perception and functionality of a space. Proper lighting can enhance precision, reduce fatigue, and overall contribute to better working and living conditions.

3- **Water in Architecture:** In various cultures, water symbolizes purity and renewal. Incorporating water into architectural design—whether through ponds, fountains, or even decorative elements—can create a sense of tranquility and peace in both interior and exterior spaces.

4- **Ventilation in Architecture:** Access to fresh air and high indoor air quality is essential for maintaining both physical and mental health. Proper ventilation helps to reduce pollutants and uncomfortable temperatures, thereby creating a healthier and more pleasant environment.

5- **Form and Visual Appeal in Architecture:** Forms can be expressive of the architect's emotions and ideas, influencing various human feelings and behaviors. For

example, circular forms typically evoke a sense of unity and softness, while angular forms can instill a feeling of strength and power. The visual appeal of prefabricated housing is crucial, as it can have a positive psychological impact on residents, enhancing their sense of pride and self-worth. The use of diverse patterns and textures can make spaces more attractive and inviting.

When these elements are thoughtfully integrated into the design of prefabricated housing, with attention to user needs, they can create meaningful and sustainable experiences. The intelligent use of colors, lighting, water elements, ventilation, and varied forms can help construct a space that is not only soothing and calming but also provides positive stimuli for behavioral change and improves the quality of life for the homeless. Moreover, this type of design can serve as an effective short-term solution and set a precedent for future housing designs. Considering the growing population and the increasing demand for housing, a creative and human-centered approach to designing prefabricated homes can be a significant step toward improving the living conditions of vulnerable individuals. In designing structures for prefabricated housing that impact not only functionality but also mental health and well-being, several innovative elements can be incorporated, combining architectural science with principles of environmental psychology. Such design should aim to create a healthy and peaceful environment that helps residents alleviate everyday stress and anxiety, ultimately enhancing their mental state. In this context, the following recommendations are proposed:

1. **Modular Structures with Flexible Spaces:** Modular structures that can be modified and adjusted not only optimize space but also allow individuals to adapt their living environment to their personal and emotional needs. These structures enable the customization of living spaces, providing residents with a greater sense of control and security, which is crucial for improving mental well-being.
2. **Use of Natural and Sustainable Materials:** Natural materials such as wood, bamboo, and clay can have positive effects on mental health when used in the construction of these types of housing. Due to their closeness to nature, these materials enhance feelings of tranquility and connection to the natural environment. Incorporating such materials in walls and flooring can give residents a greater sense of stability and security.
3. **Biophilic Design:** Biophilic design aims to establish a closer connection between humans and nature by incorporating elements such as plants, water, and natural light into the structure of prefab housing. This approach enhances mental well-being and reduces stress. For example, structures featuring green walls or vertical gardens can alleviate stress and anxiety among residents while fostering a sense of health and tranquility.
4. **Use of Therapeutic Colors and Patterns:** Colors have a direct psychological impact. Utilizing soft and calming colors like blue, green, and gray can help reduce stress and anxiety. Additionally, employing geometric patterns and soft lines in the design of structures and interior decor can

promote a sense of harmony and psychological balance.

5. **Open Structures with Natural Lighting and Large Windows:** Structures with large windows that allow maximum natural light to enter can have a positive psychological impact on mental health. Natural light stimulates the production of mood-regulating hormones like serotonin and helps prevent depression. Structures that utilize natural light create a pleasant and calming environment, fostering a sense of comfort, and reducing stress. This in turn leads to the release of "happiness hormones" like serotonin in the body, positively affecting the mental well-being of residents.
6. **Flexible and Multi-Purpose Structures:** Constructing flexible structures that can be easily adapted for various purposes can help residents customize their spaces to better meet their psychological needs. For instance, having areas that can seamlessly transform from a bedroom to a workspace or meditation space can provide a sense of flexibility and practicality.
7. **Observing Ergonomic Principles and Physical Comfort:** Designing structures that adhere to ergonomic principles helps reduce fatigue and physical strain. The interior space should be arranged in a way that allows for ease of movement and comfortable use. This not only enhances physical comfort but also positively impacts mental well-being.
8. **Proper Sound Insulation:** A key factor in improving mental health is the reduction of disruptive noise. Utilizing appropriate sound-insulating materials in structures can help create a calm and stress-free environment. Incorporating these approaches into the design of prefabricated structures can result in spaces that are not only efficient and innovative but also provide a better psychological living environment for residents.
9. **Smart Systems:** The use of smart systems in the design of prefab housing, considering psychological and therapeutic needs, can enhance the quality of life and mental well-being of residents.
 - Smart lighting control
 - Smart temperature and ventilation control
 - Smart audio systems and noise reduction
 - Smart monitoring systems: security and peace of mind
10. **Application of Renewable Technologies in Energy and Water Optimization:** In the sustainable design of prefab housing, utilizing renewable energy sources and optimizing energy consumption play a crucial role. Key approaches include installing solar cells on rooftops to generate and store electricity, and equipping homes with water purification systems that collect and filter local water sources. Photovoltaic (PV) technologies

and Membrane Distillation (MD) systems can simultaneously produce both energy and fresh water. Additionally, Photovoltaic-Thermal (PVT) collectors recover excess heat from solar cells and use it to further optimize energy consumption. These technologies enable reduced energy usage and contribute to the conservation of natural resources.

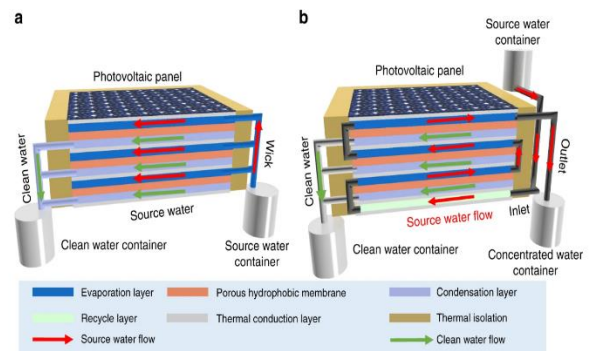


Figure 1: Schematic of Photovoltaic and Membrane Distillation (PV-MD) Integration Devices.

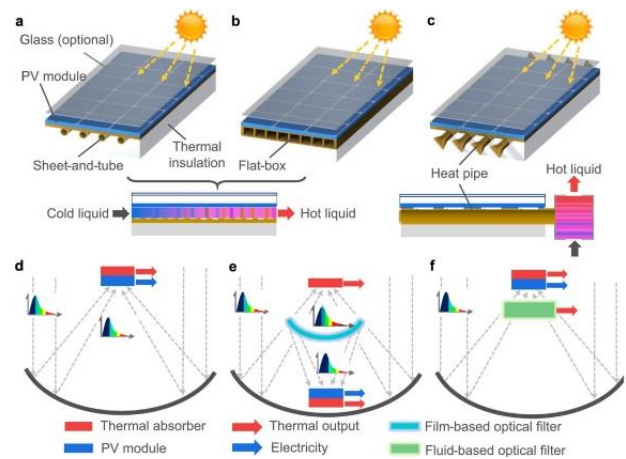


Figure 2: Designs of Liquid-Based PVT Collectors, (a) Plate and Tube Thermal Absorber, (b) Flat Channel Thermal Absorber, (c) Heat Pipe Thermal Absorber, Concentrated PVT Collector Designs: (d) Normal Design, (e) Spectral Split Design with Selective Reflective Optical Filter, (f) Spectral Split Design with Selective Absorptive Optical Filter.

In environmental psychology, the impact of various materials on mental health and human emotions is of great interest. For individuals like the homeless, who are in dire need of a stable, safe, and supportive environment, the selection of suitable materials can have significant effects. In this study, the following materials are recommended:

1. **Natural wood:**
 - Sense of warmth and security: Wood creates a sense of warmth and comfort both visually and tactilely. Its natural colors and textures can provide a calm and intimate environment, which is especially important for individuals who have experienced homelessness and feelings of insecurity. This material helps them feel a greater sense of

safety and tranquility. • **Positive effects on mental health:** Studies have shown that the presence of wood in indoor environments can reduce stress and enhance feelings of well-being, thereby improving mental health. Wood, being a natural material, resonates with nature and life, and can help restore a sense of connection to nature for homeless individuals. • **Stress Reduction:** Studies have shown that the presence of wood in indoor spaces can reduce stress, anxiety, and even blood pressure. For individuals who have experienced difficult lives, a space made of wood can help foster a sense of stability and tranquility. • **Association of Security and Protection:** Wood is often ingrained in our minds as a symbol of security and stability. This characteristic is particularly important for those who have experienced homelessness.

2. **Lightweight Concrete** :• Lightweight concrete: as an efficient and sustainable material, can be beneficial in constructing lightweight, resilient, and cost-effective housing for the homeless. • **Thermal and Acoustic Insulation:** Lightweight concrete, due to its insulating properties, helps maintain a balanced temperature and reduces external noise. This calm environment can lower stress and anxiety in individuals, contributing to a sense of security and tranquility in the space. • **Stability and Durability:** Homeless individuals often live in conditions where they feel a lack of security. Constructing housing from resilient and lightweight materials, such as lightweight concrete, can enhance this sense of security, as it provides access to a permanent space that is resistant to various weather conditions and offers stability.
3. **Glass:** Glass, especially in residential buildings, can play a very important role in improving the psychology of the occupants. Some of the psychological effects of glass include: • **Natural Light:** The use of large glass windows allows natural light to enter the interior space. Natural light helps reduce depression, boost mood, and improve mental health. This can have a particularly positive impact on homeless individuals who have been living in dark and confined environments. • **Increased Connection with the Outside Environment:** Glass, due to its transparency, allows visibility to the external surroundings. This can give individuals a sense of connection to the world around them and reduce feelings of isolation. For homeless individuals who may experience social and psychological isolation, this connection to the outside environment is especially important. • **Sense of Security and Comfort:** The use of durable and safe glass can enhance individuals' sense of security. Being able to see the outside environment without feeling threatened increases confidence in one's living space and reduces stress. Additionally, transparent and open environments help individuals feel that they are living in a safe and supportive space. • **Sense of Control and Awareness:** Glass allows individuals to see the outside environment and gain a better understanding of the changes and events occurring around them. This sense of control and awareness of the environment

can help those who have experienced homelessness regain a sense of control over their lives and boost their self-confidence. • **Beauty and Visual Appeal:** Glass, as a modern and beautiful material, can enhance the visual attractiveness of spaces. An aesthetically pleasing environment contributes to individuals' feelings of satisfaction and tranquility, positively impacting their mood and sense of self-worth.

For designing an innovative and creative prefabricated structure for the homeless, with a focus on psychological principles, psychotherapy, and factors such as light, form, water, ventilation, and visual appeal, a comprehensive structure with the following features is proposed:

1. **Natural Light and Illumination:** • **Large Windows and Skylights:** Designed to maximize the entry of natural light and enhance mental well-being. • **Soft Interior Lighting:** Utilizing warm, adjustable lighting to create a sense of tranquility and reduce anxiety.
2. **Design of Form and Interior Spaces:** • **Simple and Ergonomic Shapes:** Minimalist designs that calm the mind and create a sense of order and control. • **Flexible and Multifunctional Spaces:** Areas that can be easily adjusted for various activities (sleeping, resting, working) to support a diversity of functions. • **Use of Curves:** Eliminating sharp angles and incorporating curved lines can enhance a sense of softness and tranquility within the space.
3. **Ventilation and Air Quality:** • **Natural Ventilation and Airflow:** Positioning windows opposite each other to create a natural airflow, which not only improves ventilation but also provides a sense of freshness to the space. • **Air Filters to Reduce Pollution:** Enhancing indoor air quality to maintain physical and mental health.
4. **Water and Interaction with Nature:** • **Use of Water in Environmental Design:** Small fountains or simple water features in shared spaces create a soothing sound and a sense of connection with nature. • **Natural Humidifiers:** Indoor plants that enhance ventilation and help balance humidity levels.
5. **Visual Appeal and Color:** • **Soft and Natural Colors:** Using earthy tones, soft greens, and blues to create a sense of calm and stability. • **Natural Materials like Wood and Stone:** Incorporating these materials can evoke feelings of warmth and security for the inhabitants.
6. **Connection with Nature:** • **Small Green Spaces and Shared Gardens:** Creating natural spaces that residents can access, even if on a small scale. This helps reduce stress and enhances feelings of belonging.
7. **Socialization and Public Spaces:** • **Shared Spaces with Access to Natural Light and Ventilation:** Social rooms where individuals can interact with one another while still maintaining a sense of privacy. • **Use of Modular Designs:** Each residential unit can operate independently but also has the capability to connect and interact with other units.

8. **Environmental Compatibility and Sustainability:**
- Recycled and Sustainable Materials: Utilizing eco-friendly materials that are both cost-effective and have a lower environmental impact.
 - Renewable Energies: Installing solar panels to supply energy for the building and reduce costs.

In this project, a structure made of a steel frame along with lightweight concrete panels, wooden materials, and glass applications can be proposed. These types of structures are recyclable and easy to transport and install. Additionally, modular structures can be utilized, allowing for expansion and modification. Due to their lightweight and flexible design, these structures are a suitable option for improving the quality of life for homeless individuals.

Features of Steel and Wooden Panel Structures

Lightweight and portability: These structures are easily transportable and installable, reducing construction time.

Durability and strength: Steel has high resistance and is durable against weather conditions, while wood acts as an excellent thermal insulator.

Environmental compatibility: The wood used can be sourced from sustainable resources, and steel has a high recyclability.

Flexibility in design: These structures allow for diverse designs and can easily change shape or expand.

Low maintenance costs: Due to the durability of the materials, they require less maintenance.

Table2: Features of Steel and Wooden Panel Structures

In the design of prefabricated housing, different spaces should be designed to be both functionally efficient and to have a positive psychological impact on the residents. These spaces can include the following:

1- Living Room: A shared space for family relaxation and social interactions.

- Suggested Colors: Warm and inviting colors such as beige, cream, or light gray that create a sense of calm and connection. Lighter colors enhance the feeling of openness and make the space feel larger.

2- Kitchen: A space for preparation and cooking that requires energy and efficiency.

- Suggested Colors: Vibrant and lively colors such as white, bright yellow, or soft green. White is suitable for cleanliness and hygiene, while yellow and green are energizing and creative.

3- Bedroom: A space for rest and peaceful sleep.

- Suggested Colors: Cool and soft colors such as light blue, pastel green, or gentle purple, which evoke a sense of calm and comfort, helping to improve sleep quality.

4- Bathroom and Restroom: A space for personal hygiene and rejuvenation.

- Suggested Colors: White or light blue colors that convey cleanliness and freshness. The combination of white with blue or light gray can also give a luxurious and modern appearance to the space.

5- Home Office or Workspace: A space for focus and work.

- Suggested Colors: Neutral colors such as light gray or beige enhance concentration and contribute to a professional and modern environment. Yellow or green can also be used in moderation to increase energy and creativity.

6- Dining Area: A space for eating and social interactions.

- Suggested Colors: Warm colors such as soft orange, bright red, or yellow, which stimulate appetite and enhance a sense of togetherness.

7- Entryway and Hallways: A space that provides a welcoming feel to the home and serves as a corridor between rooms.

- Suggested Colors: Light colors such as white, cream, or beige that bring a sense of openness and brightness to the area. Utilizing mirrors and lighter colors can help make these spaces appear more open and larger.

8- Outdoor Space and Garden: An open area for relaxation, gardening, and recreation.

- Suggested colors: natural shades such as green, brown, and gray that help harmonize with the outdoor environment.

5- Conclusion

This paper explores the significance of integrating sustainable architectural principles with environmental psychology in the design of prefabricated housing to improve the quality of life for the homeless. Adopting an interdisciplinary approach to design, each space is created to meet the psychological and social needs of its residents. The use of architectural elements such as form, water features, ventilation, and the thoughtful application of colors serve as tools to reduce anxiety and foster a sense of security and stability. This article demonstrates that considering both structural and psychological aspects in the design of housing for the homeless not only meets their physical needs but also promotes mental and social well-being, fostering self-confidence and a sense of security. The use of sustainable methods in construction reduces costs and enhances efficiency while integrating natural elements and smart design to create a calming and stimulating environment that improves residents' mental health. Overall, this article emphasizes that integrating sustainable architecture principles with psychological considerations in the design of prefabricated housing serves as an effective solution to tackle the homelessness crisis. This approach enables the creation of secure, calming, and supportive environments that enhance the living conditions of homeless individuals, fostering well-being and a sense of safety.

*^{1, 2} Both authors contributed equally to this work.

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