

Review of the relationship between green space exposure and mental health

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Abstract. Mental health conditions are one of the main causes of the overall disease burden worldwide, and this raises the demand for accessible and cost-effective infrastructure that improves mental health. Growing up in urban environments is associated with a higher risk of developing psychiatric disorders. However, it has been proven that green space can provide mental health benefits and possibly lower the risk of psychiatric disorders, but the underlying mechanisms have not yet been discovered. This systematic review will examine the correlation between green space and mental health, the mechanism by which green space improves mental health, and some mediating factors that affect the results. The results show a positive correlation between exposure to green space and residents' mental health, suggesting that green space does play a part in the promotion of residents' well-being, thereby ensuring their mental health.

Keywords: Green Space Exposure, Mental Health, Residents' Psychology.

1. Introduction

In recent years, academic interest in a possible relationship between exposure to green spaces and public health has risen, as can be seen from the number of studies published [1]. As the demand for cost-effective infrastructure that promotes mental health has risen, more urban interventions have been made to address the possible risks of developing psychiatric disorders. In modern urban cities and towns, parks and green open space are among the most widely available forms, and, importantly for health equity, they are usually provided and maintained for public benefit. These interventions in green spaces contribute to the improvement of mental health and have been regarded as an effective public infrastructure that guarantees our mental health.

This systematic review will explore the association between green space exposure and mental health in three aspects: the correlation between green space and mental health, the mechanism by which green space improves mental health, and some mediating factors that affect the results. The correlation between green space and mental health will be illustrated by statistical data from other studies that proves a positive association between the two. The mechanisms by which green space benefits mental health will be explained in terms of psychological restoration, encouraging exercise, improving social coherence, and reducing pollution; and lastly, the mediate factor section will talk about three factors that will result in heterogeneity, which affect the extent at which individuals or social groups perceive green areas and are influenced by them. These factors include the types and qualities of green space, the individual and social characteristics of residents, and a measure of mental health.

The investigation of this prompt can provide more insights and implications for green space planning. As green space plays an increasingly significant role in residents' life, more and more urban policy makes are including green space in urban planning and considering the coordination between green space and buildings to maximize the health benefits of green space.

2. Correlation between green space and mental health

In a sweeping nationwide study, researchers from Denmark's University of Aarhus found that childhood exposure to green space—parks, forests, rural lands, etc.—reduces the risk of developing an array of psychiatric disorders during adolescence and adulthood. The study could have far-reaching implications for healthy city design, making green space-focused urban planning an early intervention tool for reducing mental health problems.

Using data from the Landsat satellite archive and the Danish Civil Registration System, researchers tracked the residential green space around nearly a million Danes and correlated that with their mental health outcomes. The scientists found that citizens who grew up with the least green space nearby had as much as a 55 percent increased risk of developing psychiatric disorders such as depression, anxiety, and substance abuse in later years [2].

3. Mechanisms

3.1. Psychological restoration

Green space can allow for visual stimulation, which can make people's minds more relaxed. A study suggests that visual stimulation, such as viewing a real forest, might produce psychological benefits for human health, compared to not viewing a real forest. This stimulation may be associated with feelings of comfort, which lowers blood pressure, heart rate, and psychological stress.

3.2. Encouraging exercise

Green space can provide spaces for outdoor sporting activities and opportunities for physical activity. The duration of time spent engaging in green space has an effect on reducing stress levels. A study conducted by Lu in Swedish towns and cities showed that the amount of time residents spent outdoors in green areas was inversely related to their own stress. A brief recreation program in the forest may be effective in reducing the negative symptoms of stress. Whether walking in the suburbs or in the forest, participants felt relaxed physically and psychologically.

3.3. Social coherence

Green space affects adults' perceptions of loneliness, security, and happiness. Research shows that even if adults did not have much contact with the people around them, they were less lonely as long as they lived in an environment with a high proportion of green spaces (including parks, farmland, and forests). Urban parks in green spaces, as places of social interaction, could enhance people's sense of security and belonging, and the wide visual space created by green spaces might also reduce the incidence of crime.

3.4. Reduce pollution/enhance environmental health

Green space can absorb pollutants from the air and improve air quality. Green space has a significant impact on pollution exposure. Studies indicated that people's exposure to smoke at home, and residential exposure to artificial light at night and near-roadway air pollution were associated with increased perceived stress. These connections seem to be partly mitigated by more residential green space. Urban green spaces will reduce residents' sensitivity to stress [3].

4. Possible directions for Future Research

It has been proven by various studies that green space exposure is positively correlated with residents' well-being. However, correlation does not mean causation, meaning that there are various factors and

influencing pathways that mediate the association between green space exposure and the enhancement of mental health. It is important for researchers to recognize these mediating mechanisms, which explain the possible reasons for heterogeneity, and thereby make a comprehensive review [1].

There are many aspects of heterogeneity. Various influencing factors, such as individual characteristics and social characteristics of residents, should be considered comprehensively to reduce random errors to the greatest extent and to clarify the mediatory effect of green space on mental health. Therefore, we need to fully consider the individual and social characteristics of the residents in variable control to ensure an accurate analysis of how the mediator works [4,5].

4.1. Individual and social characteristics

Different individuals have different health prerequisites, mental conditions, life style, etc. These individual characteristics all contribute to the variation in the extent to which they're influenced by green spaces. Social characteristics also plays a role in heterogeneity. Some studies have found that the health benefits of green spaces can be modified by variables such as education level and socioeconomic status. These factors are all considered to be the mediators that result in heterogeneity.

4.2. Types and qualities of green space

Few studies have examined the association between mental health and the type and quality of green spaces, and only some researchers have studied the impact of environmental conditions on artificial and natural green spaces and the impact of improved and unimproved green spaces on participants' mental health. The results showed that people's emotional and sensory states were improved in after the quality of green space was improved.

4.3. Mental health measurements

Mental health measures are mainly divided into three categories, including mental state measures, mood measures, and restoration measures. With the help of specific measurement tools, the relationship between these psychological factors and environmental factors, outdoor activity, and social cohesion was further analyzed. Such methods are more diverse, focusing on the use of observation methods and interviews, while preferences and other behavioral social survey methods are based on scales. Since this review is based on several studies, in which different studies use different tools for measurement, the results will be in different forms as well.

5. Conclusion

This systematic review examines the relationship between exposure to green space and the mental health of residents in terms of correlation, mechanisms, and possible directions for future research. The results and analysis have shown that exposure to green space may influence mental health through both psychological and physiological pathways. Green spaces serve as settings for individual and social behavior and can mitigate the negative influences of other aspects of the physical environment. Furthermore, urban planning and policy will benefit from more information on the likely generality of effects on psychiatric disorders and how those effects are realized over the course of a person's life. There are limitations to the study. When analyzing the correlation between green space and mental health, only a few studies are included, which are not sufficient to provide a representative demonstration of the positive correlation between the two factors. Detailed and comprehensive research should also be carried out on the mechanism between green space and mental health, including a study of the mixed effects of the mediators.

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