Open Access

Public Organization Management

Vol. 14(1), (Series 53): 89-102/ 2026

https://doi.org/10.30473/ipom.2025.74645.5193

E-ISSN: 2538-600X P-ISSN: 2322-522X

ORIGINAL ARTICLE

Analysis of the Role of Pedestrian-Oriented Cities in Increasing Physical Activity Among Citizens

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Receive Date: 21/May/2025
Revise Date: 24/July/2025
Accept Date: 29/July/2025

How to cite
Aghajani, F., Zarafshan, A., & Jafarzadeh Kuchaki, B. (2026). Analysis of the Role of Pedestrian-Oriented Cities in Increasing Physical Activity Among Citizens. *Public Organization Management*, 14(1), 89-102.

EXTENDED A B S T R A C T

Introduction

Extensive urbanization in recent decades has profoundly impacted lifestyle patterns, behavioral models, and public health in urban populations. The horizontal and sprawling growth of cities, expansion of low-density urban fabrics, increasing dependency on private vehicles, and neglect of human-centered aspects in urban design have led to a significant reduction in physical activity opportunities, increased air pollution, traffic congestion, psychological stress, and ultimately decreased quality of life in urban environments. Inappropriate design of urban environments plays a crucial role in the emergence of non-communicable diseases such as cardiovascular diseases, obesity, type 2 diabetes, depression, and anxiety. According to official statistics from Iran's Ministry of Health, public health conditions have deteriorated significantly. Approximately 70% of Iranians struggle with overweight issues, with obesity prevalence reaching dangerous levels. This situation becomes more concerning given that 80% of the population suffers from physical inactivity and 47% of citizens do not engage in any form of exercise.

In response to these challenges, innovative approaches in urban planning and design have prioritized restructuring the physical and functional frameworks of cities to promote citizen health. "Walkable Cities" have emerged as a cross-sectoral strategy with environmental, social, and health functions, emphasizing urban environment design that makes walking not only possible but desirable, safe, comfortable, attractive, and efficient. The theoretical foundation of walkability development traces back to pioneering works emphasizing the importance of "eyes on the street" and vibrant urban spaces for enhancing security, social participation, and sense of belonging. This includes three fundamental principles in pedestrian-oriented environment design: spatial invitation, ability to pause and socially interact, and human connection with environmental scale. These principles, combined with the "third place" theory that considers spaces between home and work crucial for psychological and social health, form the theoretical foundation for developing walkable spaces. Walkable cities, through providing appropriate infrastructure, land-use diversity, and creating quality public spaces, facilitate increased daily physical activity. Based on the ecological health model, health-related behaviors result from complex interactions between individual, interpersonal, organizational, and environmental factors, with appropriate urban design serving as the key environmental factor that positively impacts citizen health through facilitating daily physical activity, reducing exposure to pollutants and noise, decreasing stress, increasing mental restoration, and enhancing social

interactions and place attachment.
International studies demonstrate that cities with high walkability scores exhibit lower prevalence of non-communicable diseases and better mental health indicators. Despite extensive global evidence supporting walkability benefits, many Iranian cities remain dominated by traditional car-oriented urban design approaches, highlighting a significant gap in utilizing urban design capacity for promoting citizen health and addressing the fundamental question of how walkable city elements can influence citizen physical activity patterns.

Mothodology

This research employed a qualitative thematic analysis method to analyze the role of walkable cities in increasing physical activity among citizens. Thematic analysis was selected due to its methodological flexibility and ability to reveal hidden patterns in qualitative data, making it suitable for the exploratory nature of this study. The complexity of the research topic, which intersects urban planning, public health, and physical activity domains, required a method capable of identifying and organizing complex relationships between different concepts. The thematic analysis approach provided a three-level hierarchical structure (basic, organizing, and global themes), enabling logical aggregation of findings from details to generalities. The thematic analysis process followed six systematic stages: deep familiarization with data through repeated text reading, initial manual coding, theme identification and formation, theme review and refinement, precise definition and naming at three hierarchical levels, and final report compilation.
The study population comprised experts and specialists in urban design, urban planning, public health, physical activity, and public sports. Using purposive sampling and snowball technique, participants were selected based on inclusion criteria of minimum master's degree in related fields and five years of professional experience. Semi-structured interviews averaging 60 minutes each were conducted until theoretical saturation was achieved at the thirty-first interview. Four additional interviews were conducted for confirmation, resulting in 35 total interviews. Research quality was ensured using Guba and Lincoln's four criteria: credibility (interviews continued until saturation, results reviewed with participants), transferability (demographic characteristics and process details documented), dependability (all stages documented, audio files preserved), and confirmability (independent coding by two researchers with 79% inter-coder agreement). These measures collectively strengthened the research findings' quality and reliability, enabling practical application of results in urban planning decision-making processes. The comprehensive thematic analysis methodology ensured robust data collection and analysis suitable for understanding the complex relationships between urban design and citizen physical activity patterns.

Fingdings

The thematic analysis revealed six global themes explaining how walkable cities influence citizens' physical activity. Safety and Accessibility for Physical Activity emerged as the foundational theme, encompassing physical and social security in pedestrian spaces, quality walking infrastructure, and connectivity of pedestrian routes. Experts emphasized that adequate safety and accessibility are prerequisites for encouraging outdoor physical activities.
Environmental Attractiveness and Quality as Physical Activity Motivators represents aesthetic and comfort dimensions that encourage physical activity, including visual beauty, artistic elements, climatic comfort, and environmental cleanliness. Participants highlighted that attractive, well-maintained environments significantly increase citizens' motivation for outdoor activities.
Diversity, Vitality, and Social Inclusivity captures social dynamics that make walkable spaces engaging, encompassing variety of urban activities, social events in public spaces, and dedicated spaces for different age groups. Experts noted that vibrant, inclusive environments create sustained engagement in physical activity.
Specialized Physical Activity Infrastructure addresses technical requirements for supporting active lifestyles, including public sports facilities, cycling infrastructure,

and spaces for emerging sports. This theme reflects the need for purposefully designed facilities beyond basic walking infrastructure.
Social and Institutional Support for Physical Activity encompasses broader support systems including social and policy incentives, education, awareness-raising, and technology integration. Participants emphasized that infrastructure alone is insufficient without supportive social and institutional frameworks.
Physical-Functional Cohesion of Walkable Cities represents integrative aspects of successful walkable urban design, including public transportation connections, compact multifunctional design, traffic management with pedestrian prioritization, and citizen participation in designing and maintaining pedestrian spaces. This theme emphasizes the holistic approach required for creating walkable urban environments that effectively promote physical activity.

Discussion and Conclusion

This study comprehensively examined the role of walkable cities in increasing citizens' physical activity levels, revealing six key factors that significantly impact physical and mental health. The findings demonstrate that successful walkable cities require a holistic approach integrating multiple dimensions. Physical infrastructure alone is insufficient; social and cultural considerations prove equally crucial for sustained citizen engagement. Vulnerable populations, particularly children, elderly, and women, benefit most from comprehensive safety measures and inclusive design approaches. Environmental quality emerges as a critical motivator, while institutional support systems provide essential foundations for community-wide physical activity promotion. The interconnected nature of these factors suggests that piecemeal approaches are likely to fail. Successful implementation requires coordinated efforts across urban planning, public health, transportation, and social policy domains. Municipalities must adopt comprehensive strategies addressing infrastructure development, policy reform, community engagement, and cultural change simultaneously. This includes improving safety through smart lighting and surveillance systems, enhancing environmental attractiveness through urban art and green spaces, developing specialized infrastructure like cycling lanes and public sports facilities, and implementing supportive policies with educational campaigns. These findings provide actionable insights for urban planners and policymakers seeking to create healthier, more active communities through strategic walkable city development that promotes both individual and collective well-being.

K E Y W O R D S
Pedestrian-oriented City, Physical Activity, Thematic Analysis