CC BY

http://medpr.imp.lodz.pl/en
https://doi.org/10.13075/mp.5893.01616
ORIGINAL PAPER

OUTDOOR GYM AS A PUBLIC SPACE FOR THE ELDERLY – THE EXAMPLE OF GDAŃSK, POLAND

Agnieszka Gębczyńska-Janowicz, Elżbieta Marczak, Weronika Mazurkiewicz, Dominika Krefta, Natalia Mikołajczyk, Dorota Kamrowska-Załuska

Gdańsk University of Technology, Gdańsk, Poland
Faculty of Architecture

Highlights

- A healthy city is one that considers the needs of older individuals.
- Importance of considering the needs of seniors in urban planning.
- Outdoor gyms act as public spaces for elderly people.

Abstract

Background: Due to the expanding population aging phenomenon, public spaces must be redesigned architecturally to make them accessible to the elderly. Motivating people to engage in physical activity is crucial because outdoor exercise positively impacts seniors' well-being. Outdoor gyms, which serve as meeting spots, places to work out, and locations for daily walks, play a significant role in this context. This article aimed to analyze existing outdoor gyms as public spaces available to the oldest residents of Gdańsk, Poland. **Material and Methods:** The study analyzed outdoor gyms located in Gdańsk. It assessed accessibility within the city structure (distance from the nearest residential building and public transportation stops) and architectural solutions used in implementing the facilities (the degree of shading of the area where the gym is located, the presence of artificial lighting at the gym, the type of surface, and the number and type of exercise equipment). **Results:** Seventy four gyms were surveyed as part of the fieldwork carried out. **Conclusions:** Existing gyms require correction in terms of adaptation to older people's needs and consider a broader spectrum of their needs. Med Pr Work Health Saf. 2025;76(4):249–257

Key words: ageing, physical activity, older people, architecture, public space, outdoor gym

Corresponding author: Agnieszka Gębczyńska-Janowicz, Gdańsk University of Technology, Faculty of Architecture, Gabriela Narutowicza 11/12, 80-233 Gdańsk, Poland, e-mail: agnjanow1@pg.edu.pl
Received: January 28, 2025, accepted: April 14, 2025

INTRODUCTION

In 2020, the 75th United Nations General Assembly and the 73rd World Health Assembly, representing countries from around the world, committed 2020–2030 to a decade of coordinated cooperation in terms of improving the social situation of the elderly [1]. This initiative, known as the Decade of Healthy Aging, is a global effort to improve the lives of older people, their families, and their communities. The significance of this initiative is underscored by the scientifically proven phenomenon of an aging society. Current analyses project that the percentage of older people worldwide may reach nearly 12% in 2030 and 16% in 2050. In 2030 approx. 1.4 billion people worldwide will be ≥60 years [1].

Awareness of the projected doubling of the elderly population leads, among other things, to consider adapting the built environment to enable all people to age in their place of a residence ideally. Many countries are developing adaptation programs under the slogan "age-friendly cities," which details the global trend related to healthy city [2]. These guidelines postulate that the built environment should be designed "to account for the wide diversity of older people, promote their autonomy, inclusion, and contributions in all areas of community life, respect their decisions and lifestyle choices, and anticipate and respond flexibly to aging-related needs and preferences" [2].

In turn, scientific studies focusing on the impact of exercise in late adulthood showed improved cognitive function. Exercise generally improves cognitive function in older adults in many areas. Physical activity helps to train motor skills and maintain the balance needed to gain the confidence and independence needed to carry out daily activities [3,4]. Cities and communities are, therefore, obliged to provide better conditions for older people to function in the outside world. Increasing physical activity among seniors requires a systemic approach. Therefore, per the recommendations of the World Health Organization (WHO), it is crucial to create

public space as an environment activating mobility [5]. In Poland, several studies have addressed the vulnerability of public spaces in a post-socialist context, pointing to the need to adapt spaces to the diverse needs of users [6]. As societies age, the demand for rehabilitation therapy among older adults with functional impairments due to illness, aging, or accidents is steadily increasing [7]. The shift in the medical paradigm towards a biopsychosocial model has highlighted the importance of natural environments in rehabilitation, leading to a growing interest in utilizing open spaces for therapeutic purposes [8–13]. Exercises performed in public spaces are quite popular among older people. Results from surveys of seniors indicate that fresh air is more motivating to exercise than an indoor environment [14]. Some literature reviews published in the last decade confirmed the conduct of numerous studies that validate the claim that well-being and health improve when older people participate in physical activity, especially when this takes place outdoors [15,16]. Combining exercises with a natural outdoor environment can reduce exercise fatigue and improve cardiovascular health in older adults, with more significant health benefits compared to a closed environment. Regular exercise is significant in preventing and treating cardiovascular disease, as it reduces cardiovascular mortality and improves the quality of life [17]. At the same time, they improve sleep quality and immune function [7].

Outdoor exercise equipment, commonly called an outdoor gym or exercise park for seniors, is increasingly becoming popular. This infrastructure is crucial in encouraging physical activity among older adults, allowing them to exercise in public spaces. The impact of this infrastructure on the health and well-being of the aging population is indeed significant [18]. At the same time, various studies stress access to open spaces and green areas, as well as their shape and function, as a vital factor of their accessibility [19,20].

While the literature review indicates the impact of outdoor gyms on the health and well-being of the aging population, there is a need to assess the importance/weight of various elements such as ergonomics, both external and internal accessibility, or accompanying elements, and recommendations for the design and localization of this type of equipment within the city. Some elderly citizens face various health challenges, and many are still unfamiliar with outdoor gyms, lacking the awareness that some equipment may not be suitable for them [21].

This research aims to determine whether all residents have equal access to this infrastructure. The analyses also covered the location, quality of equipment, shade, and additional recreational facilities such as public spaces or playgrounds. In addition, the accessibility of outdoor gyms was assessed by identifying various barriers that older people may encounter when using these facilities, such as transportation problems, insufficient equipment, or lack of visual information. This in-depth analysis aims to provide a deep understanding of the role of outdoor gyms in promoting physical activity among older people and identify areas where they can be improved. This study is significant because it tries to understand the key role of outdoor gyms in promoting physical activity among older people. By thoroughly examining the outdoor gym infrastructure in Gdańsk, it is possible to identify areas where this type of infrastructure should be improved and where there is a lack of gyms suitable for older people.

MATERIAL AND METHODS

Design

An empirical study was conducted in 2 phases to validate the relevance of outdoor gyms in an urban environment:

- the study involved identifying existing facilities and analyzing their location for convenience and comfort for seniors, considering factors such as shading and proximity to other facilities,
- the research also involved a detailed assessment of the quality of individual exercise devices' equipment and the material solutions of the public spaces on which they are installed.

Case study setting

The study was conducted in Gdańsk, a Polish city with a population of about 487 000. According to a 2023 study, 25% (about 124 000) of the population are senior citizens, i.e., people >60 years [22]. This social structure does not differ from the general picture in Poland. A 2023 study showed that the entire country's population is 26.3% (9.9 million) elderly [23].

The high percentage of elderly residents has led the city authorities to take many measures to activate seniors in the social and physical spheres. As early as 2007, the Gdańsk Council for Seniors (Gdańska Rada ds. Seniorów) was established [24], and as of 2018, seniors, who are represented by the Gdańsk Council of Seniors (Gdańska Rada Seniorów), are not just beneficiaries but also active participants in these activities [25]. The city has also been certified as a member of the WHO's Global Network for Age-Friendly Cities and Communities [25].

For many years, outdoor gyms have been built in Gdańsk as a result of the collaborative efforts of city units, initiatives of District Councils, and city competitions such as the Civic Budget (Budżet Obywatelski). This collective action contributes significantly to older people's physical and social activation, inspiring a sense of community and shared responsibility [24–25].

Methods

In order to achieve the article's first goal of identifying existing outdoor gyms and assessing their location in the city, a survey framework was developed:

- existence of the facility,
- accessibility within the city structure:
  - distance from the nearest residential buildings,
  - distance from public transportation stops,
- analysis of nearby recreational infrastructure.

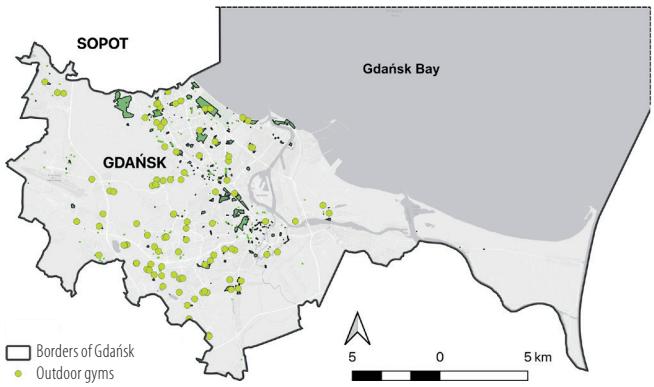
The second stage of analysis concerned the evaluation of the characteristics of the architectural solutions used in the implementation of the facilities:

- the presence of accompanying infrastructure to enable relaxation, such as benches,
- the degree of shading of the area where the gym is located,
- the presence of artificial lighting at the gym,
- the type of surface,
- the number and type of exercise equipment.

During the analysis of individual gyms, accessibility in the context of activities for the elderly and people with limited mobility, as well as the technical quality of the facilities, were also assessed.

Field surveys were conducted to obtain data for the above analyses. The information collected was entered into a Google Form based on standardized observation sheets, which ensured the reproducibility of observations and allowed for the comparison of results. The survey analyzed 74 gyms located in 24 of Gdańsk's 35 neighborhoods. There has yet to be an official register of outdoor gyms in the city. Information about their location was taken from Geographic Information System (GIS) data, from data of the city administration (Gdański Zarząd Dróg i Zieleni – GZDiZ) [26], and Google Maps. The study was conducted March–May 2024.

The observations provided an understanding of the ergonomics and functioning of outdoor gym infrastructure within neighborhoods and other recreational facilities and areas. The extent to which the gyms meet the needs of seniors and whether they are accessible was also investigated. By the principle of triangulation, the information obtained during the field research was compared with analyzed previous sources of scientific papers, policies, and evaluation reports, which allowed for the validation of the conclusions drawn from the observations.



The map created in QGIS software (OSGeo) based on publicly available data from the state register of boundaries (Państwowy Rejestr Granic) [36], data from Open Street Map and a database of outdoor gyms created based on coordinates from Google Maps.

Figure 1. Map of the location of outdoor gyms in the city of Gdańsk, Poland, March–May 2024

RESULTS

According to the data collected from the GZDiZ website [26] and Google Maps, there should be 75 outdoor gyms within the city limits of Gdańsk. This database distinguished objects in 24 districts out of 35 located within the administrative borders of Gdańsk. Data verification was conducted based on field surveys, which confirmed the location of 64 gyms (85.3%). Three gyms were decommissioned, and 8 new gym locations were identified. Seventy four outdoor gyms were accepted for further analysis and marked on the city's map (Figure 1). It indicates the locations of the density of gyms in relation to landscape conditions, including the Tri-City Landscape Park and the Gdańsk Bay. Gyms were subjected to extensive diagnostic analysis to assess their location, equipment and suitability for use by older people.

Identification of existing facilities and analysis of their location

Walking is an essential form of daily physical activity among seniors. Regularly getting out of one's home to the outdoor environment has beneficial effects on the body, both in preventive and therapeutic aspects [27,28]. Outdoor gyms, not just as exercise spots, but also as inspiring walking destinations, can act as both a walking destination and an intermediate point. In order to study the accessibility of these facilities, the distance from the nearest residential areas was analyzed. A walking time

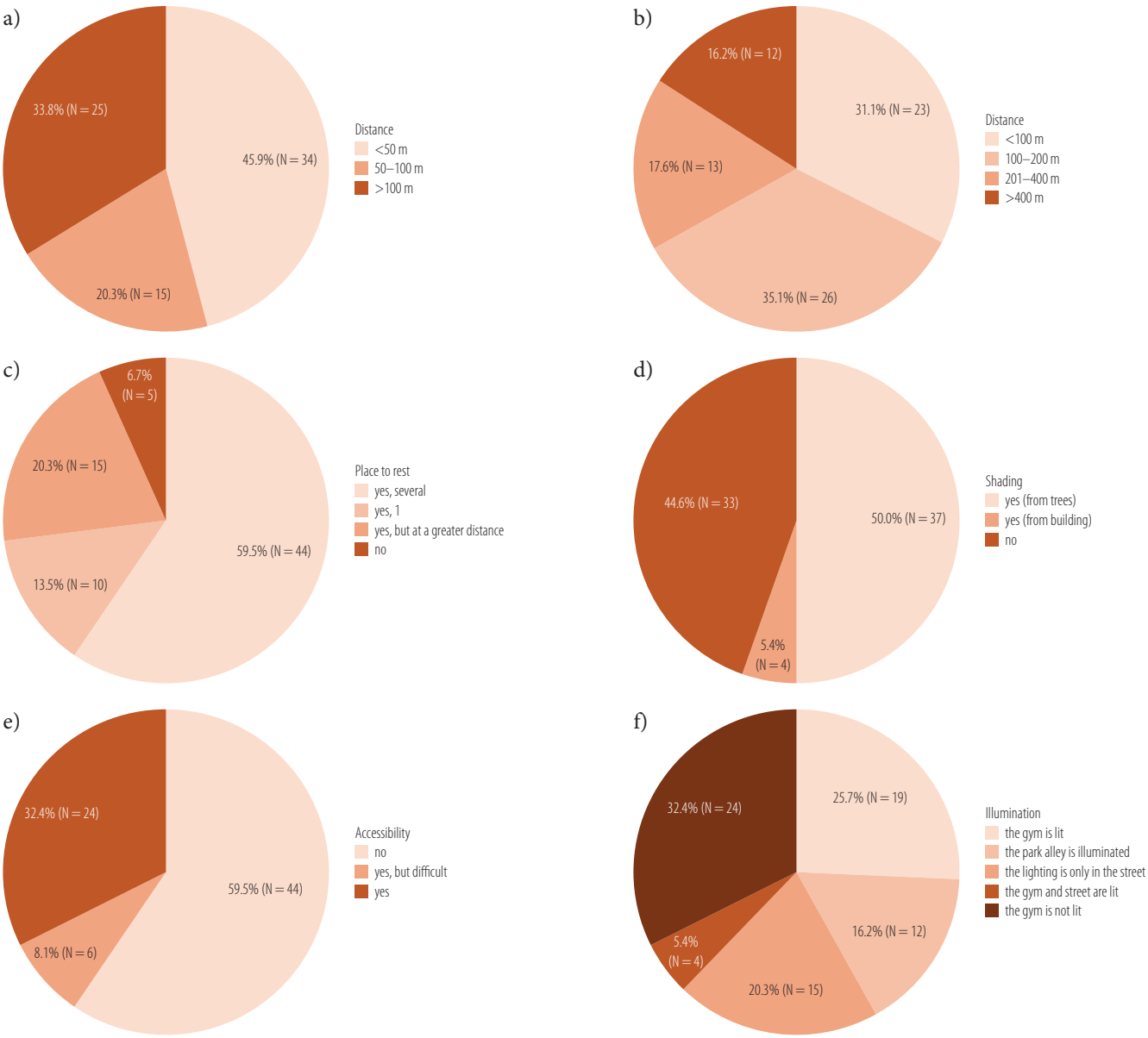


Figure 2. Gyms in relation to the following criteria: a) distance of the gym from residential development, b) distance of the gym from public transportation stops, c) the presence of places at gyms for older people to rest after a workout, d) shading of the gym, e) accessibility for wheelchair users, f) illumination of the gym with artificial light, the study conducted in Gdańsk, Poland, March–May 2024

of 15 min was taken as the optimal distance for an older adult – during this time, a person 65 years old can cover about 1 km at a speed of 4.2 km/h [29]. Analyses showed that most gyms are <100 m walking distance from the nearest residential buildings. In particular, 45.9% (N = 34) indicate a distance <50 m. The second largest group consisted of gyms – 33.8% (N = 25) – that were >100 m away, and 20.3% (N = 15) facilities were located 50–100 m from the nearest residential buildings (Figure 2a).

Studies indicate that outdoor exercise, particularly when guided by physiotherapists, is more effective in improving users' health parameters [30]. Some seniors engage in activities organized at gyms that are at a greater distance from their residences. In such cases, the distance of the gym from public transportation stops becomes a key factor. In terms of public transportation availability, in most cases (35.1% of responses), the distance is 100–200 m. A distance of <100 m between the gym and the bus stop was reported 23 times (31.1%), while a distance >400 m was recorded only 12 times (16.2%) (Figure 2b).

The popularity of outdoor gyms is often determined by their immediate proximity to other components of

Table 1. Recreation infrastructure accompanying the gym – the study conducted in Gdańsk, Poland, March–May 2024

Infrastructure type	Recreation infrastructure (N = 74) [n (%)]
Children's playground	55 (74.3)
Playing field	20 (27)
Dog park	17 (23)
Skate park	6 (8.1)
Street workout	6 (8.1)
Barbecue area	4 (5.4)
Boules court	3 (4.1)
Climbing wall	3 (4.1)
Arbor	3 (4.1)
Drinking fountain	2 (2.7)
Active park	1 (1.3)
Insect shelter	1 (1.3)
Public portable toilet	1 (1.3)

Table 2. Type of surface used in gym zone – the study conducted in Gdańsk, Poland, March–May 2024

Surface type	Outdoor gyms (N = 74) [n (%)]
Sand surface	19 (25.7)
Lawn	18 (24.3)
Fine aggregate (crushed stone particles)	13 (17.6)
Paving stones	10 (13.5)
Geo grid covered with vegetation	6 (8.1)
Concrete paving slabs	3 (4.1)
Rubber surface	2 (2.7)
Stone surface	2 (2.7)
Surface tree roots in lawn	1 (1.3)

public space. An element that contributes to the attractiveness of outdoor gyms is their proximity to children's playgrounds. This provides a convenient combination of activities for seniors who care for grandchildren or other children [31,32]. The analyses confirmed that integrating an outdoor gym with a playground is quite common – such an arrangement was observed in 55 cases (74.3%). The proximity of a dog park is also a popular solution (23%). Recreational facilities for young people, such as playing field (27%), skate parks (8.1%) or street workout (8.1%) are also frequently located nearby (Table 1).

Public space that considers the needs of the elderly should offer a variety of recreational opportunities. Of the sites analyzed in this study, 59.5% (N = 44) outdoor gyms are located near recreational areas with various characteristics. At 10 outdoor gym locations, only 1 rest area is available. There is no place at the 5 gyms for older people to rest after a workout (Figure 2c).

When designing an elderly-friendly public space, it is important to consider weather conditions. Outdoor gyms in Poland are used several months a year, usually April–October. During the summer, especially in July and August, overexposure to the sun and high temperatures can pose a serious risk to seniors. Therefore, it is recommended that public spaces frequented by the elderly be located in areas shaded by trees or canopies [31]; 50% of the analyzed outdoor gyms (N = 37) are in the shade of trees. Unfortunately, a similar number of facilities, 44.6% (N = 33), are fully exposed to the sun. In addition, 5.4% of gyms are in the shade of buildings, resulting in inadequate sunlight (Figure 2d).

Assessment of the quality of individual exercise devices and the material solutions of the public spaces

An essential element of outdoor gym equipment is the finish of the surface on which the exercise equipment is mounted. The suitable material can absorb the impact of falls and protect the elderly from other types of injuries. According to current research, it is recommended to use non-slip rubber both under and around the exercise equipment [30,31]. For the facilities analyzed, the most common surface was lawn (24.3%). Sand or dirt surfaces were also fairly common (25.7%), as well as those covered with fine aggregate (17.6%) and larger stones (2.7%). Many sites used hard surfaces such as paving stones (13.5%), geo grid (8.1%) and concrete paving slabs (4.1%). The recommended rubber surfaces were used in only 2 of the analyzed facilities (2.7%) (Table 2).

The method of finishing the surface of outdoor gyms has a significant impact on the adaptation of these sites to the needs of people with disabilities. This study also analyzed the possibility of making the gym plaza accessible to people in wheelchairs. In most of the analyzed sites, this access was found to be impossible (59.5%) or difficult (8.1%). Only one-third of the gyms (32.4%) were connected in a way that allowed access for people with disabilities (Figure 2e).

Artificial lighting may play a lesser role in outdoor gyms, as older people rarely use the equipment after dark. However, these places can serve as valuable meeting points for evening walks, fostering social interac-

Photos: a), b) Dominika Krefta, c), d) Natalia Mikołajczyk

Figure 3. The most common exercise equipment at outdoor gyms in Gdańsk, Poland: a) orbiter, b) free-standing jogger, c) rowing machine, d) twister-pendulum, March–May 2024

tion and community cohesion. The analysis shows that only 31.1% of yards with exercise equipment are artificially lit. In the remaining cases, the light of lanterns is directed at a nearby road or path (36.5%). However, in most cases, 32.4% of outdoor gyms are not illuminated by artificial light (Figure 2f).

The equipment of the analyzed outdoor gyms shows considerable diversity. In some cases, the exercise area consists of only 1 or 2 pieces of equipment – this was the case in 14 cases, accounting for 19% of all analyzed facilities. The largest number of exercise equipment, as many as 10 items, was identified at 5 gyms, accounting for 7% of the total number. Among the most common pieces of equipment were an orbiter (62%), a free-standing jogger (46%), a rowing machine (43%), a twister-pendulum (32%), and a leg lift (17%) (Figure 3).

The analyses also included a subjective evaluation of exercise equipment (Table 3). The highest rating (5) was given to only 7 sites, accounting for 9.5% of all sites analyzed. These sites were characterized by the very good condition of all exercise equipment, as well as additional equipment such as signs with instructions for use, ≥1 piece of equipment adapted to the needs of people with disabilities, allowing wheelchair access, and other amenities such as a watering hole, proximity to other recreational sites, and safe paving. Facilities rated as in good condition (4) were outdoor gyms where all equipment was operational, and there were gym rules or instructions for using the equipment; 45,9% of the facilities fell into this category. A sufficient rating (3) was given to 20.3% of the analyzed facilities. These were gyms in generally good technical condition but lacked equipment use instructions and regulations. In addition, difficult access for people with disabilities was noted. Sixteen of the analyzed gyms (21.6%) were neglected (2); in ≥1 case, the equipment was damaged, and instructions needed to be included. The lowest rating (1) was given to 2 facilities where the equipment was damaged, and the surroundings were neglected, with visible acts of vandalism.

DISCUSSION

A study conducted in Gdańsk confirmed that outdoor gyms are a common part of the city's landscape. The analyses showed that, on average, there are 2–3 such facilities in each neighborhood. Their location near residential neighborhoods makes them a destination for seniors to go for walks or a stop on their daily wanderings. Gyms also become a place for group activities, as they are often well connected to public transportation. It is also worth noting that they are often adjacent to other recreational infrastructure.

Despite the numerous presence of outdoor gyms in Gdańsk's public spaces, they are not fully adapted to the needs of the elderly. Problems with accessibility for people with mobility impairments and the ergonomics of the equipment, which is not certified for use by the elderly, make it difficult to assess the system of Gdańsk's outdoor gyms as a senior-friendly public space. In addition, many complexes need to offer clear instructions on using the equipment, exercise sets, or information on possible limitations. There is also a lack of places to rest after a workout, and the gyms are often unprotected from excessive sunlight. In many cases, neither the risk of falls nor the convenience of movement have been considered in the context of the gym's surface finish.

Table 3. Subjective assessment of technical condition – the study conducted in Gdańsk, Poland, March–May 2024

Description of the technical condition	Technical condition assessment	Responses (N = 74) [n (%)]
All devices are functional, contain operating instructions, safe surfaces, and ≥1 device adapted to the needs of people with disabilities, with the possibility of access for a person in a wheelchair; additional amenities include a drinking fountain and proximity to other recreational places.	5	7 (9.5)
All equipment is functional; there are gym rules or instructions for using the equipment.	4	34 (45.9)
The gym is in good overall technical condition, but there are no instructions for equipment and the entire gym, and it is difficult to access for disabled people.	3	15 (20.3)
The neglected gym, ≥1 piece of equipment is damaged, and there are missing or damaged equipment instructions and regulations.	2	16 (21.6)
The gym is destroyed with acts of vandalism (damage, graffiti).	1	2 (2.7)

The study's results point to the need for regulations on architectural and urban planning parameters that should be considered in the construction of such facilities. This will contribute to making gyms fully accessible to the elderly and a full-fledged public space. Increasing the availability of gyms specifically designed for seniors can encourage a more active lifestyle among this demographic. Providing facilities that cater to their needs not only promotes physical health but also fosters a sense of inclusivity and community.

To enable broader generalizability of findings and accurately assess the situation across Poland, it will be essential to conduct similar studies in various cities. Comparative analysis of results from multiple locations will provide insights into regional differences and enhance the robustness of conclusions drawn at the national level. Additionally, further research should focus on how seniors themselves perceive and evaluate outdoor gyms, which could be effectively explored through a series of structured surveys aimed at capturing their experiences and attitudes.

Activating senior citizens in public spaces is a commonly addressed issue in scientific research. This topic is particularly prevalent in Asian countries like Japan and China, where elderly people are eager to participate in outdoor exercise programs [7,28,33]. In Taiwan, scooters and bicycles are popular among seniors [34]. In Australia, outdoor gyms serve as a favored meeting place for the elderly, as highlighted by numerous publications from Prof. Levinger, who presents findings from the Exercise interveNtion outdoor proJect in the cOmmunitY (ENJOY) [18,31–32].

In contrast, Polish senior citizens often have a low opinion of their physical condition and are hesitant to engage in physical activities available in public spaces. A social survey conducted in Poland in 2016 revealed that only 31% of respondents reported participating in regular physical recreation. The most popular activities among seniors in Poland include cycling, jogging, and nordic walking [35].

To better understand these dynamics, it is important to expand the research to include the characteristics of Polish society, particularly the cultural factors influencing the behavior of older individuals in public spaces. This study examined the physical structure of existing outdoor gyms to determine their potential to encourage older adults to exercise. The authors primarily relied on scientific research conducted in other countries when developing their parameters. However, to obtain a comprehensive understanding of the usefulness of this research, sociological surveys should be conducted to gather the opinions of Polish seniors regarding their preferences for the location and equipment of outdoor gyms. Additionally, insights and expertise in gerontology and public health are essential for the success of this research.

CONCLUSIONS

- Open gyms are a public space that allows for the activation of older people.
- Appropriate equipment and clear instructions for use increase their accessibility and ease of use of the devices.
- Existing gyms require correction in terms of adaptation to the needs of older people.
- Designed gyms should take into account a wider spectrum of needs of older people.
- The research results indicate the need for a similar diagnostic analysis of gyms in other cities and the systemic unification of the principles and conditions

for designing open gyms so that they constitute public spaces that are friendly to older people and support their physical activity, which has a positive impact on their health.

AUTHOR CONTRIBUTIONS

Research concept: Agnieszka Gębczyńska-Janowicz, Elżbieta Marczak, Dorota Kamrowska-Załuska, Weronika Mazurkiewicz
Research methodology: Agnieszka Gębczyńska-Janowicz, Elżbieta Marczak, Dorota Kamrowska-Załuska, Weronika Mazurkiewicz
Collecting material: Dominika Krefta, Natalia Mikołajczyk
Statistical analysis: Dominika Krefta, Natalia Mikołajczyk, Agnieszka Gębczyńska-Janowicz, Elżbieta Marczak
Interpretation of results: Agnieszka Gębczyńska-Janowicz, Elżbieta Marczak, Dorota Kamrowska-Załuska, Weronika Mazurkiewicz, Dominika Krefta, Natalia Mikołajczyk
References: Agnieszka Gębczyńska-Janowicz

REFERENCES

1. World Health Organization [Internet]. Geneva: The Organization; 2024 [cited 2024 May 28]. Ageing – Overview. Available from: https://www.who.int/health-topics/ageing/improving-understanding-measurement-and-monitoring-of-healthy-ageing#tab=tab_1.
2. World Health Organization [Internet]. Geneva: The Organization; 2023 [cited 2024 Jun 10]. National programmes for age-friendly cities and communities: a guide, 2023. Available from: https://www.who.int/publications/i/item/9789240068698.
3. Colcombe S, Kramer AF. Fitness Effects on the Cognitive Function of Older Adults. Psychol Sci. 2003;14(2):125–130. https://doi.org/10.1111/1467-9280.t01-1-01430.
4. Leyland LA, Spencer B, Beale N, Jones T, van Reekum CM. The effect of cycling on cognitive function and well-being in older adults. PLoS One. 2019;14(2):e0211779. https://doi.org/10.1371/journal.pone.0211779.
5. World Health Organization [Internet]. Geneva: The Organization; 2018 [cited 2023 Nov 10]. Global action plan on physical activity 2018–2030: more active people for a healthier world. Available from: https://iris.who.int/bitstream/handle/10665/272722/9789241514187-eng.pdf?sequence=1.
6. Mazurkiewicz WM, Zupančič T. Sensitivity Of Public Places in Gdańsk Osowa District. Arch Res. 2015;15(1):6–23. Available from: http://www.dlib.si/?URN=URN:NBN:SI:DOC-ZC30PEMK.
7. Zhou TY, Yuan XM, Ma XJ. Can natural environments enhance acute effects of rehabilitation exercise for older adults? A pilot randomized controlled trial. Aging Clin Exp Res. 2023;35(6):1213–1219. https://doi.org/10.1007/s40520-023-02402-1.
8. Davis BE. Rooftop hospital gardens for physical therapy: a post-occupancy evaluation. HERD. 2011;4(3):14–43. https://doi.org/10.1177/193758671100400303.
9. Haering MC. The use of outdoor environments by occupational and physical therapy staff in the context of patient treatment in rehabilitation settings: an exploratory study [Internet]. Michigan State University: Environmental Design-Master of Arts; 2016 [cited 2024 Oct 6]. Available from: https://d.lib.msu.edu/etd/3903/OBJ/download.
10. Kamp D. Healing gardens. Mulgrave, Victoria: Images Publication Group Pty Ltd; 2016.
11. Lundmark L, Fjeldvik Ch. Outdoor Physiotherapy – a Study of The Usefulness of The Outdoor Environment at a Rehabilitation Centre. Arch Phys Med Rehabil. 2019;100(10):e104. https://doi.org/10.1016/j.apmr.2019.08.302.
12. Marcus CC, Sachs NA. Therapeutic Landscapes: An Evidence-Based Approach to Designing Healing Gardens and Restorative Outdoor Spaces. New York: Wiley; 2013.
13. Winterbottom D, Wagenfeld A. Therapeutic Gardens: Design for Healing Spaces. Portland: Timber Press; 2015.
14. Hooper P, Foster S, Edwards N, Turrell G, Burton N, Giles-Corti B, et al. Positive HABITATS for physical activity: Examining use of parks and its contribution to physical activity levels in mid-to older-aged adults. Health Place. 2020;63:102308. https://doi.org/10.1016/j.healthplace.2020.102308.
15. Franco MR, Tong A, Howard K, Sherrington C, Ferreira PH, Pinto RZ, et al. Older people's perspectives on participation in physical activity: a systematic review and thematic synthesis of qualitative literature. Br J Sports Med. 2015;49(19):1268–1276. https://doi.org/10.1136/bjsports-2014-094015.
16. Gębczynska-Janowicz A, Janowicz R. Public space as a place of rehabilitation for the elderly – a systematic literature review. Med Pr Work Health Saf. 2024;75(3):255–267. https://doi.org/10.13075/mp.5893.01514.
17. Nagyova I, Jendrichovsky M, Kucinsky R, Lachytova M, Rus V. Effects of nordic walking on cardiovascular performance and quality of life in coronary artery disease. Eur J Phys Rehabil Med. 2020;56(5):616–624. https://doi.org/10.23736/S1973-9087.20.06120-1.
18. Levinger P, Dunn J, Panisset M, Dow B, Batchelor F, Biddle SJH, et al. Challenges and lessons learnt from the ENJOY project: recommendations for future collaborative research implementation framework with local governments for improving the environment to promote physical activity for

older people. BMC Public Health. 2021;21(1). https://doi.org/10.1186/s12889-021-11224-7.
19. Zgórska B, Kamrowska-Załuska D, Lorens P. Can the Pandemic Be a Catalyst of Spatial Changes Leading Towards the Smart City? Urban Plan. 2021;6:216–227. https://doi.org/10.17645/up.v6i4.4485.
20. Sun X, Wang L, Wang F, Soltani S. Behaviors of seniors and impact of spatial form in small-scale public spaces in Chinese old city zones. Cities. 2020;107:102894. https://doi.org/10.1016/j.cities.2020.102894.
21. Wang C. Exploration of Exercise Characteristics and Psychological Impact of Cold Urban Elderly Based on Multivariate Data Analysis. Wirel Commun Mob Com. 2022;1:7169789. https://doi.org/10.1155/2022/7169789.
22. Urząd Miejski w Gdańsku [Internet]. Gdańsk: The Office; 2024 [cited 2024 May 28]. Gdańsk w liczbach – 2023. Available from: https://www.gdansk.pl/gdansk-w-liczbach/mieszkancy,a,108046.
23. Kancelaria Prezesa Rady Ministrów: Minister ds. Polityki Senioralnej [Internet]. Warszawa: Department of Senior Policy; 2024 [cited 2024 May 10]. Informacja o sytuacji osób starszych w Polsce za 2023 r. Available from: https://das.mpips.gov.pl/source/2024/Informacja%20o%20sytuacji%20osob%20starszych%20w%20Polsce%20za%202023%20r..pdf.
24. Urząd Miejski w Gdańsku [Internet]. Gdańsk: The Office; 2024 [cited 2024 Oct 6]. Gdańska Rada Seniorów. Available from: https://bip.gdansk.pl/rada-miasta/rada-seniorow.
25. Urząd Miejski w Gdańsku [Internet]. Gdańsk: The Office; 2024 [cited 2024 Oct 6]. Gdańsk dla seniorów. Informator 2024. Available from: https://download.cloudgdansk.pl/gdansk-pl/d/202408235761/seniorzy_publikacja_2024_web.pdf.
26. Gdański Zarząd Dróg i Zieleni [Internet]. Gdańsk: GZDiZ; 2024 [cited 2024 May 6]. Available from: https://gzdiz.gda.pl.
27. Brookfield K, Thompson CW, Scott I. The Uncommon Impact of Common Environmental Details on Walking in Older Adults. Int J Environ Res Public Health. 2017;14(2):190. https://doi.org/10.3390/ijerph14020190.
28. Harada K, Lee S, Park H, Shimada H, Makizako H, Doi K, et al. Going outdoors and cognitive function among community-dwelling older adults: Moderating role of physical function. Geriatr Gerontol Int. 2016;16(1):65–73. https://doi.org/10.1111/ggi.12437.
29. Willberg E, Fink C, Toivonen T. The 15-minute city for all? – Measuring individual and temporal variations in walking accessibility. J Transp Geogr. 2023;106:1032521. https://doi.org/10.1016/j.jtrangeo.2022.103521.
30. Barbosa WA, Leite CD, Reis C, Machado AF, Bullo V, Gobbo S, et al. Effect of Supervised and Unsupervised Exercise Training in Outdoor Gym on the Lifestyle of Elderly People. Int J Environ Res Public Health. 2023;20(21):7022. https://doi.org/10.3390/ijerph20217022.
31. Levinger P, Panisset M, Dunn J, Haines T, Dow B, Batchelor F, et al. Exercise interveNtion outdoor proJect in the cOmmunitY for older people – The ENJOY Senior Exercise Park project translation research protocol. BMC Public Health. 2019;19(1):933. https://doi.org/10.1186/s12889-019-7125-2.
32. Levinger P, Panisset M, Parker H, Batchel F, Tye M, Hill KD. Guidance about age-friendly outdoor exercise equipment and associated strategies to maximise usability for older people. Health Promot J Aust. 2021;32(3):475–482. https://doi.org/10.1002/hpja.367.
33. Harada K, Masumoto K, Katagiri K, Fukuzawa A, Chogahara M, Kondo N, et al. Frequency of going outdoors and health-related quality of life among older adults: Examining the moderating role of living alone and employment status. Geriatr Gerontol Int. 2018;18(4):640–647. https://doi.org/10.1111/ggi.13222.
34. Chow H, Chen HC, Lin LL. Association between out-of-home trips and older adults' functional fitness. Geriatr Gerontol Int. 2014;14(3):596–604. https://doi.org/10.1111/ggi.12143.
35. Główny Urząd Statystyczny [Internet]. Warszawa, Białystok: GUS; 2022 [cited 2025 Mar 20]. Sytuacja osób starszych w Polsce w 2021 r. Available from: https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/6002/2/4/1/sytuacja_osob_starszych_w_polsce_w_2021_r.pdf.
36. Geoportal [Internet]. Warszawa: 2024 [cited 2024 May 8]. Państwowy Rejestr Granic (PRG). Available from: https://www.geoportal.gov.pl/pl/dane/panstwowy-rejestr-granic-prg/.

This work is available in Open Access model and licensed under a Creative Commons Attribution 4.0 International (CC BY 4.0) – https://creativecommons.org/licenses/by/4.0/.

Publisher: Nofer Institute of Occupational Medicine, Łódź, Poland