



Designing Behavioral Mental Health Rehabilitation Center in Medan

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Abstract : *The advancement of technology and changes in lifestyle have become triggers for deviant behavior, potentially causing mental health issues. Mental health is an increasingly crucial aspect of societal well-being. Optimal mental health impacts individuals' awareness of their potential, their ability to manage life pressures stably, productive performance in work, and active participation in community life. The negative stigma in society towards individuals with mental disorders further exacerbates the number of affected individuals. In Indonesia, this issue is gaining more attention due to its impact on the quality of life for individuals and society as a whole. Mental disorders necessitate a holistic and innovative approach to rehabilitation efforts. Therefore, it is essential to establish specialized rehabilitation centers for individuals with mental disorders, providing support in both physical and mental recovery processes. Well-designed and functional spaces play a key role in enhancing the psychological well-being of individuals, creating an environment that is safe, comfortable, and preserves privacy. By adopting the Behavioral Architecture approach in design, it is expected to create an environment that meets the needs of patients and positively influences the behavior, perceptions, and feelings of everyone involved in the activities.*

Keywords: *Behavior, holistic, mental health, stigma, rehabilitation*

1. INTRODUCTION

Along with the development of modern life's dynamics, there has been a transformation in individuals' mental health, especially in the mental development of those who have experienced cultural modernization and lifestyle changes. Mental health disorders encompass a wide range, not only including individuals commonly referred to as "mentally ill" but also those experiencing depression, anxiety, and dependence on alcohol and certain drugs. Good mental health influences awareness of one's own potential, the ability to do daily activities productively, and active contribution to society.

Mental disorders are a global health issue that significantly affects the quality of life for individuals and society as a whole. Mental health is the most fundamental aspect of health. Mental disorders contribute to 16% of the global burden of disease and injury in people aged 10-19 years. A significant amount of the global disease burden is also represented by mental illness [1]. According to a report by the World Health Organization (WHO) in 2007, 20% of people experience mild to moderate mental disorders (depression and anxiety disorders) and severe mental disorders (major depression, psychotic disorders) account for 3-4%. They require mental health care that can be accessed through general health services and community mental health services [2].

In Indonesia, this issue is receiving increasing attention due to its impact on the quality of life of individuals and society as a whole. According to data from the World Health

Organization (WHO) Asia-Pacific region, the number of people with mental disorders in Indonesia reached 9,162,886 cases or 3.7% of the population (2018) [3]. Based on the Riset Kesehatan Dasar (Riskesdas, 2013) and routine data from the Ministry of Health's Data and Information Center, Indonesia ranks 4th in the world for the highest level of depression and 6th for the highest overall mental health and psychiatric disorders [3].

One of the cities with an increasing rate of mental disorders is Medan, the third-largest city in Indonesia. According to recent data, depression sufferers in Medan rank 8th nationally, reaching 7.9% of the population. Additionally, schizophrenia or psychosis disorders also have significant prevalence, with around 6.3% of Medan's residents experiencing these conditions.

The cause of the rising emotional mental disorders in society is the lack of adequate psychiatric facilities provided by the state. In Indonesia, the Ministry of Health notes that nearly 90% of the population cannot access mental health services [3]. Furthermore, negative stigma and discrimination against individuals with mental disorders exacerbate the increasing number of sufferers.

Therefore, special attention needs to be given to the physical environment in care and rehabilitation facilities. Treatment and recovery services for individuals with mental disorders require a comprehensive and holistic therapeutic approach, combining various methods such as pharmacotherapy, psychotherapy, psychosocial therapy, and psycho religious therapy [4]. Individuals with mental disorders need facilities capable of providing physical and mental recovery processes, ensuring safety, comfort, and privacy [5]. These facilities should also be able to guide individual behavior regularly and systematically so that the condition of sufferers can gradually improve.

2. LITERATURE REVIEW

How Architecture Impacts Mental Health

Each individual involved with a building will have different activities, behaviors, and needs, making an understanding of how people utilize space critically important. Optimal and well-functioning room design can positively contribute to psychological healing or a person's mental health. Behavioral architecture deeply understands how humans behave in certain environments and how design can be used to create spaces that facilitate desired behaviors, increase productivity, and create positive experiences for occupants.

The application of Behavioral Architecture in design will influence the behavior, perceptions, and feelings that arise from each activity participant [6]. In the context of

designing rehabilitation centers for individuals with mental disorders, behavioral architecture can be applied by designing spaces that support social interaction between patients and staff, creating quiet areas for reflection and meditation, and arranging layouts that facilitate patient supervision and care. This aims to create an environment that supports the recovery process and the mental well-being of patients with mental disorders, as well as enhances the effectiveness of care provided by medical staff and therapists.

3. METHODOLOGY

The design methods used include literature study, comparative study, and direct survey. The literature study provided theoretical foundations, design standards, and planning policies related to the Rehabilitation Center for Mental Disorders with a Behavioral Architecture approach. The comparative study offered ideas and insights, serving as references in the planning and design process. The survey collected existing data from the location, providing an overview of the spatial layout, special requirements, and other relevant factors. Together, these methods ensure a well-informed, contextually appropriate, and effective design.

4. DISCUSSION & RESULT

The Behavioral Architecture approach used in designing the Mental Health Rehabilitation Center aims to provide a place of recovery and facilities needed by individuals with mental disorders. The center prioritizes comfort, privacy, and security to expedite the healing process [6]. Comfort in ventilation is achieved by arranging the building mass to maximize natural ventilation and reduce air pollution. For lighting, comfort is ensured by maximizing natural light and reducing excessive light in certain rooms using light reflectors and partitions to filter incoming light. Acoustic comfort is crucial as noise can trigger disruptive behavior in individuals with mental disorders who are sensitive to unpleasant noises. Privacy ensures a sense of safety and comfort through the arrangement of masses, circulation, and spaces. Privacy levels vary for each individual, where those with mild mental disorders require lower levels compared to those with severe disorders who need higher levels. Security is enhanced through the use of materials, forms, and textures that are safe for individuals with mental disorders.

User Analysis

The analysis of users, user activities, and the spatial requirements needed in the mental health rehabilitation center building.

Table 1. User Activity Analysis

No	User	User Activity	Space Requirements
1.	Outpatient Rehabilitants	Receive regular counseling, medication, and therapy sessions.	<ul style="list-style-type: none"> – Registration Counter – Waiting Area (Lounge) – Psychologist Consultation Room – Pharmacy
2.	Inpatient Rehabilitants	<ul style="list-style-type: none"> • Receive regular counseling sessions, medication, and therapy. Rest in residential rooms. • Gather and interact with other users. • Engage in exercise such as jogging, aerobics, and weightlifting in the gym. Participate in activities such as training and education, which can include skills like crafting, sewing, playing music, etc. 	<ul style="list-style-type: none"> – Registration Counter – Waiting Area (Lounge) – Psychologist Consultation Room – Therapy Room – Psychiatrist Consultation Room – Inpatient Room – Communal Room – Dining Room
3.	Medical Service Staff	<p>a. Psychologist</p> <ul style="list-style-type: none"> - Provides counseling sessions to help individuals overcome psychological issues, develop coping strategies, and improve mental well-being. - Conducts psychological assessments to understand the patient's mental condition and assists in planning appropriate treatment. <p>b. Psychiatrist</p> <ul style="list-style-type: none"> - Conducts medical evaluations and diagnostic assessments to understand the medical aspects of mental disorders and determine treatment needs. - Determines and manages the use of psychotropic medications, adjusting doses based on clinical response. - Provides individual consultation sessions to discuss the medical and pharmacological aspects of treatment. <p>c. Psychologist / Psychiatrist Staff</p> <ul style="list-style-type: none"> - Arranges and conducts counseling and therapy sessions for patients according to the treatment schedule. - Performs psychological evaluations to assist in designing appropriate treatment 	<ul style="list-style-type: none"> – Administrative Room – Psychologist Room – Psychiatrist Room – Consultation Room – Meeting Room – Therapy Room – Staff Rest Room – Nurse Changing Room

		plans. - Conducts medical evaluations and prescribes as well as manages medications according to patient needs.	
4.	General Service Unit	<ul style="list-style-type: none"> • Handling the registration process for new patients at the rehabilitation center and providing information to patients and their families about procedures, rules, and facility amenities. • Preparing detailed treatment cost breakdowns for patients. • Managing doctor schedules and other documents. 	<ul style="list-style-type: none"> – Administration Room – Meeting Room – Head of Rehabilitation Room – Staff Room
5.	Service Unit Support	<ul style="list-style-type: none"> • Cleaning Staff -> Performs routine cleaning and disinfection throughout the facility, including patient rooms, therapy rooms, communal areas, offices, and other public areas. • Kitchen Staff -> Prepares and serves meals according to nutrition plans and dietary needs of patients. • Laundry Staff -> Handles laundering and care of linens, including patient clothing, blankets, and other items. • Security Staff -> Ensures physical security, monitors, and manages access to specific areas within the facility to maintain privacy and safety. 	<ul style="list-style-type: none"> – Janitor – Kitchen – Food Storage Room – Laundry Room – CCTV Room – Security Room – Generator & Main Distribution Panel Room – Pump & Sewage Treatment Plant Room – AHU Room
6.	Visitors	<ul style="list-style-type: none"> • Visiting the rehabilitation center according to applicable rules and approval (visiting hours, security procedures, and other regulations). • Providing emotional support to patients, bringing positive spirits, and helping create a supportive atmosphere. 	<ul style="list-style-type: none"> – Waiting Lounge – Cafeteria – Inpatient Visit Room

Behavioral Analysis of Users with Mental Disorders

According to mental health research data, the most common mental disorders in Medan are depression, schizophrenia, and anxiety. Therefore, the behavioral analysis of individuals with mental disorders will be divided into these three types of mental illnesses: depression, schizophrenia, and anxiety.

Table 2. Behavioral Analysis of Users with Mental Disorders

No	Mental Disorder	Behavior	Treatment
1.	Depression	<ul style="list-style-type: none"> • Sleep disturbances • Withdrawal from social environments • Decreased physical activity and exercise • Self-harm (hitting, using sharp objects) • Increased drug consumption in large amounts (overdosing) 	<ul style="list-style-type: none"> • Antidepressant medication • Spiritual therapy with meditation (teaching tolerance towards feelings) • Grounding techniques, such as walking barefoot on grass, aromatherapy, and enjoying flowers in the garden • Other activities like coloring, jogging, knitting, and crocheting
2.	Schizophrenia	<ul style="list-style-type: none"> • Hallucinations (talking/laughing to oneself, hearing voices) • Unusual and bizarre behavior 	<ul style="list-style-type: none"> • Antipsychotic medication • Social skills training • Meditation • Family interventions
3.	Anxiety	<ul style="list-style-type: none"> • Trembling and cold hands • Disrupted sleep patterns • Fear of being alone or fear of crowds • Easily panicking • Easily startled • Shortness of breath and tachycardia (heart rate above normal) 	<ul style="list-style-type: none"> • Antidepressant medication • Psychological treatment involving emotional processing exercises, using imagery, gradually exposing patients to feared situations, etc. • Spiritual therapy with meditation

Site Location

The location for designing the Mental Health Rehabilitation Center is on Jl. Angrek Raya, Simpang Selayang, District of Medan Tuntungan, Medan City, North Sumatra. The site measures 14,875 square meters in size. It is not situated on a main road, making it suitable for a rehabilitation building function. The surrounding area is predominantly residential with high-density housing. Nearby the site, there are residential areas and a church. RSUP H. Adam Malik Hospital is approximately 3.9 kilometers away.

**Figure 1.** Site Existing

Source : Google Earth & Author's Document (2024)

Site Analysis

1) Sun Path Analysis

Site area adapts to the north and south areas, which are optimal for air circulation and sunlight. However, the heat from the afternoon sun can be mitigated with vegetation planting, design form adjustments, and building massing, ensuring the site area remains cool and comfortable.

2) Noise Analysis

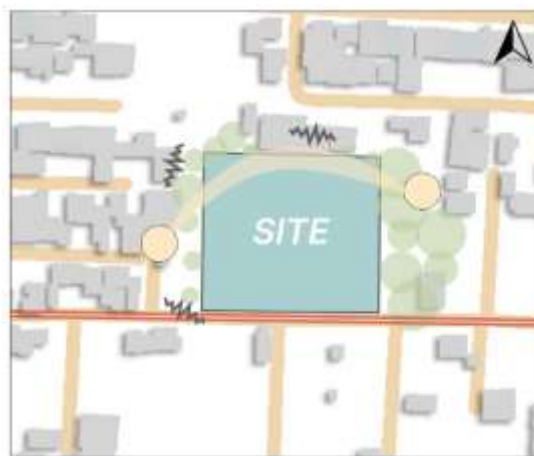
The site is not located on a main road, so it is not too noisy and will not disturb the activities of the mental health rehabilitation center. The main source of noise comes from the surrounding residential area.

3) Vegetation Analysis

The site is vacant land, so there are existing trees that are quite lush, especially on the eastern side of the site. This greenery can serve as water absorption, help reduce noise, and decrease pollution.

4) Circulation Analysis

The site is located on Jalan Anggrek Raya, which has 2 lanes with a road



width of 6.5 meters. With these 2 lanes, it can be accessed more easily.

Figure 2. Site Analysis

Source : Author's Document (2024)

1.1 Site Zoning

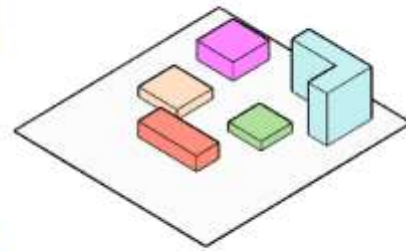
The forms of mass composition that serve as the basis for the design of the Mental Health Rehabilitation Center are considered from several factors, including:

- a. The condition of the site and the environment.
- b. Types of users and their activities.
- c. Space requirements according to their activities.

- d. Architectural forms that are responsive to the environmental conditions of the site.

The buildings at the Mental Health Rehabilitation Center are divided into 5 zones:

- 1) Reception & Outpatient Building
- 2) Administration & Service Building
- 3) Inpatient Communal Building
- 4) Inpatient Ward Building



- 5) Inpatient Therapy Building

Figure 3. Site Zoning

Source : Author's Document (2024)

1.2 Implementation of Behavioral Architectural in Design

The application of territorial concepts in behavioral architecture involves understanding and organizing physical spaces to create areas with specific meanings, used for particular activities, and facilitating interaction among individuals. Here are some aspects of implementing territorial concepts in behavioral architecture:

- 1) The main entrance is located on Jalan Anggrek Raya.
- 2) Reception, lobby, and administration rooms are near the main entrance as public buildings, making them easily accessible to visitors.
- 3) Parking areas are situated on the front West and East sides of the building to avoid disrupting other vehicle circulation and minimizing noise disturbances.
- 4) The management zone and loading dock are placed on the West side, aligning with the parking circulation, which simplifies operational control of the building.
- 5) The therapy building is located at the back of the site to avoid noise and prevent disruptions to therapeutic activities.
- 6) The inpatient ward building is placed at the back of the site, requiring tranquility, and is positioned on the right side because the East side has a green vacant lot, providing potential scenic views.



Figure 4. Site Plan Description

Source : Author's Document (2024)

The Mental Health Rehabilitation Center with a Behavioral Architecture Approach combines principles of physical and environmental design to create spaces that support and stimulate the healing and recovery process for individuals with mental disorders.



Therefore, inpatient areas have a special zone where patients cannot freely access other spaces.

Figure 5. Inpatient Zone

Source : Author's Document (2024)

In section (a) of Figure 4, the inpatient zone is bordered by a semi-outdoor seating area surrounded by wooden columns and vegetations.

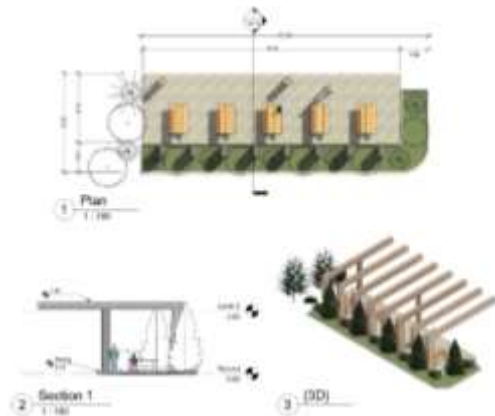
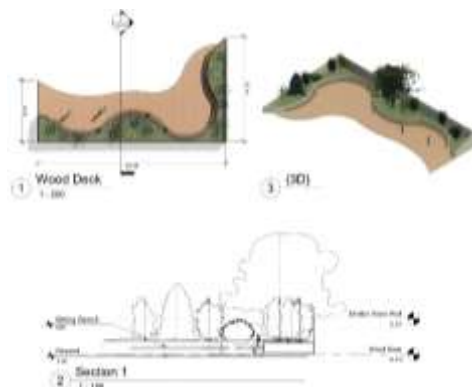


Figure 6. Semi-Outdoor Seating Area

Source : Author's Document (2024)

In section (b), the inpatient zone is enclosed by a wooden deck with a 2.5-meter-high



wall. The wall is surrounded with plants to create a calming atmosphere and features curved seating areas.

Figure 7. Wooden Deck

Source : Author's Document (2024)

In the inpatient zone, there is a sheltered walkway designed based on considerations of patient behavior, as they move between the communal building-inpatient ward-therapy building. This sheltered walkway ensures that patients feel safe and comfortable during their mobility, particularly in hot or rainy weather conditions.

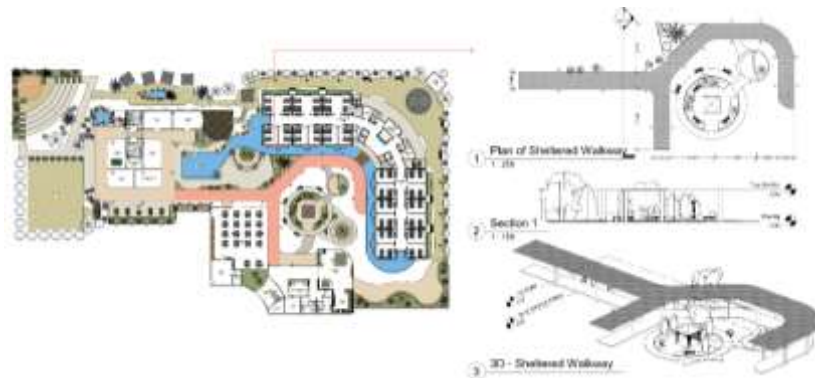


Figure 8. Sheltered Walkway

Source : Author's Document (2024)

1.3 Room Analysis

The design of the space is adjusted to the behavior and activities of the users of the Mental Health Rehabilitation Center to ensure that they feel comfortable and safe.

a. Inpatient Room (1 person)

Design of inpatient rooms for patients with higher stress levels and tendencies towards destructive behavior (throwing objects, hitting, etc.).

Table 3. Design Implementation in Inpatient Room

Design Elements	Behavioral Design Implementation
Wall	Soundproof walls to reduce noise and the use of bright and colorful & bright wallpaper to help alleviate anxiety and improve mood.
Floor	Non-slip floors to minimize the risk of patients getting injured (falling).
Sliding door	Besides facilitating accessibility, the use of sliding doors prevents behaviors that could lead to self-harm through door handles.
Window	The windows used are fixed windows with laminated glass.
Built-in furniture	Besides being more sturdy and durable, built-in furniture aims to prevent destructive behaviors such as slamming or throwing objects, thereby enhancing safety for both patients and nurses.
Curved table	Tables in patient rooms should not have sharp corners to ensure patient safety and should support good ergonomic design.
CCTV	CCTV installation is implemented to enhance security and monitor patient activities to prevent any harmful actions.
Shower	Using an overhead shower, where water flows directly from the shower head without long hoses or cords, is employed to prevent patients from wrapping the cords around their bodies or necks.
Nurse Call Button	The nurse call button allows patients to immediately request assistance from nurses in case of emergency.



Figure 9. Inpatient Room

Source : Author's Document (2024)

b. Nurse Monitoring Area

Design of the nurse monitoring area on each floor of the ward building to facilitate nurses in monitoring patient activities in a safe and comfortable zone.

Table 4. Design Implementation in Nurse Monitoring Area

Design Elements	Behavioral Design Implementation
Glass Divider	Glass material is used in the monitoring zone to allow nurses to monitor patients without being in close proximity, which could potentially be dangerous.
Transaction Window	The medication transaction window between nurse monitoring area-medicine room is designed to minimize physical contact, maintain sterilization, and expedite the medication retrieval process.
CCTV	CCTV in each room can be monitored by nurses in this area.

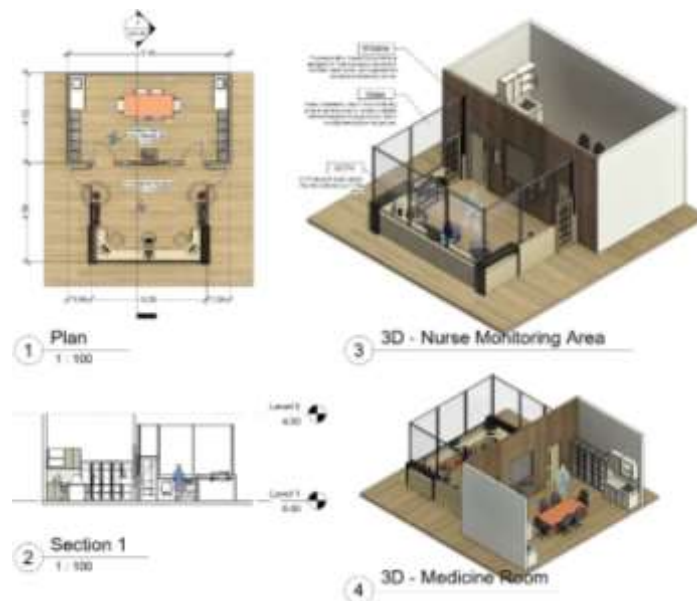


Figure 10. Inpatient Room

Source : Author's Document (2024)

1.4 Architectural Render



Figure 11. Perspectives

Source : Author's Document (2024)

5. CONCLUSIONS

The Behavioral Mental Health Rehabilitation Center in Medan City is designed to ensure an environment that supports optimal recovery for individuals with mental disorders. Here are the key concepts applied in the design of Mental Health Rehabilitation Center:

- **Comfort:** Every space within the Mental Health Rehabilitation Center is designed to create a comfortable and soothing atmosphere for patients. The use of natural lighting, calming colors, and ergonomic space design is the main focus in creating an environment that supports psychological comfort.
- **Privacy:** The importance of privacy is carefully considered in the design of the space. Each patient has access to private space that provides tranquility and security, while still allowing for controlled social interaction that supports their recovery process.
- **Safety:** Safety aspects are prioritized in the design, from controlled access arrangements to the use of safe and environmentally friendly construction materials. This aims to create an environment free from additional stress and risk, providing a sense of security for all inhabitants of the Mental health rehabilitation center.

The Behavioral Architecture approach not only considers the physical aspects of the building but also pays attention to the influence of the environment on patients' mental well-being. Thus, Behavioral Mental Health Rehabilitation Center is expected to become an effective place to provide psychological recovery assistance for individuals with mental disorders in Medan City.

6. ACKNOWLEDGEMENTS

This study was conducted to fulfill the final thesis requirements at the Department of Architecture, Universitas Sumatra Utara. The author wishes to express gratitude to the Department of Architecture, Universitas Sumatra Utara, for their guidance during the research writing process.

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