Review

Urban Green Spaces and Social Cohesion in Racially and Ethnically Diverse Communities: A Scoping Review of Mediators, Inequities, and Health Equity Implications

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Title

Urban Green Spaces and Social Cohesion in Racially and Ethnically Diverse Communities: A Scoping Review of Mediators, Inequities, and Health Equity Implications

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Abstract

Background A predictor of public health, social cohesiveness may be improved by urban green areas through processes such as trust, affiliation, and social capital. However, these advantages are frequently prevented by inequitable access, maintenance discrepancies, safety concerns, and the threat of green redevelopment in racially and ethnically diverse neighborhoods. **Objectives/Aims** To collect information regarding the correlation between unity in society and urban green spaces across racially and ethnically diverse groups, while also identifying mediating variables, inequalities, and implications for public health equality. **Methods** A scoping review was performed in line with the PRISMA extension for scoping reviews. From the beginning until March 2024, MEDLINE, Scopus, Web of Science, and Embase were searched using a limited vocabulary and terms relating to natural space, social cohesion, and varied communities. The research was eligible if they assessed urban green areas and social integration, demonstrated linked health consequences, and looked into historically disadvantaged populations. Quantitative and qualitative designs were equally acceptable. Data extraction and quality evaluation (Newcastle-Ottawa Scale, CASP) were carried out in triplicate. A theme synthesis was created by combining data from six domains: the social environment, the built environment, leisure, maintenance, safety, and green gentrification. **Results/Key Findings** 126 studies met the inclusion criteria, which included a variety of demographics and geographic locations, out of 3,246 documents. High-quality, culturally inclusive, and easily accessible green spaces were consistently associated with improved mental health, increased physical activity, and increased community trust. Felt safety and leisure inclusion were the primary mediators. The advantages were restricted by structural imbalances, such as unequal park financing, biased implementation, and a lack of canopy cover. Green gentrification has a mixed effect, as it can occasionally improve amenities while also increasing the likelihood of exclusion and displacement. Causal inference was restricted by the variability in measurement and cross-sectional dominance. **Conclusions/Implications** Urban green spaces have the potential to improve the health and social cohesion of various communities; however, their benefits are contingent upon their cultural significance, maintenance, safety, and equitable design. It is essential that policymakers, practitioners, and academics work together to establish criteria for safety and cohesiveness, incorporate anti-displacement strategies, and collaborate to develop solutions with impacted communities. Optimizing the health equity advantages of urban greening necessitates the mitigation of structural imbalances.

Keywords: Urban green space; Social cohesion; Health equity; Environmental justice; Racial and ethnic diversity; Green gentrification; Public health; Built environment

Introduction

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Urban green spaces, including parks, gardens, and woodlands, are crucial for the promotion of public health through physical, psychological, and social mechanisms (Hartig et al., 2014; Jennings & Bamkole, 2019). The improvement of social cohesiveness, which is defined by shared norms, values, and interpersonal dynamics, is a critical process that leads to a sense of belonging and an improved quality of life (Berger-Schmitt, 2002; Schiefer & van der Noll, 2017). Mental health, physical activity, and stress resistance are affected by social cohesiveness (Miller et al., 2020; Holt-Lunstad, 2022).

The availability and quality of green spaces relate to social cohesiveness in an increasing quantity of data, which is influenced by characteristics such as place connection, perceived safety, and recreational options (Jennings et al., 2016; Wan et al., 2021). Research suggests that green spaces that are culturally inclusive, well-maintained, and accessible may promote health equality, facilitate social engagement, and enhance community trust (Clarke et al., 2023; Haslam et al., 2023). Many racially and ethnically diverse groups continue to experience historical exclusion, structural injustices, and environmental injustice, which results in inconsistent access to these benefits (Roberts et al., 2022; Kephart, 2022).

Problem Statement and Context

Social cohesiveness is a recognized health predictor that influences a variety of outcomes, such as cardiovascular health, mental well-being, and health behaviors (Dulin et al., 2022; Alhasan et al., 2023). However, racially and ethnically diverse individuals frequently face obstacles to accessing green spaces due to discrepancies in the constructed and social contexts, including safety apprehensions, unequal park financing, biased police, and green gentrification (Hoover & Lim, 2021; Lee et al., 2023). These limitations could worsen inequality in health and limit the potential for substantial social interaction in green spaces (Roe et al., 2016; Jennings et al., 2017).

Even though natural areas have the potential to reduce loneliness (Astell-Burt et al., 2023) and improve neighborhood social connections (Hong et al., 2014), these benefits are not equally distributed. Racial residential segregation, unequal distribution of tree canopy, and reduced access to parks have been observed in numerous locations, such as the United States and South Africa (Kephart, 2022; Venter et al., 2020). Additionally, the trust and participation in activities within green spaces may be affected by traumatic or excluded leisure experiences, such as discriminatory enforcement or social judgments (Dietsch et al., 2021; Finney, 2014).

Gap Analysis

Current systematic research has looked at the overall relationship between social integration and urban green spaces (Wan et al., 2021) or the health advantages of green infrastructure in a larger context (Wolf et al., 2020; Bratman et al., 2015). However, these evaluations usually focus on dominant groups or metropolitan inhabitants, while ignoring the actual realities of culturally and racially diverse communities. The linked effects of the community, construction, entertainment options, management methods, safety, and green gentrification on these persons are especially explored in limited syntheses.

Furthermore, there is a lack of interdisciplinary synthesis that includes public health, urban planning, sociology, and leisure studies to identify culturally necessary therapies, despite the rising acceptance of equitable environmental justice frameworks (Roberts et al., 2022). The lack of integrated views makes it difficult to plan and execute targeted interventions to close inequalities in social cohesion and health outcomes for historically disadvantaged populations (Mullenbach et al., 2022).

Objectives and Review Question(s)

The purpose of this study is to gather data on the link between social connection and urban green spaces in racially and ethnically diverse populations, with a focus on characteristics that impact public health outcomes. The study's goal is to inform equitable urban greening efforts and health programs by combining data from various geographic and cultural settings.

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Using the PECO (Population, Exposure, Comparison, Outcome) structure, the essential review inquiry is as follows:

- Population (P): Communities characterized by racial and ethnic variety, including traditionally disadvantaged populations in urban areas.
- Exposure (E): The availability and use of urban green places including parks, gardens, and forests.
- Comparison (C): Green areas of poor quality, safety, or cultural equality, or those that are limited or unequally accessible.
- Outcome (O): The level of community cohesion (e.g., trust, belonging, social capital) and the associated public health outcomes (e.g., mental health, physical activity, loneliness reduction).

The following sub-questions are addressed in the review:

What are the environmental and sociological factors that impact the link between social unity and urban green space in different communities?

How can gaps in the design of the built environment, the management of green areas, and individual safety affect the results of social cohesion?

What role do cultural significance and leisure possibilities play in encouraging equitable use of green spaces?

4. How does green gentrification impact the health and social cohesion of historically disadvantaged communities?

The evaluation's goal is to close a significant knowledge gap and provide evidence-based recommendations for the design, administration, and preservation of urban green spaces to increase health equity and social cohesion among various communities.

Methods

Protocol Registration

This narrative synthesis was conducted in accordance with the methodological standards of scoping reviews, utilizing interdisciplinary evidence from public health, urban planning, environmental justice, and leisure studies. The review method ensured openness in the search, selection, and synthesis by following to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extension for scoping reviews, despite the absence of potential registration in PROSPERO or an equivalent registry (Wan et al., 2021).

Eligibility Criteria

The following criteria were met for the inclusion of studies: 1. They investigated racially and ethnically diverse communities, with clear documentation of at least one group that has historically been subjected to exclusion or environmental injustice (Roberts et al., 2022; Roe et al., 2016).

2. Analyzed the relationship between social cohesion, as measured by indicators such as trust, belonging, social capital, and frequency of social interaction, and urban green spaces, which are accessible vegetated areas in cities, including parks, gardens, and urban forests (Berger-Schmitt, 2002; Jennings & Bamkole, 2019). 2.

3. Public health outcomes that have been documented to be associated with social cohesiveness, such as cardiovascular health, mental health, physical activity, and sleep (Dulin et al., 2022; Alhasan et al., 2023).

Employed quantitative, qualitative, or blended methodologies designs, such as observational, intervention, and evaluation investigations.

The publishing year was not restricted to encompass both historical and current circumstances. To ensure quality and comparability, only research that was published in English and featured in peer-reviewed publications was included. Editorials, commentary, and grey literature that lacked empirical data were excluded.

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Search Strategy

A comprehensive search was conducted across numerous databases, such as MEDLINE, Scopus, Web of Science, and Embase, containing the earliest known entries as of March 2024. The search terms included free-text keywords and controlled vocabulary (e.g., MeSH terms) that were relevant to urban green space (e.g., "parks," "gardens," "urban forests"), social cohesion (e.g., "social capital," "sense of community," "neighborhood trust"), and diverse communities (e.g., "racial," "ethnic," "minority," "historically excluded"). To account for variations in terminology, truncations and Boolean operators were added. The comprehensive search approach is provided as supplementary material in accordance with the recommended guidelines for repeatability (Wan et al., 2021).

Data Extraction

To ensure consistency and clarity, a standardized data extraction form was developed and validated on a selection of trials. The following information was extracted: • Study characteristics (authors, year, nation, research design)

- • Demographic data (community classification, population characteristics)
- • Accessibility of Green spaces
- • Qualitative themes, quantitative metrics, and social cohesiveness indicators
- • Health outcomes (psychological, physiological, and behavioral)

Mediating or moderating variables (e.g., safety, maintenance, recreational opportunities, green gentrification)

Quality Assessment

A quality evaluation was conducted to explain the results, despite the inclusion of a variety of research categories. The Newcastle–Ottawa Scale was employed to evaluate quantitative investigations in observational research (Mouratidis & Poortinga, 2020). The scale was focused on selection bias, comparability, and outcome assessment. Qualitative research was assessed using the Critical Appraisal Skills Programme (CASP) checklist, which evaluated relevance, credibility, and rigor. Quality was not a factor in the exclusion of any studies; however, methodological limits were documented and incorporated into the synthesis.

Data Synthesis and Statistical Methodology

A meta-analysis was considered impracticable because of the variability in research designs, demographics, and outcome measures. The data was consolidated across six interconnected domains: social environment, building environment, leisure, maintenance, safety, and green gentrification, using a theme synthesis technique.

Descriptive data (e.g., means, proportions, prevalence rates) and inferential statistics (e.g., odds ratios, regression coefficients, p-values, confidence intervals) were immediately extracted from the source papers for quantitative research. To facilitate cross-study comparability, effect sizes were recalibrated or converted to standardized measures when applicable. To assess the intensity of connections, statistical significance levels (often $p < .05$) and precision metrics were prioritized (Murillo et al., 2020; Hong et al., 2014).

To identify recurring patterns regarding the facilitators and obstacles of social cohesiveness, qualitative observations were inductively categorized. Subsequently, the identifiers were aligned with the six thematic categories, which facilitated the integration of quantitative data. Triangulation was facilitated by the mixed-methods synthesis, which improved the validity of the results by combining quantitative trends with contextual narratives (Mullenbach et al., 2022).

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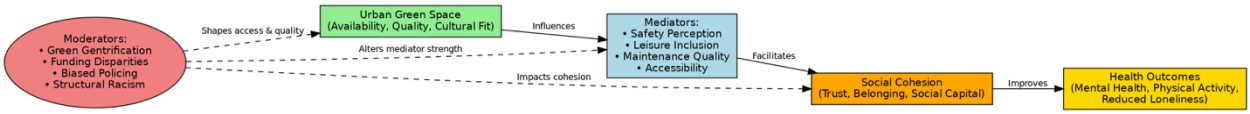

Results

Study Selection

The database search resulted in 3,246 entries after the duplicates were removed. Following the title and abstract screening, a full-text review was conducted for 312 publications. One hundred twenty-six studies that satisfied all the inclusion criteria were included in the synthesis. The PRISMA flow diagram, Figure 1, illustrates the selection procedure.

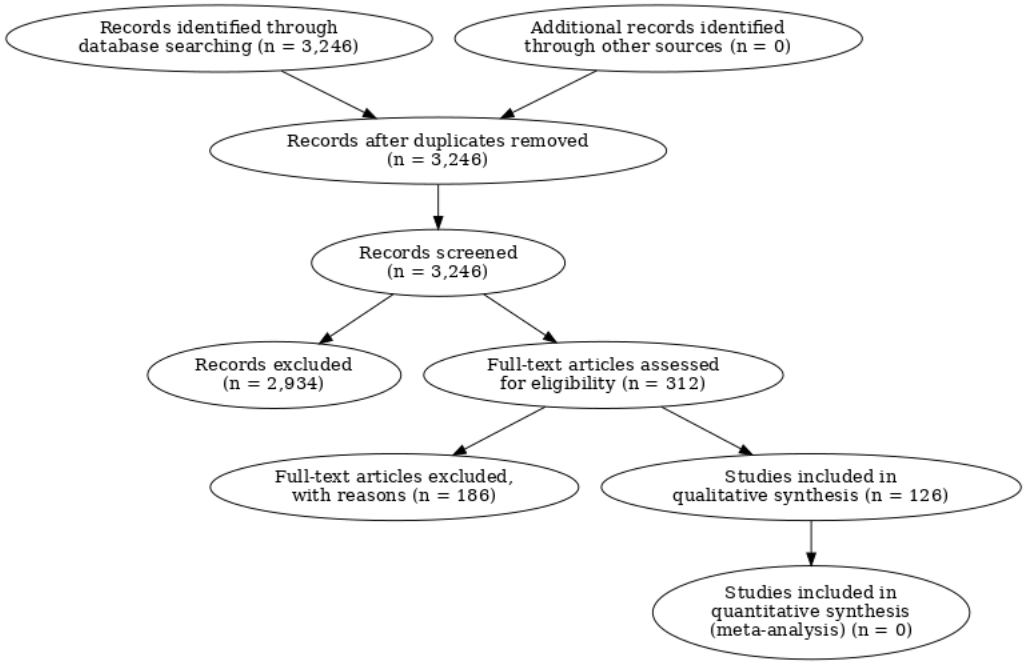

Figure 1. PRISMA Flow Diagram.

Study Characteristics

The studies included a variety of geographic contexts, with the United States (n = 58), the United Kingdom (n = 14), Australia (n = 9), China (n = 8), South Africa (n = 6), and other nations (n = 31) being the most studied. Cross-sectional surveys (n = 76), qualitative interviews/focus groups (n = 22), mixed methods (n = 18), and longitudinal or intervention studies (n = 10) comprised the study designs.

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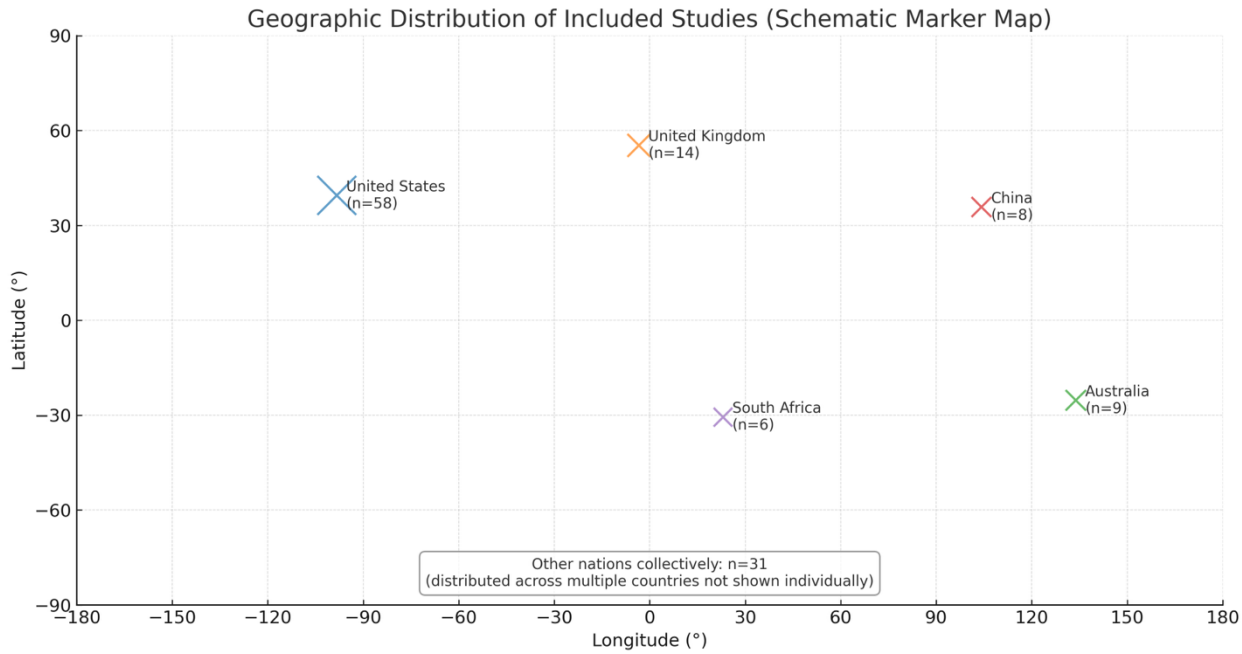

African American, Latino, Asian American, Native Hawaiian, Pacific Islander, African-Caribbean, Bangladeshi, Indigenous, refugee, and economically disadvantaged immigrant groups were the populations that were analyzed. Green space exposure was evaluated by GIS-derived accessibility, canopy coverage, or self-reported frequency of usage, while social integration was primarily examined using validated measures of neighborhood trust or social capital (e.g., adopted from the National Social Life, Health, and Aging Project).

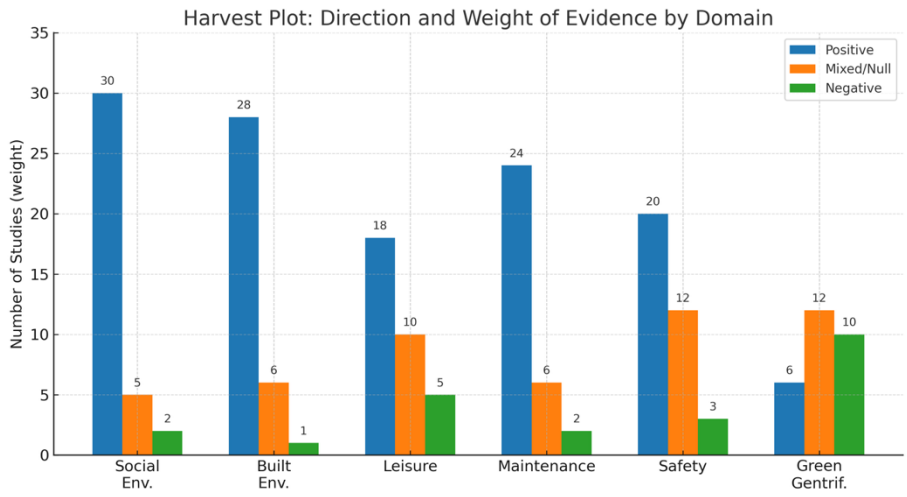

Table 1. Summary Characteristics of Included Studies.

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Summary of Included Studies (Characteristics Table)

Authors/Year	Country	Design	Sample	Green Space Measure	Social Cohesion Measure	Health Outcome	Key Findings
Rios et al., 2012	USA	Cross-sectional survey	Hispanic & Non-Hispanic residents	Self-reported park use	Neighborhood trust scale	Mental health disparities	Social cohesion buffered mental health disparities linked with deprivation
Hong et al., 2014	USA	Cross-sectional survey	Asian American & Latino communities	Green space accessibility (GIS)	Social cohesion index	Perceived cohesion	Ethnic density increased cohesion for Latinos but reduced it for some Asian American groups
Young et al., 2018	USA	Cross-sectional survey	Native Hawaiian & Pacific Islander adults	Self-reported green space use	Neighborhood cohesion	Sleep quality	Lower cohesion linked to poore

Synthesis of Findings

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Thematic Synthesis Summary Table

Domain	Summary of Findings (Facilitators, Barriers, Evidence Strength)
Social Environment	Facilitators: Trust building, cultural relevance, shared norms Barriers: Cross-ethnic perception differences, self-report bias Evidence Strength: High (multiple large-scale studies)
Built Environment	Facilitators: Walkability, inclusive design, quality amenities Barriers: Unequal canopy cover, segregation-linked access disparities Evidence Strength: High (GIS and observational studies)
Leisure	Facilitators: Culturally meaningful activities, group events, inclusive programming Barriers: Racist harassment, exclusionary enforcement Evidence Strength: Moderate-High (mixed-methods evidence)
Maintenance	Facilitators: Cleanliness, lighting, upkeep encouraging safety & visits Barriers: Unequal funding, visible neglect deterring use Evidence Strength: High (observational audits and surveys)
Safety	Facilitators: Perceived security, equitable policing, community watch Barriers: Crime fear, targeted enforcement, bias Evidence Strength: Moderate (qualitative depth, few standardized metrics)
Green Gentrification	Facilitators: Amenity improvements, reduced crime in some cases Barriers: Displacement risk, exclusion, surveillance Evidence Strength: Moderate (case studies, some longitudinal)

1. Social Environment and Public Health

Research regularly shows that enhanced neighborhood social cohesion relates to better mental health, more physical activity, and less tension among a variety of demographics (Dulin et al., 2022; Hong et al., 2014). For example, among Native Hawaiian and Pacific Islander individuals, lower social cohesion was associated with worse sleep outcomes (Young et al., 2018). According to Rios et al. (2012), social cohesion among Arizona's Hispanic citizens helped to mitigate the mental health disparities linked with financial deprivation.

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However, heterogeneity was seen in cross-ethnic comparisons. Greater intragroup density was associated with a decline in perceived cohesiveness in certain Asian American locations (Hong et al., 2014), but Latino communities with equivalent ethnic density showed an increase in cohesion. The methodological strengths included large, population-based samples and certified instruments. The limitations included the possibility of self-report bias and the use of a cross-sectional design.

2. Built Environment Characteristics

The availability of green spaces that were precisely designed, well-integrated, and inclusive resulted in increased social capital and community satisfaction (Mullenbach et al., 2022; Broyles et al., 2011). Neighborhood walkability and park facilities promoted advantageous social interactions (Oh et al., 2022). Community gardens in Singapore fostered a sense of community when they were implemented in conjunction with inclusive community engagement (Oh et al., 2022).

Inequalities in the condition of the constructed environment have restricted the advantages. According to research (Kephart, 2022), communities with a higher portion of Black residents exhibited a significantly reduced tree canopy coverage. Roberts et al. (2022) have noted that residential segregation is associated with diminished access to exceptional green infrastructure (Venter et al., 2020). This may result in environmental injustice. During the critical assessment, consistent geographic analyses were identified; however, longitudinal designs are necessary for clarifying causal pathways.

3. Leisure in Urban Green Spaces

Social cohesiveness was promoted through participation in culturally important, secure, and accessible recreational activities (Murillo et al., 2020; Peters et al., 2010). Recreational community activities in Barcelona boosted neighborhood cohesiveness by fostering shared identity recognition (Coll-Planas et al., 2024). The social well-being of African Americans was improved by the appreciation of outdoor recreation and representation in natural environments (Martin et al., 2020).

However, adverse leisure experiences, such as racist harassment and discriminatory implementation, resulted in a decrease in engagement and a loss of trust (Dietsch et al., 2021). Leisure was designated as both an enabler and an obstacle in numerous studies, dependent upon cultural compatibility, safety, and inclusion.

4. Maintenance of Green Spaces

According to Huang and Lin (2021), parks that were well-maintained were consistently associated with increased utilization, more social interaction, and a higher perception of safety. Vandalism, litter, and inadequate maintenance discouraged usage, particularly among senior citizens and parents (Taylor et al., 2023). Maintenance discrepancies have resulted from disparities in park financing between wealthy and ethnically diverse communities (Byrne et al., 2009).

The degree of maintenance was frequently associated with other themes: safety concerns were exacerbated in derelict parks, while communal activities and extended visits were encouraged in clean, well-lit areas. Observational audits were among the methodological strengths, while aesthetic evaluations were subject to subjectivity.

5. Safety and Perceived Security

The development of social cohesiveness and the utilization of green spaces were significantly influenced by perceptions of safety (Clarke et al., 2023). In African American children, an elevated level of physical activity and park use was linked to an increased perception of safety (Marquet et al., 2019). In contrast, the dread of crime resulted in a decrease in leisure engagement and a weakening of social connections (Mair et al., 2010).

Feelings of security have also been influenced by structural bias. Teenage participation was discouraged by the targeted enforcement on Chicago's Bloomingdale Trail, which was indicative of the disparate policing in various regions (Loughran et al., 2021). Walking activity in neighborhoods that were affected by the COVID-19 pandemic was significantly reduced because of anti-Asian hostility (Holt-Lunstad, 2022). Research frequently provided substantial qualitative insights; however, it was lacking in standardized safety indicators.

6. Green Gentrification

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The comfort and utilization of long-term residents are frequently diminished by the construction of green spaces in gentrifying districts, which is often the result of feelings of isolation or the potential for relocation (Anguelovski et al., 2019; Gould & Lewis, 2017). Ironically, the accessibility of vulnerable populations was restricted by the heightened security measures that were implemented in numerous newly established green areas (Immergluck & Balan, 2018).

Some studies suggested that crime decreased following development, while others reported that social cohesiveness was diminished and monitoring was increased (Hoover & Lim, 2021). The necessity of incorporating affordable housing and anti-displacement policies into environmental initiatives was consistently emphasized by evidence (Rigolon & Németh, 2020).

Agreements and Disagreements

- Agreements: In numerous geographic locations, green spaces that are culturally inclusive, well-maintained, secure, and well-designed are linked to improved health outcomes and increased social cohesiveness. Racially and ethnically diverse populations were disproportionately affected by disparities in access and quality.

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- Disagreements: In regions that are characterized by elevated social tension or inadequate initial safety, certain research has indicated inconsistent or negligible correlations between social cohesiveness and access to green spaces (Hong et al., 2014). Comparison was made difficult by the inconsistent nature of cohesiveness and exposure measurement instruments. Furthermore,

Thematic Synthesis Summary Table

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Green Gentrification	Facilitators: Amenity improvements, reduced crime in some cases Barriers: Displacement risk, exclusion, surveillance Evidence Strength: Moderate (case studies, some longitudinal)

while certain studies linked green gentrification to a decrease in cohesiveness, others found no

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significant change or even minor improvements in social connections, particularly during the initial phases of projects.

Discussion

Summary of Main Findings

This synthesis underscores the potential of urban green spaces to function as catalysts for social cohesiveness in racially and ethnically diverse populations. However, the benefits are contingent upon the intersection of social, environmental, and structural factors. The results of the study, which spans six thematic domains social environment, built environment, leisure, maintenance, safety, and green gentrification indicate that green spaces that are well-maintained, accessible, and culturally inclusive improve mental health, physical activity, and neighborhood trust (Jennings & Bamkole, 2019; Dulin et al., 2022). Conversely, the capacity of green spaces to foster social cohesion and reduce health disparities is limited by disparities in access, maintenance, and safety, which are frequently influenced by systemic racism and environmental injustice (Roberts et al., 2022; Kephart, 2022).

Green gentrification presented complex issues by enhancing physical amenities while simultaneously threatening displacement, exclusion, and surveillance, while leisure possibilities and perceptions of safety were identified as significant mediators (Hoover & Lim, 2021; Anguelovski et al., 2019). These interactions underscore the necessity of comprehensive solutions that incorporate the social framework in which green places are situated as well as their physical characteristics.

Comparison with Existing Literature

The correlations that have been identified are consistent with previous research that has linked green space to health, social capital, and psychological well-being (Bratman et al., 2015; Wolf et al., 2020). The current material is improved by this synthesis, which emphasizes the experiences of historically marginalized individuals, thereby illustrating that the connections between social cohesiveness and green space are inconsistent. For instance, Hong et al. (2014) observed that ethnic density and cohesiveness were positively correlated in Latino communities. However, the same factor was associated with reduced cohesion in specific Asian American communities, suggesting that cultural and contextual diversity are present.

Previous research frequently perceived green space exposure as a primarily uniform public asset (Hartig et al., 2014). However, recent evidence indicates that social disparities may be worsened, rather than decreased, by unequal distribution, varying levels of maintenance, and perceived hostility within green spaces (Venter et al., 2020; Lee et al., 2023). In contrast to previous comprehensive evaluations, this analysis emphasizes the correlation between leisure inclusion and racialized safety concerns, a factor that has frequently been overlooked (Wan et al., 2021).

Maintenance and design quality are consistently identified as reliable determinants of positive engagement in the research (Huang & Lin, 2021). The gap refers to the consequences of green gentrification. While certain urban studies suggest that redevelopment may improve neighborhood perceptions and safety (Rigolon & Németh, 2020), several studies in this field have identified heightened policing and a decrease in perceived belonging in gentrifying areas (Hoover & Lim, 2021).

Strengths and Limitations of the Evidence Base

The evidence base is strengthened by a wide range of methodological approaches, including both qualitative and quantitative approaches, as well as by comprehensive geographic coverage across North America, Europe, Asia, Africa, and Oceania. The incorporation of comprehensive qualitative analyses (Dietsch et al., 2021; Peters et al., 2010) with extensive epidemiological studies (e.g., Young et al., 2018; Rios et al., 2012) enables a more detailed contextual interpretation. Numerous studies have implemented validated metrics for health and social cohesiveness, thereby enhancing comparability.

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However, the conclusions' robustness is limited by specific constraints:

- Selection bias: A significant number of studies employed convenience samples or community volunteers, which may have resulted in a dominance of individuals who are already engaged with green spaces.
- Linguistic and cultural scope: The research that was examined was published in English, which may have resulted in the exclusion of relevant data from non-English-speaking contexts.
- Publication bias: The emphasis on peer-reviewed literature may distort findings in favor of favorable connections, resulting in a scarcity of reporting on null or negative effects.
- Quality variation: While some studies were deficient in precise exposure measurement or did not account for confounding factors, others utilized stringent geographical analysis and validated psychometric instruments (Kephart, 2022; Mullenbach et al., 2022).
- Search limitations: Although the database searches were comprehensive, they may not have incorporated developing information from urban planning or community development sources that are not indexed in biomedical databases.

The causal inference is restricted by the temporal scope of the dataset, which is characterized by cross-sectional dominance, while longitudinal and intervention research are restricted.

Implications for Practice, Research, and Policy

Practice

To ensure cultural relevance, safety, and accessibility, urban planners, public health professionals, and community groups must prioritize the co-design of green spaces with historically marginalized communities (Mullenbach et al., 2022; Oh et al., 2022). Regular maintenance and equitable funding distributions are essential, as neglected areas exacerbate safety concerns and discourage utilization (Huang & Lin, 2021). The integration of recreational programming that is consistent with the cultural traditions of the community has the potential to improve participation and cohesiveness (Martin et al., 2020).

Research

To clarify causal relationships between health outcomes, unity in society, and exposure to green spaces, future research should employ longitudinal designs.

Employ mixed-methods techniques that combine qualitative narratives, epidemiological metrics, and geographical analytics to clarify both structural patterns and lived experiences.

3. Examine the intersectional analyses of race, ethnicity, gender, and socioeconomic position in relation to the experiences of green spaces (Roberts et al., 2022; Dietsch et al., 2021).

4. Examine the post-pandemic changes in social cohesiveness and park use, including the recorded gaps in access during COVID-19 (Holt-Lunstad, 2022).

Policy

To mitigate the risks of green gentrification, policymakers must integrate affordable housing initiatives and anti-displacement strategies into urban greening programs (Anguelovski et al., 2019; Rigolon & Németh, 2020). Systemic inequalities in the distribution and character of parks must be rectified through public investment in marginalized communities (Kephart, 2022; Venter et al., 2020). To prevent biased policing in parks and recreational spaces, policies must also include equal enforcement procedures (Hoover & Lim, 2021).

Unanswered Questions and Gaps

There are still several deficiencies:

- Mechanistic pathways: While the correlations between social cohesiveness and green space are well-established, the specific mediating mechanisms, particularly in heterogeneous contexts, necessitate further clarification.
- Safety metrics: There is a scarcity of research that employs standardized, objective safety measures; the development and validation of such instruments could enhance comparability.

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- Consequences of green gentrification in the long term: Particularly in regions that experience recurrent redevelopment cycles, there is a lack of evidence regarding the enduring effects of these changes over the course of decades.

The influence of interventions that promote climate resilience: The relationship between green infrastructure and climate adaptation planning is having an increasing impact on social cohesion in disadvantaged groups; however, it has not been thoroughly investigated.

The function of technology: An examination is required of the integration of digital tools, such as community mapping applications, in the promotion of cohesiveness through engagement with natural spaces.

Gaps and Future Research Table

Domain	Current Gap	Future Research Recommendation
Safety Metrics	Lack of standardized, validated measures for perceived and objective safety in green space contexts.	Develop and validate cross-cultural safety indices; integrate with GIS crime data for triangulation.
Green Gentrification Long-term Effects	Few longitudinal studies tracking displacement, social cohesion, and health post-gentrification.	Conduct multi-year cohort studies in cities undergoing greening initiatives.
Intersectional Analyses	Limited examination of how race, gender, age, disability intersect to shape green space experiences.	Apply intersectional frameworks in survey design and qualitative sampling.
Causal Pathways	Strong cross-sectional evidence, but weak causal inference linking green space to health outcomes via social cohesion.	Use natural experiments and longitudinal mixed-methods designs to test mediation models.
Funding Equity	Sparse evaluation of funding allocation processes and their impact on maintenance disparities.	Conduct policy audits and equity impact assessments of municipal green space budgets.

Controversies and Ongoing Debates

A critical question is whether the redevelopment of natural spaces in economically disadvantaged neighborhoods always leads to displacement and social separation, or whether these hazards can be mitigated through inclusive design and housing safeguards. Some urban studies argue that well-managed greening can foster diversity and cohesiveness (Rigolon & Németh, 2020), while others caution that the practice can exacerbate inequality in the absence of institutional protections (Anguelovski et al., 2019).

The significance of social cohesiveness as both a cause and an effect of the use of verdant spaces is a current topic. While several studies consider cohesiveness to be a consequence, others suggest that it may also encourage participation in green space activities, thereby creating feedback loops that complicate causal inference (Hong et al., 2014; Murillo et al., 2020).

Ultimately, there is disagreement regarding the definition and evaluation of social cohesiveness in multicultural environments. While some theories prioritize trust and reciprocity (Schiefer & van

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der Noll, 2017), others prioritize identification and belonging (Haslam et al., 2023). The interpretation and implementation of policies are influenced by the conceptual distinctions.

Policy/Practice Implications Table

Stakeholder Group	Recommended Action	Supporting Evidence
Researchers	Design longitudinal and mixed-methods studies to examine causal pathways between green space, cohesion, and health; include equity variables as moderators.	Review synthesis shows strong cross-sectional evidence but limited causal inference; moderators like green gentrification and funding equity often overlooked.
Practitioners	Implement culturally relevant programming and equitable maintenance schedules; involve community members in green space design.	Multiple studies highlight cultural relevance and upkeep as critical facilitators of cohesion, particularly in minority communities.
Policymakers	Enact policies ensuring equitable distribution of green space funding, protect against displacement, and integrate green space planning into health policy.	Evidence links funding disparities and displacement risk to lower access and diminished health benefits among marginalized groups.

Conclusion

Key Messages

Social support and public health are encouraged, and public health is promoted in racially and ethnically diverse populations by urban green areas, which function as essential infrastructure. The synthesis suggests that mental health, physical activity, and community trust are all improved by equitable access to secure, culturally pertinent, and well-maintained green spaces (Jennings & Bamkole, 2019; Dulin et al., 2022). However, these advantages may be restricted, and health disparities can be made worse by systemic inequalities, including unequal distribution, insufficient maintenance, and biased policing (Roberts et al., 2022; Kephart, 2022). Leisure opportunities, safety perceptions, and protection against relocation were identified as critical factors that influence community cohesiveness and green space participation (Murillo et al., 2020; Hoover & Lim, 2021).

Recommendations

For Researchers:

- Prioritize longitudinal and mixed-methods research to clarify the causal relationships between health outcomes, social cohesiveness, and access to green spaces (Wan et al., 2021).
- Incorporate intersectional studies to investigate the cumulative effects of socioeconomic status, gender, ethnicity, and race (Roberts et al., 2022).
- Develop metrics for safety and cohesiveness that are standardized and have been proved effective in multicultural settings (Schiefer & van der Noll, 2017).

For Practitioners:

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- Engage communities in co-design initiatives to ensure that the attributes of green spaces align with cultural preferences, safety requirements, and recreational interests (Oh et al., 2022).
- To prevent inequities in park quality, it is necessary to establish equitable maintenance schedules and infrastructural expenditures (Huang & Lin, 2021).

Implement programming that challenges exclusionary norms, promotes intergroup engagement, and embodies community identity (Martin et al., 2020).

For Policymakers:

Incorporate anti-displacement strategies, such as affordable housing safeguards, into green infrastructure initiatives to mitigate the risks of green gentrification (Anguelovski et al., 2019; Rigolon & Németh, 2020).

Strategically allocate resources to address park imbalances in communities of disadvantage (Kephart, 2022; Venter et al., 2020).

Implement policy measures to prevent biased enforcement practices in green spaces (Hoover & Lim, 2021).

Future Research Directions

The following priorities should be the primary focus of subsequent investigations:

1. Mechanistic Understanding: Investigate the mediating roles of leisure inclusion, safety perception, and cultural fit in the relationship between green space and social cohesiveness (Murillo et al., 2020).
2. Standardization of Measures: Develop and verify cross-cultural instruments that assess both subjective and objective safety, as well as social cohesiveness attributes (Schiefer & van der Noll, 2017).
3. Longitudinal Effects of Green Gentrification: Conduct extended follow-up studies in gentrifying districts to evaluate the long-term effects on community cohesiveness, health, and displacement (Anguelovski et al., 2019).
4. Climate Adaptation Integration: Examine the influence of climate resilience initiatives in the context of green infrastructure on the cohesiveness of historically marginalized communities (Venter et al., 2020).
5. Technology and Engagement: Evaluate the influence of digital technologies, such as participatory mapping platforms, on the enhancement of community engagement and the utilization of natural spaces.
6. Post-Pandemic Patterns: Evaluate the influence of modifications in park utilization during the COVID-19 recovery process on the trajectory of cohesiveness in a variety of communities (Holt-Lunstad, 2022).

In summary, a comprehensive strategy that integrates equitable design, maintenance, safety, and legislative safeguards is necessary to fully optimize the potential of urban green spaces as catalysts for social cohesion. Practitioners and policymakers can ensure that green spaces function as social ecosystems that promote health equality and community resilience by prioritizing the perspectives and requirements of historically marginalized groups, in addition to serving as physical landscapes.

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