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Review of Literature on Open Green Space for Positive Mental Health in the Low-Income Community

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Abstract
This paper examines favoured open green spaces that impacted low-income communities for mental health from previous studies. The selected previous studies were collected and filtered using the PRISMA method to identify the keywords. The expected findings included the standards of open green space that provide mental health benefits among low-income communities. In recommendation, the keyword need to be more specific for precise results, and the criteria discovered from the previous studies can guide the development of the new or current residential area for low-income communities to promote positive mental health.

Keywords: Open green space; low-income community; positive mental health

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1.0 Introduction

Open green spaces are beneficial to humans with sustainability and well-being. The benefits are widely discovered, including the impact of open green space on mental health. Exploring the value of open green space gives insight into overall well-being. According to Astell-Burt and Feng (2019), the study showed the number of tree canopies in a radius of 1.6km within the residential area is less prevalent in mental health. Open green spaces such as neighbourhood parks have a connection to the stress result with the appropriate elements such as safety (Hussein et al., 2021). Similar to Ishak et al. (2018) highlighted design and accessibility, landscape elements, and safety as factors that contribute to the efficacy of alleviating stress in the community. In addition, the positive input on the involvement with open green space towards the physiological includes improving positive emotions and reducing mood swings (Aziz et al., 2021). Simkin et al. (2020) have stated positive feelings such as intensity, willingness, and vitality when people stroll in urban green spaces at least five times a month.

The low-income community that lives in the area that lacks the presence of open green spaces makes the opportunity to have recreational activities that can improve positive mental health low. The percentage of open green spaces is limited due to the land used for residential development. Besides that, some greenspace in low-income living environments is associated with health inequality. In the short term, individuals who report high negative moods are more likely to select a natural area, rather than other types of area, as their favourite place (Barton & Rogerson, 2017). Rigolon (2016) stated multiple obstacles could prevent low-income or multi-ethnic

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communities from using urban greenspaces. Urban green space is often less accessible or of poorer quality in regions with higher indices of social or economic hardship on a structural level. Open green spaces are vital for social interaction and relaxation as the main key to ensuring long-term positive mental health. Therefore, from previous studies, this paper examines the ideal open green spaces that impact low-income communities for mental health. The objectives are to identify the elements in open green spaces for positive mental health and to figure out the physical conditions of existing open green spaces used by low-income communities in urban areas.

2.0 Literature Review

In every residential setting, open green spaces are essential and have positively impacted mental health. The situation can become bad when living in an urban environment can be stressful and overwhelming. The noise, pollution, and lack of nature can affect mental health. Residents can live in a housing area with or without green spaces (Storper & Manville, 2006). However, low-income people have no choice but to live in unequal distribution of green spaces. Furthermore, this group of people cannot appreciate the benefits of green space presents. Some residents lack knowledge of the benefits and common sense of taking care of the green space regarding vandalism. Frequently individuals from low-income communities miss out on access to open green spaces, so crucial for maintaining their physical and mental well-being (Basu & Nagendra, 2021). Low-income residential areas, unfortunately, the communities often lack access to these spaces due to the high cost of land in urban areas.

According to Bakar et al. (2016), they have poor-quality facilities and safety, and the community have limited time to recreation at the park. This means that residents are denied the opportunity to benefit from the mental health benefits of open green space. The quality of urban greenspaces has been linked to both satisfaction and the use of greenspaces to escape from chaos. When the quality has worsened, participation in physical activity or recreation in the green space becomes lessened (Roberts et al., 2018). A recent study found that satisfaction with local greenspace was a better predictor of children's mental well-being than the availability of green space. The elements included a proper safe place, accessibility, and abundant green (McEachan et al., 2018). Aside from quality, perceived safety is a significant barrier to green space utilisation to prevent anxiety when visiting green space (Roe et al., 2016). Cronin-de-Chavez et al. (2019) mentioned the factor prevalence of low-income communities visiting the park is the built environment itself where the condition of the area, such as improper or unsafe playgrounds, no specific areas for children's play, such as a garden, lack of accessibility, and not enough number of toilets.

Low-income or ethnic minority groups' use is also highly influenced by ideas about the benefits of green space, whether they would feel accepted, and other perceived hurdles, such as cultural and linguistic limits (Das et al., 2017). A study by Swahn et al. (2022) mentioned that people who live in urban slums prefer the physical spaces that can associate them with performing sports, education, worship, workplaces, and green space to be related to happiness. Lui et al. (2021) show that urban green space accessibility and distribution have a huge gap in the environment of poor with rich people compared to their ethnic backgrounds. According to Hussein et al. (2022), low-income urbanites have moderate stress scores when satisfied with the safety, good natural lighting and precise information at the park. The satisfaction included access for persons with disabilities, children, and seniors and a reasonable distance from the park to the residential. Thus, the significance of this study will overview elements and criteria that enhance positive mental health among the low-income community through open green space.

3.0 Methodology

The previous study was selected using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). These protocols have been used to filter the reporting items by retrieving the relevant articles. The databases used in this study include PubMed and ScienceDirect. Furthermore, the search strategy includes finding the keywords based on the previous systematic reviews on the effect of open green space on mental health among low-income. In this study, positive mental health was defined as mental well-being to search the terms included mental health or psychological health or well-being. On the other hand, open green space was defined as vegetation areas in urban areas, including "green space", "parks", "urban areas", "gardens", "green areas", or "nature". For low-income, the term included "poor", "low-income residents", or "low-income community". However, due to the limitation on three keywords in an article, the article that did not cover low-income residential is still included as long as have green space and mental health that covers urban areas.

The selected studies that met the criteria, including open green space, low- income and positive mental health considered eligible. The keywords included open green space with vegetation in or within a residential area, gardens, parks, urban parks, and public spaces. Other than the mentioned keywords will be excluded. Furthermore, the search timeline for published articles was limited from 2019 to 2023 in English and available in full text for the journal article extraction to preserve for the latest review. To prevent the error, academic journals review papers, theoretical papers, methodological papers, and reports for governments were excluded as they focused on literature from research articles. This includes the journal article that held interviews as a methodology to avoid biased results. All the excluded criteria are the limitation of this study. To figure out the elements in open green spaces for positive mental health, the taxonomy from the previous studies has been adapted and extracted accordingly to the purpose of this study. The taxonomy adapted in the articles is based on earlier studies where features, condition, accessibility, aesthetics and safety (Bedimo-Rung et al., 2005; McCormack et al., 2010; Ishak et al., 2018) are simplified into three categories as shown in Fig 1 the flow chart on the methodology.

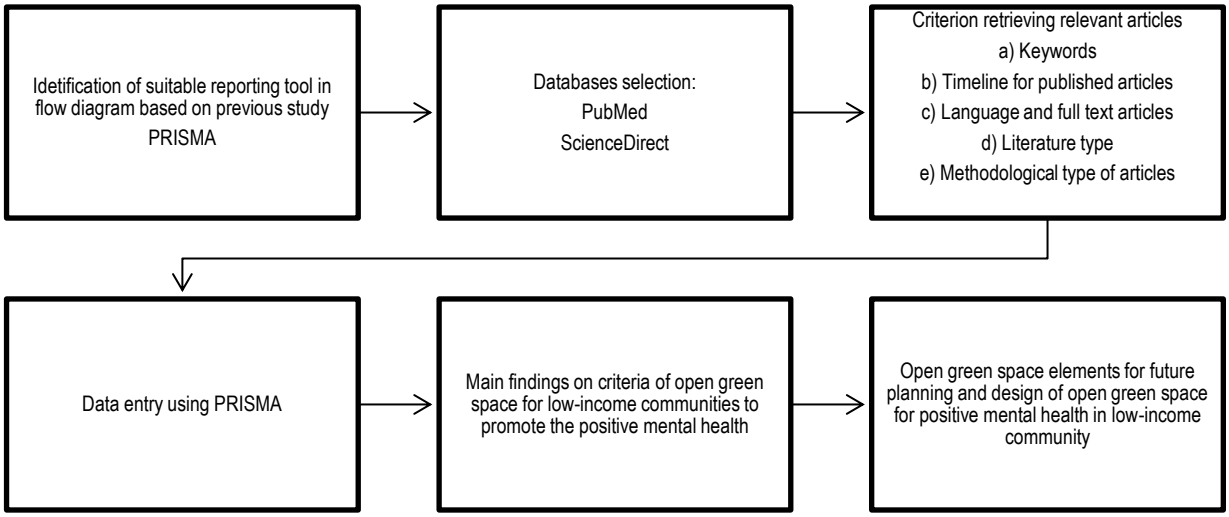

Fig. 1: Flow chart of study methodology
(Source: Authors)

4.0 Results

The screening of relevant topics via titles and abstracts was identified as the inclusion criteria. A number of 12 that met the criteria based on the search strategy mentioned are to be reviewed by the authors. Fig 1 shows the flow diagram of included and excluded criteria.

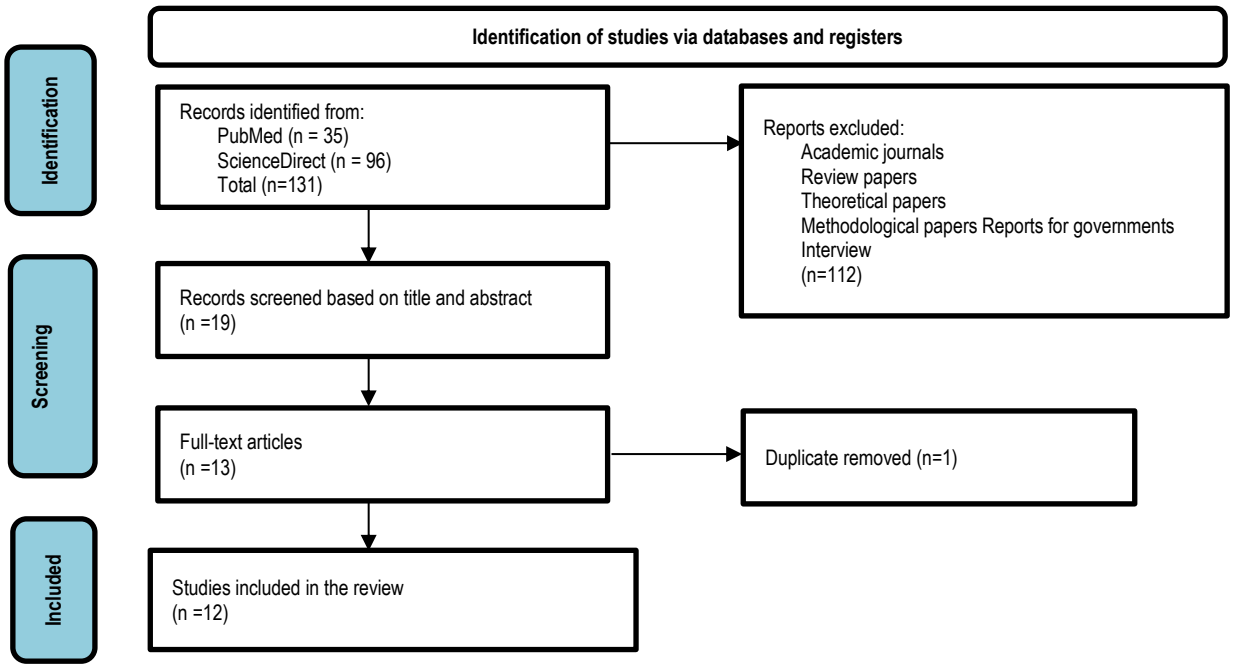

Fig. 2: Flow diagram of included and excluded criteria
(Source: Authors)

Table 1: Main findings on criteria of open green space for low-income communities to promote the positive mental health

No.	Author(s), Year, Country	Research problems	Methodology	Findings	Open green space elements
1	*Astell-Burt & Feng (2019), Australia*	The amount of green space or particular types of green space is connected with healthier mental well-being.	10-item Kessler Psychological Distress Scale, self-reported by the physician to diagnose depression or anxiety, and self-rated general health	Protecting and restoring urban tree canopies precisely is a better alternative to promoting public mental health.	Landscape features
2	*Liu et al. (2019a), China*	Systematically explores biopsychosocial paths associating contact with neighbourhood greenness to psychological well-being.	Questionnaire survey, World Health Organization Well-being Index (WHO-5), Normalised Difference Vegetation Index (NDVI) – greenness assessed	Recreation walking, social gathering in the neighbourhood, and satisfied neighbourhood greenspaces are related to greenness and exposure to mental well-being.	Planning and accessibility
3	*Mattocks (2019), United States*	Association between neighbourhood disorder with mental health.	Analysis of quantitative data: Wave 1 of the National Institute on Aging's (NIA) Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) and neighbourhood-level indicators from the Baltimore Neighborhood Indicators Alliance (BNIA)	If measured, natural environments besides parks, such as trees, gardens, fields, schoolyards, urban farms, and even bodies of water, could significantly influence mental health. Individuals' perceptions of access to park space may have a more decisive influence on mental health outcomes than their objective reality (safety, street networks, walkability, and traffic which could influence one's ability to reap the benefits from proximity to parks).	Landscape features, Safety
4	*Vujcic et al. (2019), Serbia*	Identify the association between urban green spaces advantages and visitors' well-being for physical and mental.	Face-to-face survey on site	Running and jogging activities in urban green spaces are known as suitable areas and can relieve nervousness by self-reported.	Planning and accessibility
5	*Barreto et al. (2019), Spain*	The exposure of residents of different income levels surrounded by green areas and the presence of mental health issues	General Health Questionnaire (GHQ-12), Vegetation Index	The availability of green space in the neighbourhood and the frequency of common mental diseases in the 200-meter buffer group of people with intermediate incomes and the 400-meter and 1,500-meter buffers in the group of people with low incomes.	Planning and accessibility, Landscape features
6	*Hedblom et al. (2019), Sweden*	Urban green space and an urban setting as prospective in stimulating and recovering stress.	2D 360° Virtual Reality photo, Auditory stimuli, and five mild electric shock stimuli	Urban environment exposure (parks and forests) can subordinate stress levels by listening to birds chirping and natural smells.	Landscape features
7	*Hunter et al. (2019), United States*	Contribution of duration, frequency, and nature quality in urban space for reducing the stress	Saliva cortisol and salivary alpha-amylase (self-administered collection of saliva samples)	Spending around 20 to 30 minutes can reduce stress by about 21%/h for salivary cortisol and 28%/h using salivary amylase.	Planning and accessibility
8	*Wang et al. (2019), China*	Urban green space characteristics effect affects aesthetic choices and restorative possibility.	Stimuli Photographic image, internet survey	Preference for esthetics increased with more natural elements (trees, flowers, water, and fish). Potential in restorative gets an increased number of trees, flowers or water. Birds increased fascination but did not significantly influence preference and overall restorative potential.	Landscape features
9	*Liu et al. (2019b), China*	The association between neighbourhood environment and mental health, a built environment connected to urban cities, and appropriate social capital.	Questionnaire survey and GIS for spatial and census data	Neighborhood safety and appropriate neighbourhood connections, and mutuality had positive links to mental health.	Landscape features, Safety

10	*Subiza-Pérez et al. (2020), Spain*	Restoration in urban squares.	Brief General Data Questionnaire, Place Attachment and Place Identity Scale, Restoration Outcome Scale (ROS-S) in the Spanish version, and Perceived Restorativeness Scale (PRS)	There are sufficient benches, water, fountains, playgrounds, and trees. Provides space for recreation, entertainment and being physically active in the urban landscape as psycho-environmental attributes.	Planning and accessibility
11	*Braçe et al.(2020), Spain*	The impact on access to a green space view from home affects anxiety and depression.	The survey questionnaire and interview Hospital Anxiety and Depression Scale (HADS)	Lower anxiety and depression risks among adults who enjoy a view of green spaces from home.	Planning and accessibility, Landscape features
12	*Pearson et al. (2021), United States*	Residents in low-income communities expose to type 2 diabetes because of stress.	Perceived stress scale (PSS), survey questionnaire	Feeling unsafe when walking on the pathway at neighbourhood green space even though with the higher number of the park's area	Planning and accessibility, Safety

(Source: Authors)

5.0 Discussion

Table 1 presents the main findings of the included studies. Three of the 12 articles were piloted in the United States, followed by Spain (n = 3) and China (n = 3). The remaining studies were conducted in Australia, Sweden and Serbia (n = 1). The classified key elements in providing the findings are modified into three key aspects: planning and accessibility, landscape features, and safety to keep positive mental health. Particular articles have one or more key aspects of the open green space elements for positive mental health, as shown in Fig 3.

Fig. 3: Open green space elements for positive mental health
(Source: Authors)

5.1 Planning and accessibility (visual, distance, accessibility, design, location, size, condition)

The engagement between societies in planning urban parks is essential as it is crucial in delivering the benefits to improve mental health problems. When the users' needs encounter the participation of professionals such as landscape architects and planners, the useful parks will be able to give benefits not only for physical health but also for mental health. Liu et al. (2019a) have identified walking for recreation neighbourhood social cohesion and satisfaction with neighbourhood greenspaces associated with mental well-being. The visit duration between 20 and 30 min will improve the benefit of urban parks visitation that can reduce stress (Hunter et al., 2019). In terms of design, the urban square provided prospects for relaxation, meeting people and committing to physical activity as psycho-environmental characteristics (Subiza-Pérez et al., 2020). Therefore, suitable planning with good accessibility of urban parks can be produced to inspire users to engage with the outdoor environment.

5.2 Landscape features (softscape and hardscape)

A study by Astell-Burt and Feng (2019) shows that the best of urban greening is through the protection and restoration of urban tree canopies, precisely in promoting mental health in the community. Mattocks (2019) stated the installation of a natural environment and

parks, the characteristics such as trees, gardens, turfs, schoolyards, urban farms, and even water bodies should be added as displays the significant stimulus on mental health. The restoration of urban squares that comprise adequate landscape features, for instance, benches, water, fountains, playgrounds, and trees, to the users in improving mental well-being. The stimulation study by Hedblom et al. (2019) represents the potential stress induction and recovery in urban environments through supplementary natural settings such as parks and forests that include singing birds and natural smells. The study shows users are showing lower stress levels after exposure to the stressor offsets (an urban forest, a city park, and an urban environment). On the other hand, Braçe et al. (2020) revealed that adult users who appreciate access to a green space view from home have a lower risk of anxiety and depression.

5.3 Safety

Safety has become crucial for users in shaping their behaviour and involvement towards urban parks. In a previous study, Liu et al. (2019b) indicated that neighbourhood safety, appropriate neighbourhood interactions among the users, and mutuality had progressive relations with mental health. According to Mattocks (2019), the safety, path systems, walkability, and traffic possibly will stimulate users' ability to obtain assistance from closeness to parks for mental health. Thus, stress levels can be reduced effectively via enthusiastic safety and activities in public green spaces. The safety of open green spaces needs to be improvised even though the number of green spaces available is sufficient. According to Pearson et al. (2021), feeling insecure and unsafe when walking on the pathway in neighbourhood area green spaces leads to stress that increases non-communicable diseases such as type 2 diabetes among adults. Thus, the consideration encompassing landscape architects is needed to enhance the social relations, well-being, and safety factor in designing the open green space in low-income residential.

6.0 Conclusion

To summarise, open green space is essential for maintaining positive mental health, especially in low-income communities where it may be lacking. It is time for policymakers and city planners to prioritise the creation of these spaces so that all residents can benefit from them. The results have shown limited sources due to the studies done, as most of the results are review papers. In this regard, in addition to assessing the benefits of open green space for mental health within low-income areas, green space metrics could also consider the accessibility, use, and perceptions of open green space. To fully comprehend how accessible open green space promotes positive mental health. Innovative urban design strategies might aim to mimic important elements that are significant in urban settings. When developing, planning, and restoring urban areas at the low-income neighbourhood level, minimum criteria for green space requirements, such as ratio, elements, and quality of green space, could be specified. The present findings will improve the planning of open green space in low-income residential in the future by providing suitable guidelines.

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Paper Contribution to Related Study

This study has identified the favoured open green spaces that impacted low-income communities for mental health from previous studies. The limitation for low-income communities to get access and utilise the open green space are lower than privileged communities. Hence, this group will be exposed to mental health issues escalating. Moreover, with ideal criteria, the open green space for low-income residents can provide the benefits of staying healthy at no cost. Besides that, this study will help professionals structure the standards, such as guidelines for developing and planning open green space.

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