Environment and Social Psychology (2025) Volume 10 Issue 6 ISSN: 2424-8975 (O)
doi: 10.59429/esp.v10i6.3818 2424-7979 (P)

RESEARCH ARTICLE

Behavioral criteria in pocket park design through the lens of environmental psychology: A systematic review

Dong Han, Mohd Jaki Bin Mamat*

School of Housing, Building, and Planning, Universiti Sains Malaysia, 11700, Malaysia

*** Corresponding author:** Mohd Jaki Bin Mamat. mohdjaki@usm.my

ABSTRACT

Although pocket parks are being marketed as essential urban green spaces in congested urban settings, their layout frequently ignores the behavioral and psychological reactions of patrons. Understanding how spatial design might promote comfort, interaction, and well-being in these types of environments is made possible by environmental psychology. The purpose of this study is to discover behavioral characteristics derived from environmental psychology that impact pocket park design by conducting a literature review. The objective is to comprehend how urban small-scale green spaces influence human perception, comfort, and interaction. Peer-reviewed papers were sourced from sources such as Scopus, Web of Science, Taylor & Francis, and Google Scholar, in accordance with PRISMA principles. Design criteria and pocket park-related keywords were employed. Recurring behavioral and psychological criteria were categorized using thematic synthesis. Comfort, social interaction, perceived safety, restorative quality, emotional well-being, walkability, activities, and privacy are the eight primary behavioral emphasis areas that the review finds as being pertinent to pocket park design. Additionally, attention is paid to nine design components, including "natural & restorative elements," "visual & spatial experience," "accessibility, proximity & connectivity," and "functional activity settings." Pocket park design has a significant impact on psychological experiences and behavioral patterns in addition to being aesthetically pleasing and functional. It is necessary to include psychological insights into landscape architecture in order to develop pocket parks with a human-centered approach. The study suggests a set of behavioral standards that can direct the creation of urban microparks that are more socially sensitive, inclusive, and emotionally influential.

Keywords: Pocket parks; environmental psychology; behavioral criteria; comfort; social interaction; restorative environments

1. Introduction

Pocket parks have become essential micro-scale green areas that provide social, psychological, and ecological advantages to city people in response to growing urban densification and dwindling public space availability[1]. Opportunities for extensive green infrastructure are limited in high-density metropolitan locations due to land availability issues and growing real estate prices[2,3]. Urban resilience, however, depends on having access to green space, which provides vital ecosystem services like biodiversity support,

ARTICLE INFO
Received: 3 May 2025| Accepted: 24 May 2025 | Available online: 25 June 2025

CITATION
Han D, Mamat MJB Behavioral criteria in pocket park design through the lens of environmental psychology: A systematic review *Environment and Social Psychology* 2025; 10(6): 3818 doi:10.59429/esp.v10i6.3818

storm water management, air purification, and thermal regulation[4]. Crucially, by encouraging social contact, stress reduction, and physical activity, natural settings also improve human well-being[5,6].

According to Palliwoda et al.[7], pocket parks—small-scale public green areas usually constructed from unused urban land—are becoming essential parts of urban green infrastructure. These areas, sometimes referred to as vest-pocket parks or mini-parks, are easily accessible, reasonably priced, and multipurpose spaces that meet the immediate requirements of nearby communities[8]. According to study, well-designed pocket parks can provide advantages similar to those of bigger urban parks despite their modest size, especially when it comes to daily enjoyment, social interaction, and mental healing[9]. They are particularly useful in small urban areas where there are few larger parks due to their versatility and close proximity[10].

These parks can facilitate leisure, relaxation, social connection, and psychological healing activities thanks to design features like benches, play structures, walkways, and natural landscaping[11]. Some, like skateboarding, exercise, or kid's play, are made with specific purposes in mind[12]. Pocket parks provide accessible and multipurpose public areas that promote community involvement, health, and urban sustainability, adding to the diversity and resilience of urban green infrastructure through its flexibility in form and function[13]. Concerns like underuse, problems with safety perception, and the possibility of inadequate maintenance, however, also draw attention to the necessity of evidence-based design that addresses behavioral outcomes as well as psychological demands.

The increasing usage of micro-scale green spaces in urban planning and the dearth of user-centred design guidelines are the driving forces behind this study. Pocket parks are a crucial but little-studied topic for behavioral and environmental research because they offer a singular convergence of limited physical space and intricate human requirements. Although the idea of pocket parks has become more popular in planning and design circles, definitions, design standards, and proof of advantages are still lacking in the scholarly literature. No thorough synthesis has looked at pocket park design through the lens of environmental psychology, which is crucial for comprehending how physical settings affect behaviour and psychological outcomes. Previous reviews have focused on specific aspects, such as usage factors or regional research trends. The majority of empirical studies focus solely on ecological or functional aspects. Furthermore, the overlap across themes—for example, "vegetation density," "greenery," and "natural elements"—indicates a conceptual ambiguity that environmental psychology may be able to address.

Therefore, the necessity to elucidate the ways in which design elements impact behaviour and well-being through the application of fundamental psychological theories including Attention Restoration Theory (ART) , Stress Reduction Theory (SRT) , Behavior Setting Theory and Place Attachment Theory serves as the basis for this review. By addressing the following research questions and providing a theory-driven categorization of design themes that links specific physical elements with acknowledged psychological demands and reactions, this study seeks to bridge this gap. The study also seeks to critically evaluate the potential and constraints of pocket park design in enhancing user well-being by fusing psychological frameworks with empirical data. Such an approach can assist future scholars and urban planners in making educated judgement based on user-centred evidence..

RQ1: What are the common behavioral design criteria identified in pocket park research?

RQ2: How are these criteria informed by environmental psychology, and what implications do they hold for future planning and design?

2. Theoretical perspective

This study develops a systematic, theory-informed approach for examining behavioral design motifs in pocket parks by referencing four fundamental ideas from environmental psychology. These theories were chosen because they can explain behavioral and psychological reactions to designed environments and have empirical significance to human-environment interaction. The results of numerous empirical investigations on pocket park design were compiled and interpreted in this study using a content analysis methodology. Four fundamental theories of environmental psychology—Attention Restoration Theory (ART) [14], Stress Reduction Theory (SRT)[15], Behaviour Setting Theory[16], and Place Attachment Theory[17]—were used as the basis for the theory-informed framework that guided the coding process. These ideas offered a behavioral framework for classifying and interpreting design-related motifs according to their behavioral and psychological importance. These theories were selected because they reflect distinct but complementary aspects of the person-environment relationship.

These concepts provided a behavioral framework for categorizing and analyzing design-related motifs based on their psychological and behavioral significance. Crucially, the theoretical framework came before the coding approach and influenced how empirical patterns and theme overlaps between research were interpreted. The research design (qualitative, quantitative, or mixed-methods), data collection method (e.g., observational study, survey, case study), key design features (e.g., greenery, seating, play areas), and central behavioral or psychological outcomes (e.g., stress reduction, restoration, social interaction) were the criteria used to systematically code each study that was part of the review.

The behavioral mechanisms put forth by the chosen psychological theories served as the foundation for the theoretical coding system. The Attention Restoration Theory (ART), for example, was used to group themes pertaining to vegetation, water features, natural light, and visual access to the sky since these factors are known to support focused attention recovery through sensory compatibility and soft curiosity. Stress Reduction Theory (SRT) has been connected to stress-relieving elements like shade, open space, and auditory comfort. Behaviour Setting Theory was linked to design features including walkways, benches, playgrounds, and activity areas that encourage recurring or regular social and physical behaviours. Lastly, Place Attachment Theory was in line with characteristics that foster emotional attachment and cultural significance (such as historical allusions, landmarks, and beautiful design aspects). Each theory's initial contribution to environmental psychology and its applicability to classifying design themes in this review are summed up in the **Table 1**

Table 1. Theories for coding strategy and analytical approach.

Theory	Originator	Description	Basis for Categorization
Attention Restoration Theory (ART)	Kaplan & Kaplan (1989)[14]	Natural settings help restore directed attention and reduce mental fatigue.	Focus on natural elements, visual and sensory stimuli, vegetation, water, and quiet.
Stress Reduction Theory (SRT)	Ulrich et al.(2023)[15]	Nature reduces stress via positive affect and lower physiological arousal.	Elements that evoke calmness and comfort like water, shade, flowers, softscape, spatial openness.
Behavior Setting Theory	Barker (1968)[16]	Repeated social behaviors occur in "settings" shaped by physical environment and activities.	Functional aspects like seating, paths, play spaces, social nodes, and affordances.
Place Attachment Theory	Scannell & Gifford (2010)[17]	Emotional bonds between people and place foster care, use, and belonging.	Cultural, historical, aesthetic, and community elements that create meaning.

A more thorough synthesis of the relationships between park physical elements and psychological experiences and behavioral effects was made possible by this multi-theoretical framework. The framework guided interpretation by taking into account user cognition, emotion, behaviour, and identity rather than just frequency.

The main tool for organizing data, categorizing themes, and conducting frequency analysis was the Excel platform. Nine more general behavioral categories created by inductive and deductive coding were assigned to each design-related topic (n = 170) found in the 34 chosen studies: (1) Natural & Restorative Elements, (2) Functional Activity Settings, (3) Seating, Rest, & Social Interaction, (4) Accessibility, Proximity & Connectivity, (5) Aesthetic & Place Identity, (6) Safety, Comfort & Enclosure, (7) Ecological & Biodiversity Features, (8) Urban Integration & Design Adaptability, and (9) Visual & Spatial Experience.

By looking at the frequency and co-occurrence of themes both inside and between theoretical categories, the content analysis placed a strong emphasis on identifying patterns among research. This made it possible to identify the prevailing behavioral objectives behind each design aspect as well as to consolidate phrases that overlapped. In addition to supporting ART and SRT, for instance, recurrent connections between "vegetation," "shade," and "quiet" settings also highlight the overlapping psychological affordances of seemingly straightforward design elements.

All things considered, the theoretical framework was crucial in forming and analyzing the data. Through a clear and methodical analytical process and a coding strategy rooted in well-established theories of environmental psychology, this study offers a behaviorally grounded framework for evaluating the psychological effectiveness of pocket park design elements.

3. Materials and methods

After a thorough assessment of 34 studies, 100 distinct design-related themes pertaining to pocket park user behaviour were identified. These themes were grouped based on how well they fit psychological theory. This methodical thematic synthesis offers a starting point for comprehending how particular park features affect visitor experience.

To gain a comprehensive understanding of the state of the area, the study started with a methodical review of the literature. This review focused on academic research that uses environmental psychology to analyse behavioral parameters in pocket park design for more sustainable cities.

A precise set of inclusion criteria was applied in order to ensure the calibre and relevance of the selected research (**Table 2**). A literature search was conducted across major academic databases, including Scopus, Web of Science (WoS), Taylor & Francis, and Google Scholar, in order to identify a wide range of peer-reviewed publications and pertinent academic outputs.

Table 2. Inclusion and exclusion criteria

Criterion	Inclusion	Exclusion
Topic, Abstract, Keywords	Pocket park & design criteria	
Date	≥2015.1-2025.5	＜2015
Data collection source	Both original and secondary research were considered	
Language	English	Other languages

The initial set of records discovered through these databases, prior to full-text screening and eligibility assessment, is shown in **Table 3**. To ensure relevance to recent developments and to limit the breadth of the

literature evaluation, the inclusion criterion for publication date was restricted to studies published between January 2015 and April 2025. This time frame was selected to focus the analysis on research on pocket park design criteria conducted in the past ten years.

Table 3. Search keywords in 4 databases.

Databases	Search keywords	No.
Scopus	Article title, Abstract, Keywords ("pocket park" OR "urban micro park" OR "small urban green space") AND (All fields ("design criteria" OR "landscape design" OR "public space"))	95
WoS	Abstract ("pocket park" OR "urban micro park" OR "small urban green space") AND (Abstract ("design criteria"))	229
Taylor&Francis	Abstract ("pocket park") AND ("design")	13
Google Scholar	Keywords (ALL=("pocket park & design criteria")) AND ALL=("urban green spaces & design criteria")AND ALL=("urban micro park & design criteria")	32
	Total	369

A second manual Google Scholar search using the phrases "pocket park & design criteria," "urban green spaces & design criteria," and "urban micro park & design criteria" yielded 32 relevant studies. This was part of a broader data collecting process that first identified 337 papers using results from WoS, Scopus, and Taylor & Francis. After removing duplicate items, the dataset contained 308 unique records.

The screening and selection process was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework[18]. Following the initial screening stage, which involved evaluating titles, abstracts, and keywords, 85 studies were chosen for further quality assessment. 53 papers were retained for full-text examination following a careful assessment of their methodological soundness and applicability.

34 empirical papers were selected for the study's final analysis after a thorough assessment since they met all inclusion criteria. **Figure 1** illustrates the selection procedure, which includes the inclusion and exclusion stages, in accordance with PRISMA guidelines.

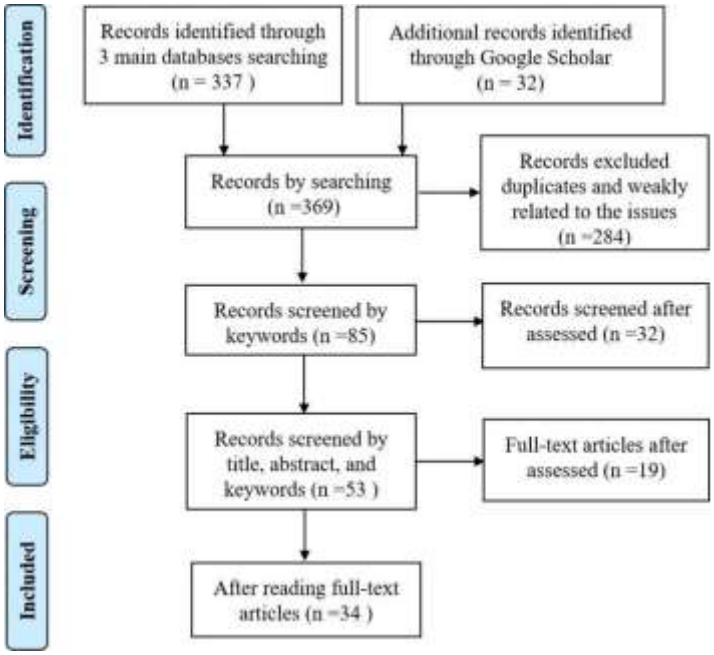

Figure 1. PRISMA flow diagram of the study.

4. Results

4.1. General findings

34 papers were located and systematically classified following a literature search. Based on the findings, four pieces were published in the journal "Forests," and three articles each were published in the journals "Sustainability" and "International Journal of Environmental Research and Public Health."

	Journal	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Year
2015	International Journal of Development and Sustainability	1											1
2016	American journal of preventive medicine		1										1
2017	Journal of urban Design			1									1
2017	Urban Design International			1									1
2018	Forests				1					1	2		4
2018	Science of the Total Environment				1								1
2019	In IOP Conference Series: Materials Science and Engineering					1							1
2019	International Journal of Environmental Research and Public Health					2				1			3
2019	Landscape and Ecological Engineering					1							1
2021	Land							1	1				2
2021	Civil Engineering and Architecture							1					1
2022	MethodsX								1				1
2022	Sustainable Cities and Society								1				1
2022	Civil snd Environmental Engineering Reports								1				1
2022	In IOP Conference Series: Earth and Environmental Science								1				1
2022	Environment-Behaviour Proceedings Journal								1				1
2022	Environmental Challenges								1				1
2023	Sustainability									3			3
2023	Environmental and Sustainability Indicators									1			1
2023	Scientific Reports									1			1
2024	Frontiers of Architectural Research										1		1
2024	Journal of Asian Architecture and Building Engineering										1		1
2024	Journal of Environmental Management										1		1
2025	Discover Cities											1	1
2025	Buildings											1	1
2025	Ecological Indicators											1	1
	Total		1	2	2	4	0	2	7	7	5	3	**34**

Figure 2. Number of publications per journal and year.

As seen in **Table 4**, the selected papers mostly employed mixed-methods methodology, with 23 studies doing so. Nine research employed quantitative approaches, whereas just two employed a qualitative strategy. For a detailed overview of the selected publications, including the exact technique employed and their associated categories, readers are referred to Table A1 in Appendix A.

Table 4. This is a table.

Methodology	Data Source	Count
Qualitative(2)	Literature Review,Observation, Case Comparisons	1
	Literature Review, Observation, Measurement	1
Quantitative(9)	Survey, Observation	1
	Measurement	1
	Literature Review, Observation	1

Methodology	Data Source	Count
	Observation, Interview	1
	Survey	1
	Survey, Measurement	2
	Survey, Interview	2
	Literature Review, Case Comparisons	2
	Literature Review, Observation, Case Comparisons	1
	Literature Review, Survey	1
	Literature Review, Survey, Observation	2
	Observation, Interview，Review	2
Mixed Methods(23)	Survey, Interview	2
	Survey, Measurement	4
	Survey, Observation	4
	Survey, Observation, Measurement	1
	Survey, Observation，Interview	3
	Survey, Review	1
	Total	34

Table 4. (*Continued*)

The majority of the study was conducted in Asia and Europe, according to further research. Three articles are from North America, six are from Europe, one is from Africa, and twenty-one are from Asia. Multiple nations are covered by three articles (**Table 5**).

Table 5. Number of the country of studies.

Region	Country	Count
Asia (21)	China(14), Iran(2), Hong Kong and Singapore(1), Indonesia(1), Malaysia(1), South Korea(1), Syria(1)	21
Europe (6)	Poland(4), Germany(1), Italy(1)	6
North America (3)	US (3)	3
Africa (1)	Egypt (1)	1
Multiple(3)	Multiple countries(3)	3
Total		34

4.2. Results of content analysis

Using both inductive theme synthesis and deductive theory-based coding, this review mapped important behavioral and psychological aspects that are pertinent to pocket park design across nine main design criteria categories. Comfort, social contact, perceived safety, restorative quality, emotional well-being, walkability, exercise support, and privacy were found to have substantial thematic coherence. These are the main behavioral focuses found in the literature that was reviewed. Concurrently, 170 design-related subjects were categorized into nine broad groups to determine the ways in which physical components affect these behavioral results.

4.2.1. Key behavioral focus

The most commonly mentioned behavioral elements are comfort (21 mentions) and social engagement (20 mentions), as shown in **Figure 3**, indicating that psychological comfort and interpersonal connection are

essential to pocket park user experiences. Perceived safety (17), restorative quality (12), emotional well-being (9), walkability (7), physical recreation (6), and privacy (5) are further recurring themes. Affordance (4), accessibility (3), aesthetic preferences (2), community involvement (2), and fascination (2) were among the other themes identified. The design elements that promote psychological recuperation, user inclusion, and repeated use are heavily emphasized in this distribution.

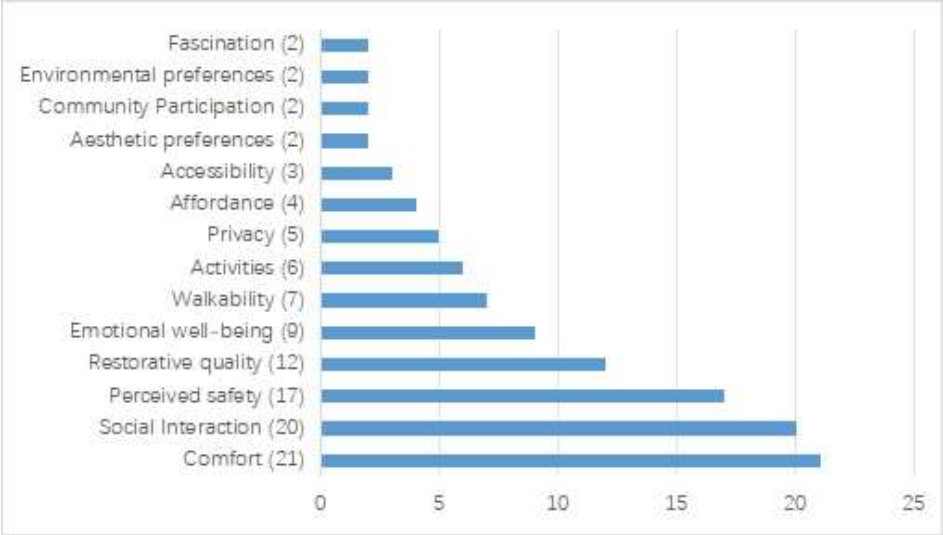

Figure 3. Key behavioral focus aligned with in reviewed studies.

4.2.2. Key design elements of the pocket park

With a total of 170 citations over 100 distinct themes, the design themes were categorized into nine groups that represent important user-environment interactions (Figure 4). The categories that were most often mentioned were Visual & Spatial Experience (n = 44) and Natural & Restorative Elements (n = 49), both of which are strongly related to Stress Reduction Theory (SRT) and Attention Restoration Theory (ART). Accessibility, Proximity & Connectivity (n = 17), Functional Activity Settings (n = 15), and Urban Integration & Design Adaptability (n = 14) are other well-represented categories that align with theories of inclusive, active public space design and Behaviour Setting Theory. Aesthetic & Place Identity (10), Safety, Comfort & Enclosure (10), Seating, Rest & Social Interaction (6), and Ecological & Biodiversity Features (5) were less often mentioned but still important.

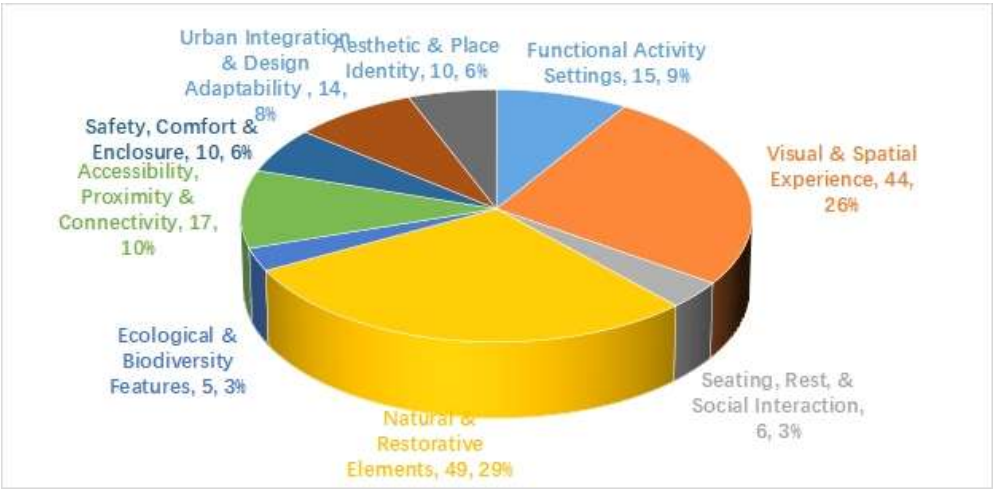

Figure 4. Key design elements of the pocket park in reviewed studies.

This pattern suggests that elements that promote social interaction, behavioral affordances, and cognitive restoration—all important concepts in environmental psychology—are highly valued in pocket park studies. **Table 6** presents representative research and summarises the distribution of coded themes within each category.

Table 6. Themes in each category of key design element.

Category	Sub-themes
1. Natural & Restorative Elements(26)	Planting enclosure, vegetation density, greenery, flowers, water bodies, wildlife, vegetation buffers, tree canopy, tree density, vegetation diversity, species composition, lawn, pollination strategy, shading, sky gardens, roof terraces, courtyards, visual connection with nature, hedges, margins, shrubs, trees, sky, green ratio, vegetation coverage, vegetation color[19-30]
2. Functional Activity Settings(10)	Recreational facilities, exercise facilities, active/passive spaces, gymnasiums, playgrounds, supervised activities, relaxation facilities, sports facilities, street food, play equipment [13,26,31-36]
3. Seating, Rest, & Social Interaction(3)	Seating layout, social nodes, comfort of resting facilities [25,33,36]
4. Accessibility, Proximity & Connectivity(8)	Accessibility, proximity, facility accessibility, accessibility routes, proximity to residential areas, proximity to roads, connectivity, integration [32,37-42]
5. Aesthetic & Place Identity(7)	Specificity, authenticity, aesthetics, landmark, historical integration, material selection, cultural & decorative elements[8,21,24,35,43-46]
6. Safety, Comfort & Enclosure(7)	enclosure, permeability, lighting, safety, thermal comfort, acoustic comfort, maintenance & comfort [47,48]
7. Ecological & Biodiversity Features(5)	Ecological elements, ecology, insect hotels, biodiversity, nature interaction[20,22,30,34]
8. Urban Integration & Design Adaptability(9)	Multi-functionality, edge design, service availability, park layout, urban configuration, adaptability, functionality, mixed land use, community-led design[8,13,31,37,39,41,43-45,49,50]
9. Visual & Spatial Experience(25)	Path layout, ground paving, building enclosure, spatial layout, park hierarchy, distribution density, walking loops, park size /area, edge design, spatial configuration, microclimate, natural vs. artificial elements, structural composition, planting arrangement, land plot development, topography, road network density, street layout, open space layout, canopy density, green visibility, spatial containment, wide field of vision, distributing space, sky & solar access[19,23,27,46-48,50]

4.2.3. The link between behavioral focus and design criteria

The nine design categories, which are based on environmental psychology, include emotional and behavioral triggers in addition to spatial characteristics. Both physical and psychological purposes are served by the most prominent design features, which include vegetation layers, open views, pathways, sitting, shaded sections, and multipurpose spaces. These categories, which were created by synthesizing 100 thematically coded elements, are based on well-known psychological frameworks, specifically Place Attachment Theory, Behaviour Setting Theory, Stress Reduction Theory, and Attention Restoration Theory (ART). In urban pocket park environments, each type promotes particular psychological processes and behaviour.

In order to help users' cognitive and emotional recovery, natural and restorative elements are essential. A multi-sensory experience that adheres to the fundamental principles of ART and SRT is created by components including lush flora, foliage, tree canopy, flowers, water elements, and a clear view of the sky.

Stress reduction and attentional recovery have been empirically connected to "soft fascination," visual pleasure, and sensory modulation, all of which are made possible by these natural traits. The psychological advantages of being in close proximity to nature in urban settings are further enhanced by design features like shade, micro-climatic comfort, and picturesque views. The use of ART and SRT theories to revitalize riverine environments using a mental health improvement strategy was demonstrated in Soleimani and Sayari's case study[51]. The Restorative Design Scale (RDS), an assessment tool to gauge the possibility of mental repair, was also made available by Bahr[52].

Routine actions and planned activities that promote user engagement and physical well-being are supported by functional activity settings. Playgrounds, sports courts, exercise equipment, and walking loops are examples of facilities that provide structured settings in which Behaviour Setting Theory's key idea of predictable patterns of use might manifest. These environments provide chances for exercise, mobility, and interactive play—all of which foster socialization, motor skills, and a feeling of vitality. Pocket parks are more adaptable because to characteristics like open lawns and multipurpose areas that can be used for a variety of purposes and user preferences. The case study by Keshmiri and Nikounam Nezami provides an illustration of behavioral setting and how it affects neighbourhood parks' environmental quality[53].

Benches, shady rest spots, and gathering spots are examples of seating, rest, and social interaction features that are crucial for promoting social behaviour and promoting psychological comfort. Well-designed rest places let users stop, think, and interact with others, according to both SRT and Behaviour Setting Theory. The seating arrangement, comfort, and accessibility have a direct impact on how long visits last and how likely people are to interact with one another, promoting social cohesiveness and restorative benefits. For instance, particular design techniques to enhance the landscape health of community parks have already been suggested in light of Zhang et al.'s findings[54].

The foundation of a park's usability and inclusion is accessibility, proximity, and connectivity. The regularity and spontaneity of park use are increased by features including easily accessible paths, close proximity to residential areas, and obvious connections to pedestrian networks. By encouraging congruence between spatial layouts and behavioral patterns, these characteristics are consistent with behaviour setting theory. Additionally, connectivity promotes fair access and strengthens the park's integration into the city, guaranteeing its applicability to a range of user groups. The study by Riungu et al. provided an illustration of how to comprehend park visitors' spatial behaviour[55].

Place Attachment Theory is supported by aesthetic and place identity criteria that increase belonging and community pride by fostering emotional connection and cultural significance through landmarks, historical signals, and authentic materials. In accordance with SRT and Behaviour Setting Theory, Safety, Comfort, and Enclosure—through lighting, visibility, and clearly defined boundaries—address users' desire for security, especially for vulnerable populations. Reflecting the ideas of ART and Place Attachment, ecological and biodiversity features like native plantings and habitat support encourage interest, restoration, and environmental care.According to Behaviour Setting Theory, urban integration and design adaptability guarantee the park's relevance through adaptable layouts and contextual responsiveness, promoting prolonged participation. Last but not least, features of the Visual and Spatial Experience, such as view corridors and spatial legibility, promote comfort, visual interest, and navigation while strengthening restorative and exploratory behaviour, which in turn reinforce ART and SRT. Pedroso's thesis discusses the significance of taking into account both the spaces' unique design and how they interact with the environment[56].

In conclusion, the study's theme categories represent psychologically relevant factors that influence behaviour and perception in addition to discrete design qualities. This approach offers a theoretically supported and behaviorally informed lens through which to assess and direct the design of pocket parks by connecting environmental psychology theories to particular design objectives. This method emphasizes how crucial it is to match psychological function with physical design when creating inclusive, health-promoting urban green areas.

5. Discussion

5.1. Discussion of findings

The first theory-informed mapping of the relationship between design elements and psychological consequences in micro-scale urban green spaces was provided by this review, which synthesized 34 empirical investigations to identify nine key behavioral design criteria in pocket parks. By applying the Attention Restoration Theory (ART), Stress Reduction Theory (SRT), Behaviour Setting Theory, and Place Attachment Theory, this study was able to assess the psychological meaning of design motifs across the cognitive, affective, and social domains in addition to organizing them descriptively.

The results show that design aspects that are commonly linked to ART and SRT, such vegetation layers, open views, and water features, promote stress reduction, attentional recovery, and psychological repair. In the meantime, by organizing repetitive activities and encouraging social cohesiveness, practical features like benches, play areas, and walkways support behaviour setting theory. By encouraging emotional connections and symbolic meanings, design elements that convey identity or cultural value—like historical symbols or material authenticity—correspond with Place Attachment Theory.

The great degree of overlap between categories—for example, greenery promotes both emotional attachment and cognitive restoration—is a crucial finding from this synthesis. This overlap shows that design elements frequently fulfil several psychological purposes, pointing to the necessity of integrative thinking in both landscape architecture and policy formation. Additionally, a theoretical gap that should be addressed by future study is indicated by the review's failure to emphasize negative elements or unintended effects, such as under-utilization, perceived insecurity, or design exclusion.

5.2. Limitations

Despite the fact that using databases has several methodological benefits, this review also points out several significant disadvantages. First, the exclusion of non-English publications and grey literature may have reduced the evidence base's diversity and representativeness. Second, because research conducted in specific geographic areas are more common, the results might not be as generalisable to broader international situations. Furthermore, the absence of interdisciplinary integration in the literature under study restricts the potential for more imaginative or thorough interpretations. This includes a missed opportunity to connect design discussions with related domains such as public health, cultural geography, or social equity. To alleviate these concerns, future research should consider broadening the inclusion criteria to include non-traditional and multilingual sources, putting policies in place to reduce regional concentration, promoting methodological standardization, and utilizing a variety of disciplinary perspectives to increase the findings' robustness and applicability.

5.3. Implications and future research directions

This study emphasizes the importance of behavioral design criteria in pocket parks within the frameworks of environmental psychology and provides a theory-informed synthesis of these criteria. The review goes beyond descriptive analysis to create conceptual connections between physical design elements

and psychological results by utilising theories including Attention Restoration Theory (ART), Stress Reduction Theory (SRT), Behaviour Setting Theory, and Place Attachment Theory. The empirical basis of user-centred design is reinforced by this theoretical integration, which also advances a more organized comprehension of the ways in which micro-scale urban green spaces promote social interaction, cognitive function, and well-being. The intricacy and diversity of human-environment interactions in small-scale parks are further highlighted by the way overlapping design themes serve multifunctional psychological functions, such as plants promoting both emotional attachment and cognitive restoration.

Practically speaking, this study offers an evidence-based framework to help planners, designers, and legislators direct the creation and assessment of pocket parks. To make sure that tiny parks satisfy a range of user demands, the nine-category behavioral framework created here can be used as a planning tool or checklist for post-occupancy evaluation. According to the findings, modest green areas can have disproportionately large benefits when purposefully created to serve psychological goals, particularly in metropolitan settings with little open space. The sensory, social, and symbolic aspects of features like sitting, shade, and paths should be given equal weight with their spatial layout by planners. This entails promoting inclusivity across age, gender, and ability groups, utilizing culturally relevant materials, and integrating local narratives.

The study also emphasizes how important it is to consider social equality, cultural distinctiveness, and long-term behavioral effects when designing pocket parks. Despite the general relevance of the design motifs found, their expression and efficacy will differ depending on the demographic, climatic, and cultural context. It seems improbable that a one-size-fits-all approach will result in fair or long-lasting effects. Rather, context awareness and participative methodologies ought to be embraced in future research and practice.

Several avenues for further research are revealed by building on these contributions:

More theory-driven empirical research is required to examine the causal pathways that environmental psychology proposes. The majority of current research is correlational or observational. Stronger evidence about the effects of particular design components on psychological outcomes like stress recovery, attention restoration, or social inclusion may be found in experimental, longitudinal, or quasi-experimental studies. According to Sun et al., researchers frequently enquire about cause and effect in their discussion of healthy cities[57]. The built environment interventions through urban planning and design practices are the reasons.

Future research must be more geographically and culturally diverse. The majority of the literature is still set in urban settings in East Asia and the West. It would be easier to differentiate more universal psychological reactions from culturally conditioned design-behavior interactions if comparative studies were conducted across under-represented regions (such as South Asia, Africa, and Latin America). An excellent illustration of this is the study conducted by Perry et al. in 2021 into the experiences of older adults with disabilities when using urban parks[58]. We can also draw inspiration from Wayara's research[59].

A standardized vocabulary or ontology of behavioral design features might be beneficial to the field. There is conceptual ambiguity as a result of the frequent interchangeability of contemporary terminology like "greenery," "natural elements," and "vegetation." Future meta-analyses would be supported and analytical clarity would be enhanced by a more accurate typology that is directly connected to theoretical notions. The study by Hui and Jim offers some suggestions for additional research[60].

New opportunities for monitoring behaviour and exposure to the environment are presented by digital tools. Wearable sensors, GPS applications, drone photography, and real-time stress monitoring are just a few of the technologies that can produce detailed information about how people navigate and react to pocket parks. These resources can assist flexible, evidence-based planning and serve as a supplement to

conventional surveys. Zhang et al. used drone remote sensing to evaluate the association between physical activity levels and the spatial features of urban parks[61]. In urban playgrounds, Tarpani et al. carried out hyperlocal microclimate studies using wearable sensing, modelling, and questionnaires[62]. Von Ziegler stated that a new era of detailed behaviour tracking data presents both opportunities and challenges[63]. In addition to conventional surveys and observations, these techniques can be used to monitor physiological stress levels, social engagement, and microclimatic comfort in real time.

Future studies ought to examine the role that pocket parks play as equitable infrastructures. Small parks may serve as important entry sites for nature and social interaction, especially in underprivileged areas. Research should look at how access, usage, and perception are influenced by the intersections of race, class, age, gender, and disability. This would guide design techniques that are more inclusive and focused on justice.

Lastly, scholars ought to investigate how resilient pocket parks are over the long run to urban stresses like gentrification, densification, and climate change. Strategies to maintain these areas as robust, adaptable parts of urban ecosystems can be informed by an understanding of how behavioral functions change over time. According to Pauleit et al.[64], cities should prioritise strengthening their ability for strategic planning and collaborative governance.

All things considered, this study offers a theoretical and practical framework that can be expanded upon by further studies that address methodological advancements, conceptual difficulties, geographic disparities, and empirical gaps. Pocket parks will become more significant as cities continue to get denser—not simply as green "leftovers," but as purposefully planned, behaviorally significant urban areas. Therefore, future research needs to be as flexible, inclusive, and dynamic as the areas it seeks to understand.

6. Conclusions

This thorough review has demonstrated that the way pocket parks are designed has a big influence on how individuals act and think in urban environments. This study offers a systematic and theoretically informed explanation of how small urban green spaces affect social behaviour and psychological effects by combining 170 design-related themes from 34 empirical investigations into nine behaviorally significant categories. By grouping 100 design-related themes into 9 major categories and connecting them to significant environmental psychology theories, this study provides a theory-informed framework for understanding how specific design criteria promote human well-being and social interaction in small urban green spaces.

The findings demonstrate that, in addition to being recreational amenities, thoughtfully designed pocket parks are psychologically restorative areas that foster social connection, physical activity, mental comfort, and ecological awareness. Design elements like vegetation structure, spatial arrangement, accessibility, and cultural symbolism are not only visually beautiful and useful, but they are also strongly linked to users' stress reduction, behavioral patterns, site attachment, and cognitive recovery. Crucially, the study emphasizes how many of these design elements assist overlapping psychological processes, such as promoting emotional bonding and attention restoration, underscoring the necessity of comprehensive, user-centred design methodologies.

Through the integration of theoretical understanding with real-world implementation, this review advances environmental psychology and urban planning. This research highlights the significance of integrating environmental psychology into urban planning procedures. For policymakers, landscape architects, and urban planners, this theoretical alignment offers a behavior-based approach to evaluating and

enhancing the performance of tiny urban parks. The framework aids in converting intangible psychological demands into tangible spatial strategies by coordinating design principles with well-known theories including Attention Restoration Theory, Stress Reduction Theory, Behaviour Setting Theory, and Place Attachment Theory.

As cities continue to promote livable public spaces and densify, pocket parks are an important typology where thoughtful design may yield major advantages for ecological sustainability, community cohesion, and mental wellness. This review confirms that behavioral science-guided micro-scale interventions can provide disproportionately big advantages for urban resilience and well-being. The proposed behavioral paradigm will serve as the foundation for future research and evidence-based design interventions that maximize the social and psychological advantages of pocket parks in diverse urban situations. In order to ensure that these tiny areas serve significant purposes, this study urges scholars and practitioners to design pocket parks using inclusive, contextually aware, and theoretically informed methods as urban surroundings become more complex.

Author contributions

Conceptualization, Dong Han and Mohd Jaki Mamat; methodology, Dong Han; software, Dong Han; validation, Dong Han and Mohd Jaki Mamat; formal analysis, Dong Han; investigation, Dong Han; resources, Dong Han; data curation, Dong Han; writing—original draft preparation, Dong Han; writing—review and editing, Mohd Jaki Mamat; visualization, Dong Han; supervision, Mohd Jaki Mamat; project administration, Mohd Jaki Mamat. All authors have read and agreed to the published version of the manuscript.

Funding

This research did not receive any financial support.

Acknowledgments

The authors would like to thank all participants for their valuable contributions to this study..

Conflict of interest

The authors declare no conflicts of interest..

References

1. Das, S., Choudhury, M. R., Chatterjee, B., Das, P., Bagri, S., Paul, D., ... & Dutta, S. (2024). Unraveling the urban climate crisis: Exploring the nexus of urbanization, climate change, and their impacts on the environment and human well-being–A global perspective. AIMS Public Health, 11(3), 963. https://doi.org/10.3934/publichealth.2024050
2. Thomson, G., & Newman, P. (2021). Green infrastructure and biophilic urbanism as tools for integrating resource efficient and ecological cities. Urban planning, 6(1), 75-88. https://doi.org/10.17645/up.v6i1.3633
3. Brom, P., Engemann, K., Breed, C., Pasgaard, M., Onaolapo, T., & Svenning, J. C. (2023). A decision support tool for green infrastructure planning in the face of rapid urbanization. Land, 12(2), 415. https://doi.org/10.3390/land12020415
4. Pamukcu-Albers, P., Ugolini, F., La Rosa, D., Grădinaru, S. R., Azevedo, J. C., & Wu, J. (2021). Building green infrastructure to enhance urban resilience to climate change and pandemics. Landscape ecology, 36(3), 665-673. https://doi.org/10.1007/s10980-021-01212-y
5. Jabbar, M., Yusoff, M. M., & Shafie, A. (2022). Assessing the role of urban green spaces for human well-being: A systematic review. GeoJournal, 1-19. https://doi.org/10.1007/s10708-021-10474-7

6. Barragan-Jason, G., Loreau, M., de Mazancourt, C., Singer, M. C., & Parmesan, C. (2023). Psychological and physical connections with nature improve both human well-being and nature conservation: A systematic review of meta-analyses. Biological Conservation, 277, 109842. https://doi.org/10.1016/j.biocon.2022.109842
7. Palliwoda, J., Banzhaf, E., & Priess, J. A. (2020). How do the green components of urban green infrastructure influence the use of ecosystem services? Examples from Leipzig, Germany. Landscape Ecology, 35, 1127-1142. https://doi.org/10.1007/s10980-020-01004-w
8. Rosso, F., Cappa, F., Spitzmiller, R., & Ferrero, M. (2022). Pocket parks towards more sustainable cities. Architectural, environmental, managerial and legal considerations towards an integrated framework: A case study in the Mediterranean region. Environmental Challenges, 7. Scopus. https://doi.org/10.1016/j.envc.2021.100402
9. Zhang, Y., Hu, Y., Wei, Y., & Xie, Y. (2025). Can pocket parks be compared to community parks in the restoration effect of physical and mental health for young adults? A comparative experiment in high-density urban Green spaces. Frontiers in Public Health, 13, 1610497. https://doi.org/10.3389/fpubh.2025.1610497
10. Basu, S., & Nagendra, H. (2021). Perceptions of park visitors on access to urban parks and benefits of green spaces. Urban Forestry & Urban Greening, 57, 126959. https://doi.org/10.1016/j.ufug.2020.126959
11. Jaszczak, A., Pochodyła, E., Kristianova, K., Małkowska, N., & Kazak, J. K. (2021). Redefinition of park design criteria as a result of analysis of well-being and soundscape: The case study of the Kortowo Park (Poland). International Journal of Environmental Research and Public Health, 18(6), 2972. https://doi.org/10.3390/ijerph18062972
12. El-Kholy, S. A., Moustafa, Y. M., & Abou El-Ela, M. A. (2022). Urban park design and children's physical activity levels: an investigation of design characteristics of green areas and playgrounds. Journal of Engineering and Applied Science, 69(1), 93. https://doi.org/10.1186/s44147-022-00152-x
13. Currie, M. A. (2017). A design framework for small parks in ultra-urban, metropolitan, suburban and small town settings. Journal of urban Design, 22(1), 76-95. http://dx.doi.org/10.1080/13574809.2016.1234334
14. Kaplan, R., & Kaplan, S. (1989). The experience of nature: A psychological perspective. Cambridge university press.
15. Ulrich, R. S. (2023). Stress reduction theory. D. Marchand, E. Pol, & K. Weiss (Eds.), 100, 143-146. https://www.researchgate.net/profile/Roger-Ulrich-2/publication/377281012_Ulrich_RS_2023_Stress_reduction_theory/links/659e9458c77ed940476dab17/Ulrich-RS-2023-Stress-reduction-theory.pdf
16. Barker, R. (1968). Ecological psychology: Concepts and methods for studying the environment of human behavior. Stanford, CA: Stanford University Press.
17. Scannell, L., & Gifford, R. (2010). Defining place attachment: A tripartite organizing framework. Journal of environmental psychology, 30(1), 1-10.
18. Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2010). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. International journal of surgery, 8(5), 336-341. https://doi.org/10.1136/bmj.b2535
19. Naghibi, M., Faizi, M., & Ekhlassi, A. (2022). Visual questionnaire survey to apply design possibilities in relation to planting enclosure in five vest-pocket parks. MethodsX, 9, 101638. https://doi.org/10.1016/j.mex.2022.101638
20. Cariñanos, P., Grilo, F., Pinho, P., Casares-Porcel, M., Branquinho, C., Acil, N., ... & Vilhar, U. (2019). Estimation of the allergenic potential of urban trees and urban parks: towards the healthy design of urban green spaces of the future. International Journal of Environmental Research and Public Health, 16(8), 1357. https://doi.org/10.3390/ijerph16081357
21. Jaszczak, A., Małkowska, N., Kristianova, K., Bernat, S., & Pochodyła, E. (2021). Evaluation of soundscapes in urban parks in olsztyn (Poland) for improvement of landscape design and management. Land, 10(1), 66. https://doi.org/10.3390/land10010066
22. Daniels, B., Zaunbrecher, B. S., Paas, B., Ottermanns, R., Ziefle, M., & Roß-Nickoll, M. (2018). Assessment of urban green space structures and their quality from a multidimensional perspective. Science of the Total Environment, 615, 1364-1378. https://doi.org/10.1016/j.scitotenv.2017.09.167
23. Li, Y., Song, Y., Cho, D., & Han, Z. (2019). Zonal classification of microclimates and their relationship with landscape design parameters in an urban park. Landscape and Ecological Engineering, 15, 265-276. https://doi.org/10.1007/s11355-019-00378-7
24. Franjaya, E. E., Sitompul, R. A., & Satria, W. D. (2022, October). The design of Rajabasa pocket park based on Lampung Cultural Motifs. In IOP Conference Series: Earth and Environmental Science (Vol. 1092, No. 1, p. 012024). IOP Publishing. https://doi.org/10.1088/1755-1315/1092/1/012024
25. Huang, Y., Lin, X., Lin, S., Chen, Z., Fu, W., Wang, M., & Dong, J. (2023). Pocket Parks: A New Approach to Improving the Psychological and Physical Health of Recreationists. Forests, 14(10). Scopus. https://doi.org/10.3390/f14101983
26. Hussein, H., Jhung, L. K., & Zhang, H. (2022). Green Pause in a City: Design elements of a pocket park in Kuala Lumpur. Environment-Behaviour Proceedings Journal, 7(19), 191-200. https://doi.org/10.21834/ebpj.v7i19.3206

27. Ma, G., Pellegrini, P., Ma, J., & Shi, L. (2024). Investigating the influence of elements in pocket parks on the psychological restoration of young people: A study from Guiyang and Chongqing in Southwest China. Journal of Asian Architecture and Building Engineering. Scopus. https://doi.org/10.1080/13467581.2024.2398204
28. Peng, H., Li, X., Yang, T., & Tan, S. (2023). Research on the Relationship between the Environmental Characteristics of Pocket Parks and Young People's Perception of the Restorative Effects-A Case Study Based on Chongqing City, China. SUSTAINABILITY, 15(5). https://doi.org/10.3390/su15053943
29. Xu, J., Qiu, B., Zhang, F., & Zhang, J. (2024). Restorative Effects of Pocket Parks on Mental Fatigue among Young Adults: A Comparative Experimental Study of Three Park Types. FORESTS, 15(2). https://doi.org/10.3390/f15020286
30. Yin, Y., Shao, Y., Wang, Y., & Wu, L. (2023). Developing a Pocket Park Prescription Program for Human Restoration: An Approach That Encourages Both People and the Environment. International Journal of Environmental Research and Public Health, 20(17). Scopus. https://doi.org/10.3390/ijerph20176642
31. Zhou, C., Xie, M., Zhao, J., & An, Y. (2022). What affects the use flexibility of pocket parks? Evidence from Nanjing, China. Land, 11(9), 1419. https://doi.org/10.3390/land11091419
32. Cohen, D. A., Han, B., Nagel, C. J., Harnik, P., McKenzie, T. L., Evenson, K. R., ... & Katta, S. (2016). The first national study of neighborhood parks: Implications for physical activity. American journal of preventive medicine, 51(4), 419-426. https://doi.org/10.1016/j.amepre.2016.03.021
33. Tan, Z., Lau, K. K. L., Roberts, A. C., Chao, S. T. Y., & Ng, E. (2019). Designing urban green spaces for older adults in Asian cities. International journal of environmental research and public health, 16(22), 4423. https://doi.org/10.3390/ijerph16224423
34. Bradecki, T., & Opania, S. (2022). Functional-Environmental Evaluation of Pocket Parks in Urbanized Areas-The Case Study of Gliwice. CIVIL AND ENVIRONMENTAL ENGINEERING REPORTS, 32(4), 50–72. https://doi.org/10.2478/ceer-2022-0044
35. Hamdy, M., & Plaku, R. (2021). Pocket parks: Urban living rooms for urban regeneration. Civil Engineering and Architecture, 9(3), 747–759. Scopus. https://doi.org/10.13189/cea.2021.090316
36. Zhang, L., Xu, X., & Guo, Y. (2023). The Impact of a Child-Friendly Design on Children's Activities in Urban Community Pocket Parks. Sustainability (Switzerland), 15(13). Scopus. https://doi.org/10.3390/su151310073
37. Abd El Aziz, N. (2015). POTENTIALS OF CREATING POCKET PARKS IN HIGH DENSITY RESIDENTIAL NEIGHBORHOODS: THE CASE OF ROD EL FARAG, CAIRO, CITY. International Journal of Development and Sustainability. https://isdsnet.com/ijds-v4n7-3.pdf
38. Almohamad, H., Knaack, A. L., & Habib, B. M. (2018). Assessing spatial equity and accessibility of public green spaces in Aleppo City, Syria. Forests, 9(11), 706. https://doi.org/10.3390/f9110706
39. Xue, F., Gou, Z., & Lau, S. (2017). The green open space development model and associated use behaviors in dense urban settings: Lessons from Hong Kong and Singapore. Urban Design International, 22, 287-302. https://doi.org/10.1057/s41289-017-0049-5
40. Chen, Z., Liu, Q., Li, M., & Xu, D. (2024). A New Strategy for Planning Urban Park Green Spaces by Considering Their Spatial Accessibility and Distributional Equity. Forests, 15(3), 570. https://doi.org/10.3390/f15030570
41. Dong, J., Guo, R., Guo, F., & Cai, J. (2024). Potential evaluation and implementation strategy for pocket park construction in high-density urban areas: A case study in Dalian, China. Frontiers of Architectural Research, 13(2), 319–334. Scopus. https://doi.org/10.1016/j.foar.2023.12.007
42. Ghamsary, E., Karimimoshaver, M., Akhavan, A., Goruh, Z., Aram, F., & Mosavi, A. (2023). Locating pocket parks: Assessing the effects of land use and accessibility on the public presence. ENVIRONMENTAL AND SUSTAINABILITY INDICATORS, 18. https://doi.org/10.1016/j.indic.2023.100253
43. Lai, S., & Deal, B. (2025). An innovative approach to urban parks and perception: a cross-cultural analysis using big and small data. Discover Cities, 2(1), 27. https://doi.org/10.1007/s44327-025-00075-1
44. Labuz, R. (2019, February). Pocket park–a new type of green public space in Kraków (Poland). In IOP Conference Series: Materials Science and Engineering (Vol. 471, No. 11, p. 112018). IOP Publishing. https://doi.org/10.1088/1757-899X/471/11/112018
45. Bajwoluk, T., & Langer, P. (2023). The Pocket Park and Its Impact on the Quality of Urban Space on the Local and Supralocal Scale—Case Study of Krakow, Poland. Sustainability (Switzerland), 15(6). Scopus. https://doi.org/10.3390/su15065153
46. Wang, X., Li, G., Pan, J., Shen, J., & Han, C. (2023). The difference in the elderly's visual impact assessment of pocket park landscape. SCIENTIFIC REPORTS, 13(1). https://doi.org/10.1038/s41598-023-43522-y
47. Zhong, J., Liu, J., Xu, Y., & Liang, G. (2022). Pedestrian-level gust wind flow and comfort around a building array–influencing assessment on the pocket park. Sustainable Cities and Society, 83, 103953. https://doi.org/10.1016/j.scs.2022.103953
48. Rosso, F., Pioppi, B., & Pisello, A. L. (2024). Tactical urban pocket parks (TUPPs) for subjective and objective multi-domain comfort enhancement. Journal of Environmental Management, 349. Scopus. https://doi.org/10.1016/j.jenvman.2023.119447

49. Duan, X., Lin, B., Meng, L., & Zhao, F. (2025). A Method for Selecting and Optimizing Pocket Park Design Proposals Based on Multi-Attribute Decision Making. BUILDINGS, 15(7). https://doi.org/10.3390/buildings15071026
50. Zhang, Z., Yang, J., Shi, Y., Yang, H., Chen, D., Zhang, C., Zhang, Z., & Zhang, X. (2025). Installation of pocket parks in mountainous cities: A case study on the nonlinear effect of the built environment on pocket park vitality in Chongqing, China. ECOLOGICAL INDICATORS, 173. https://doi.org/10.1016/j.ecolind.2025.113417
51. Soleimani, S., & Sayari, S. (2024). Application of ART and SRT theories to revitalize riverine landscapes with a mental health improvement approach (case study: Qeshlaq River, Sanandaj. Urban Structure and Function Studies, 11(41), 55-83.
52. Bahr, C. (2024). The Restorative Design Scale (RDS) An Assessment Guide: Measuring the Potential for Mental Restoration in Urban Green Spaces. https://doi.org/10.26076/aade-1554
53. Keshmiri, H., & Nikounam Nezami, H. (2023). The Concept of Behavioral Setting and its Impact on Improving Environmental Quality Neighborhood Parks (Case Study: Shiraz SEKONJ Neighborhood Park). Iran University of Science & Technology, 33(2), 0-0. https://doi.org/10.22068/ijaup.687
54. Zhang, L., Liu, S., & Liu, S. (2021). Mechanisms underlying the effects of landscape features of urban community parks on health-related feelings of users. International journal of environmental research and public health, 18(15), 7888. https://doi.org/10.3390/ijerph18157888
55. Riungu, G. K., Peterson, B. A., Beeco, J. A., & Brown, G. (2021). Understanding visitors' spatial behavior: a review of spatial applications in parks. Tourism Spaces, 65-89. https://doi.org/10.1080/14616688.2018.1519720
56. Pedroso, S. H. (2024). Urban Parks and Green Corridors. The Hibiya and Pocket Park in Tokyo. https://www.academia.edu/download/77414493/CEA16-14891799.pdf
57. Sun, G., Choe, E. Y., & Webster, C. (2023). Natural experiments in healthy cities research: how can urban planning and design knowledge reinforce the causal inference?. Town Planning Review, 94(1), 87-108. https://doi.org/10.3828/tpr.2022.14
58. Perry, M., Cotes, L., Horton, B., Kunac, R., Snell, I., Taylor, B.& Devan, H. (2021). "Enticing" but not necessarily a "space designed for me": experiences of urban park use by older adults with disability. International journal of environmental research and public health, 18(2), 552. https://doi.org/10.3390/ijerph18020552
59. Wayara, C. (2021). Decolonizing "Greenspace" and the "Equitable City" Paradigm: Emphasizing 'Subjectivity'to Support Inclusionary Design Interventions and Health Justice for Black and Brown Bodies.
60. Hui, L. C., & Jim, C. Y. (2022). Unraveling visiting-activity patterns of heterogeneous communities for urban-park planning and design. Forests, 13(6), 841. https://doi.org/10.3390/f13060841
61. Zhang, R., Cao, L., Wang, L., Wang, L., Wang, J., Xu, N., & Luo, J. (2024). Assessing the relationship between urban park spatial features and physical activity levels in Residents: A spatial analysis Utilizing drone remote sensing. Ecological Indicators, 166, 112520. https://doi.org/10.1016/j.ecolind.2024.112520
62. Tarpani, E., Pigliautile, I., & Pisello, A. L. (2023). On kids' environmental wellbeing and their access to nature in urban heat islands: Hyperlocal microclimate analysis via surveys, modelling, and wearable sensing in urban playgrounds. Urban Climate, 49, 101447. https://doi.org/10.1016/j.uclim.2023.101447
63. von Ziegler, L., Sturman, O., & Bohacek, J. (2021). Big behavior: challenges and opportunities in a new era of deep behavior profiling. Neuropsychopharmacology, 46(1), 33-44. https://doi.org/10.1038/s41386-020-0751-7
64. Pauleit, S., Vasquéz, A., Maruthaveeran, S., Liu, L., & Cilliers, S. S. (2021). Urban green infrastructure in the Global South. Urban ecology in the Global South, 107-143. https://doi.org/10.1007/978-3-030-67650-6_5

Appendix A

Table A1. List of studies review.

Authors	Year	Title	Country of study	Data source	Research design
Naghibi et al.	2022	"Visual questionnaire survey to apply design possibilities in relation to planting enclosure in five vest-pocket parks"	Iran, Asia	Survey, Interview	Mixed Methods
Lai & Deal	2025	"An innovative approach to urban parks and perception: a cross-cultural analysis using big and small data"	Multiple countries	Survey, Reviews	Mixed Methods
Labuz	2019	"Pocket park–a new type of green public space in Kraków (Poland)"	Poland, Europe	Literature Review, Observation, Case Comparisons	Qualitative
Zhou et al.	2022	"What affects the use flexibility of pocket parks? Evidence from Nanjing, China"	China, Asia	Survey, Observation	Quantitative
Abd El Aziz	2015	"POTENTIALS OF CREATING POCKET PARKS IN HIGH DENSITY RESIDENTIAL NEIGHBORHOODS: THE CASE OF ROD EL FARAG, CAIRO, CITY"	Egypt, Africa	Survey, Observation，Interview	Mixed Methods
Zhong et al.	2022	"Pedestrian-level gust wind flow and comfort around a building array–influencing assessment on the pocket park"	China, Asia	Measurement	Quantitative
Currie	2017	"A design framework for small parks in ultra-urban, metropolitan, suburban and small town settings"	USA, North America	Observations, Interviews, Reviews	Mixed Methods
Almohamad et al.	2018	"Assessing spatial equity and accessibility of public green spaces in Aleppo City, Syria"	Syria, Asia	Literature Review, Observation	Quantitative
Cohen et al.	2016	"The first national study of neighborhood parks: Implications for physical activity"	USA, North America	Observation, Interview	Quantitative
Cariñanos et al.	2019	"Estimation of the allergenic potential of urban trees and urban parks: towards the healthy design of urban green spaces of the future"	Multiple countries	Literature Review, Survey	Mixed Methods
Jaszczak et al.	2021	"Evaluation of soundscapes in urban parks in olsztyn (Poland) for improvement of landscape design and management"	Poland, Europe	Survey, Observation，Interview	Mixed Methods
Xue et al.	2017	"The green open space development model and associated use behaviors in dense urban settings: Lessons from Hong Kong and Singapore"	Hong Kong and Singapore, Asia	Survey	Quantitative
Chen et al.	2024	"A New Strategy for Planning Urban Park Green Spaces by Considering Their Spatial Accessibility and Distributional Equity"	China, Asia	Survey, Measurement	Quantitative
Daniels et al.	2018	"Assessment of urban green space structures and their quality from a multidimensional perspective"	Germany, Europe	Literature Review, Survey, Observation	Mixed Methods

Authors	Year	Title	Country of study	Data source	Research design
Tan et al.	2019	"Designing urban green spaces for older adults in Asian cities"	China, Asia	Survey, Interview	Quantitative
Li et al.	2019	"Zonal classification of microclimates and their relationship with landscape design parameters in an urban park"	South Korea, Asia	Survey, Measurement	Mixed Methods
Bajwoluk & Langer	2023	"The Pocket Park and Its Impact on the Quality of Urban Space on the Local and Supralocal Scale—Case Study of Krakow, Poland"	Poland, Europe	Survey, Observation, Measurement	Mixed Methods
Bradecki & Opania	2022	"Functional-Environmental Evaluation of Pocket Parks in Urbanized Areas-The Case Study of Gliwice"	Poland, Europe	Literature Review, Observation, Case Comparisons	Mixed Methods
Dong et al.	2024	"Potential evaluation and implementation strategy for pocket park construction in high-density urban areas: A case study in Dalian, China"	China, Asia	Survey, Measurement	Mixed Methods
Duan et al.	2025	"A Method for Selecting and Optimizing Pocket Park Design Proposals Based on Multi-Attribute Decision Making"	China, Asia	Survey, Interview	Mixed Methods
Franjaya et al.	2022	The Design of Rajabasa Pocket Park based on Lampung Cultural Motifs"	Indonesia, Asia	Literature Review, Observation, Measurement	Qualitative
Ghamsary et al.	2023	"Locating pocket parks: Assessing the effects of land use and accessibility on the public presence"	Iran, Asia	Literature Review, Survey, Observation	Mixed Methods
Hamdy & Plaku	2021	"Pocket parks: Urban living rooms for urban regeneration"	Multiple countries	Literature Review, Case Comparisons	Mixed Methods
Huang et al.	2023	"Pocket Parks: A New Approach to Improving the Psychological and Physical Health of Recreationists"	China, Asia	Survey, Observation	Mixed Methods
Hussein et al.	2022	"Green Pause in a City: Design Elements of a Pocket Park in Kuala Lumpur"	Malaysia, Asia	Observation, Interview，Review	Mixed Methods
Ma et al.	2024	"Investigating the influence of elements in pocket parks on the psychological restoration of young people: A study from Guiyang and Chongqing in Southwest China"	China, Asia	Survey, Measurement	Quantitative
Peng et al.	2023	"Research on the Relationship between the Environmental Characteristics of Pocket Parks and Young People's Perception of the Restorative Effects-A Case Study Based on Chongqing City, China"	China, Asia	Survey, Interview	Quantitative
Rosso et al.	2022	"Pocket parks towards more sustainable cities"	Italy, Europe	Literature Review, Case Comparisons	Mixed Methods
Rosso et al.	2024	"Tactical urban pocket parks (TUPPs) for subjective and objective multi-domain comfort enhancement"	USA, North America	Survey, Observation	Mixed Methods

Authors	Year	Title	Country of study	Data source	Research design
Wang et al.	2023	"The difference in the elderly's visual impact assessment of pocket park landscape"	China, Asia	Survey, Measurement	Mixed Methods
Xu et al.	2024	"Restorative Effects of Pocket Parks on Mental Fatigue among Young Adults: A Comparative Experimental Study of Three Park Types"	China, Asia	Survey, Measurement	Mixed Methods
Yin et al.	2023	"Developing a Pocket Park Prescription Program for Human Restoration: An Approach That Encourages Both People and the Environment"	China, Asia	Survey, Observation	Mixed Methods
Zhang et al.	2023	"The Impact of a Child-Friendly Design on Children's Activities in Urban Community Pocket Parks"	China, Asia	Survey, Observation，Interview	Mixed Methods
Zhang et al.	2025	"Installation of pocket parks in mountainous cities: A case study on the nonlinear effect of the built environment on pocket park vitality in Chongqing, China"	China, Asia	Survey, Observation	Mixed Methods

Table A1. (*Continued*)