JOURNAL OF CULTURAL ANALYSIS AND SOCIAL CHANGE

Journal of Cultural Analysis and Social Change,
2025, 10(3), 2177-2187
ISSN: 2589-1316

Who uses Outdoor Fitness Equipment in Urban Spaces? User Profiles and Usage Patterns: A Scoping Review

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Citation: Urbano, M., Giakoni, F., Larrinaga-Undabarrena, A., Río, X., Coca, A., & Martínez-Santos, R. (2025). Who uses Outdoor Fitness Equipment in Urban Spaces? User Profiles and Usage Patterns: A Scoping Review. *Journal of Cultural Analysis and Social Change*, *10*(3), 2177–2187. https://doi.org/10.64753/jcasc.v10i3.2729

Published: December 03, 2025

ABSTRACT

This scoping review aims to systematically map the available evidence on the use of outdoor fitness equipment (OFE) in urban spaces, identifying user profiles, usage patterns, contextual factors, barriers, and facilitators. The review followed the PRISMA-ScR guidelines, with the protocol registered in the Open Science Framework (osf.io/h2tz8). Searches were conducted in Web of Science and Scopus databases, including studies published between 2010 and 2025 in English or Spanish that directly observed the use of OFE in public settings. Ten studies met the inclusion criteria. Results show that OFE are primarily used by adults and older adults, with participation varying according to sex and cultural context. Usage is characterized by short, moderate-intensity sessions, most frequently in the morning and late afternoon, with greater attendance on weekends. Environmental and design factors—such as proximity, maintenance, shade, and complementary amenities—strongly influence participation levels. Reported barriers include poor maintenance, overcrowding, and lack of knowledge about correct use, whereas accessibility, safety, and social interaction act as key facilitators. Only one study assessed cost-effectiveness, revealing limited economic evidence. OFE are an accessible and low-cost strategy for promoting community physical activity, but their effectiveness depends on integration with broader urban health and mobility strategies. Future research should explore long-term impacts, economic feasibility, and the role of local governance and technical management in sustaining these facilities.

Keywords: Outdoor Fitness Equipment, Physical Activity; User Profiles; Urban Parks; Built Environment

INTRODUCTION

In recent decades, cities have undergone a rapid process of urbanization that has transformed lifestyles and reduced opportunities for daily movement. This trend is linked to the increase in physical inactivity, recognized as one of the main risk factors for chronic non-communicable diseases and premature mortality worldwide (World

Health Organization [WHO], 2020). In response to this challenge, contemporary urban policies have begun to prioritize the development of active spaces that promote physical activity, social cohesion, and community well-being (Sallis et al., 2016).

Urban parks and green environments have proven to be key settings for promoting physical activity, providing free and accessible spaces for play, sport, and recreation (Manta et al., 2018; Stewart et al., 2018; Van Dyck et al., 2013; Van Hecke et al., 2017; Zhai et al., 2020). Moreover, the configuration of urban space can influence not only physical activity levels (Kaczynski, Potwarka, & Saelens, 2008) but also the development of social capital, perceptions of safety, and health equity (Bedimo-Rung, Mowen, & Cohen, 2005; Sallis et al., 2016). Thus, cities that invest in well-designed recreational infrastructure can contribute to the creation of more active and cohesive populations (Bedimo-Rung, Mowen, & Cohen, 2005; Kaczynski, Potwarka, & Saelens, 2008; Sallis et al., 2016).

Within this framework, outdoor fitness equipment (hereafter OFE), also known as *fitness zones*, has proliferated in urban settings worldwide (Chow, Mowen, & Wu, 2017; Cranney et al., 2016; Furber et al., 2014; Iepsen & Silva, 2015; Veitch et al., 2021; Zhai et al., 2020). Local governments consider them a low-cost strategy to encourage community-level physical activity by installing durable exercise machines in outdoor spaces that enable strength, flexibility, and aerobic training (Cohen et al., 2012; Cranney et al., 2016; Furber et al., 2014; Iepsen & Silva, 2015). Their appeal lies in their accessibility and free use, positioning them as an inclusive tool in contexts of social inequality (Lee, Lo, & Ho, 2018). In fact, recent studies show that OFE are associated with increased park attendance and users' energy expenditure (Cohen et al., 2012; Cranney et al., 2016).

However, the impact of this facilities is heterogeneous. In some contexts, increases in moderate and vigorous physical activity have been observed, whereas in others, usage is limited to short sessions of insufficient intensity to meet WHO recommendations (Ng et al., 2021). Likewise, evidence suggests that factors such as design, location, maintenance, availability of complementary infrastructure (shade, water, restrooms...), and users' sociodemographic characteristics can influence the use levels (Kaczynski, Stanis, & Besenyi, 2014).

Despite the growing political and scientific interest in outdoor fitness equipment, no comprehensive synthesis has yet been conducted to determine who uses these facilities, how they are used, and what usage patterns emerge in different contexts. Previous reviews have focused on their overall effectiveness or health benefits (Lee et al., 2018; Ng et al., 2021), but none have specifically addressed user profiles, usage dynamics, barriers and facilitators, or the quality of the motor activity they generate.

Therefore the objective of this scoping review is to systematically map the available evidence on outdoor fitness equipment, identifying user profiles, usage patterns, contextual and environmental factors, barriers and facilitators, as well as the nature of the motor actions performed, in order to guide interventions and urban policies that maximize their impact on public health and social cohesion

METHOD

This scoping review was conducted following the PRISMA extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanations (see Supplementary Material). The protocol of this scoping review was previously registered on the Open Science Framework (OSF) and is available at osf.io/h2tz8.

A bibliographic search was carried out in the Web of Science and Scopus databases by two independent experienced researchers. The selected articles were those that demonstrated direct observation and analysis of outdoor fitness equipment (OFE), including senior exercise parks and calisthenics parks located in municipal public spaces.

To be included, studies had to meet the following inclusion criteria:

1. Direct observation conducted in facilities with OFE.
2. Reporting of user profiles (age, sex, sociodemographic characteristics).
3. Analysis of usage patterns (frequency, duration of stay, intensity, type of activity, social interaction).
4. Description or characterization of the installed equipment (type, quantity, layout, accessibility, and maintenance condition).
5. Publication in English or Spanish between 2010 and 2025.

In addition, studies meeting any of the following exclusion criteria were discarded:

1. Research protocols or systematic reviews.
2. Studies focused on parks or green spaces without specific attention to OFE.
3. Research in which the main variable was not the observation of OFE use and equipment.
4. Articles where OFE were only mentioned tangentially.

The literature search was restricted to keywords, titles, and abstracts. Search terms were combined using the Boolean operator OR within each group and then combined between groups according to the PCC (Population, Concept, Context) framework (Pollock et al., 2023) using the Boolean operator AND (Table 1). The truncation

operator ("*") was used to capture word roots. The final search strategy was based on the terms described in Table 1, ensuring broad and systematic coverage of the available literature.

Table 1. Search Strategy

Element	Description	Search Terms Used
P (Population)	Users of outdoor physical exercise facilities.	"outdoor gym*" OR "outdoor fitness equipment" OR "fitness equipment in public parks" OR "exercise park*" OR "fitness zone*" OR "senior playground*" OR "active park*" OR "calisthenics park*" OR "parques biosaludables" OR "circuitos biosaludables" OR "gimnasios al aire libre" OR "parques de calistenia" OR "parques activos" OR "circuitos de ejercicio"
C (Concept)	User profiles and usage patterns related to physical activity practice.	"physical activity" OR "exercise" OR "sport" OR "play" OR "recreation" OR "leisure activities" OR "actividad fisica" OR "ejercicio" OR "deporte" OR "juego" OR "recreacion" OR "ocio activo" OR "accion motriz"
C (Context)	Urban parks and spaces where outdoor fitness equipment is installed.	"outdoor gym*" OR "outdoor fitness equipment" OR "fitness equipment in public parks" OR "exercise park*" OR "fitness zone*" OR "senior playground*" OR "active park*" OR "calisthenics park*" OR "parques biosaludables" OR "circuitos biosaludables" OR "gimnasios al aire libre" OR "parques de calistenia" OR "parques activos" OR "circuitos de ejercicio"

After duplicate removal the two researchers independently screened the titles and abstracts of the retrieved studies to identify potentially eligible articles. Abstracts that partially met inclusion and exclusion criteria, that is, those that did not provide sufficient information, were reviewed in full text. Subsequently, the same two researchers examined the included and excluded articles, confirming the reason for each decision. In cases of disagreement, a third researcher made the final decision by reviewing and resolving discrepancies strictly based on the predefined criteria.

For data extraction, the following information was collected from each included study: (1) year of publication; (2) country of origin; (3) study design (including sample type, study duration, observed variables, and applied techniques); (4) characteristics of the equipment installed in parks (type, number, arrangement, and condition); (5) user profiles (age, sex, sociodemographic features); (6) usage patterns (frequency, intensity, duration, and types of exercises performed); and (7) main findings related to the use of OFE and their social or community implications.

The PRISMA flow diagram (Figure 1) describes the review process carried out. Initially, 210 articles were identified through the search, of which 75 were removed as duplicates. After title and abstract screening, 66 articles that did not meet inclusion criteria were excluded. The remaining articles were assessed in full text, and 45 were excluded for meeting one of the exclusion criteria (reason 1: no direct observation of OFE; reason 2: focused on parks without equipment; reason 3: different primary variable). Finally, a total of 10 articles met all inclusion criteria and were included in this review, most of which were cross-sectional studies based on systematic observations.

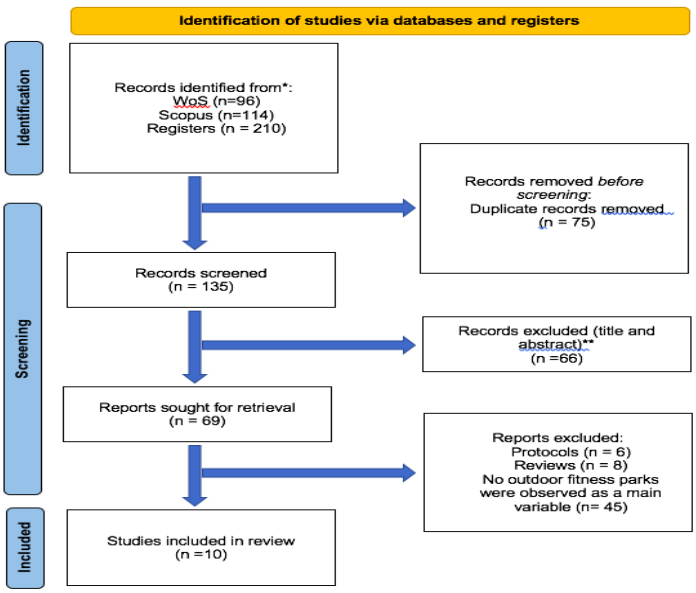

Figure 1. PRISMA Flow Diagram of Study Selection Process.

RESULTS

The articles selected for this scoping review were published between 2012 and 2025 and were conducted across seven different countries: the United States (Cohen et al., 2012; Sami et al., 2020), Taiwan (Chow et al., 2017; Chow & Wu, 2019), Thailand (Somnil, 2021), Brazil (da Silva et al., 2021), Israel (Baron-Epel & Ran, 2023), India (Vatta et al., 2025), and Australia (Levinger et al., 2024; Paudel et al., 2024). These studies were carried out in varied contexts, including urban parks, residential areas, beaches, municipalities, and university campuses.

Regarding methodological design, cross-sectional observational approaches predominated (Chow et al., 2017; da Silva et al., 2021; Baron-Epel & Ran, 2023), alongside quasi-experimental pre–post intervention studies (Cohen et al., 2012; Sami et al., 2020; Levinger et al., 2024) and mixed-methods studies (Chow & Wu, 2019; Somnil, 2021; Paudel et al., 2024; Vatta et al., 2025).

Table 1 presents a synthesis of the main characteristics of the studies included in this review, specifying the author and year, country, objectives, design, sample, investigated variables, instruments, intervention, and key results.

Table 1. Main Characteristics of the Studies Included in the Scoping Review

Author/Year	Country	Study Objective	Design and Method	Sample	Variables Investigated	Instruments	Intervention	Key Findings
Cohen et al., 2012	USA (California, Los Angeles)	To evaluate the impact and cost-effectiveness of installing fitness zones (OEE) in urban parks.	Quasi-experimental pre–post design	N = 12 urban parks; N = 1,818 park users interviewed.	Park use; PA level; Energy expenditure (METs); Age; Gender; Ethnicity; Frequency of use; Reasons for use; Proximity to park	SOPARC, intercept interviews; ArcGIS (distances); METs Compendium	Observations in three periods: pre (2008–2009, no OEE), first post (2009–2010, with OEE), and second post (2010, with OEE). Observations three times/day, four days per period. Post-installation: hourly observations in fitness zones (07:30–19:30).	23,577 people observed (2,570 in fitness zones). 11% increase in post 1, stable in post 2. Peaks between 9:30–11:30 and 15:30–17:30; average 27 users/day (max 89). 66–72% moderate/vigorous PA in fitness zones vs. 31–35% elsewhere. Women predominated in fitness zones post-installation. Cost-effectiveness: net gain 1,909 METs/week (52,311 per year), ≈ $0.105 per MET.
Chow, Mowen & Wu, 2017	Taiwan	To describe characteristics of outdoor fitness equipment (OFE) users in Xihu Park and analyze usage patterns.	Cross-sectional observational study	N = 1 park with OFE	Sex; Age; Frequency and time of use; Stations used; Duration of use	Adapted SOPARC and video recordings	Observations over two weekdays and two weekend days (6:00–21:00) + 42 h of video during peak hours (6:30–8:30; 15:30–17:30).	623 total users; 500 video coded. Peak use in morning (6:30–8:30) and afternoon (15:30–17:30). 71% women, 52.5% older adults. 79.9% used <3 stations; mean total use <9 min. Popular: *triple arm stretch*, *air walker*. Children used less time than adults or seniors.
Chow & Wu, 2019	Taiwan	To observe and classify OFE usage behaviors, compare them to manufacturers' instructions, analyze sex/age differences, and assess injury risks.	Cross-sectional mixed observational design	N = 2 parks with OFE	Equipment type; Sex; Age; Usage patterns; Duration; Potential risks	Video recordings and expert panel	28 h of video during peak morning/afternoon times (weekdays + weekends). Expert panel (physiotherapy, sport science, training, engineering) evaluated risks.	493 users, 4 devices observed (*air walker, waist twister, ski machine, waist/back massager*). 63% women, 47% older adults. 6–7 usage patterns per device; 30–45% improper use. Experts noted risk of injury due to unstable movements/out-of-range motion.

Sami et al., 2020	USA (California)	To evaluate park users' PA levels before and after OEE installation and compare placement along trails vs. fitness zones.	Quasi-experimental pre–post design	N = 2 urban parks	PA level; MET average; Intervention status; Age; Gender; Ethnicity; Day; Time; Target area	SOPARC	Pre (no OEE) and post (OEE installed) observations for 3 days pre/post per park, 4 × 1h intervals/day (07:00–08:00; 12:00–13:00; 15:30–16:30; 18:00–19:00). 48 total h by 32 trained observers.	Increased PA likelihood post-installation (Edison OR = 1.19; Garden Grove OR = 1.23); higher effect in fitness zone (OR = 5.29). METs rose +0.85 ($p < 0.001$). Men and adults predominated; post-intervention: more women, younger and diverse users.
Somnil, 2021	Thailand (Udon Thani)	To observe who uses OFE in urban parks, how they are used, usage motives, and users' perceptions.	Mixed-methods cross-sectional study	N = 3 OFE sites in public parks; 15 user interviews.	Sex; Age; Time of use; Equipment type; Duration; Perceived intensity; Usage motives; Benefits; Companionship	Video recordings and interviews	In-situ observation + video for 3 days over 9 weeks (17:00–19:00). Semi-structured interviews on frequency, perceived intensity, favorite equipment, benefits, motives, companionship.	7,000 OFE uses recorded in 9 weeks. Adults main users, followed by children. Peak 17:30–18:30. Popular: *waist twisting, bicycle, hip-balance swing*. Duration <5 min/device; ≈30 min/session. Perceived intensity moderate (5/10). Motives: convenience, health, enjoyment. Most attended with friends.
da Silva et al., 2021	Brazil (Uberaba)	To analyze associations between individual, environmental, and usage pattern characteristics and overall use volume of outdoor fitness zones (OFZ).	Cross-sectional observational study	N = 148 users interviewed; N = 9 OFZ randomly selected (of 38).	Sex; Age; Education/income; Marital/family status; Health/disease; Leisure PA level; Usage pattern; Transport; Environmental features	Observation protocol (Parra et al., 2010); questionnaire; IPAQ	Observations 3 days (2 weekdays + 1 weekend), 3 time slots (7:00–9:00; 11:00–12:00; 17:00–19:00). Structured in-person interviews.	58.8% women; mean age ≈54 years. Mean use 105.8 min/week. Higher use (>90 min/week) among those attending with friends (PR = 2.43–3.43). Nearby walking/running tracks increased usage. Poor maintenance and lack of tracks/panels linked to non-use.
Baron-Epel & Ran, 2023	Israel (Haifa, Herzliya, Nahariya)	To measure outdoor gym usage and analyze environmental/infrastructural factors associated with higher utilization.	Cross-sectional observational study	N = 18 OGs (cities, beaches, residential areas)	Total users/hour; Sex; Age; User type; Location; Infrastructure; Visibility	SOPARC	120 observation periods (30–60 min), 107 h total, mornings (6–9 h) and afternoons (before sunset), weekdays/weekends (Apr–Jul, Oct–Dec 2021).	979 users (~9/hour; 4.3 exercising/hour). Predominantly men and young adults; low participation among women and older adults. Greater use in parks/beaches (9–10/hour) vs. residential (1.5/hour). Amenities (shade, restrooms, fountains) increased use; fencing reduced it.
Levinger et al., 2024	Australia (Victoria)	To assess the impact of installing "Seniors Exercise Parks" and community activation programs on park visits and PA among older adults.	Quasi-experimental pre–post design	N = 6 municipal parks	Park visits; Visitor demographics; Sex; Age; PA type and level; Seniors Park use; Site and seasonal effects	Adapted SOPARC	Observations pre-upgrade, 1 month post, and 12 months after baseline (7 days/week, 11 scans/day, 30-min intervals).	Children/adults majority overall; older adults' presence increased significantly (IRR 3.55) and active behavior rose +11% at 12 months. Seniors Park use increased from 6.9% to 16.6–29.3% among older adults.
Paudel et al., 2024	Australia (Melbourne)	To explore use of senior-specific OFE in two parks and understand perceived barriers/facilitators.	Mixed-methods cross-sectional study	N = 2 senior-oriented OFE; N = 140 older adults interviewed	Number of older visitors; OFE users; Sex; Age; Visit motives; Companions; Frequency; Perceived barriers/facilitators	Modified SOPARC and intercept interviews	4 days (2 weekdays + 2 weekend days) at two time points (T1 Nov 2021, T2 Oct 2022; 8:30–17:30, hourly intervals).	Very low use: T1 0.7% (A), 0% (B); T2 2.8% (A), 0.7% (B). Barriers: health, lack of knowledge, occupation by children. Facilitators: promotion, classes, redesign.

Vatta et al., 2025	India (Varanasi)	To explore outdoor gym use and users' perceptions in a public university setting.	Sequential mixed-methods (quantitative observation + qualitative interviews)	N = 4 OGs; N = 66 participants (36 students, 27 visitors, 3 staff).	OG use; Time; Day; Season; Sex; Age; Perceived benefits/barriers; Improvement suggestions	Manual counts + semi-structured interviews	Observations 1 week/month (Dec 2022–Mar 2023), 4 daily slots (6:30–8:30; 11:00–13:00; 15:00–17:00; 18:30–20:30).	3384 users at OG-C, 2380 OG-D, 2004 OG-B, 792 OG-A. More use on weekends. Main benefits: physical/mental health, socialization, safety, accessibility. Barriers: lack of time (92%), crowding (52%), damaged equipment (45%).

Regarding user profiles, most studies agreed that outdoor fitness equipment (OFE) is primarily used by adults and older adults (Chow, Mowen, & Wu, 2017; Chow & Wu, 2019; Somnil, 2021; Paudel et al., 2024). However, some studies reported different patterns. Baron-Epel and Ran (2023) identified a predominance of young adults, whereas Levinger et al. (2024) indicated that, in overall park visits, the main groups were children and adults. Nevertheless, following the installation of the *Seniors Exercise Park*, older adults significantly increased both their park attendance (IRR 3.55) and their physical activity level (+11% active at 12 months), becoming the main users of that specific area by the end of the follow-up. In the particular case of Vatta et al. (2025), conducted in a university setting in India, the main users of outdoor gyms were young and middle-aged adults.

With respect to sex, several studies reported a predominance of male users (Cohen et al., 2012; Sami et al., 2020; Baron-Epel & Ran, 2023; Vatta et al., 2025), whereas others found greater female participation (Chow, Mowen, & Wu, 2017; Chow & Wu, 2019; Somnil, 2021; da Silva et al., 2021). In the specific case of the *fitness zone* at Garden Grove (Target Area 1), female participation increased notably after the installation of the equipment (Sami et al., 2020). Similarly, Cohen et al. (2012) reported that, before the installation of fitness zones, men were the majority in the park overall, but afterward, women surpassed men in the use of the equipment. Sami et al. (2020) also found that men remained the majority among overall park users, while female participation increased significantly in the fitness zone during the post-intervention period. Other studies likewise observed predominantly female use of OFE (Chow, Mowen, & Wu, 2017; Chow & Wu, 2019; da Silva et al., 2021), contrasting with those by Baron-Epel and Ran (2023) and Vatta et al. (2025), which reported higher male usage rates.

Concerning usage times and days, several studies agreed that peak attendance occurred in the early morning and late afternoon. Cohen et al. (2012) identified peaks between 9:30–11:30 and 15:30–17:30, while Chow, Mowen, and Wu (2017) observed more intense use between 6:30–8:30 and again between 15:30–17:30. Consistently, Chow and Wu (2019) confirmed that these hours concentrated the highest number of users. In contrast, Somnil (2021) observed peak use between 17:30–18:30, and Vatta et al. (2025) also recorded increased attendance during evening hours (18:30–20:30). Across several contexts, higher attendance was observed on weekends compared to weekdays (Chow, Mowen, & Wu, 2017; da Silva et al., 2021; Vatta et al., 2025).

Regarding usage patterns, Chow, Mowen, and Wu (2017) found that most users (79.9%) used fewer than three stations per visit, with a total duration of less than nine minutes. Children used the equipment for shorter periods than adults and older adults. In a subsequent study, Chow and Wu (2019) identified six to seven patterns of use per device, many of them were not aligned with manufacturers' instructions; non-recommended behaviors accounted for 30–45% of observations, especially among children and older adults. An expert panel therefore noted potential injury risks due to unstable or out-of-range movements. Somnil (2021) reported average durations of less than five minutes per device and approximately thirty minutes per session, with a estimated moderate intensity (5/10). Finally, da Silva et al. (2021) found that higher weekly usage volume (>90 minutes) was associated with attending alongside friends.

Regarding factors associated with usage, several studies indicated that park environment and design condition frequency of use. Baron-Epel and Ran (2023) found that outdoor gyms located in parks and beaches showed higher utilization rates than those in residential areas, and that amenities such as restrooms, fountains, and shade promoted use, while fencing or proximity to children's areas reduced it. Similarly, Da Silva et al. (2021) observed that having nearby walking or running tracks increased the likelihood of exceeding 90 minutes of weekly use. Other studies highlighted the importance of equipment layout and design, noting greater physical activity levels when machines were grouped together rather than dispersed along paths (Sami et al., 2020).

Pre–post design studies provided specific evidence of changes following equipment installation, allowing comparisons before and after "intervention". Collectively, these studies showed increases in park attendance, attraction of new users, and a higher probability of engaging in physical activity within equipped areas, as well as improvements in participation and physical activity levels among older adults (Cohen et al., 2012; Sami et al., 2020; Levinger et al., 2024).

In terms of user perceptions, various barriers were identified, including lack of time, occupation of the equipment by children, lack of knowledge about its proper use, poor maintenance, overcrowding, and deteriorated facilities (Paudel et al., 2024; Vatta et al., 2025). Reported facilitators included equipment promotion, organization

of guided classes, spatial redesign, and perceptions of a safe, accessible, and free environment, as well as perceived benefits for physical, mental, and social well-being (Paudel et al., 2024; Vatta et al., 2025).

The reviewed studies indicate that the installation of outdoor fitness equipment is associated with an increase in users' physical activity compared with parks without such equipment, although with variations depending on context. Cohen et al. (2012) reported that 66–72% of fitness zone users achieved moderate or vigorous activity levels, compared to 31–35% in other park areas. Similarly, Sami et al. (2020) found a significant increase in the probability of engaging in physical activity after installation (OR = 1.19 in Edison; OR = 1.23 in Garden Grove), with a particularly strong effect in the fitness zone (OR = 5.29), accompanied by an increase in energy expenditure (ΔMETs = +0.85; $p < 0.001$). Somnil (2021) reported perceived intensity at a moderate level (5/10).

Although most studies focused on describing user profiles, usage patterns, and achieved physical activity levels, only one included an economic analysis assessing the cost-effectiveness of fitness zone installation. That study found a net gain of 1,909 METs per week (equivalent to 52,311 per year), with an estimated cost of 10.5 cents per MET, reinforcing the need to further explore the economic feasibility of such interventions (Cohen et al., 2012).

DISCUSSION

The findings of this scoping review provide a broader understanding of the role of outdoor fitness equipment (OFE) in promoting community physical activity. The included studies reveal both common patterns and contrasts regarding usage and urban design features of these spaces.

User Profiles

In relation to user profiles, OFE generally serve as resources that promote physical activity among adults (Chow, Mowen, & Wu, 2017; Somnil, 2021), older adults (Chow & Wu, 2019; Levinger et al., 2024; Paudel et al., 2024), and children (Chow, Mowen, & Wu, 2017; Somnil, 2021).

For children, usage tends to be primarily playful, consistent with research on school playgrounds and park areas highlighting the value of spontaneous movement as a catalyst for vigorous activity (Reimers & Knapp, 2017; Schipperijn et al., 2024). In contrast, young people are identified as a group with limited use of these facilities (Chow, Mowen, & Wu, 2017; Chow & Wu, 2019), a trend aligned with the globally high prevalence of physical inactivity in this age group (Guthold et al., 2020). Their motivation is linked more to play and exploration than to structured exercise (Reimers & Knapp, 2017; Schipperijn et al., 2024). As shown by Chow, Mowen, and Wu (2017), this group also exhibits difficulties in understanding and correctly performing exercises. In the same vein, Gutiérrez-Santiago, Paramés-González, and Prieto-Lage (2022) observed that more than 75% of adolescents misinterpreted the information panels and performed exercises incorrectly, thus increasing the risk of injury. These results are complemented by the studies of Chow and Wu (2019) and Somnil (2021), which emphasize the need to update OFE signage systems through accessible digital resources, such as QR codes, to encourage safer and more engaging use among young people.

Regarding sex, the results of this review are heterogeneous. Kaczynski and Henderson (2008) note that safety is a key factor in female participation in open spaces, and that cultural context strongly influences usage patterns.

Usage Patterns

In terms of activity patterns, this review does not identify a clearly defined time frame for use. While some studies report attendance peaks in the morning, others emphasize greater use in the afternoon or even at night. This heterogeneity is consistent with previous reviews attributing variability to contextual factors such as climate, work schedules, and cultural norms (Fernández-Rodríguez et al., 2020; Lee et al., 2018).

Regarding the type of activity, the results reveal sessions of short duration and moderate intensity, in line with previous reviews suggesting that OFE alone do not ensure compliance with international physical activity recommendations, unless integrated into broader routines or guided programs (Fernández-Rodríguez et al., 2020; Ng et al., 2021).

Environmental and Design Factors

Environment and park designa emerge as decisive factors influencing frequency of use, consistent with reviews highlighting the value of the built environment in promoting physical activity (Bedimo-Rung et al., 2005; Kaczynski & Henderson, 2008). Furthermore, green and open spaces have been found not only to encourage movement but also to provide psychological and social benefits, including stress reduction, mental restoration, community cohesion, and decreased mortality risk (Twohig-Bennett & Jones, 2018; Grigoletto et al., 2021).

Within this framework, OFE could be considered part of a broader urban strategy integrated with cycling paths and active mobility systems. This approach aligns with experiences such as Bogotá's *Ciclovía* program, where

these initiatives have promoted both physical activity and community cohesion and social integration (Torres et al., 2013; Mejía-Arbeláez et al., 2021).

Barriers and Facilitators

The most frequently reported barriers to use include lack of time, equipment deterioration, overcrowding at certain hours, occupation of the equipment by children, and limited knowledge of proper use. These findings are consistent with the international literature on barriers to community physical activity (Scott et al., 2014; Cranney et al., 2016).

Likewise, deficiencies in maintenance and signage are recurrent obstacles, particularly in Brazil and India, where studies report damaged equipment, absence of information panels, and low accessibility (da Silva et al., 2021; Vatta et al., 2025). A study conducted in Gdańsk (Poland) showed that, despite a large network of OFE, many facilities were not adapted to the needs of older adults, presenting ergonomic limitations, unsafe surfaces, inadequate accessibility for people with mobility impairments, and lack of shade, lighting, or clear usage instructions (Gębczyńska-Janowicz et al., 2025). Complementarily, the review by Lee et al. (2018) found that, globally, users identified accessibility, maintenance, and safety as priority needs, confirming that these limitations represent a widespread trend not restricted to specific contexts.

Conversely, key facilitators included free access, proximity, social interaction, perceived safety, and contact with nature, consistent with evidence of the psychological benefits of exercising in green environments, such as stress reduction, mood improvement, and enhanced sense of community belonging (Twohig-Bennett & Jones, 2018; Van den Berg et al., 2017; Wicks, 2022). Similarly, studies conducted in Brazil found that the main reasons for using OFE were enjoyment and health, followed by stress management and socialization (Mathias et al., 2019). Overall, evidence suggests that OFE serve psychological and recreational functions that transcend their purely physical dimension, which helps explain their capacity to attract and retain users.

Finally, only the study by Cohen et al. (2012) included in this review incorporated a cost-effectiveness analysis, estimating a cost of USD 0.105 per additional MET, comparable to other community-based interventions. However, the systematic review by Fernández-Rodríguez et al. (2020) concluded that, in many cases, OFE use complements other primary physical activities, thus limiting their autonomous contribution to achieving international activity recommendations.

PRACTICAL IMPLICATIONS

The results of this scoping review highlight the need to conceptualize outdoor fitness equipment (OFE) as part of an integrated urban strategy that connects parks, cycling paths, and active mobility systems. To maximize their impact, it is recommended to ensure accessibility, safety, and regular maintenance, as well as to provide complementary infrastructure such as shade, drinking water, and restrooms. Moreover, it is essential to adapt design and signage to the diversity of users, incorporating digital resources that facilitate understanding and promote safe use, particularly among young people. Finally, complementing OFE with guided programs and community-based activities can enhance adherence, increase exercise intensity, and strengthen their contribution to public health.

LIMITATIONS

This review presents several limitations that should be considered when interpreting its findings. First, the methodological heterogeneity of the included studies, with variations in design, samples, measurement instruments, and cultural contexts, makes it difficult to establish direct comparisons and generalizations. Likewise, most of the studies focused on describing user profiles and usage patterns, whereas assessments of motor quality, social benefits, or economic impacts were scarce and poorly systematized.

Another limitation lies in the limited number of longitudinal studies and cost-effectiveness analyses, which prevents an accurate assessment of the sustained impact of OFE on public health and the economic feasibility of their implementation. Additionally, much of the available evidence comes from specific urban contexts (mainly in Asia, the Americas, and Oceania), meaning that findings may not be generalizable to other sociocultural environments. Finally, studies published in languages other than English, Portuguese, and Spanish were not included, which may have restricted the scope of the available evidence.

CONCLUSION

Outdoor fitness equipment represents an accessible and low-cost strategy for promoting physical activity within communities. This review shows that OFE are used primarily by adults and older adults, with short-duration, moderate-intensity sessions influenced by design, environmental, and accessibility factors. Although they offer benefits related to enjoyment, socialization, and community cohesion, their ability to ensure adequate physical activity levels depends on their integration into broader routines and organized programs.

At the same time, the review highlights the considerable heterogeneity in the variables, instruments, and observational methods used across studies. The absence of a unified framework for classifying OFE, recording user behaviors, and assessing environmental conditions limits the comparability and cumulative value of current evidence. Future research should therefore move toward developing a comprehensive and standardized observation methodology, including a shared taxonomy of equipment types and consistent indicators of use, intensity, and context. Such harmonization would facilitate cross-study comparisons and support the generation of robust evidence to guide urban planning, design, and public health strategies related to OFE.

Furthermore, the findings underscore the importance of improving signage, maintenance, and adaptation to the needs of specific population groups, as well as fostering more diverse motor experiences that go beyond repetitive individual exercises.

REFERENCES

Baron-Epel, O., & Ran, I. (2023). Factors impacting the use of outdoor gyms: Israel as a case study. *Cities & Health, 7*(6), 1045–1054. https://doi.org/10.1080/23748834.2023.2203970

Bedimo-Rung, A. L., Mowen, A. J., & Cohen, D. A. (2005). The significance of parks to physical activity and public health: A conceptual model. *American Journal of Preventive Medicine, 28*(2 Suppl 2), 159–168. https://doi.org/10.1016/j.amepre.2004.10.024

Chow, H.-W., & Wu, D.-R. (2019). Outdoor fitness equipment usage behaviors in natural settings. *International Journal of Environmental Research and Public Health, 16*(3), 391. https://doi.org/10.3390/ijerph16030391

Chow, H.-W., Mowen, A. J., & Wu, G.-L. (2017). Who is using outdoor fitness equipment and how? The case of Xihu Park. *International Journal of Environmental Research and Public Health, 14*(4), 448. https://doi.org/10.3390/ijerph14040448

Cohen, D. A., Marsh, T., Williamson, S., Golinelli, D., & McKenzie, T. L. (2012). Impact and cost-effectiveness of family Fitness Zones: A natural experiment in urban public parks. *Health & Place, 18*(1), 39–45. https://doi.org/10.1016/j.healthplace.2011.09.008

Cranney, L., Phongsavan, P., Kariuki, M., Stride, V., Scott, A., Hua, M., & Bauman, A. (2016). Impact of an outdoor gym on park users' physical activity: A natural experiment. *Health & Place, 37*, 26–34. https://doi.org/10.1016/j.healthplace.2015.11.002

da Silva, D. B., Sebastião, E., de Sousa, T. F., Tribess, S., & Papini, C. B. (2021). Outdoor Fitness Zone: Utilization pattern, and environmental and individual characteristics associated with the volume of utilization. *Motriz: Revista de Educação Física, 27*, e10210022920. https://doi.org/10.1590/S1980-657420210022920

Evenson, K. R., Wen, F., Hillier, A., & Cohen, D. A. (2013). Assessing the contribution of parks to physical activity: Social context, gender, and age. *Journal of Physical Activity and Health, 10*(3), 396–409. https://doi.org/10.1123/jpah.10.3.396

Fernández-Rodríguez, E. F., Merino-Marbán, R., Romero-Ramos, O., & López-Fernández, I. (2020). A systematic review about the characteristics and patterns of use of outdoor gyms. *Journal of Human Sport and Exercise, 15*(Proc3), S688–S707. https://doi.org/10.14198/jhse.2020.15.Proc3.21

Gębczyńska-Janowicz, A., Marczak, E., Mazurkiewicz, W., Krefta, D., Mikołajczyk, N., & Kamrowska-Załuska, D. (2025). Outdoor gym as a public space for the elderly – The example of Gdańsk, Poland. *Medicina Pracy, 76*(4), 329–340. https://doi.org/10.13075/mp.5893.01616

Grigoletto, M. E., Arantes, B. A., & Reis, R. S. (2021). Urban green spaces and physical activity: A systematic review. *Cities, 110*, 103084. https://doi.org/10.1016/j.cities.2020.103084

Gutiérrez-Santiago, A., Paramés-González, A., & Prieto-Lage, I. (2022). Effect of teaching method on exercise execution in adolescents' use of outdoor fitness equipment. *Perceptual and Motor Skills, 129*(4), 1302–1320. https://doi.org/10.1177/00315125221098635

Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2020). Global trends in insufficient physical activity among adolescents: A pooled analysis of 298 population-based surveys with 1.6 million participants. *The Lancet Child & Adolescent Health, 4*(1), 23–35. https://doi.org/10.1016/S2352-4642(19)30323-2

Kaczynski, A. T., & Henderson, K. A. (2008). Parks and recreation settings and active living: A review of associations with physical activity function and intensity. *Journal of Physical Activity and Health, 5*(4), 619–632. https://doi.org/10.1123/jpah.5.4.619

Kaczynski, A. T., Potwarka, L. R., & Saelens, B. E. (2008). Association of park size, distance, and features with physical activity in neighborhood parks. *American Journal of Public Health, 98*(8), 1451–1456. https://doi.org/10.2105/AJPH.2007.129064

Kaczynski, A. T., Stanis, S. A. W., & Besenyi, G. M. (2012). Are park proximity and park features related to park use and park-based physical activity among adults? *Preventive Medicine, 54*(3–4), 271–273. https://doi.org/10.1016/j.ypmed.2012.01.003

Lee, J. L. C., Lee, K. L., Shi, S. L., Lee, K. N. K., Wong, A. &. L., Ho, R. T. H., y Ng, P. H. F. (2018). Outdoor gyms in public open spaces: An integrative review. *Urban Forestry & Urban Greening, 34*, 325–336. https://doi.org/10.1016/j.ufug.2018.07.018

Levinger, P., Dreher, B. L., Soh, S.-E., Dow, B., Batchelor, F., & Hill, K. D. (2024). Results from the ENJOY MAP for HEALTH: A quasi experiment evaluating the impact of age-friendly outdoor exercise equipment to increase older people's park visitations and physical activity. *BMC Public Health, 24*, 1663. https://doi.org/10.1186/s12889-024-19042-3

Manta, S. W., Lopes, A. A. S., Hino, A. A. F., Benedetti, T. R. B., & Rech, C. R. (2018). Open public spaces and physical activity facilities: Study of systematic observation of the environment. *Revista Brasileira de Cineantropometria & Desempenho Humano, 20*(5), 445–456. https://doi.org/10.5007/1980-0037.2018v20n5p445

Mathias, N. G., Melo Filho, J., Szkudlarek, B. C., Gallo, L. H., Fermino, R. C., & Gomes, A. R. S. (2019). Motivos para a prática de atividades físicas em uma academia ao ar livre de Paranaguá-PR. *Revista Brasileira de Ciências do Esporte, 41*(2), 222–228. https://doi.org/10.1016/j.rbce.2018.03.030

Mejía-Arbeláez, C., Sarmiento, O. L., & Reis, R. S. (2021). Social inclusion and physical activity in Ciclovía programmes: A systematic review. *International Journal of Environmental Research and Public Health, 18*(2), 655. https://doi.org/10.3390/ijerph18020655

Ng, J. Y., Lee, C., Chua, J. K., Lim, J. Y., Fung, S. S., Cheong, K. J., & Tan, S. B. (2021). Effectiveness of outdoor exercise parks for older adults: A systematic review and meta-analysis. *Health & Place, 68*, 102532. https://doi.org/10.1016/j.healthplace.2021.102532

Paudel, C., Timperio, A., Loh, V., Salmon, J., Deforche, B., & Veitch, J. (2024). Understanding factors influencing the use of specialized outdoor fitness equipment among older adults in Australia. *Health Promotion International, 39*(6), daae160. https://doi.org/10.1093/heapro/daae160

Pollock, D., Peters, M. D. J., Khalil, H., McInerney, P., Alexander, L., Tricco, A. C., Evans, C., de Moraes, É. B., Godfrey, C. M., Pieper, D., Saran, A., Stern, C., & Munn, Z. (2023). Recommendations for the extraction, analysis, and presentation of results in scoping reviews. *JBI Evidence Synthesis, 21*(3), 520–532. https://doi.org/10.11124/JBIES-22-00123

Reimers, A. K., & Knapp, G. (2017). Playground usage and physical activity levels of children based on playground spatial features. *Journal of Public Health, 25*(6), 661–669. https://doi.org/10.1007/s10389-017-0828-x

Sallis, J. F., Bull, F., Burdett, R., Frank, L. D., Griffiths, P., Giles-Corti, B., & Stevenson, M. (2016). Use of science to guide city planning policy and practice: How to achieve healthy and sustainable future cities. *The Lancet, 388*(10062), 2936–2947. https://doi.org/10.1016/S0140-6736(16)30068-X

Sami, M., Smith, M., & Ogunseitan, O. A. (2020). Placement of outdoor exercise equipment and physical activity: A quasi-experimental study in two parks in Southern California. *International Journal of Environmental Research and Public Health, 17*(7), 2605. https://doi.org/10.3390/ijerph17072605

Schipperijn, J., Madsen, C. D., Toftager, M., Johansen, D. N., Lousen, I., Amholt, T. T., & Pawlowski, C. S. (2024). The role of playgrounds in promoting children's health – A scoping review. *International Journal of Behavioral Nutrition and Physical Activity, 21*(1), 72. 10.1186/s12966-024-01618-2

Scott, A., Stride, V., Neville, L., & Hua, M. (2014). Design and promotion of an outdoor gym for older adults: A collaborative project. *Health Promotion Journal of Australia, 25*(3), 212–214. https://doi.org/10.1071/HE14041

Stewart, T., Mavoa, S., Smith, M., Versey, J., Foley, L., Huang, N., & Duncan, S. (2018). Associations between park facilities, user demographics, and physical activity levels at public parks in New Zealand. *Health & Place, 51*, 104–113. https://doi.org/10.1016/j.healthplace.2018.03.004

Somnil, P. (2021). An observational study on who is using outdoor fitness equipment in urban public parks and how to use it: A case study of Udon Thani parks. *Journal of Physical Education and Sport, 21*(Suppl. issue 4), 2320–2325. https://doi.org/10.7752/jpes.2021.s4296

Torres, A., Sarmiento, O. L., Stauber, C., & Zarama, R. (2013). The Ciclovía and Cicloruta programs: Promising interventions to promote physical activity and social capital in Bogotá, Colombia. *American Journal of Public Health, 103*(2), e23–e30. https://doi.org/10.2105/AJPH.2012.301142

Twohig-Bennett, C., & Jones, A. (2018). The health benefits of the great outdoors: A systematic review and meta-analysis of greenspace exposure and health outcomes. *Environmental Research, 166*, 628–637. https://doi.org/10.1016/j.envres.2018.06.030

Van den Berg, M., Maas, J., Verheij, R. A., & Groenewegen, P. P. (2017). Green space as a buffer between stressful life events and health. *Social Science y Medicine, 136–137*, 1–8. https://doi.org/10.1016/j.socscimed.2015.04.014

Van Dyck, D., Sallis, J. F., Cardon, G., Deforche, B., Adams, M. A., Geremia, C., & De Bourdeaudhuij, I. (2013). Associations of neighborhood characteristics with active park use: An observational study in two cities in the USA and Belgium. *International Journal of Health Geographics, 12*(1), 26. https://doi.org/10.1186/1476-072X-12-26

Van Hecke, L., Deforche, B., Van Dyck, D., De Bourdeaudhuij, I., Veitch, J., & Van Cauwenberg, J. (2017). Social and physical environmental factors influencing adolescents' physical activity in urban public open spaces: A qualitative study using walk-along interviews. *PLoS ONE, 11*(5), e0155686. https://doi.org/10.1371/journal.pone.0155686

Vatta, L., Pandey, U., Pandey, A., Yelam, B., & Rathi, N. (2025). Open gyms and physical activity in a university setting: A mixed-methods study from Varanasi, India. *Journal of Health, Population and Nutrition, 44*, 155. https://doi.org/10.1186/s41043-025-00916-0

Wicks, C. (2022). Psychological benefits of outdoor physical activity in natural environments: A systematic review and meta-analysis. *Applied Psychology: Health and Well-Being, 14*(3), 787–808. https://doi.org/10.1111/aphw.12353

World Health Organization [WHO]. (2020). *Guidelines on physical activity and sedentary behaviour*. World Health Organization. https://www.who.int/publications/i/item/9789240015128

Zhai, Y., Baran, P. K., & Wu, C. (2020). How walkable are neighborhood parks? An assessment using the neighborhood environment walkability scale. *Urban Forestry & Urban Greening, 47*, 126515. https://doi.org/10.1016/j.ufug.2019.126515

