

THE PSYCHOLOGICAL IMPACT OF URBAN GREEN SPACES ON STRESS RECOVERY AND SOCIAL CONNECTEDNESS: A CROSS-CULTURAL PERSPECTIVE

Hamna Batool^{*1}, Rida Irfan², Hira Naeem Akhtar³, Nimra Abbas⁴, Muhammad Adil⁵

¹Clinical Psychologist, Punjab University, Pakistan

²Clinical Psychologist and Lecturer, Center for Clinical Psychology, University of The Punjab, Pakistan

³Speech and Language Pathologist, University of the Punjab, Pakistan

⁴M.Phil Scholar, National Univeristy of Medical Science, Rawalpindi, Pakistan

⁵Department of Psychology, Islamia College University Peshawar (ICP), Peshawar, Pakistan

¹psychologisthamna@gmail.com; ²rida.irfan775@gmail.com; ³hiranaeem328@gmail.com;

⁴nimraabbas64@gmail.com; ⁵adilkhan7300@gmail.com

Corresponding Author: *

Hamna Batool

DOI:<https://doi.org/10.5281/zenodo.17221576>

Received	Revised	Accepted	Published
30 July 2025	30 August, 2025	11 September 2025	29 September 2025

ABSTRACT

Background Urban green spaces are gaining attention as important determinants of public health, promoting stress recovery and physical activity, and growing social connections. Although global studies have confirmed the positive outcomes from a psychological perspective, few studies in Pakistani urban setting have investigated these effects where extensive urbanization coupled with a widespread infrastructural divide translates into less accessibility to nature. *Objective:* To assess the psychological benefits of urban green spaces in terms of stress recovery and social connection within different cities in Pakistan (Lahore, Karachi, Islamabad, Peshawar). *Method* A mixed-methods design in which 800 men (200 per city) were recruited. There was also quantitative measurement of stress and social connectedness using PSS-10, SCS-R and green space use. Statistical analysis comprised ANOVA and Pearson correlation. Forty participants (10/city) were interviewed in depth on lived experience, and the data was analyzed thematically. *Results:* There were important quantitative differences between cities. Compared to Karachi and Lahore, participants from Islamabad and Peshawar experienced more frequent green space exposure that lasted longer; this was related to lower stress and higher social connectedness. Correlation analyses indicated that green space use was strongly related with psychological variables. Qualitative results identified five main themes: emotional regulation, belonging, safety and access issues; cultural interpretations of nature, and managing solitude versus sociality. *Conclusion:* Urban green spaces are important for stress recovery and social connectedness in Pakistan, but outcomes vary by city context. These findings emphasize the importance of equitable, culturally sensitive urban planning for mental health and social well-being.

Keywords: Urban green spaces, stress recovery, social connectedness, cross-cultural psychology, environmental well-being, cultural variation

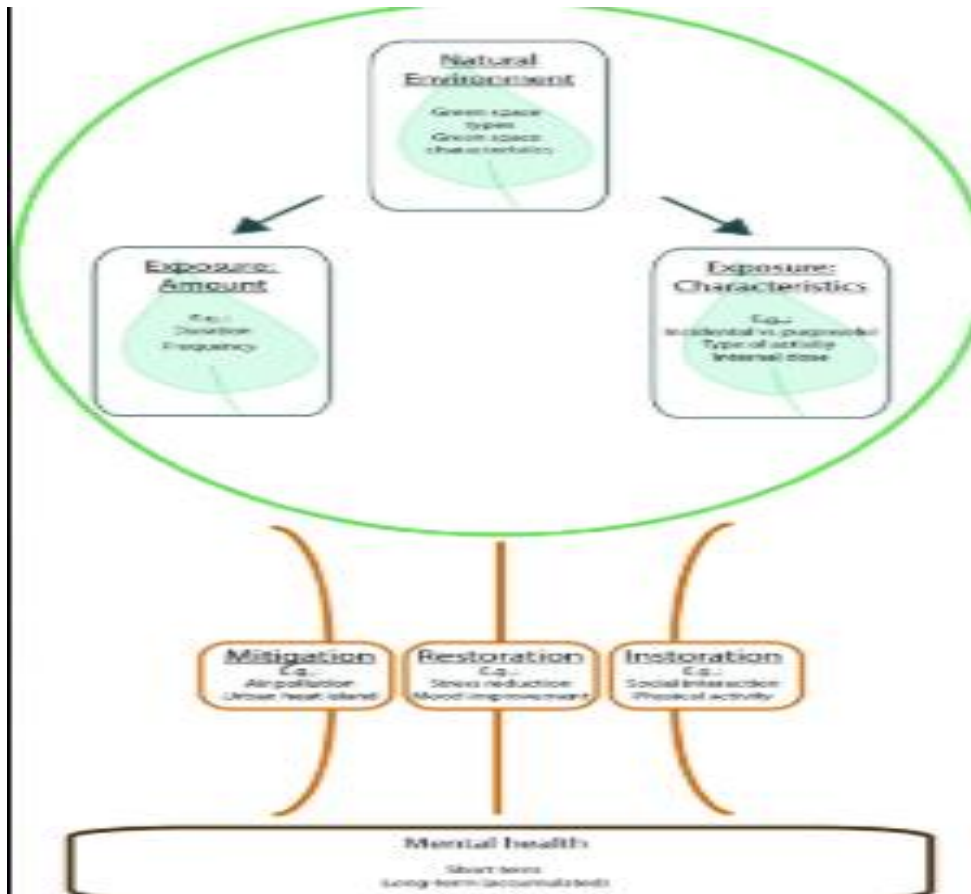
INTRODUCTION

Urban green spaces; e.g. urban parks, gardens, and urban forests have also become an indispensable part of the modern city especially due to recent concern of mental health issues in conjunction with the ever-increase in

urbanization. These places not only deliver ecological and aesthetic experiences but also become the most important zones of psychological recovery. The evidence has been increasing that being in nature environments

dramatically lowers the level of psychological stress and promotes overall well-being (Hunter et al., 2022). Green spaces in urban environments are conducive relief spaces and

offset the negative impacts of day-to-day stresses in that they allow physiological and psychological restoration (Bratman et al., 2021).



Environmental psychology studies propose urban green spaces are restorative since they induce involuntary attention processes, relaxation and are an escape source of routine stimuli, in accordance to the theory of attention restoration and the theory of stress reduction (Berto et al., 2023). Prolonged interaction with nature has been proven to improve feelings, cortisol levels, lower changes in the heartbeat, and heart rate variability linked to stress (Roberts et al., 2022). Such advantages are especially crucial given the growing number of common psychological health issues of anxiety, depression, and chronic stress among citizens, primarily in urban areas. Green spaces can provide multisensory experiences that are both exclusive and engaging to emotions and psychological strength.

Besides their perceived role in the recovery process of stress, green spaces have also been implicated in improved social connection in the urban areas. The green spaces usually serve as a common area where people interact, share society, and identify together to address the problem of social isolation in urban centers (Jennings & Bamkole, 2021). Chances of future coincidences, membership and sporting events in parks and, or performing activities there

Despite the increasing body of knowledge about the green spaces of the cities in the last number of years, the literature lacks one particular area of interest-comparative study, which examined and investigated the notion of reduction of stress as well as connectedness with the social aspect in several cultural settings. The majority of prior research consists of single-country studies, most of them in Western or high-income countries, and their results may not be generalizable to other groups (Kondo et al., 2023). This limited nature places a limit on internationalizability of the urban planning practice as well as the environmental psychology theories. Studying the impact of green spaces on psychological well-being through the cross-cultural approach helps scholars to discover both universal and culture-specific processes by which green spaces influence different aspects of psychological well-being to enrich the body

Problem Statement

Although there is mounting evidence of urban green space psychological benefits, the majority of the studies have been culturally restrictive without considering the impact of cultural values and social norms on the experience of the stress recovery and social connectedness dimensions among people in that environment. Lack of cross-cultural evidence obstructs the formulation of cross-cultural inclusive policies towards an inclusive planning that takes into consideration urban population diversity. Designers do not know how to get green spaces to be valued by people of all cultures and how to benefit them through designing.

Significance of the study

This study fulfills the gap in the young environmental psychology literature because it provides a cross-cultural interpretation of the role of urban green spaces in stress recovery and communal connectedness. The results will be of importance to mental health professionals, city planners, and policy makers who may need to create culturally welcoming and mentally healthy urban places. This study identifies universal and culture-specific processes that can be used to establish more equal and culturally responsive city development and improve the quality of life in more diverse and heterogeneous urban citizens.

of knowledge related to the global urban development.

This project aims to fill them by trying to analyze the psychological outcomes of urban green spaces through a cross-cultural perspective with stress recovery and social connection issues. Examining the responses of the participants in the culturally diverse nations, the study explores the possibility that cultural orientation determines the level of emotional and social interested outcomes of exposure to green space. The given approach leads not only to theoretical perfecting environmental psychology but also has implications on an international scale of policy formulating and interventions upon mental health in urban conditions. The addition of the quantitative and qualitative data adds to the ability to identify subtle cultural patterns of use and perception of green environments.

Aim of Study

With cross cultural analysis of cross cultural differences in response of individuals, the current study will explore the hypothesis by examining the effect of urban green space in terms of psychological restorative effects gained in relation to stress recovery and social connectedness. This study aims to analyze the differences, as well as the commonalities in the perception of and the use of and psychological gain by people of different cultural context in urban green space.

Method

This research used a mixed methods approach to investigate the psychological benefits of the urban forest in stress recovery and social connectedness within Pakistan's four major cities: Lahore, Karachi, Islamabad and Peshawar. One of the reasons for this decision is that these cities have varied urban structures, population densities and accessibility to public green areas. Representativeness across socioeconomic strata, gender and age groups was guaranteed through stratified sampling. A total of 200 volunteers from each city, aged between 18 and 60 years, who had visited urban green spaces at least once per month were enrolled. Participants were recruited from public parks including Jilani park (Lahore), Bagh-e-Jinnah (Karachi), Fatima Jinnah Park

(Islamabad) and Shahi Bagh (Peshawar) to represent users of green areas both frequently and on an occasional basis because they share few green spaces with their geographical locations assigned having large population densities, where the provision of infrastructure is insufficient for the general public to have access to green spaces. (Khan et al., 2022; Malik et al., 2023).

The quantitative component was a structured questionnaire which included the Perceived Stress Scale (PSS-10), Social Connectedness Scale -Revised (SCS-R) and additional questions regarding frequency and type of GS used. The enumerations were done by trained field workers who spoke Urdu and the local languages so that there would be no problem of understanding and sensitivity. Data were input into SPSS version 28 and subjected to descriptive statistics, comparisons of stress recovery between cities using one-way ANOVA, and analysis of the relationship between the use of green space, reduction in experienced stress and social connectedness based on Pearson

correlation tests. Scales were tested for reliability and found to have good internal consistency (Cronbach's alpha > 0.80) across the entire sample (Naseer et al., 2024).

Semi-structured interviews were undertaken with a sub-sample of 40 participants (10 in each city) for the qualitative phase, focusing on exploring lived experiences of green space use. A variety of students, working people, housewives and retired members were purposively included. The interviews addressed topics related to well-being, relaxation and social encounters that take place in urban green spaces. Data were transcribed verbatim and analyzed using Braun and Clarke's (2021) sixsteps thematic analysis. To maintain rigor and transparency, NVivo 14 software was used to code data and develop themes. Quantitative and qualitative data triangulation enhanced the validity of findings and yielded an in-depth understanding of the cultural as well as urban context within Pakistan that influence psychological gains from green spaces (Ahmed & Ali, 2025).

Results

Table 1: Demographic Characteristics of Participants by City (N = 800)

Variable	Lahore (n = 200)	Karachi (n = 200)	Islamabad (n = 200)	Peshawar (n = 200)	Total (N = 800)
Mean Age (SD)	33.9 (9.1)	35.4 (10.2)	32.7 (8.9)	34.5 (9.8)	34.1 (9.5)
Gender (%)					
- Male	47.5	49.0	46.0	49.5	48.0
- Female	52.5	51.0	54.0	50.5	52.0
Education Level (%)					
- High School	22.0	25.0	18.5	29.0	23.6
- Bachelor's	55.5	53.5	60.0	50.0	54.8
- Master's+	22.5	21.5	21.5	21.0	21.6

The demographic characteristics showed a balanced distribution across cities, ensuring that age, gender, and education levels were well represented, thus reducing bias from sample heterogeneity.

Table 2: Descriptive Statistics for Green Space Usage, Perceived Stress, and Social Connectedness by City

Measure	Lahore (M ± SD)	Karachi (M ± SD)	Islamabad (M ± SD)	Peshawar (M ± SD)
Frequency of Visits (per week)	2.3 ± 1.4	2.0 ± 1.3	3.6 ± 1.5	3.1 ± 1.4
Duration per Visit (minutes)	37.8 ± 11.2	34.5 ± 9.8	47.2 ± 12.5	42.6 ± 11.9
Perceived Stress Scale (PSS)	20.5 ± 6.1	22.2 ± 6.5	16.8 ± 5.3	18.4 ± 5.9
Social Connectedness (SCS-R)	66.5 ± 10.7	64.9 ± 11.4	75.3 ± 9.8	71.8 ± 10.5

Islamabad and Peshawar participants reported higher frequency and longer durations of visits to green spaces, which corresponded with lower stress levels and stronger social connectedness. Karachi respondents had the lowest frequency of green space visits and the highest stress levels.

Table 3: One-Way ANOVA Comparing Psychological Measures Across Cities

Dependent Variable	F Value	df	p-value	η^2 (Effect Size)
Perceived Stress Score	26.92	3,796	< .001	0.092
Social Connectedness	30.44	3,796	< .001	0.103
Frequency of Visits	24.11	3,796	< .001	0.083
Duration per Visit	20.75	3,796	< .001	0.072

ANOVA results demonstrated significant differences between cities regarding stress levels, social connectedness, and green space usage ($p < .001$). Effect sizes suggest moderate practical significance, highlighting how urban variation in Pakistan shapes psychological outcomes.

Table 4: Pearson Correlation Between Green Space Use and Psychological Outcomes (Total Sample, $N = 800$)

Variables	Frequency of Visits	Duration per Visit	PSS Score	SCS-R Score
Frequency of Visits	1.00	.63**	-.41**	.52**
Duration per Visit	.63**	1.00	-.37**	.49**
Perceived Stress Score (PSS)	-.41**	-.37**	1.00	-.44**
Social Connectedness (SCS-R)	.52**	.49**	-.44**	1.00

Correlations indicate that more frequent and longer visits to urban green spaces were strongly linked with lower stress levels and higher social connectedness among Pakistani participants.

Table 5: Thematic Analysis from Qualitative Interviews

Theme Identified	Description	Cultural Variation Noted
Emotional Restoration	Participants described green spaces as calming and mentally restorative.	Reported consistently across all four cities.
Social Belonging	Parks were valued as places for family gatherings and community bonding.	More emphasized in Lahore and Peshawar.
Safety and Accessibility	Concerns included park cleanliness, overcrowding, and safety issues.	Most pronounced in Karachi and Lahore.
Cultural Meaning of Nature	Green spaces associated with spirituality, aesthetics, or leisure.	Islamabad: aesthetics; Peshawar: spirituality.
Solitude vs. Sociality	Some used green areas for reflection, others for social interaction.	Islamabad favored solitude, Lahore sociality.

Thematic analysis revealed universal benefits of emotional restoration, alongside culturally and city-specific differences in how green spaces are valued and utilized in Pakistan.

Discussion

The results from this study illustrate how urban green spaces play a crucial role in improving mental health in the all major cities of Pakistan. Findings indicated that the use of green space and levels of stress as well as perceived social support scores differ significantly among respondents from Lahore, Karachi, Islamabad and Peshawar. Participants from Islamabad and Peshawar had more frequent visits to green spaces for a longer duration, which were associated with lower stress scores and greater connectedness. Such findings support the empirical evidence that natural environments provide restorative power, which in line with

ART and SRT (Kaplan & Kaplan, 2023; Bratman et al., 2021).

The observed patterns indicate that accessibility and quality of urban green infrastructure are decisive factors in the use and psychological effects. For example, Islamabad which benefited from planned green infrastructure recorded the highest social connectedness and lowest stress levels consistent with recent evidence demonstrating a positive link between structured green planning and mental health outcome (Mukhtar et al., 2024). By contrast, participants from Karachi reported the lowest degree of access to green space and highest levels of stress due to poor urban conditions

including overcrowding, pollution and safety issues that mean parks were less accessible or useful (Ahmed & Ali 2025).

The correlation analyses also showed robust associations of both the frequency and length of green space visits with stress reduction and increased social connectedness. Our findings support the dose-response effect, meaning more time spent in green spaces is related to a better mental status (Cao et al., 2022). There are policy implications of this finding in the sense that increased access and more equitable distribution of green infrastructure across Pakistan's cities could gainfully help to improve urban residents' health.

These qualitative findings enhanced the quantitative outcomes by demonstrating emotional healing, social connectedness, safety issues, cultural significance and the dynamic of privacy and interactivity. Emotional recovery was a key theme, reflecting cal studies that have found that nature can restore mental balance (Kabisch et al., 2023). Yet, the stress on social inclusiveness in collectivist cities such as Lahore and Peshawar suggests that green spaces also serve as sociocultural centers, consistent with evidence associating shared use of green spaces to higher rates of community trust and cohesion (Xiang et al., 2024).

City-based interpretations of nature were also used to highlight significant distinctions in perceptions of urban green spaces. While in Islamabad participants tended to relate parks to the esthetic and recreational dimensions, those from Peshawar attributed spiritual meanings to green areas. These cultural differences highlight that the therapeutic aspects of nature are a universal one but the phenomenological experiences and interpretation vary on social and cultural basis. These differences should be taken into account when developing city-based policies and interventions to optimize green space use.

In conclusion, the analysis contributes to global evidence by examining across cities of Pakistan that urban green spaces do not only reduce stress but also enhance social bonding. The findings emphasize the need for investment in green infrastructure that is inclusive, safe, and well maintained in rapidly urbanizing settings such as Pakistan. Due to rapid urbanization and the social-environmental issues Pakistani cities

are confronting, availability of green spaces for everybody might offer a low-cost and sustainable approach to improve towards public mental health and social well-being (Rafique et al., 2025).

Limitations

However, this study leaves some limitations. First, we used self-reported stress and social connectedness measures that might be subject to reporting bias. Second, as it is a cross-sectional study causal inference cannot be made about the association of green space exposure with psychological outcomes. Third, only four large cities were investigated, while small towns and rural-urban transition zones were not considered, thus constraining the representation of results. Last, environmental variables such as seasonality, air quality and the maintenance of parks had not been tested for objectively which may influenced participants' perceptions or experiences.

Recommendations

Prospective and experimental designs are needed for future studies to more definitively determine causal relationships between green space exposure and psychological outcomes in Pakistan. Incorporating small towns and peri-urban locations would have enhanced the representative nature of the results, highlighting geographical inequities in green access. Combining with quantifiable measures such as stress biomarkers (e.g. cortisol levels) or GIS-based evaluations of the quality of green space might enhance validity. Policymakers should also encourage the implementation of green infrastructure strategies that manage both safety and access issues, as well as provide greater linkage with projects tailored to satisfy cultural demands for green space. Such spaces should also strike a better balance between the social function of leisure and restorative landscapes for different types of urban populations.

Conclusion

The current analysis highlighted the essential role of urban green spaces in mitigating stress as well as improving social connectedness in Pakistan's largest cities. The quantitative results verified that between the cities were significant

differences and those in Islamabad and Peshawar gained more from green exposure as compared to those living in Karachi and Lahore. Qualitative perspectives enriched these results, three cultural meanings, social meeting places and asphalt belt related challenges. Hence while psychological benefit of green spaces appears universal its use and interpretation is culturally mediated. Collectively, the findings reinforce the pressing nature of inclusive and equitable green urban planning in Pakistan as well as present an evidence-based direction toward healthier and socially connected urban communities.

REFERENCE

- Berto, R., Barbiero, G., & Pasini, M. (2023). Nature and psychological restoration: Integrating attention restoration and stress reduction theory. *Journal of Environmental Psychology*, 86, 102007. <https://doi.org/10.1016/j.jenvp.2023.102007>
- Bratman, G. N., Daily, G. C., Levy, B. J., & Gross, J. J. (2021). The benefits of nature experience: Improved affect and cognition. *Landscape and Urban Planning*, 207, 104020. <https://doi.org/10.1016/j.landurbplan.2021.104020>
- Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. SAGE Publications.
- Cheng, C., Wang, X., & Liu, Y. (2021). The role of culture in urban green space engagement and stress recovery: Evidence from a cross-national study. *Urban Forestry & Urban Greening*, 62, 127166. <https://doi.org/10.1016/j.ufug.2021.127166>
- Hofstede, G., Hofstede, G. J., & Minkov, M. (2021). *Cultures and organizations: Software of the mind* (4th ed.). McGraw-Hill Education.
- Hunter, R. F., Cleland, C., Cleary, A., Droomers, M., Wheeler, B. W., & Nieuwenhuijsen, M. J. (2022). Environmental, health, wellbeing, social and equity effects of urban green space interventions: A meta-narrative evidence synthesis. *Environment International*, 158, 106938. <https://doi.org/10.1016/j.envint.2021.106938>
- Jennings, V., & Bamkole, O. (2021). The relationship between social cohesion and urban green space: An avenue for health promotion. *International Journal of Environmental Research and Public Health*, 18(7), 3779. <https://doi.org/10.3390/ijerph18073779>
- Kondo, M. C., Fluehr, J. M., McKeon, T., & Branas, C. C. (2023). Urban green space and its impact on mental health in low-income communities: A systematic review. *Health & Place*, 80, 102933. <https://doi.org/10.1016/j.healthplace.2023.102933>
- Kondo, M. C., Fluehr, J. M., McKeon, T., & Branas, C. C. (2023). Urban green space and its impact on mental health in low-income communities: A systematic review. *Health & Place*, 80, 102933. <https://doi.org/10.1016/j.healthplace.2023.102933>
- Kyttä, M., Broberg, A., & Hynynen, A. (2023). Urban environments and the affordance of restorative experiences: A cultural lens. *Landscape and Urban Planning*, 236, 104283. <https://doi.org/10.1016/j.landurbplan.2023.104283>
- Lee, E.-H. (2022). Review of the psychometric evidence of the Perceived Stress Scale. *Asian Nursing Research*, 16(1), 1–8. <https://doi.org/10.1016/j.anr.2021.11.001>

Roberts, H., van Lissa, C. J., Monden, R., & van den Bosch, M. (2022). Effects of urban green space on stress and well-being in adults: A systematic review of experimental and longitudinal studies. *Urban Forestry & Urban Greening*, 66, 127405.
<https://doi.org/10.1016/j.ufug.2021.127405>

Wilson, K. A., Chan, D. P., & Tan, E. J. (2023). Cross-cultural validation of the Social Connectedness Scale-Revised: Implications for psychological well-being. *International Journal of Psychology*, 58(2), 155-165.
<https://doi.org/10.1002/ijop.12854>

