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Park Design Attributes for Mental Restoration: A systematic review and thematic analysis

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Abstract
This study aims to investigate landscape attributes in park environments that could contribute to visitors' mental restoration. A systematic review of 178 articles from the ScienceDirect and Scopus websites published between 2019 and 2024 was conducted, and 16 studies were found that met the inclusion criteria. The study found that green and blue attributes, living animals, safety, space representation and layout, and activity engagement are crucial attributes in landscape design that should be priorities in park environments for mental recovery. It advocates evidence-based landscape design to enhance parks, benefiting policymakers, planners, and architects while urging future research on long-term mental health effects.

Keywords: Design attributes; Park environment; Mental restoration; Systematic review

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1.0 Introduction

Mental health disorders are noted as the leading cause of morbidity and total disability worldwide. About 792 million individuals, or 10.7% of the world's population, suffered from mental health disorders in 2017 (Wang et al., 2022). Accessible green spaces are crucial for managing stress and mental exhaustion. In previous literature, very little research mentioned about how certain park design attributes support mental restoration (Fleckney, 2023; Hussein et al., 2023). Most research places a significant value on experiencing access to nature, but it does not thoroughly examine the ways in which specific attributes, including tree canopy density, spatial layout, or sensory stimulation, might impact mental health (Shobri et al., 2023; Cao et al., 2023). Furthermore, safety attributes are frequently oversimplified and studied insufficiently as compared to cleanliness and lighting, making it difficult to determine how directly they relate to psychological recovery (Shafee et al., 2019; Wan et al., 2024). Additionally, most results are derived from cross-sectional data, which provides little understanding of the psychological impacts of park exposure (Grigoletto et al., 2023). Most notably, there is still a big gap between theory and practice because there are not many studies give insight to the planners and landscape architects with evidence-based design guidelines for successfully integrating restorative attributes into park environments (Buttazzoni et al., 2022; Thani et al., 2023). This systematic review and thematic analysis aim to identify park design attributes and characteristics of restorative environments that serve as stimuli for mental restoration in the park environment.

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1.1 Purpose of study

Through systematic review and thematic analysis, this study examines how specific park design attributes contribute to mental restoration. It attempts to bridge the gap between landscape design and mental health by identifying important attributes of park landscapes that affect psychological well-being and stress reduction.

1.2 Objectives of study

This study aims to (1) identify and categorise specific park design attributes that promote mental restoration and (2) evaluate their effects on psychological well-being, including stress reduction and cognitive restoration. The findings are intended to enhance evidence-based urban planning practices and guide future park design strategies, enabling planners, landscape architects, and policymakers to be able to develop restorative spaces that promote public mental health in urban park contexts.

2.0 Literature Review

Prior research has documented the mental health benefits of green spaces, emphasising their role in stress reduction, cognitive restoration, and emotional well-being (Astell-Burt & Feng, 2019; Li et al., 2023). However, most of this literature overlooks the effects of specific park design attributes. This study advances the debate by focusing clearly on these significant landscape attributes. Green features, blue elements, the presence of living animals, safety and accessibility, spatial layout, and activity engagement are the six essential park design criteria that are systematically identified and categorised in this study. It applies upon a foundation of environmental psychology theories such as Attention Restoration Theory (Kaplan, 1995), Stress Reduction Theory (Ulrich, 1983), arousal theory and Prospect-Refuge Theory (Appleton, 1975) whereby to interpret how these design features contribute to psychological restoration in a more focused examination of empirical data linked to landscape design attributes in urban park contexts.

In comparison to previous research, which frequently addressed safety in general terms, this study focuses on the specific contributions of well-lit pathways, visible sightlines, and spatial layout to psychological comfort and perceived security (Shobri et al., 2023; Wan et al., 2024). Additionally, the presence of sensory stimuli, such as birdsong and natural scents, is examined as a key aspect of the design framework, an aspect that was overlooked in previous work (Chen & Kang, 2023; Mueller & Flouri, 2023). Several factors that influence mental health conditions are income, education, marital status, area density, and exposure to green spaces (Ha et al., 2022). Regular contact with natural environments provides long-term psychological benefits such as stress reduction and improved mental resilience (Grigoletto et al., 2023). However, there is knowledge gaps between which specific park attributes contribute most significantly to mental well-being.

It is noted that access to parks, safety, biodiversity, and availability of facilities are the key factors that influence the effectiveness in improving psychological health. Studies examining the link between self-reported emotional well-being and observable stress reduction in park settings remain limited. Sustainable planning has increasingly emphasised equitable access to green spaces as a fundamental right, given its potential to mitigate community mental health issues (Jin et al., 2023). Modern areas have often resulted in distancing people from natural environments, posing risks to mental health (Zhu et al., 2023). Thoughtful landscape design that integrates both green spaces (parks, gardens) and blue spaces (rivers, ponds) has demonstrated significant mental health benefits, including stress reduction (Buttazzoni et al., 2022).

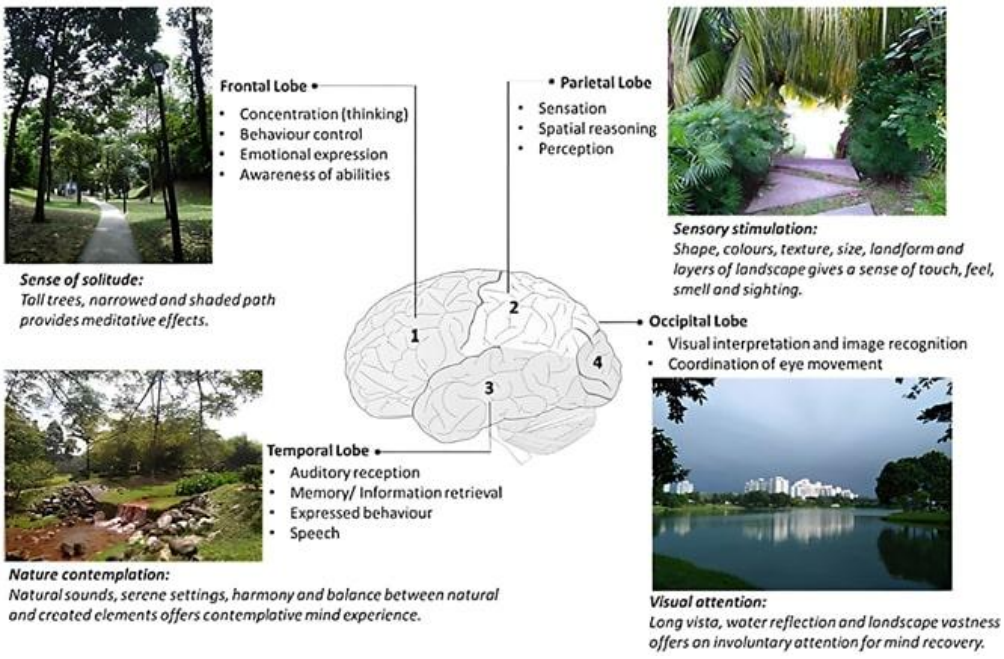

Fig 1: Characteristics of landscapes that induce positive brain activity towards stress reduction.
(Source: Thani et al., 2022)

Even though earlier research has demonstrated the benefits of green and blue spaces for mental restoration, there are still unresolved issues in implementing green and blue spaces in urban parks. (Grigoletto et al., 2023; Hussein et al., 2023). Thus, by executing the systematic review, classifying, and reviewing park attributes under six main themes such as safety, spatial layout, inclusion of animals, green attributes, blue attributes, and activity engagement, it will identify and categorise specific park design attributes that promote mental restoration and evaluate their effects on psychological well-being, including stress reduction and cognitive restoration. Rather than correlational studies, this literature addresses the practical application of its findings on how specific park design attributes contribute to mental restoration. The study provides insightful information by combining empirical studies from 2019 to 2024 in order to understand park design attributes contributed to mental restoration. It is anticipated that the result may be used as a guideline in creating evidence-based park designs for the satisfaction of urban park users especially in mental health issues.

3.0 Methodology

This study used a systematic literature review in thematic analysis. The methodology is designed to be a comprehensive, transparent, and replicable process of identifying and synthesising findings from empirical studies published between 2019 and 2024. The sources are from the ScienceDirect and Scopus databases. A structured search as the employed targeted keywords drawn from prior studies, including “parks”, “green space”, “green areas”, “sustainable planning”, “landscape design”, and “mental restoration”. These terms aimed to capture a wide yet focused range of research from park attributes to mental health impact. To guarantee quality and relevance, the search was (1) restricted to full-text journal articles in open access, (2) only in English languages, and (3) published between 2019 to 2024, which ensured current and relevant results. Figure 2 shows the framework of the systematic review applied for this study.

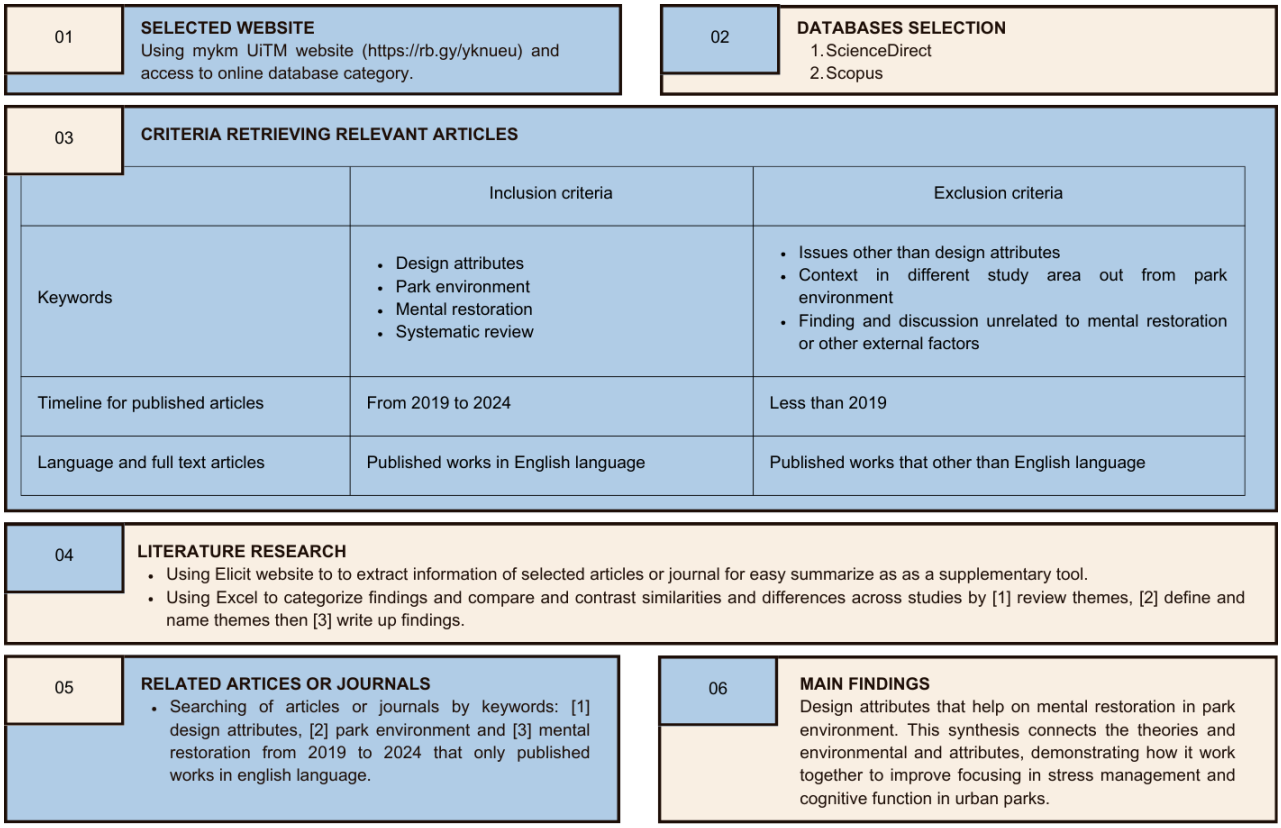

Fig 2: Framework of systematic reviews in this study
(Source: Author)

Furthermore, studies that incorporated external factors (e.g., weather conditions, public health contexts such as COVID-19) were only accepted if they continued to emphasize landscape attributes as the main determinants influencing mental restoration. This decision acknowledges that outdoor experiences in parks occur within broader societal and environmental contexts. As an example, during pandemics or changing weather patterns, individuals may respond differently to the same park attributes. Thus, including such studies enhances the ecological validity of the findings and reflects the real-world complexity of urban park usage. A total of 178 articles were initially identified.

After conducting the thematic analysis, the next step is to run the three-stage systematic selection process which included (1) screening of titles and abstracts removing irrelevant or duplicate records, (2) full-text evaluation to determine eligibility based on the inclusion criteria and (3) methodological appraisal ensuring research quality and rigour. After went through the filtering process, 16

articles were selected as the articles met all the criteria for final analysis. These multi-layered approaches minimised bias and ensured that only methodologically sound and thematically relevant articles were selected.

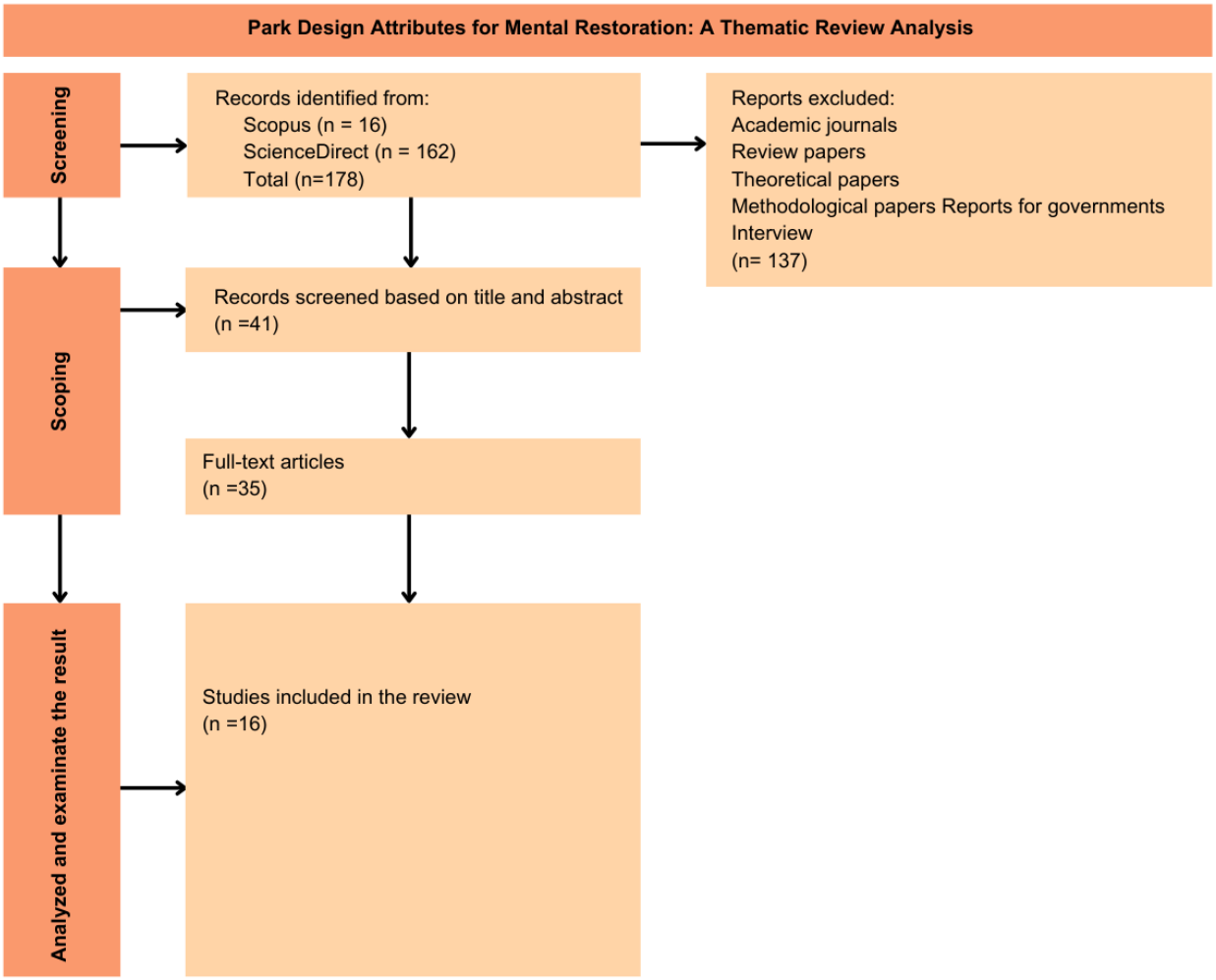

Fig 3: Flowchart of the article's selection process
(Source: Author)

As for landscape attributes, their roles contributing to mental restoration were categorized through thematic analysis. The protocol included (1) Data Extraction: Relevant information from each paper, including study goals, methodology, and identified landscape attributes; (2) Initial Coding: Repetitive details were given descriptive names such as "tree canopy", "water features", and "animal presence"; (3) Theme Development: Similar codes were combined into more general themes that reflected psychological functions and related attributes; (4) Refinement and Validation: Ensuring conceptual clarity, examine and enhance themes.

4.0 Results and Findings

Parks are space that contributed to psychological and cognitive restoration. However, park designs, sometimes rely on subjective interpretation (Shobri et al., 2023) and this study will transcend insight on the park designs attributes promoting mental restoration. 16 selected articles via systematic analysis couple with theme synthesis demonstrated a firm established findings of park design in the present of environmental psychology theories. Four fundamental theories were chosen to structure the awareness of certain landscape attributes that affect mental restoration.

Attention Restoration Theory (ART) by Kaplan (1995) suggested that natural environments help in mental restoration by allowing the mind to rest and recover from overseen attention exhaustion, another notable theory is Stress Recovery Theory (Ulrich, 1983) explained how exposure to nature encourages positive emotional responses and reduces physiological stress. While Beryne (1951) promoted Arousal Theory which suggested that nature helps balance psychological arousal, preventing both overstimulation and under-stimulation, and the Prospect Refuge Theory (Appleton, 1975) emphasized on the psychological importance of spatial configuration an open view for visibility (prospect) and enclosed areas for safety (refuge) in promoting comfort and security. Figure 4 shows the theoretical maps of the linkages between the empirical findings and articles searched.

Table 1 shows further details from articles selected for the specific landscape features aligned with each theme and summarizes how each theory is linked with the identified design themes.

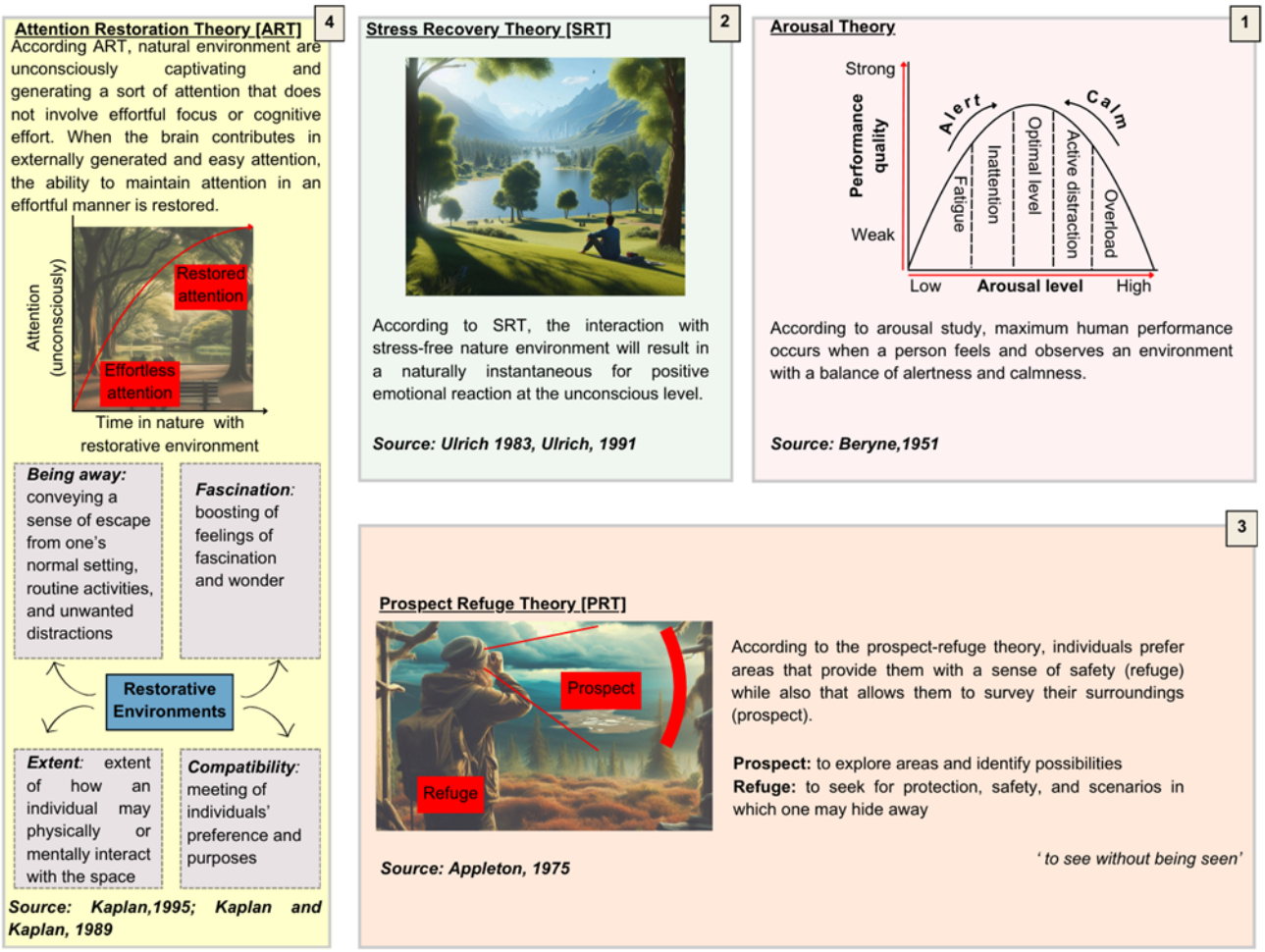

Fig 4: Theories related to mental restoration derived from reviews in this study.
(Source: Author)

Table 1: Summary of landscape attributes for mental restoration in a park setting.

Authors	Landscape Attributes	Features	Theories
Inclusion of living animals			
Zhao & Gong (2022) Yin et al. (2023) Chen & Kang (2023)	animal species (non-threatening species) Therapeutic natural sounds	• Water-based Animals • Land-based Animals • Natural Sounds • bird songs • Water sounds	• Arousal (movement from animals or sounds can balance under- and over-stimulation, supporting emotional regulation) • PRT (Hearing or seeing animals can support a sense of refuge and emotional comfort) • ART (Provide soft fascination that helps restore attention) • SRT (Reduces physiological stress)
Mueller & Flouri (2023)	Ecological Quality of Green Spaces	• presence of animal biodiversity	
Green attributes			
Fleckney (2023)	Psychological pathways (sensory elements)	• trees • Natural smells	• ART • SRT both theories offering soft fascination and emotional relief
Cao et al. (2023)	landscape structure	• Greenery Distribution	
Yin et al. (2023)	Therapeutic	• Green space-presence of trees, grass, and other vegetation	
Wan et al. (2024)	natural substrate	• Plant Configuration	
Shobri et al. (2023)	Space represents	• Tree Coverage and Shading	
Hussein et al. (2023)	landscape features	• Tree Canopy and Vegetation	

Jie Yin et al. (2022) Mueller & Flouri (2023) (Vegaraju et al., 2024)	Visual Prospect and Refuge Ecological Quality of Green Spaces Green Space	• Natural elements • Species Richness • Vegetation Diversity • Percentage of Green Space	
Blue attributes			
Fleckney (2023)	Psychological pathways (sensory elements)	• water	• SRT • Arousal
Cao et al. (2023) Yin et al. (2023)	landscape structure Therapeutic	• Water Features • blue space (natural or manmade)-rivers, fountains or lakes, streams or waves	Both theories help in lowering physiological arousal and stress.
Wan et al. (2024)	natural substrate	• Water Quality • Waterfront Planting	
Hussein et al. (2023)	Water Features	• Water elements	
Safety			
Cao et al. (2023) Wan et al. (2024) Shobri et al. (2023) Hussein et al. (2023) Shafee et al. (2019)	park infrastructure road walking comfort sport and leisure activities planning stage park characteristics	• Lighting • Maintenance • Safety Features • Safety and Cleanliness • safety • Safety	• PRT (emphasising the psychological need for navigability and security in restorative spaces)
Space representation and layout			
Cao et al. (2023) Shobri et al. (2023) Hussein et al. (2023) Jie Yin et al. (2022) Shafee et al. (2019) Mueller & Flouri (2023) (Vegaraju et al., 2024)	landscape structure Space represents planning stage Visual Prospect and Refuge park characteristics Space represents Blue Space	• Spatial Design and Layout • Natural Versus Man-Made Elements • Topography and Elevation • Open, expansive and free from congestion • Community Involvement • Accessibility • Ecological Sustainability • Familiarity with the Environment • Aesthetic and Calming Qualities • Comfort • Accessibility • Species Abundance • Trail Length and Access	• PRT (emphasising the psychological need for navigability and security in restorative spaces) • SRT (Reduce perceived risk, thereby helping emotional comfort and mental restoration) • ART (minimise cognitive overload, supporting mental recovery)
Activities engagement			
Cao et al. (2023) Wan et al. (2024) Shobri et al. (2023) Grigoletto et al. (2023) Shafee et al. (2019)	park infrastructure road walking comfort sport and leisure activities Types of activities (Tranquillity and Relaxation) Types of amenities	• Walking Paths • Exercise Equipment • Amenities • Pathway Design and Quality • Shaded Walkways • Seating and Rest Areas • Diverse Facilities • Accessibility of Equipment • Social and Group Engagement • Relaxation and Leisure Areas • Physical Activities • Social Interactions • Family-Oriented Activities • active engagement opportunities • Passive Engagement Opportunities	• Arousal (Regulate stimulation and encourage positive social interaction) • PRT (emphasising the psychological need for navigability and security in restorative spaces) • ART (Supports cognitive restoration by facilitating mental disengagement from routine stressors)

(Source: Author)

5.0 Discussion

Out of the 16 journal articles analysed, 9 articles mentioned about green attributes, 5 articles related to blue attributes, 4 articles stated on inclusion of living animals, 5 articles study on safety, 7 articles mentioned about issues regarding with space representation and layout and only 5 articles concerning on the activity's engagement opportunities. Referring to the identification and characterization of the 16 journal articles, it can be tailored into six key themes namely (1) green attributes; (2) blue attributes; (3) inclusion of living animals; (4) safety; (5) space representation and layout; and (6) activities engagement. Figure 5 shows the themes and park design attributes for mental restoration derived from this study.

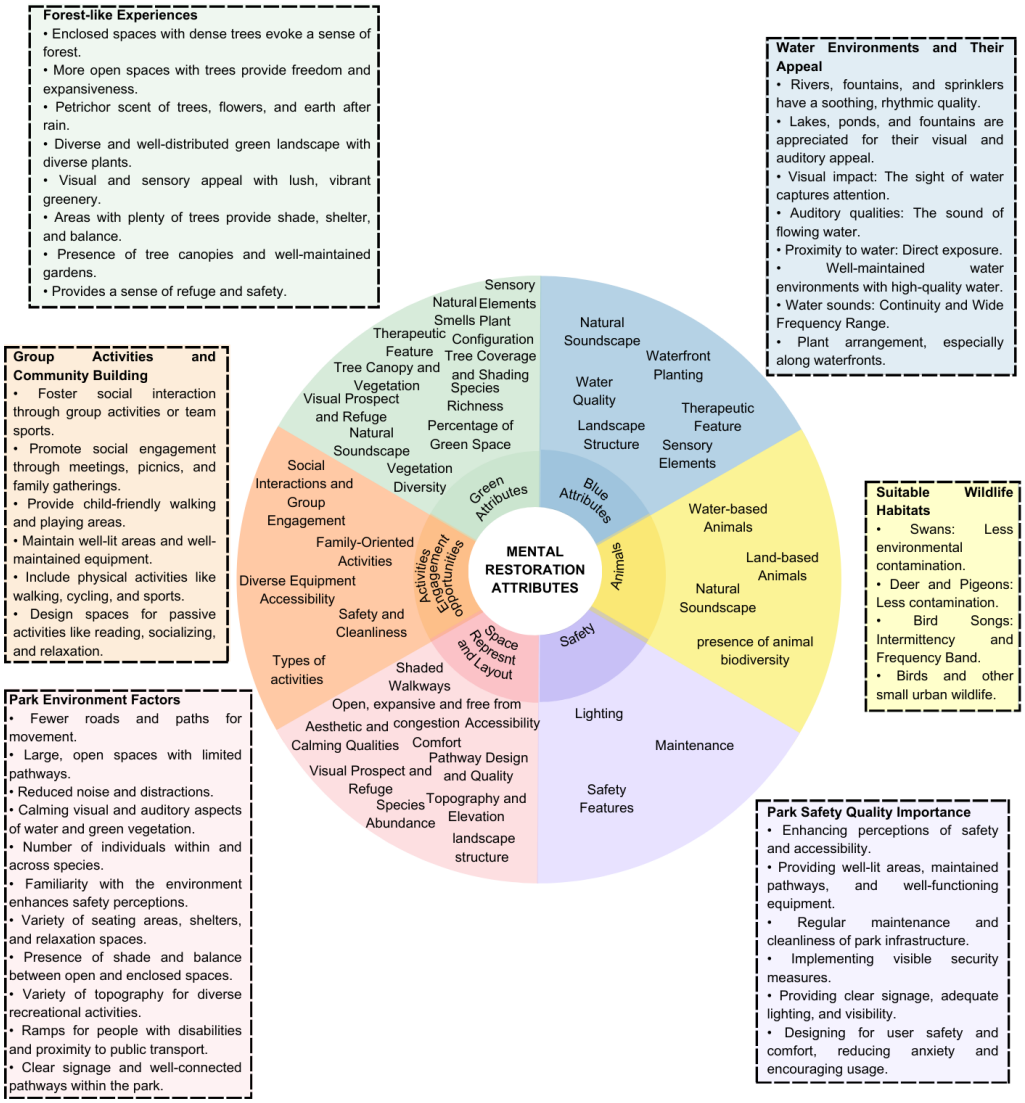

Fig 5: The themes and park design attributes for mental restoration derived from this study.
(Source: Author)

5.1 Green Attributes

Research by Astell-Burt & Feng (2019) and Li et al. (2023) showed that green attributes and natural scents promote stress recovery and emotional well-being. This review is further studied by Fleckney (2023) and Hussein et al. (2023), confirming that visual and scent. Moreover, Mueller & Flouri (2023) highlight that biodiversity itself, through species richness, can enhance psychological strength.

5.2 Blue Attributes

Water features such as fountains, lakes, or rivers have been widely acknowledged for their calming effects (Yin et al., 2023; Wan et al., 2024). This review supports Buttazzoni et al. (2022) by emphasising that auditory components (e.g., flowing water) significantly reduce cognitive restoration.

5.3 Inclusion of Living Animals

Non-threatening living animals and natural sounds like birdsong foster psychological comfort and tranquillity, and Chen & Kang (2023) found that natural acoustic environments stimulate positive social behaviour. This aligns with Bazrafshan et al. (2023), who observed that naturalistic features strengthen place attachment, which in turn enhances relaxation and emotional bonding with green spaces.

5.4 Safety and Accessibility

Infrastructure elements like pathway lighting, signage, and maintenance for increasing perceived security (Shafee et al., 2019; Cao et al., 2023). Wan et al. (2024) further stress the importance of comfort in walking infrastructure to encourage repeated park visits, reinforcing the value of safe design as an implementer of mental restoration.

5.5 Space and Activities

Grigoletto et al. (2023) and Shobri et al. (2023) indicate that design elements like elevation, openness, and seating areas promote social interaction, physical activity, and emotional well-being. Moreover, place attachment derived from repeated, meaningful engagement with specific park features contributes to mental restoration, even though it remains difficult to measure (Bazrafshan et al., 2023). One of the notable findings from this study is the highlighting of sensory stimuli such as sounds from birds and running water and scent stimuli such as the aroma from flowery plants or from trees after the rain, which create a relaxing environment.

Urban planners and landscape architects can implement these insights in real-world planning through an environmentally friendly urban park design and park users-friendly based design which promote mental and physical health outcomes. Hence, urban planners and landscape architects should incorporate sensory diversity element, such as scented plants, shaded seating, and soundscapes like rustling leaves or bird noises in their design. Thus, by ensuring all these qualities are taken into consideration, Sustainable Development Goals (SDG)s 3 (Good Health and Well-Being) and SDG 11 (Sustainable Cities and Communities) are achieved. It is exacerbated that park design for mental restoration purposes should be regulated and designated of significant zoning area especially for the special needs people.

6.0 Conclusion and Recommendations

In conclusion, enhancing psychological well-being requires the incorporation of mental restoration features in park design. Parks offer pleasant spaces that minimise stress and cognitive pressure by combining elements of green and blue. Natural landscapes, such as forestry areas and water features, are thought to aid mental restoration by offering visual and sensory calmness, according to the Attention Restoration Theory (ART) and Stress Recovery Theory (SRT). The Prospect-Refuge Theory (PRT) additionally highlights the value of open, safe areas where visitors feel both protected (refuge) and free to explore (prospect). This balance is made possible by big green spaces, shaded seating, and well-placed trees, which guarantee that visitors are at ease and secure. Proper lighting, maintenance, and well-connected pathways further enhance safety, reducing anxiety and encouraging frequent park visits. Furthermore, Arousal Theory supports the idea that social interaction and physical exercise are important components of mental health. Walking routes, fitness equipment, and public areas in parks promote movement and social contact, which promotes relaxation and a sense of community. By encouraging emotional and mental restoration, the inclusion of living animals and natural noises (such as birdsong and river movement) improves the park's therapeutic effects. Given the circumstances, a community can benefit from emotional balance and mental restoration when they are in a well-designed park that incorporates nature, safety, accessibility, and interaction possibilities. Although this study reveals some landscape attributes and their features contributing to mental restoration, further studies are needed to specify the criteria of each attribute and feature for landscape design guidelines. Previous studies suggested that being in nature provides safety, activity engagement, green and blue attributes, inclusion of living animals, and representation of spatial and layout landscape design could boost perceived restorativeness, but the process of how those intercorrelated features in green spaces restore visitors' mental health remains unclear. In addition, the results show that research on safety in park environments only shows two notable features, such as lighting and safety in general terms, which remain obscure and call for further research to dive into the safety in correlation to mental health well-being in park environments. It is advised that park planners optimise the potential of mental restoration in park design attributes by integrating accessible infrastructure, water features, organised layouts, and a variety of park environments. These findings have implications for policymakers, urban planners, and landscape architects in designing parks that maximise mental health benefits. Future research should focus on longitudinal studies that examine the lasting effects of specific park attributes on mental restoration and emotional resilience.

Acknowledgement

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Paper Contribution to Related Field of Study

This article links park design, neuropsychology, and landscape design offering theoretical perspectives to help visitors improve mental restoration in parks environment. The results can be beneficial for parks planners, policymakers, and researchers in creating healthier and more livable parks. Results highlight the importance of evidence-based design in park development, making certain that parks serve not only as leisure areas but also as vital public health resources specifically for mental restoration, thereby aiding the formulation of policy structures and intervention approaches that correspond with SDG 3 (Good Health and Well-Being) and SDG 11 (Sustainable Cities and Communities).

References

Appleton, J. (1975). The experience of landscape. Wiley.

Amira, F., Shafee, A., & Kamaruddin, S. M. (2019). The Effective Characteristics of an Urban Park Through Visitors Perception Case Study: KLCC Park. In Built Environment Journal (Vol. 16, Issue 2).

Astell-Burt, T., & Feng, X. (2019). Association of Urban Green Space with Mental Health and General Health among Adults in Australia. JAMA Network Open, 2(7).

Bazrafshan, M., Spielhofer, R., Wissen Hayek, U., Kienast, F., & Grêt-Regamey, A. (2023). Greater place attachment to urban parks enhances relaxation: Examining affective and cognitive responses of locals and bi-cultural migrants to virtual park visits. Landscape and Urban Planning, 232.

Bazrafshan, M., Spielhofer, R., Wissen Hayek, U., Kienast, F., & Grêt-Regamey, A. (2023). Greater place attachment to urban parks enhances relaxation: Examining affective and cognitive responses of locals and bi-cultural migrants to virtual park visits. Landscape and Urban Planning, 232. https://doi.org/10.1016/j.landurbplan.2022.104650

Buttazzoni, A., Dean, J., & Minaker, L. (2022). Urban design and adolescent mental health: A qualitative examination of adolescent emotional responses to pedestrian- and transit-oriented design and cognitive architecture concepts. Health and Place, 76.

Cao, L., Sun, Y., Beckmann-Wübbelt, A., & Saha, S. (2023). Characteristics of urban park recreation and health during early COVID-19 by on-site survey in Beijing. Npj Urban Sustainability, 3(1).

Chen, X., & Kang, J. (2023). Natural sounds can encourage social interactions in urban parks. Landscape and Urban Planning, 239.
Fleckney, P. (2023). 'A little escape dome': Exploring how older adolescents experience urban parks as sites of mental wellbeing in Melbourne, Australia. Landscape and Urban Planning, 235.

Grigoletto, A., Toselli, S., Zijlema, W., Marquez, S., Triguero-Mas, M., Gidlow, C., Grazuleviciene, R., van de Berg, M., Kruize, H., Maas, J., & Nieuwenhuijsen, M. J. (2023). Restoration in mental health after visiting urban green spaces, who is most affected? Comparison between good/poor mental health in four European cities. Environmental Research, 223.

Ha, J., Kim, H. J., & With, K. A. (2022). Urban green space alone is not enough: A landscape analysis linking the spatial distribution of urban green space to mental health in the city of Chicago. Landscape and Urban Planning, 218.

Harjanti, I. M., Buchori, I., & Kurniati, R. (2023). Does the Urban Park Provision Fit the Social Needs of the Community? Evidence for Semarang City, Indonesia. Pertanika Journal of Social Sciences and Humanities, 31(3), 1271–1295.

Hussein, H., Ishak, S. A., & Zhang, H. (2023). Review of Literature on Open Green Space for Positive Mental Health in the Low-Income Community. Environment-Behaviour Proceedings Journal, 8(25), 125–131.

Jin, Z., Wang, J., Liu, X., Han, X., Qi, J., & Wang, J. (2023). Stress Recovery Effects of Viewing Simulated Urban Parks: Landscape Types, Depressive Symptoms, and Gender Differences. Land, 12(1).

Li, Q., Liu, Y., Yang, L., Ge, J., Chang, X., & Zhang, X. (2023). The impact of urban green space on the health of middle-aged and older adults. Frontiers in Public Health, 11.

Mueller, M. A. E., & Flouri, E. (2023). Urban biodiversity and adolescent mental health and well-being. Journal of Environmental Psychology, 92.

Pasanen, T. P., White, M. P., Elliott, L. R., van den Bosch, M., Bratman, G. N., Ojala, A., Korpela, K., & Fleming, L. E. (2023). Urban green space and mental health among people living alone: The mediating roles of relational and collective restoration in an 18-country sample. Environmental Research, 232.

Thani, S. K. S. O., Cheok, N. S., & Hussein, H. (2022). A Preliminary Assessment of Neuro-Salutogenic Landscape Stimuli in Neighbourhood Parks: Theory-Based Model for Stress Mitigation. 6th Kuala Lumpur International Conference on Biomedical Engineering 2021, 86, 461–469.

Thani, S.K. S. O, Hussein, H., Föhn, M., & Ng, S. (2023). Salutogenic Landscape Design with Cognitive Restoration Stimuli for Stress Intervention. Environment-Behaviour Proceedings Journal, 8(25), 133–140. https://doi.org/10.21834/e-bpj.v8i25.4841

Wan, J., Wu, H., Collins, R., Deng, K., Zhu, W., Xiao, H., Tang, X., Tian, C., Zhang, C., & Zhang, L. (2023). Integrative analysis of health restoration in urban blue-green spaces: A multiscale approach to community park. Journal of Cleaner Production, 140178.

Wang, P., Han, L., Hao, R., & Mei, R. (2022). Understanding the relationship between small urban parks and mental health: A case study in Shanghai, China. Urban Forestry and Urban Greening, 78.

Yao, W., Zhang, X., & Gong, Q. (2021). The effect of exposure to the natural environment on stress reduction: A meta-analysis. In Urban Forestry and Urban Greening (Vol. 57). Elsevier GmbH.

Yin, J., Bratman, G. N., Browning, M. H. E. M., Spengler, J. D., & Olvera-Alvarez, H. A. (2022). Stress recovery from virtual exposure to a brown (desert) environment versus a green environment. Journal of Environmental Psychology, 81.

Yin, J., Ramanpong, J., Chang, J., Wu, C. da, Chao, P. H., & Yu, C. P. (2023). Effects of blue space exposure in urban and natural environments on psychological and physiological responses: A within-subject experiment. Urban Forestry and Urban Greening, 87. https://doi.org/10.1016/j.ufug.2023.128066

Zhu, W., Wang, J., & Qin, B. (2023). The relationship between urban greenness and mental health: A national-level study of China. Landscape and Urban Planning, 238. https://doi.org/10.1016/j.landurbplan.2023.104830