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INTEGRATION OF THE THERAPEUTIC ARCHITECTURE APPROACH IN PUBLIC BUILDINGS: EVALUATION OF PRIORITY IMPROVEMENT INDICATORS

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Abstract

Mental health issues have become a pressing concern in the modern working environment, particularly among public service workers who are exposed to persistent occupational stress. Built environments play a critical role in mitigating psychological strain, and therapeutic architecture offers a promising spatial intervention to address mental well-being. This study investigates the application of therapeutic architectural principles in a public service building, Sewaka Dharma, located in Denpasar, Indonesia. Using the Joint Multivariate Preference (JMP) method, the research evaluates user perceptions across six core dimensions of healing design, sense of personal control, social support, positive distractions, connection to natural views, elimination of environmental stressors, and the ability to engender positive feelings. Data were collected through structured questionnaires distributed to building users, focusing on 26 sub-indicators associated with the aforementioned variables. The results show that five indicators presence of indoor water elements, availability of entertainment facilities, access to natural outdoor views, integration of interactive art, and access to food services scored significantly below the overall mean. These findings highlight specific spatial deficiencies that limit the building's restorative function and user comfort. The study contributes practical recommendations for public facility improvements by emphasizing evidence-based spatial design strategies that enhance psychological resilience and support mental health in the workplace.

Keywords: Therapeutic Architecture, Public Service Building, Psychology, Denpasar

1. INTRODUCTION

Mental health constitutes a fundamental component of human well-being, contributing significantly to quality of life, productivity, and the continuity of individuals' social functioning. Nonetheless, mental health disorders remain a major global public health concern. According to the World Health Organization (WHO), over 970 million people worldwide suffer from mental health conditions, including depression, bipolar disorder, schizophrenia, and dementia (Mashar, 2021). In Indonesia, data from the Ministry of Manpower of the Republic of Indonesia (2024) reports approximately

875,000 cases of stress, depression, and anxiety disorders that have resulted in the loss of more than 17 million workdays. A Gallup survey conducted in Southeast Asia further indicates that 20% of respondent's experience significant psychological stress, with public service workers identified as being at particularly high risk due to complex workloads and performance pressures (Ministry of Finance of the Republic of Indonesia, 2024).

This issue is exacerbated by psychologically unsupportive workplace environments. Factors such as time pressure, role ambiguity, lack of social support, and physical discomfort in the workplace contribute further to the decline in workers' mental well-being (Fadlilah, 2021; Kosasih & Komala, 2024). Physical environments designed with consideration for psychological needs have been shown to possess therapeutic potential. Several studies highlight that natural lighting, cross ventilation, the use of soft and natural color schemes, and visual connections to nature significantly reduce stress levels and enhance psychological recovery (Jiang, 2023). Research also affirms that the presence of green spaces and natural views is directly correlated with improvements in workers' psychological well-being (Zhang et al., 2021).

In the context of architectural design, the therapeutic architecture approach functions as a spatial intervention framework that integrates healing principles into the built environment. This approach posits that design elements such as form, color, scale, proportion, material, lighting, and access to nature are not merely aesthetic components, but exert a profound influence on users' perception, emotional state, and healing processes (Mahmoud, 2017). Furthermore, the approach is structured around six core pillars of healing architecture: sense of personal control, social support, positive distractions, eliminating environmental stressors, connecting users to natural views, and engendering positive feelings (Sigalingging et al., 2021; Vollmer et al., 2024).

These six dimensions serve as essential benchmarks in establishing a comprehensive healing environment across various building typologies, including public service facilities. However, the implementation of these principles within public sector workplaces in Indonesia particularly within government buildings remains largely undocumented. To date, there has been no comprehensive study evaluating the extent to which therapeutic architectural principles have been applied in public buildings, nor how such applications may influence the mental well-being of both employees and visitors.

Accordingly, this study was conducted to address this research gap by evaluating the application of therapeutic architectural elements in one of Denpasar City's public service buildings Graha Sewaka Dharma. Employing the Joint Multivariate Preference (JMP) analysis method, the study aims to identify priority improvement indicators and formulate spatial design recommendations that contribute to creating a work environment conducive to mental health and psychological well-being. The JMP method was selected due to its ability to simultaneously and comprehensively map user preferences across various design elements, making it particularly relevant for assessing spatial experience in a multidimensional manner.

2. LITERATURE REVIEW

Therapeutic architecture is a multidisciplinary approach that integrates principles of environmental psychology, spatial design, and public health to support users' psychological well-being. Its theoretical foundation is rooted in Attention Restoration Theory (ART) and Stress Reduction Theory (SRT), both of which emphasize the

importance of natural elements and structured environments in reducing stress and restoring cognitive functioning (Kaplan, 1995).

Built environments that foster a sense of control, offer sensory stimulation, and provide aesthetic experiences have been shown to enhance psychological comfort. Access to natural daylight, noise control, and spatial flexibility play a critical role in maintaining users' emotional stability (Jiang, 2023). In parallel, spatial attributes such as form, color, lighting, and spatial configuration contribute significantly to building mental resilience within interior environments (Mahmoud, 2017).

Numerous empirical studies affirm the role of visual connection to nature in psychological recovery. Direct access to green landscapes has been found to elevate mood and accelerate post-stress mental recovery (Zhang et al., 2021). Furthermore, six core dimensions underpin the creation of a healing environment: sense of personal control, social support, positive distractions, eliminating environmental stressors, connecting users to natural views, and engenders feelings (Sigalingging et al., 2021).

Within the framework of evidence-based design, the concept of "The Healing Seven" identifies seven architectural elements such as privacy, sightlines, human-scale proportions, and social interaction that have been empirically shown to reduce perceived stress and enhance psychological comfort (Vollmer et al., 2024). Despite its strong theoretical and empirical foundations, the implementation of therapeutic architecture principles in public service buildings remains limited, particularly in developing countries. Several studies highlight that public infrastructure often neglects the integration of restorative spaces, as evidenced by the scarcity of green views, rigid spatial arrangements, and the lack of inclusive relaxation zones.

This study aims to address that gap by evaluating the extent to which therapeutic architecture principles have been implemented in a public service building specifically, the Sewaka Dharma Building in Denpasar City. Employing a quantitative approach using Joint Multivariate Preference (JMP) analysis, this research seeks to identify spatial improvement priorities that can enhance psychological support and mental well-being for users within the context of a dense, tropical urban environment.

3. RESEARCH METHODS

This study employed a mixed-methods approach with a descriptive-evaluative design, combining qualitative and quantitative methods to gain a comprehensive understanding of the implementation of therapeutic architecture in public service buildings. The object of the study was Graha Sewaka Dharma, a public service facility in Denpasar City characterized by high visitor traffic and open access to public information. The qualitative component involved an in-depth literature review to formulate evaluation indicators, while the quantitative component assessed user perceptions of the presence and effectiveness of therapeutic design elements within the building.

3.1 Data Collection

Data collection was conducted in two stages. Qualitative data were obtained through a literature review of theories and prior research related to healing architecture, restorative design, and psychological well-being in architectural environments. This process resulted in the identification of six dimensions and 26 evaluation indicators, which served as the foundation for the development of observation instruments and survey questionnaires. Quantitative data were gathered through direct field observations by the research team and user perception surveys administered to active building users

(employees) using a five-point Likert scale. The questionnaire was structured around the predefined indicators and captured perceptions of therapeutic design elements such as natural lighting, access to nature, spatial privacy, multisensory comfort, and physical accessibility.

3.2 Data Analysis

Quantitative data were analyzed using the Joint Multivariate Preference (JMP) method with the aid of JMP Statistical Discovery software. This analysis aimed to identify indicators that scored below the average and to determine spatial design improvement priorities based on user perceptions. Meanwhile, qualitative data from field observations were cross-compared with survey results to ensure the validity of the findings. The results from both data sources were then integrated to formulate evidence-based design recommendations aimed at enhancing the psychological comfort of users in public service buildings.

4. FINDINGS AND DISCUSSION

This section presents the findings derived from a combined analysis of direct observations and user perception assessments regarding the implementation of therapeutic architecture principles in the Graha Sewaka Dharma Public Service Building in Denpasar City. The discussion is structured into two main themes. The first examines the extent to which the six dimensions of therapeutic architecture have been implemented in the context of public service buildings, based on staff perceptions and spatial indicator observations. The second evaluates the indicators that scored below average using the Joint Multivariate Preference (JMP) analysis, in order to identify priority areas for spatial design improvement that would more effectively support users' mental well-being.

4.1 Evaluation of the Implementation of Therapeutic Architecture Principles in Public Service Buildings

The JMP analysis of the five sub-indicators under the sense of personal control dimension reveals a notable variation in achievement levels. Sub-indicator P2 (lighting quality within the building) received the highest mean score of 4.0, suggesting that the lighting aspect particularly natural and well controlled lighting adequately supports users' visual comfort. Sub-indicators P4 (seating options) and P3 (auditory comfort from music) each scored 3.3, indicating a reasonably positive perception of spatial flexibility and auditory environment, although these elements are not yet fully optimized. P1 (accessibility and ease of circulation) scored 3.2, pointing to areas for improvement in terms of physical access and spatial flow. Meanwhile, P5 (availability of quiet rest zones) recorded the lowest score at 2.5, highlighting the limited provision of tranquil spaces for relaxation. The strong performance of P2 aligns with previous research asserting that lighting especially high-quality natural lighting is a core element of therapeutic architecture, capable of improving mood, reducing stress, and enhancing productivity (Aliyu *et al.*, 2022). In the context of Graha Sewaka Dharma, this suggests that the lighting design effectively contributes to users' psychological comfort.

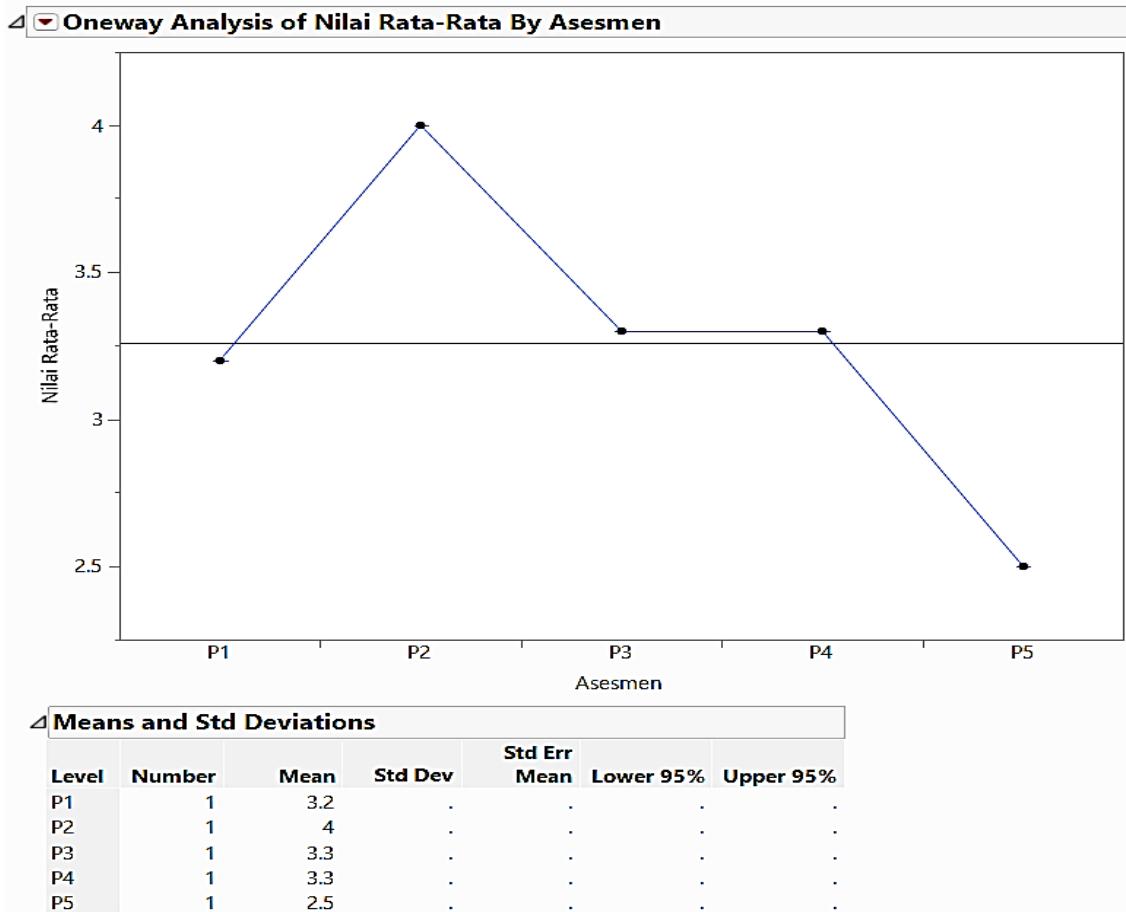


Figure 1. Bivariat Analysis Results of Sense of Personal Control Variable
Source: Researchers (2025)

Conversely, the relatively low score of P1 indicates persistent barriers in terms of accessibility. Previous research suggests that adequate physical accessibility including safe, disability-friendly, and navigable pathways significantly enhances users' positive perceptions of the built environment (*Cho, 2023*). Furthermore, well-designed and ergonomic circulation paths can reduce cognitive load and improve users' sense of control in interacting with space (*Mahmoud, 2017*).

For sub-indicator P3, the score of 3.3 suggests that background music has contributed to auditory comfort; however, there remains room for refinement. This comfort is highly contingent on factors such as the genre of music, volume level, and its contextual appropriateness within the building's functional environment. A similar interpretation applies to P4, where flexibility in seating arrangements allows users to choose their preferred levels of privacy or social engagement. Nevertheless, expanding the variety and ergonomic quality of seating configurations may further enhance users' personal control over spatial experiences (*Laurentia & Choandi, 2023*).

The most critical finding lies in sub-indicator P5, where the low score reflects the lack of quiet rest areas. The presence of such zones within public service buildings is essential for psychological restoration, particularly in high-traffic and task-intensive environments. Quiet spaces allow users to regulate sensory input according to their individual needs, which in turn can mitigate stress levels (*Jiang, 2023*). The absence of such facilities undermines the therapeutic potential intended through the application of therapeutic architectural principles.

Based on the JMP analysis of the *social support* variable, sub-indicator P10 (availability of Wi-Fi and mobile signal) received the highest score of 3.2, followed by P7 (variation in furniture settings) at 2.8, and P9 (access to garden space) at 2.4. In contrast, P6 (private spaces for staff) and P8 (easy access to food sources) recorded the lowest scores, at 1.8 and 1.7 respectively. This pattern indicates that while digital connectivity is relatively well-provided, aspects of social support related to basic needs and access to personal space remain significantly underdeveloped.

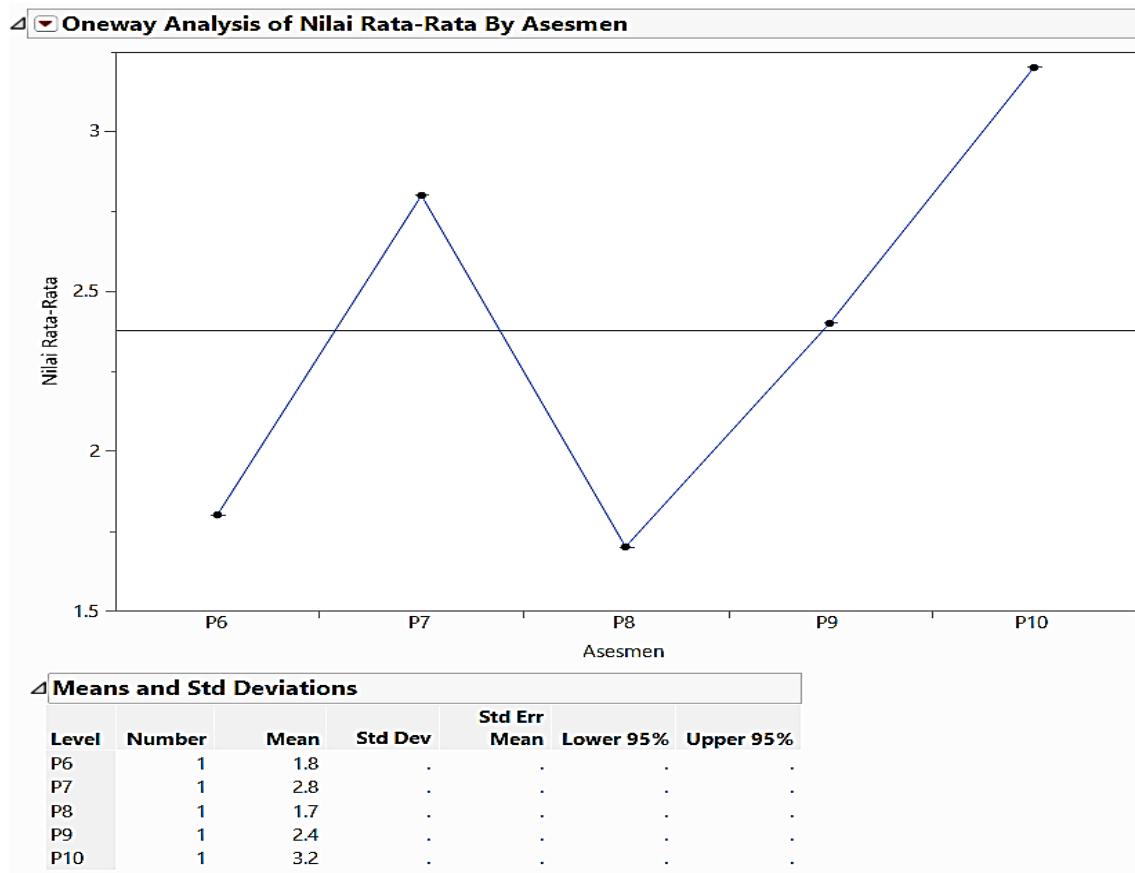


Figure 2. Bivariat Analysis Results of Social Support Variable
 Source: Researchers (2025)

The low score of P6 indicates a lack of spaces that allow employees to rest or engage in personal activities without disruption. Studies on healing organizations emphasize that the availability of private spaces in the workplace contributes significantly to psychological comfort and the quality of social interactions among employees (Livne et al., 2021). Similarly, the low score for P8 highlights inadequate access to food facilities, even though the presence of easily accessible canteens or dining areas is essential to support employee well-being and informal social interactions at work. The moderate scores for P7 and P9 suggest that while variations in furniture arrangements and access to outdoor spaces are present, there remains room for improvement. Diverse seating configurations and connectivity with green outdoor areas can enhance emotional regulation and foster a positive social atmosphere (Yan et al., 2024). Therefore, physical enhancements that facilitate social interaction, personal rest, and convenient access to support services are critical to optimizing the social support dimension within the framework of therapeutic architecture.

JMP analysis of the positive distraction variable revealed that P13 (natural imagery through murals, virtual videos, or ornaments) obtained the highest score of 3.8, followed closely by P15 (water elements with natural sounds) at 3.7. P14 (interactive floors and walls) received a moderate score of 2.8. In contrast, P11 (entertainment facilities such as music, games, TV/LCD) and P12 (interactive art) had the lowest scores, at 1.4 and 1.5 respectively. This pattern indicates that the case study site is more successful in incorporating natural visual elements and pleasant acoustic environments than in providing interactive entertainment or participatory art experiences.

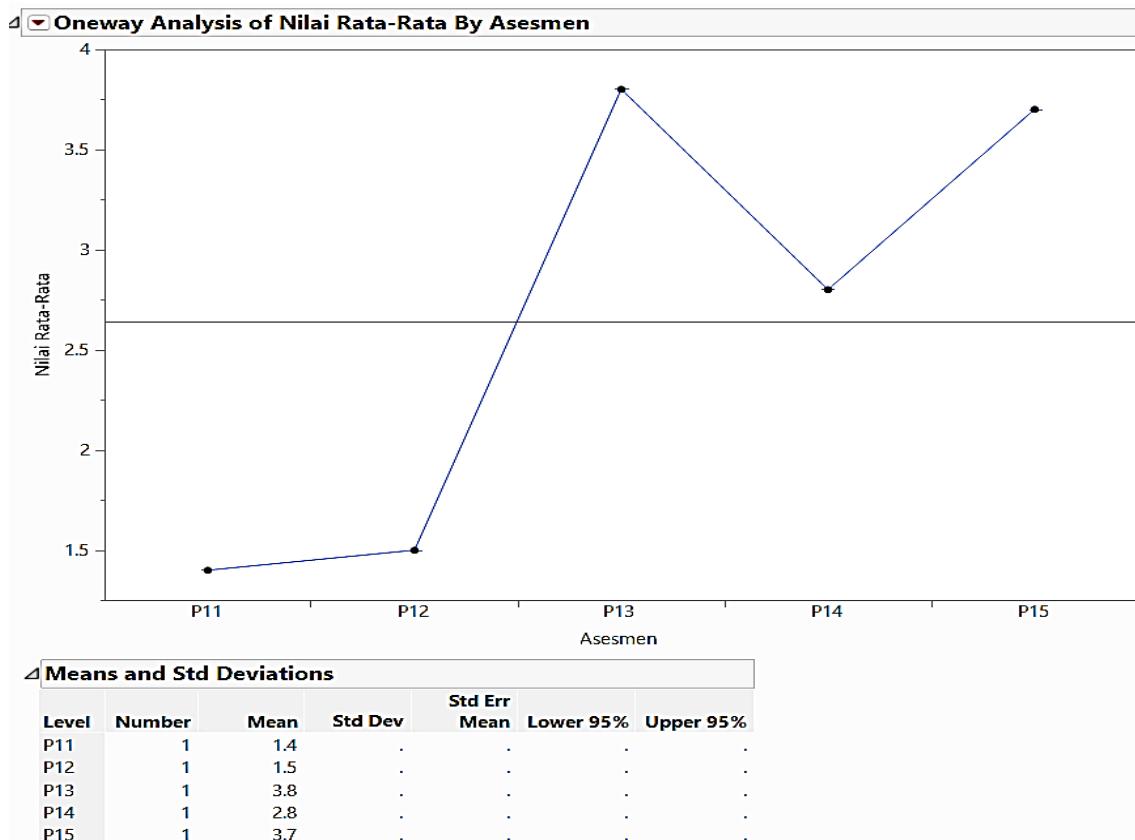


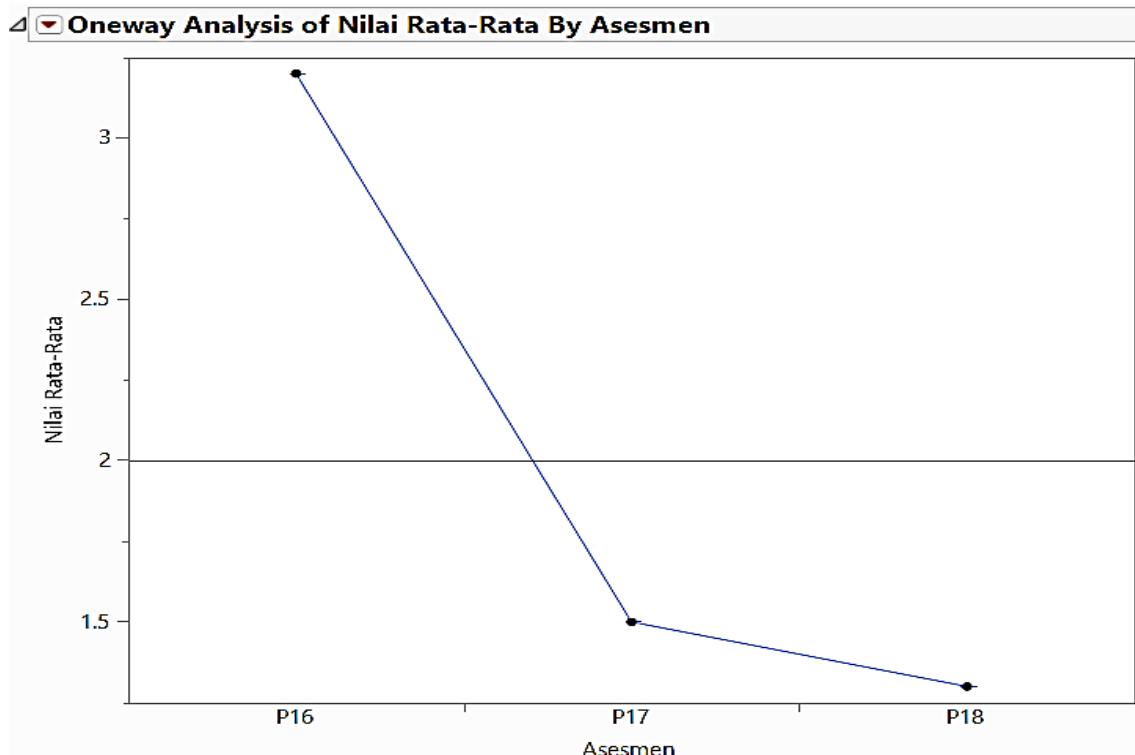
Figure 3. Bivariate Analysis Results of Positive Distraction Variable
Source: Researchers (2025)

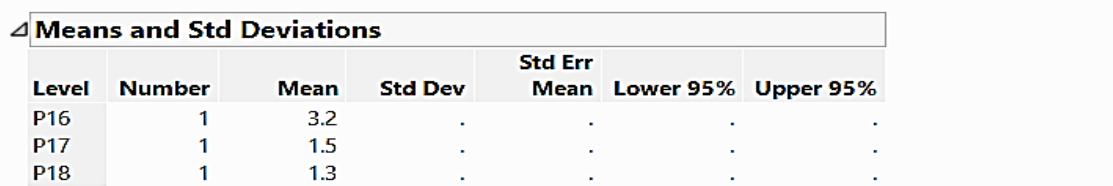
The low score of P11 indicates that entertainment facilities within the building remain highly limited. Yet, the presence of light recreational features integrated into public environments can serve as effective positive distractions, helping to redirect users' attention away from stressors and improve their overall mood. Similarly, the low rating of P12 points to a lack of interactive art installations that can stimulate user participation and creative engagement. Such features have been shown to enhance emotional involvement and foster more memorable spatial experiences (Fadlilah, 2021).

Conversely, the high scores for P13 and P15 demonstrate the successful integration of nature-based visual and acoustic elements. Natural imagery whether in the form of murals or digital media is consistently associated with increased psychological comfort and reduced stress levels (Jiang, 2023). Likewise, the presence of water features accompanied by natural sounds aligns with the core tenets of biophilic design, which emphasize the importance of positive sensory stimulation derived from nature to promote tranquility and support users' mental restoration (Sigalingging et al., 2021).

The JMP analysis of the *connecting user to natural views* variable revealed that P16 (presence of natural elements such as indoor plants and ambient nature sounds) received the highest score of 3.2, indicating that vegetation and the simulation of natural ambience within the building have been relatively well accommodated. In contrast, P17 (visual access to exterior natural landscapes) and P18 (presence of water features such as aquariums in interior spaces) scored significantly lower, at 1.5 and 1.3 respectively. These results suggest that direct visual integration with outdoor landscapes and the incorporation of indoor water elements remain highly limited.

The integration of natural elements such as vegetation, daylight, and water whether indoors or outdoors is a critical component of healing architecture, known to support psychological recovery and the restoration of user energy (Sigalingging et al., 2021). The limited visual access to external landscapes, as reflected in the low score for P17, undermines the potential effectiveness of therapeutic design in enabling stress reduction through calming views. Moreover, visual connection with nature achieved through well-positioned large windows or intentional framing of views and the inclusion of indoor water features have been empirically shown to lower stress levels and enhance psychological comfort in both public and residential buildings (Jiang, 2023). The very low rating of P18 further suggests that water elements have not yet been utilized, despite their proven cognitive and multisensory contributions to enhancing the restorative qualities of space.



4  Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
P16	1	3.2	.	.	.	.
P17	1	1.5	.	.	.	.
P18	1	1.3	.	.	.	.

Figure 4. Bivariate Analysis Results of Connecting User to Natural Views Variable
 Source: Researchers (2025)

The JMP analysis of the *eliminating environmental stressors* variable indicates that among the six sub-indicators, P22 (full accessibility for wheelchair users) received the lowest score. This suggests that the facilities at Graha Sewaka Dharma have yet to fully accommodate individuals with mobility impairments. Other sub-indicators including P19 (noise mitigation), P20 (privacy and perceived safety), P21 (restroom cleanliness), P23 (varied lighting for visual comfort), and P24 (air circulation and thermal comfort) scored relatively higher, though each still presents opportunities for further improvement.

The low performance on P22 underscores the presence of physical barriers that compromise both the inclusivity and comfort of users with special mobility needs. Universal design principles mandate that all public spaces should provide equitable access for all individuals, which includes unobstructed pathways, wide doorways, and sanitary facilities adapted for wheelchair users (Charles & Abbey, 2024). The absence of adequate accessibility not only restricts physical movement but also poses the risk of psychological distress and feelings of exclusion among persons with disabilities.

In addition, variables such as privacy, noise mitigation, air quality, and adaptive lighting are critical components in establishing a therapeutic environment that effectively minimizes environmental stressors (Cho, 2023). Built environments that offer adequate control over ambient noise levels, provide appropriate lighting, and maintain good air quality have been shown to enhance both physical comfort and users' mental well-being. Therefore, while most aspects related to environmental stress control at Graha Sewaka Dharma appear to be at a satisfactory level, improving physical accessibility for all users particularly individuals with disabilities emerges as a strategic priority. This is essential to ensure the development of an inclusive, healthy environment that fully embodies the principles of therapeutic architecture.

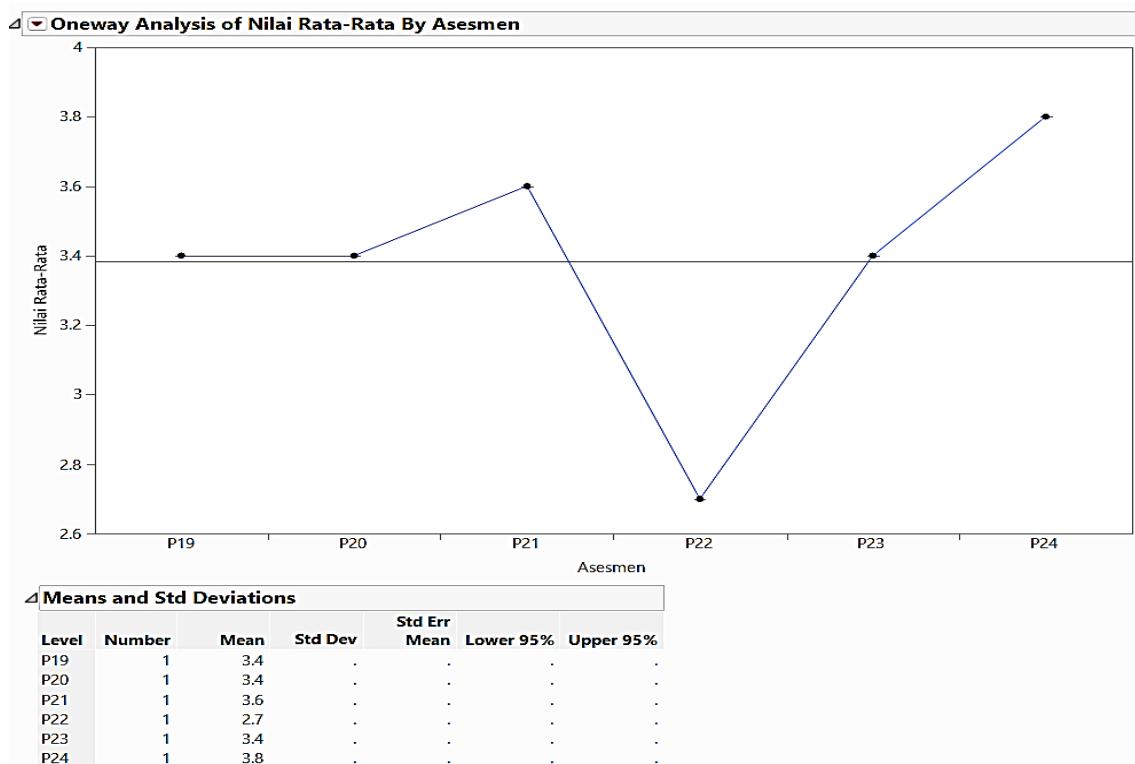


Figure 5. Bivariat Analysis Results of Eliminating Environmental Stressors Variable
Source: Researchers (2025)

The JMP analysis of the *Engenders Feelings* variable reveals that P25 (the sense of peace and positive expectations evoked by the building's interior and exterior) received a higher score compared to P26 (opportunities for users to experience meaningful relaxation), which recorded the lowest score in this category. These findings suggest that while the architectural design of Graha Sewaka Dharma has succeeded in creating a visually calming atmosphere and eliciting positive emotional impressions, the availability of designated facilities that allow users to fully engage in restorative moments remains suboptimal.

The absence or inadequacy of spaces specifically designed for relaxation may hinder the full realization of therapeutic benefits. Emotional comfort in built environments is not solely determined by visual aesthetics but also by the presence of functional zones that support self-regulation activities such as sitting in a quiet area, enjoying natural views, or engaging in informal interaction with the surroundings (Yan et al., 2024). A combination of calming physical elements and both active and passive relaxation facilities can reinforce feelings of tranquility and instill a sense of positive expectation. Therefore, while the visual impression of peace has been well established, enhancing physical relaxation facilities such as shaded seating gardens, comfortable lounge areas, or tranquil reading corners should become a design priority. These improvements would help increase the P26 score and ensure the full therapeutic potential of the building is achieved.

4.2 Identification of Priority Improvement Based on JMP Analysis

The JMP analysis of the six therapeutic architecture variables revealed that the majority of sub-indicators achieved scores approaching or exceeding the average threshold. Nevertheless, a number of sub-indicators fell below the mean, specifically P6, P7, P8, P9, P11, P12, P14, P17, P18, and P22. Among these, the five lowest-scoring indicators were P18 (presence of water elements in the interior), followed by P11 (availability of entertainment facilities), P17 (visual connection to natural outdoor views), P12 (presence of interactive art), and P8 (ease of access to food sources).

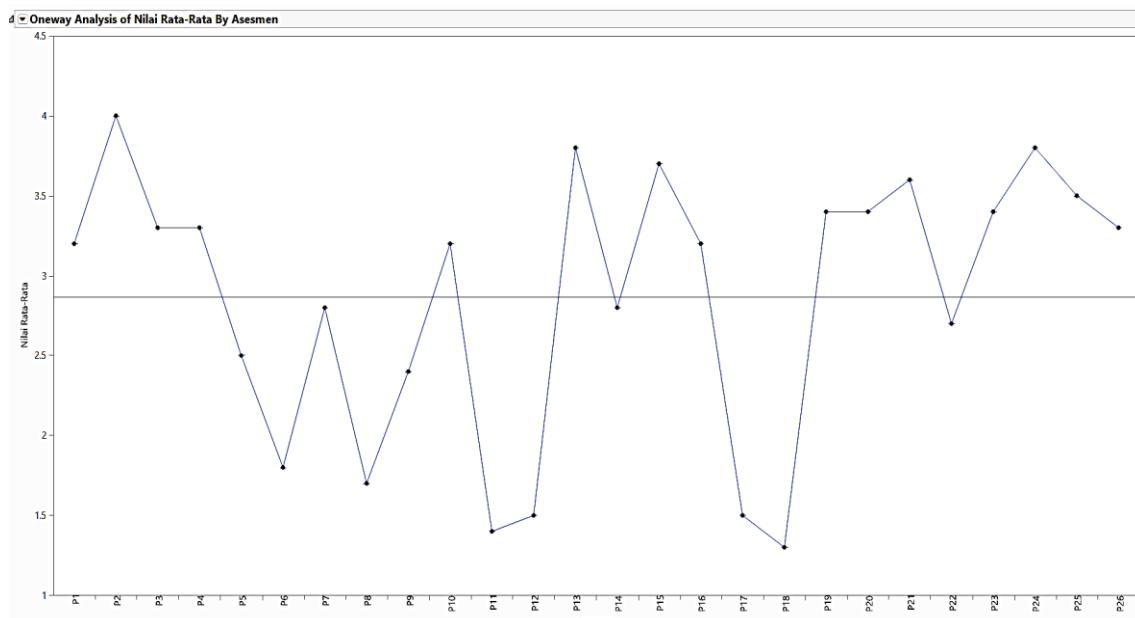


Figure 6. Bivariate Analysis Results of All Therapeutic Architecture Variable
 Source: Researchers (2025)

The low score on P18 reflects the limited utilization of water elements as positive multisensory stimuli. In fact, water features in interior spaces have been proven to exert calming effects through a combination of visual and auditory stimulation, and are recognized as a key component of biophilic design that supports users' psychological recovery (Sigalingging et al., 2021). Similarly, the low score on P17 indicates a suboptimal visual connection between users and the outdoor landscape, potentially restricting the restorative potential of the built environment (Jiang, 2023). Furthermore, indicators P11 and P12, which represent the dimension of positive distractions, also recorded below-average values, suggesting that entertainment facilities and interactive art installations have not been effectively integrated to divert users' attention from mental stress. Positive distraction is one of the core mechanisms within the healing architecture approach, known to improve mood, reduce psychological tension, and strengthen users' emotional engagement with space.

Additional low scores were observed for indicators P8 and P6, which relate to the dimension of social support, particularly the provision of private spaces for staff and the ease of access to food facilities. The availability of these features is crucial for supporting users' social and physical well-being, as they facilitate informal interaction and provide opportunities for personal restoration (Livne et al., 2021). Finally, indicator P22, which reflects accessibility for users with disabilities, also fell below the average. This finding highlights limitations in the application of universal design principles, despite the fact that physical accessibility is a fundamental requirement for the creation of inclusive public environments (Charles & Abbey, 2024).

Overall, the findings affirm that while most dimensions of therapeutic architecture have been adequately implemented, several spatial elements require urgent enhancement. The priority indicators identified through the JMP analysis namely interior water features (P18), visual connection to outdoor landscapes (P17), entertainment facilities (P11), interactive art (P12), access to food (P8), and accessibility for persons with disabilities (P22) serve as a critical foundation for formulating spatial design recommendations. Optimizing these indicators will enhance the therapeutic function of the building and align the public service environment more closely with design principles that genuinely support mental health and psychological well-being. Based on the JMP analysis, several indicators scored below the average, highlighting critical areas in need of improvement to strengthen the therapeutic quality of the Graha Sewaka Dharma public service building. These indicators provide the basis for developing spatial design recommendations that are both applicable and contextually responsive to the building's existing conditions and the psychosocial needs of its users.

First, the integration of water features within the building's interior (P18) can be achieved through the incorporation of reflective pools, indoor fountains, or calming water wall installations. These elements not only enhance the aesthetic appeal of the environment but also serve as positive multisensory stimuli that support psychological recovery by providing rhythmic and soothing natural sounds (Fadlilah, 2021; Sigalingging et al., 2021).

Second, to enhance visual connectivity with surrounding natural landscapes (P17), it is recommended to open sightlines toward existing greenery through the optimization of window openings, panoramic glass panels, or the creation of internal courtyards. Where feasible, the addition of vertical gardens on the external façade can offer continuous natural visual stimuli from within the interior (Jiang, 2023).

Third, improvements to entertainment and interactive art facilities (P11 and P12) can be realized by installing ambient entertainment systems, such as soft instrumental music in waiting areas, interactive screens with uplifting content, and dynamic art installations. Interactive art designed to evoke positive emotions has been shown to function as a valuable form of positive distraction, capable of enhancing users' mood and engagement (Vollmer et al., 2024).

Fourth, to reinforce the dimension of social support (P6 and P8), it is advisable to provide private rest areas for staff and visitors, furnished with ergonomic seating and soft lighting. Additionally, easy access to nutritious food and beverages may be facilitated through vending machines, open pantries, or small-scale cafés with direct access to primary public spaces. Such provisions can encourage informal social interactions and foster a more supportive working atmosphere (Livne et al., 2021).

Fifth, enhancing physical accessibility (P22) is essential for achieving inclusive design. Key improvements include the installation of ramps with standard slopes, handrails, tactile signage, and circulation paths that are fully wheelchair-accessible. Inclusive design not only fulfills regulatory requirements but also strengthens the perception of spatial justice and promotes universal comfort and dignity (Charles & Abbey, 2024).

All of these recommendations aim to create a built environment that is not only aesthetically pleasing but also possesses a high therapeutic value. By aligning spatial improvements with the six core dimensions of therapeutic architecture, the transformation of public spaces such as Graha Sewaka Dharma holds significant potential to enhance users' mental well-being. The adoption of psychologically restorative design principles is crucial for broader implementation in public service buildings, forming part of a holistic strategy to improve the quality of life in urban communities.

5. CONCLUSION

This study underscores the significance of implementing the therapeutic architecture approach in the design of public service buildings as a spatial strategy to support users' mental health and psychological well-being. Through an evaluation of six core dimensions' sense of personal control, social support, positive distractions, eliminating environmental stressors, connecting users to natural views, and engendering feelings it was found that although most indicators were adequately present at the Graha Sewaka Dharma Public Service Building, several critical aspects still require priority improvement. The lowest-scoring indicators, including the presence of water elements, visual access to natural scenery, interactive art, entertainment facilities, and access to food, reveal spatial gaps in creating a truly restorative work environment. These findings inform design recommendations that emphasize the enhancement of natural elements, integration of calming entertainment, provision of private spaces to support informal social interaction, and improved physical accessibility for users with disabilities.

Conceptually, the results of this research broaden the discourse on healing architecture in the context of tropical urban environments and contribute to evidence-based design practices relevant to public space policy development. Furthermore, this study opens avenues for future inquiry into the necessity of structured assessment methods for evaluating the therapeutic quality of built environments, forming a foundation for transforming public buildings into spaces that are not only functional but also psychologically restorative.

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