



Article

The Use of Urban Parks by Older Adults in the Context of Perceived Security

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Abstract: The perception of urban greenery is determined by many aspects, including the personal security of different groups of city dwellers. The objective of this study was to investigate if there are differences between the sense of security of older adults and other groups of urban park users, and which factors play an important role in the evaluation of personal security and thus determine the use (or not) of parks. A survey questionnaire was administrated to a sample of randomly selected park users in Poland ($n = 394$), including seniors ($s = 69$). The results show statistically significant differences in security perception between respondents under the age of 60 and those over the age of 60 in the case of all questioned factors. At the same time, all of them are important for a sense of security in older adults. This knowledge is crucial for designing more inclusive and age-friendly urban parks, which should meet the needs and expectations of older adults and encourage them to engage in more activity.

Keywords: urban greenery; older adults; perceived security; fear factors; age-friendly parks; active-friendly parks; physical activity; inclusiveness; Poland



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1. Introduction

Urban greenery provides a wide range of social benefits for city dwellers [1]. These benefits, which may improve people's quality of life, become of key importance and should be taken into account in the planning and design process of urban parks functioning as open public spaces free and available to everyone. This approach is crucial nowadays, especially for older adults in the context of increasing their health and well-being. Demographic aging is a global trend resulting from a sustained change in the age structure of the global population, driven by rising levels of life expectancy. The share of 60+ aged people in the total population is growing rapidly, especially in the 21st century. At the same time, the number of threats, such as reduced physical and mental performance, the occurrence of diseases and injuries, etc., is increasing with age, which translates directly into increasing motor impairment and progressive disability in aging [2]. It is estimated that the share of people that are aged 65 or more, recognized at 727 million people in 2020 (9.3% of the population), will more than double over the next three decades, reaching over 1.5 billion in 2050 (16.0% of the population). It is also expected that in the coming decades, a large percentage of the increase in older adults will occur in urban areas [3]. The above-mentioned tendencies are observed also in Poland; a strong increase in the share of the elderly in the population has also been observed: in 2005 it was 17.2%, in 2006 it increased to 17.2%, and in 2019 it was as high as 25.3%. The forecasts for the coming years include further growth: in 2030, it will reach 28.0%, in 2040, about 32.0%, and in 2050, over 35.0%. In 2050, people of senior age living in cities are expected to constitute 23.5% of the Polish population. The aging causes changes not only in the economic sphere, but also to lifestyles, forming new cultural patterns, especially in terms of how people spend their free time. According to

data from the Central Statistical Office, 55.1% of Polish older adults go for a walk or spend time outdoors (including urban parks) at least once a week [4].

1.1. Aging-Friendly and Safe Urban Greenery

The creation of conditions for active and friendly aging of the population [5], including aging-in-place [6], should be focused on using the potential of urban green areas for enhancement of both the mental and physical health of older adults. It is in line with approaches promoted by the WHO relating to activity by optimizing opportunities for health, participation, and security in order to enhance quality of life and well-being [7]. Healthy aging aims to keep the elderly in good condition and independence for as long as possible [8–11]. The creation of places where older adults can be socially and physically active is a global health priority [12]. Green areas, mentioned as age-friendly features [7], play an especially important role in this context. Green areas located close to the place of residence become positively perceived neighborhood parks and more frequently visited by 60+ aged people [13]. With respect to “healthy aging” and especially “active aging” [14], urban parks have been identified as important places of physical activity for senior city residents [15]. They are places of walking, rest and recreation, and sport [16–20], and provide an opportunity to be active daily [13,17,21]. They also ensure that older adults have contact with nature [22–24] in a highly urbanized space and encourage them to spend more time outdoors [25]. Urban parks may also promote the development of many forms of social interactions [1,26] by establishing bonds with others and participation in social life [20,23,27–34], which is important for maintaining mental health [24,25,30,35–43]. Due to those benefits, urban green spaces become free of charge and inclusive spaces for all “public health resources” in cities. However, only safe urban parks may perform all above-mentioned functions at a high level [44]. At the same time, there is a relation between perceived security and physical activity. Older adults especially have different perceptions, needs, as well as desires related to the use of urban green areas than other groups of users [26]. They generally need to feel safe in urban parks in order to rest or spend time actively. In that context, many factors related to security which affect their choice of park, undertaken activities, as well as the duration of their visits [45] should be taken into account in the research on the use of urban parks by older adults.

Security is one of the most important categories that allow for the description of the context of life and the way a person functions [46–51]. It is defined as an objective state of non-threat that is subjectively felt by individuals or groups, or the process of reaching that state. This definition includes two perspectives of understanding security: the objective perspective, which is related to external factors essential for a proper life; and the subjective perspective, which is related to an individual assessment of the state of possession or availability of essential goods. In psychology, security is understood as a need, value, belief, and feeling [46,47,49,52,53]. The feeling of security is so significant that it becomes a motivating factor either as a need [46,48] or as a value [49,53]. The problem of security does not exist apart from an individual’s perception and personal experience [47]. Although it is subjective, it plays an important role in assessing the situation and making decisions [48,54]. It can, therefore, be concluded that security in urban green spaces is, and will continue to be, an important social issue. Many studies confirm that a sense of security is recognized today as one of the most important aspects influencing the perceived quality and attractiveness of urban parks [41,55,56]. Otherwise, negative effects such as fear, anti-social behavior, and stress can occur [57]. At the same time, the age of users is important for the way parks are designed and then used [58,59], especially if the main groups of visitors to green areas in cities are older adults [60]. For those groups of adults, it is not only accessibility or proximity, but above all, safety that determines the use of urban parks [24,26,31,58,61].

1.2. Security Providing Factors in Urban Parks in Context of Older Adults Activity

Age is often associated a lower level of personal safety and avoiding places in the open air, which is especially observed in 60+ aged people [62], and thus may decrease

their physical activity. According to Wiles et al. [63], the sense of security is important for older adults and applies to the park environment. The literature referring to seniors' assessment of safety in urban greenery and the factors shaping it, including their impact on physical activity, does not give an unambiguous answer to the question of whether they differ in this respect from other age groups. Some authors claim that 60+ aged park users are generally more afraid of dangers in urban green areas than younger ones [26,64–69]. Fear generally limits the use of the park for older adults more than that it does for young people [65]. They are also more likely to express concerns about safety and crime [70]. However, the relationship between safety and urban parks is complex and involves many aspects. Individual factors can be critical for how safety problems are approached in the physical environment [71], and the use of this knowledge is important for the planning and design of urban parks.

1.2.1. Visibility

Many aspects of visibility can influence the sense of security in urban parks [72]. Lighting is one of the frequently mentioned factors, usually having a positive impact on the perception of security in public spaces by all user groups and is used as a solution for crime prevention [73–78]. Good visibility allows people to observe the surroundings and see potential threats from a distance [73,79–82]. The time of day, related to the amount of light, has an impact on the perceived safety [83–86], i.e., strongly shaded areas are usually assessed as dangerous and should therefore be avoided [82–84]. The sense of danger increases at night [74,81,87–92], which especially affects older adults who are more afraid of using parks after dark so as not to become victims of crime [86]. For this reason, the amount of artificial lighting also becomes an important predictor of the perceived safety in urban green areas [93–97].

Some research confirms that older adults derive considerable pleasure from viewing and being in nature which, in turn, has a positive effect on their well-being and quality of life [98]. However, many park users avoid areas with poor lighting resulting from high a density of trees and understory vegetation [64]. Many studies confirm that the character of vegetation itself can be an important factor affecting perceived personal safety [92,99–103]. Dense and neglected greenery may be assessed as elements which block the escape route in times of danger, create potential hiding places for criminals and undesirable park users [98,104–106] and thus contributes to an increase in crime [81,101,107–109] and a lower sense of security, especially in older adults [106]. City dwellers prefer parks without dense vegetation and feel safer in areas with high visibility [110]. The anxiety related to the presence of vegetation in parks has been described in many publications [64,104,109]. In connection with the fear of crime, in the case of 60+ aged people, it may limit or even prevent their physical activity [111,112].

1.2.2. Maintenance and Cleanliness of Parks and Park Facilities

Good maintenance of urban parks is crucial to the perception of urban greenery as low-risk areas and allows people of advanced age to feel safer [113,114]. It also determines a positive image of green areas. People tend to avoid areas containing equipment that is damaged [30] because it suggests that park is run down and possibly unsafe [115]. Older adults prefer well-maintained infrastructure and facilities [24] and pay particular attention to the technical condition of facilities such as benches, which are the basic elements ensuring rest [116,117]. However, it is equally important to maintain other furniture, structures, and devices [118]. Well-maintained paths are highly desired by all users of urban parks [26,119,120], especially by older adults [24,106,121–125] for whom poor paving can significantly limit activity in open public spaces [126]. For those with an active lifestyle, the quality of equipment [26], including sports and fitness facilities is also important [127,128]. Additionally, well-kept greenery strengthens the sense of security [62,64,108,118,129] at the same time as increasing the attractiveness of urban parks [57,80,108], which is also desired by older adults [106]. Neglected plants with damaged and falling branches threaten

the safety of park users as they can cause injuries or even the death of people who are accidentally hit [130–133]. Maintaining green areas and other park facilities at a high level, which improves safety and accessibility, is mentioned as one of the most important aspects in designing inclusive urban parks [116] and a form of support in preventing criminal behavior [134].

Many physical factors related to cleanliness can increase the feeling of insecurity in urban green spaces [92,135,136], i.e., disordered physical environment such as dirty or neglected areas, the presence of litter on the ground, overfilled refuse bins, graffiti, damaged equipment, dilapidated buildings, the presence of dog droppings [30,137], as well as vandalism and physical signs of incivilities [97]. These signs of insufficient management of green areas or an excessive number of visitors [138,139] may also strongly impact the perception of security in urban parks [97]. Dirty spaces encourage anti-social behavior and crime [140,141]. The presence of graffiti on park facilities and buildings can contribute to the perception of a lack of safety [80,142]. Some studies also prove that litter on the ground and vandalism may heighten the sense of fear in public spaces [143]. A low level of cleanliness in urban parks is often identified as the reason minimizing the number of visits, regardless of the type of users [144,145], and a factor decreasing their use in physical activity [139]. A clean space without rubbish is important for various groups of park users [24,121,146], especially for older adults [26,106].

1.2.3. Mobility Facilities

Many 60+ aged users of urban green areas pay attention to factors such as the accessibility of the facility and the quality of its infrastructure, especially when related to mobility facilities. Several studies reflect the general assumption that older adults tend to reach parks on foot and walk in the open air mainly for the sake of their health [147–149]. Walking, as a moderate-intensity exercise, is the most common behavior in urban parks and can be easily integrated with other activities; therefore, walking is more attractive to older adults than high-intensity exercise [150–152]. Since for those groups of park users the sense of security both in relation to their own body and the environment seems to play a fundamental role [153,154], the technical condition of equipment may influence decisions regarding the use of urban green areas. The presence and quality of park paths are important for 60+ aged users [24,106,121], and because they are the basic elements that ensure navigating the terrain, they also play an important role for the safety of their use. The lack of paths, uneven terrain, and poor-quality surface, are seen as problems for many park users [119]. Well-paved and safe paths are highly demanded by older adults [122,123]. A smooth surface and barrier-free pavements can increase their independence and social participation as many of people over the age of 60 have mobility problems [155] and are the most at risk, such as those who are prone to falls [156], or with basic weakness of functions related to movement and balance [157]. At the same time, security may be associated with a sense of frailty and vulnerability [111,158]. Older adults with reduced mobility and/or a history of falls appreciate the smoothness of the pavement in combination with continuous curbs and crossings on pedestrian routes [12]. The lack of amenities in this context may limit their physical activity [159], including the intensity of using parks. Additionally, a general diversity of park topography difficult for 60+ aged users to overcome may be one of specific attributes affecting their use of urban green spaces [160,161] and may have an impact on the perception of the area as safe or not [151]. The availability and safe use of parks are also determined by other features, such as walk slope and presence of mobility facilities, which are particularly demanded by the disabled and older adults [151]. Especially, functional aids also influence their activity. In urban spaces, including green areas, there may be many physical barriers limiting both walks and recreation [162,163]. The lack of basic amenities, such as benches [164], paths, and mobility aids [165], dissuades older adults from being physically active in parks [152]. The lack of access to other amenities, such as ramps (including those with handrails on both sides), especially in the case of 60+ aged users with limited mobility and other disabilities, additionally causes worry about

physical safety and discourages visiting green areas [166]. Possible difficulties in moving around the park may be thus the key factors affecting the sense of security [163,167].

1.2.4. External Protection

The security measures applied in urban parks relate to various elements, the most common of which is the use of a fence that acts as a strong psychological deterrent and spatial control element, as well as an element that provides a certain degree of privacy [168,169]. Enclosure, both visual and physical, does not only affect safety, but can also create a calm atmosphere, trigger restorative experiences, and affect the possibility for restoration [170]. The presence of law enforcement agencies, such as the police and guards, video surveillance (closed-circuit television cameras (CCTV)) or compulsory signs has an impact on the safety and reduction of crime in public spaces and green areas. CCTV and improved street lighting are the most well-developed surveillance measures used in urban public spaces [75,171] and are an alternative to the presence of police officers who are not able to patrol the park at all times [45]. However, parks are considered difficult to monitor because their large size and vegetation limit the view into the open space. Although closed-circuit television often does not cover the entire area [115,172], its use has an impact on reducing the fear of crime [173,174]. Therefore, it is crucial to use various forms of external protection and adapt them to the characteristics of the site. The implementation of the Crime Prevention Through Environmental Design (CPTED) strategy, the aim of which is to reduce the sense of anonymity and strengthen the natural disposition of people to observe the environment, may also be helpful [175–177].

1.3. Aim of the Study

Based on the literature review, older adults represent a group of park users with special preferences related to the security. However, there is not much information regarding how they differ in relation to other age groups of people visiting urban green spaces. According to our best knowledge, the research in that field has not been conducted and published in the context specific to Poland. Only a few papers concern the sense of security of urban park users and are related to selected aspects, e.g., impact of vegetation [101,167] or CPTED [178]. There is also no detailed research identifying the factors that affect the sense of security of older adults, especially in the context of comparisons with other groups. Taking into account the special needs of older adults, the research on perceived security related to the physical attributes of parks which may affect physical activity of this group of users requires broadening. This applies to aspects such as topography and the presence of paths and equipment which facilitate walkability and ensure the access to urban parks. Another group consists of factors related to the maintenance and cleanliness of urban greenery. Important aspects are also related to visibility as well as external protection.

Therefore, the objective of this study was to investigate which factors were important for shaping security perception (mobility facilities, maintenance and cleanliness, visibility, and external protection), indicated after literature review, play an important role in evaluation of personal security of their users. It was also crucial to highlight how senior age differentiates the perception of security. This paper is the continuation of our previous study [179], which analyzed how gender differentiates the perception of safety in urban parks and showed statistically significant differences in selected factors. Due to the previously indicated gaps in Polish studies, we decided to examine these factors in relation to older adults as a group of park users with special requirements, and are, at the same time, more exposed to threats and thus to social exclusion. The data collected in this study may support designing new urban parks, but also contribute to the modernization of existing urban parks, making them more inclusive. Therefore, we want to confirm the following hypotheses:

Hypothesis 1. *There are differences between the sense of security of older adults and other groups of urban park users.*

Hypothesis 2. *Most factors related to aspects of the presence of mobility facilities, maintenance and cleanliness, visibility, and external protection are more important for older adults' sense of security as a group of park users with special requirements.*

2. Materials and Methods

2.1. Participants

This study was conducted on a group of 394 randomly selected adult park users, including 69 respondents over 60 years old (F = 40, M = 29). The sample differed in terms of gender, education, place of residence, access to urban parks and frequency of their use. All sample characteristics details are presented in Table 1.

Table 1. Sample characteristics (elaborated by authors).

Variable	<i>n</i>	%	60+ Aged Park Users	% of 60+ Aged Park Users
Age				
18–29	124	31.31%		
30–44	101	25.51%		
45–59	100	25.25%		
60+	69	17.42%		
Gender				
male	137	34.8%	40	58.0%
female	257	65.2%	29	42.0%
Place of living				
village and small town	119	30.2%	26	37.7%
middle town and city	275	69.8%	43	62.3%
Education				
elementary	7	1.77%	1	1.4%
basic vocational education	13	3.28%	6	8.7%
secondary education	119	30.05%	31	44.9%
higher education	257	64.90%	31	44.9%
Presence of urban parks in place of living				
no parks or other green places	25	6.3%	1	1.4%
one	45	11.4%	6	8.7%
a few	324	82.2%	62	89.9%
Frequency of use of urban parks				
no use	6	1.5%	0	0%
couple of times per year	98	24.9%	14	20.3%
once a month	82	20.8%	19	27.5%
once per week	109	27.7%	25	36.2%
2–3 times per week	79	20.1%	9	13.0%
everyday	20	5.1%	2	2.9%

Most of the respondents (275, 69.8%) declared that they live in cities with public parks. The largest group of respondents, 82.32% of all users and 89.9% of older adults, had access to more than one park. A total of 11.4% of all users and 8.7% of older adults had access to at least one park near the place of living. Only 6.31% of all respondents and 1.4% of older adults declared that didn't have any parks in their town/city; however, they visited parks in other places. Therefore, the vast majority of respondents, including people over 60 years of age, had no problem with access to urban parks.

Most of the respondents (109, 27.7%) visit parks once a week. In case of the oldest park users, those who visit them once a week were the biggest group; approximately one third of older park users declared this frequency of use (25, 36.2%). However, in the case of the

remaining groups of respondents, the situation was different. In the entire research sample, the second largest group of respondents are those who do it sporadically, several times per year (98, 24.9%) and in the case of people over 60, it was the group visiting the park once a month (19, 27.5%). The respondents visiting parks once a month (82, 20.71%) and 2–3 times per week (79, 19.95%) take the next positions among all respondents. In the case of older adults, 20.3% (14) of them declared that they visit urban parks a couple of times per year and 13% (9) of them declared that they visit urban parks 2–3 times per week. The results indicate that seniors used urban parks more often than their younger counterparts.

2.2. Selection of Factors Affecting Perception of Security

The implementation of the research aims required, first of all, the identification of factors shaping safety in urban parks based on literature review, as those emphasized as being associated with perceived security related to the use of urban parks and their physical attributes [57,64,65,73,74,89,90,92,111,179]. They were classified into 4 categories according to the scheme presented in Table 2: (1) the presence of mobility facilities, including 3 factors (related to walkability in the park); (2) maintenance and cleanliness, including 6 factors (related to various elements of the park condition); (3) visibility, including 5 factors (determined by the level of illumination and density of greenery); and (4) external protection (related to presence of police patrol or video surveillance and fence).

Table 2. Categories of factors indicated in questionnaire (elaborated by authors).

Category of Factors	Particular Factors
Mobility facilities	park paths functional aids (ramp, lift) varied topography
Maintenance and cleanliness	condition of equipment pavement condition condition of greenery level of filling the rubbish bins level of litter graffiti on park facilities
Visibility	bright day dark night artificial lighting possibility to be visible and to see others presence of hidden or hard to reach places greenery with leaves greenery without leaves
External protection	police patrol video surveillance fence, night closure

2.3. Questionnaire Characteristics and Procedure

The questionnaire as a research instrument has been used to collect information from the respondents. Its structure, except main demographic data (presented in Table 1), consisted of questions following the above-mentioned categories and their factors selected for the study. The questionnaire asked the participants to rate each of the factors in terms of perceived security on a 5-point Likert scale [180], where 1 meant a very low, and 5 meant a very high impact of the factor. The questionnaire was pilot tested prior to data collection to ensure clarity of the questions and improved.

The quantitative data used for analysis was collected through the survey questionnaire conducted online in the period from March to August 2020. It was aimed at an anonymous group of respondents over 18 years old, randomly selected from users of urban parks. Then, the PS Imago Pro 6.0 program was used to analyze the collected data. A Student's

t-test was used to show the significance of differences in responses between under 60 and 60+ aged respondents ($p < 0.05$). The reliability of the ratings of factors was tested with the Cronbach reliability test and yielded a relatively high Cronbach's alpha = 0.816.

The raw data retrieved from questionnaires were used for statistical analysis purposes in terms of the statistical significance of the differences between the responses of older adults and other age groups of survey participants. The aim was to check whether the group of 60+ aged park users, identified in the research to be particularly vulnerable to exclusion, has a different perception of the importance of selected factors in the context of safety in urban parks. In line with the assumptions contained in the hypotheses, it was first checked which of the indicated factors are the most important for older adults in the context of their perceived security. Then, it was determined how many and which factors had statistically significant differences in their perception of importance for shaping the sense of security in various age groups, in particular, between older adults and younger users of urban parks.

3. Results

The respondents' opinions about the factors influencing their safety in urban parks were important to answer the question of their general sense of safety in these places.

When asked about the general assessment of the level of safety in parks on the 5-point Likert scale, the respondents indicated a level of 4.08 (older adults: 4.33). A high number of respondents, including 78.1% (86.9% of older adults) declared either a high or a very high (4 or 5) level of safety perception in urban parks. In contrast, only 3.3% (1.4% of older adults) indicated either a very low or a low (1 or 2) level of safety. The Student's *t*-test showed a statistically significant difference in the general perception of safety in public parks between these groups ($p = 0.002$, mean perceived security ratings for people under 60: 4.01, 60+: 4.33). The differences between the under 60 and 60+ aged respondents of the general perception of security in urban parks are presented in Figure 1.

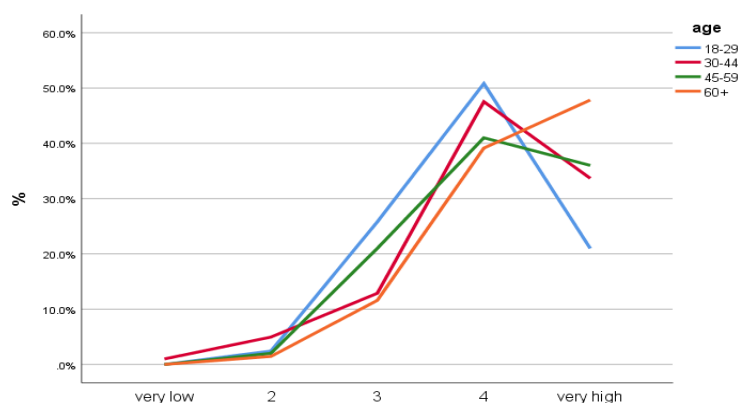


Figure 1. General assessment of the level of safety in urban parks by users (age groups) (elaborated by authors).

The results of the mean perceived security ratings related to all safety-related factors taken into account in the survey are presented for all respondents, as well for all respondents divided into the under 60 and 60+ groups (see Table 3).

Table 3. Differences in responses between under 60 and 60+ aged park users (elaborated by authors).

Factor	Mean Perceived Security Ratings	Standard Deviation	Mean Perceived Security Ratings		t-Value	Significance
			under 60	60+		
Mobility facilities						
park paths	4.02	1.181	3.93	4.42	−3.665	$p < 0.001$
functional aids (ramp, lift)	3.90	1.268	3.77	4.51	−4.984	$p < 0.001$
varied topography	3.24	1.388	3.10	3.91	−4.832	$p < 0.001$
Maintenance and cleanliness						
condition of equipment items (benches and other rest equipment, litter bins, etc.)	4.13	1.091	4.06	4.51	−4.703	$p < 0.001$
pavement condition	3.91	1.174	3.79	4.46	−5.304	$p < 0.001$
condition of greenery	3.59	1.305	3.45	4.23	−4.957	$p < 0.001$
level of filling the rubbish bins	3.23	1.305	3.16	3.51	−2.590	$p = 0.010$
level of litter	3.79	1.189	3.72	4.10	−2.363	$p = 0.018$
graffiti on park facilities	2.95	1.394	2.87	3.33	−2.510	$p = 0.012$
Visibility						
bright day	4.21	1.213	4.14	4.55	−2.373	$p = 0.018$
dark night	3.91	1.345	3.80	4.40	−3.248	$p = 0.001$
artificial lighting	4.19	1.020	4.13	4.46	−2.628	$p = 0.009$
possibility to be visible and to see others	4.33	0.955	4.27	4.59	−2.691	$p = 0.007$
presence of hidden or hard to reach places	3.76	1.348	3.66	4.19	−3.215	$p = 0.001$
greenery with leaves	3.33	1.381	3.17	4.06	−5.148	$p < 0.001$
greenery without leaves	3.00	1.302	2.86	3.75	−4.994	$p < 0.001$
External protection						
police patrol	4.17	1.106	4.13	4.32	−0.949	$p = 0.343$
video surveillance	4.18	1.105	4.10	4.56	−3.549	$p < 0.001$
fence, night closure	3.67	1.351	3.47	4.33	−5.306	$p < 0.001$

The first column in Table 3 presents the mean perceived security ratings for all respondents. Seven factors were indicated as very important (mean rate over 4.0). Three of them are connected to visibility (bright day, artificial lighting, and possibility to be visible), two are connected to external protection (police patrol and video surveillance), one was connected to maintenance and cleanliness (condition of equipment items), and one was connected to mobility facilities (park paths). Therefore, it can be indicated that in all discussed categories there are very important factors for the respondents' sense of security. None of the factors achieved an average value lower than 2.5. One factor averaged responses between 2.5 and 3.0, and 11 of the 19 analyzed factors averaged between 3.0 and 4.0. The results show that the factors included in the survey were mostly considered by the respondents as important or very important.

The third and fourth columns of Table 3 present the differences in responses given by under 60 and 60+ aged park users. In general, the under 60 and 60+ aged respondents differently rated their overall safety level when visiting public parks, as well as the significance of most of the specific cases indicated in the questionnaire. When broken down by factor, it can be seen that older respondents generally gave more weight to factors that may have an impact on safety in all analyzed cases (all factors).

Out of all 19 factors, 9 were indicated by 60+ aged park users as particularly important for them (score 4.40 and higher) in the context of ensuring their safety in urban parks. From the mobility facilities category, the presence of park paths and functional aids (ramp, lift) was determined to be particularly important for the surveyed older adults. In the

maintenance and cleanliness category, older adults indicated that the condition of pavement and equipment items were very important factors. In the visibility group of factors, the most important factors were identified to be the following: bright day and dark night, artificial lighting and possibility to be visible and to see others, i.e., those related to the presence or absence of light and the conditions for noticing potential threats. In the category of external protection, video surveillance was the only important factor; however, two other factors reached also high scores (over 4.30).

The Student's *t*-test was used to show the significance of differences in responses between under 60 and 60+ aged respondents ($p < 0.05$). As indicated in Table 3 (the fifth column), 18 of 19 indicated factors were statistically significant between these two groups. The biggest difference in the perception of factors affecting safety in urban parks was indicated in the case of pavement condition. Greenery with leaves was also much more important for older adults as compared to younger respondents. Significantly higher than the other categories of park users, people aged 60+ assessed the importance of factors such as functional aids (ramps, lifts) and varied topography that determine the safety and comfort of their physical movement in urban greenery. In the case of 8 factors, the *t*-value was over 4.0. Figure 2 shows a comparison of both groups of respondents (under 60 and 60+) with general results.

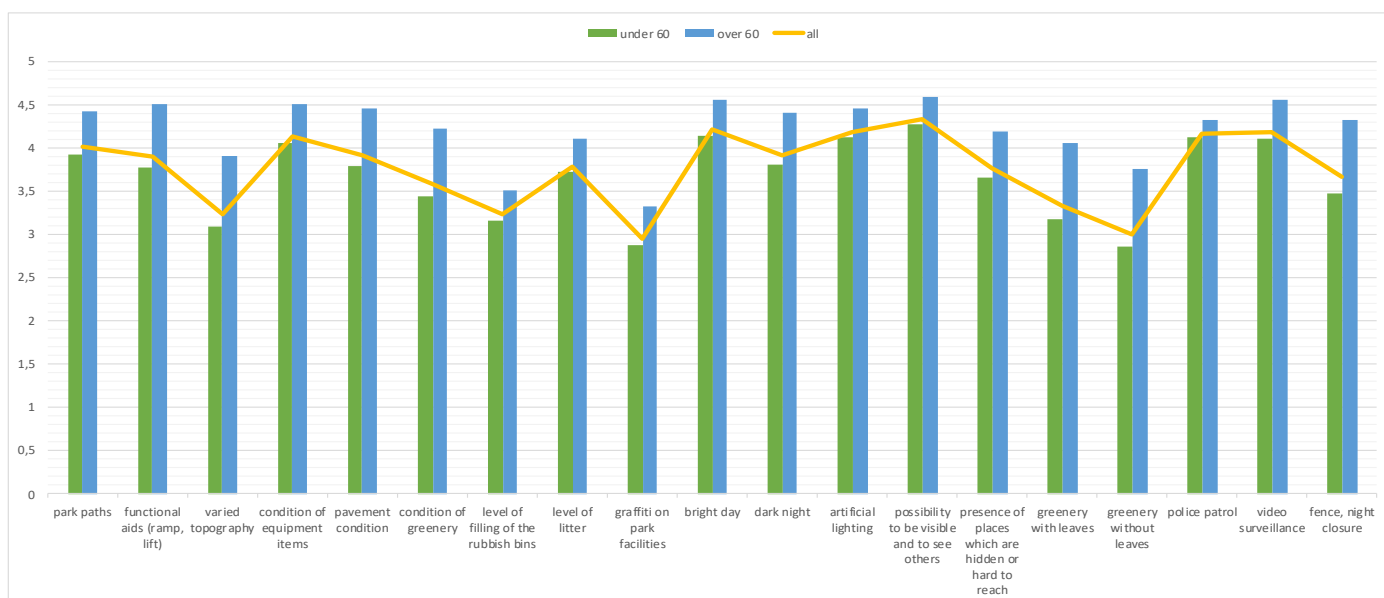


Figure 2. Summary of indications of the significance of factors influencing the perceived security of respondents by age (elaborated by authors).

4. Discussion

The quality and attractiveness of urban parks, which translate directly to their use, depend on many aspects, with safety being one of the key factors, as confirmed by many studies [92,163,181]. According to Sundevall and Jansson [106], creating an inclusive public space appropriate for various age groups, including older adults, requires getting to know their habits and expectations. Therefore, shaping safe parks requires recognizing which factors are of the greatest importance for the users' sense of security, especially those groups that are at risk of marginalization and exclusion, such as older adults. Contemporary shaping of urban green areas requires user-oriented design and management based upon a full understanding of the needs of all users [71,182,183]. Research on the perception of security by various groups of users is crucial for understanding their perspective and creating inclusive parks. This approach is currently being promoted [33,41,71,106,116,184–187] due to global aging trends. Conducting research on the safety of older adults in parks is also justified due to the need to create conditions for active aging [188].

The first hypothesis was that there are differences between the sense of security of older adults and other groups of urban park users. After literature review, we indicated that factors influencing the sense of security of all groups of users of urban green areas are discussed in publications to a very different extent [92,181]. In the case of reports regarding age, some of them show that older adults, included in the group of people with special requirements, generally have a lower sense of security than other age groups of users of public spaces [26,64–69]. However, the distinction in the perception of security between various age groups is not widely described.

The Student's *t*-test used in this study to show the significance of the differences in responses between under 60 and 60+ aged respondents ($p < 0.05$) indicated that there was a difference in the case of 18 out of 19 factors. Only in the case of presence of police patrol in urban parks was there not statistically significant difference in perception among respondents under and over 60 years old. This proves that the needs of older adults differ from younger park users, which should have an impact on designing of urban parks.

The second hypothesis was that most factors related to aspects of the presence of mobility facilities, maintenance and cleanliness, visibility, and external protection are more important for the older adults' sense of security, as they are a group of park users with special requirements. The confirmation of this hypothesis would allow the formulation of the statement that older adults pay more attention to security-providing factors than younger adults. The obtained results show that for all 19 factors, the importance assigned to them by older adults was greater than for the under 60 park users. The largest differences in the indications of the significance of individual factors between age groups (*t*-value above 4.0) occurred for eight factors: fence, pavement condition, greenery with and without leaves, functional aids, condition of greenery, varied topography, and condition of equipment. The results also allowed for the distinction of nine factors that have the greatest impact on the sense of security of older adults (score 4.40 and higher on the Likert scale). Among them were the presence of park paths and functional aids, the condition of pavement and equipment items, bright day and dark night, artificial lighting, the possibility to be visible and to see others, and video surveillance.

The obtained results are important because they firmly show the differences in the perception of safety between older and younger park users and at the same time prove that for older adults the factors influencing the sense of security are more important than for others. The conclusions from our study contribute to the development of research in this field, because there is very little cross-sectional research in the literature on the relationship between various factors occurring in parks and the sense of security of older adults.

In the mobility facilities category, selected factors (such as the presence of park paths and pavement condition) were identified by Wang and Rodiek [151] as particularly important for older adults. Other publications discussed the role of these elements, mainly in the context of ensuring the accessibility of urban parks, as well as the need to maintain them in good condition [26,116,122,123,151]. Only several studies have reported that not only the lack of paths, but also the uneven ground or poor-quality sidewalks are perceived as a problem for many park users [12,157]. However, there is not much current research on the direct link between the quality of path surfaces and their overall maintenance in parks in the context of the sense of security of older adults. It is also important to associate the perception of the sense of security resulting from this factor with another in this category, i.e., varied topography, which is discussed very rarely in the literature and mainly concerns the visual attractiveness of urban parks [160,161]. Only a few publications mention that general difficulties in moving around the park are one of the key factors affecting the sense of security [162]. The results of the research presented in this paper have also confirmed that the presence of varied topography is one of the factors important for the sense of security of older adults.

Functional aids (ramps, lifts) are also among the other factors that are particularly important for the sense of security of older adults, which was confirmed in our study. Their application is important for the proper functioning of public spaces in cities, ensuring their

accessibility. However, most of the research in this area is in the context of designing spaces not related to green areas [23,189,190]. It also applies mainly to the disabled [191–193], and yet many able-bodied people lose their ease of movement and undergo height differences throughout their lives. Research in this area sporadically concerns green areas [26].

In the maintenance and cleanliness category, some research confirms that both of those aspects are generally important for adolescents and influence their visiting and physical activity in urban parks [45,60,187,188] and have an impact on older adults' security [24,106,121,146]. The results related to the condition of park facilities, such as equipment and pavement, have been assessed as very important for the perception of security of 60+ aged users in our study. These findings are in line with the experiences presented by other studies [24,26,106,116,117,121–124]. The good condition of greenery, which makes the park visually attractive [57,80,108], is also crucial for older adults. This is mentioned in our study, as well as in other publications [24,92,106,179]. The results presented in publications show that all aspects of damage and litter usually have a significant impact on the sense of security of adolescent park users and older adults [30,97,106,135,136].

In the visibility category, factors such as bright day, dark night, and artificial lighting are generally recognized as having an impact on the sense of safety of all users, mainly in urban spaces, but less studied with regard to urban green areas [103]. However, in our research, two other factors from the visibility category (greenery with and without leaves) were among those showing the largest differences in the indications of significance of individual factors between age groups. At the same time, other research has not developed this field of study in the context of seniors.

The results related to the external protection category allowed to distinguish video surveillance as a particularly important factor for all respondents, not just older adults. This is consistent with the results of many studies conducted among various users of not only parks, but also public spaces in general [70,174,175,194–198]. At the same time in the opinion of older adults', the use of cameras in urban green areas is perceived as an important strategy for maintaining a safe environment [45]; however, there is a lack of research on this relation. There is also no reference in any research to the importance of fencing parks and closing them at night, which was indicated in our study as important for the security perception of 60+ aged park users.

It is worth noting that although attention is drawn to the impact of various factors on the sense of security on users of public spaces [26,72,92,181], very little research is focused directly on older adults as users of urban parks, which is so important to improve both their health and physical condition. The results of our study indicate the importance of many factors for shaping both "age friendly" and "activity friendly" urban parks, which may provide safe and barrier-free green areas crucial to encouraging the physical activity of older adults' [13]. They also confirm that the concerns of 60+ aged park users about their safety should be addressed with responsibility [26,45].

5. Conclusions

Creating urban green areas requires ensuring equal opportunities for different user groups and to avoiding potential conflicts between them. The global aging of urban populations is driving the adoption of age-friendly approaches. The challenge is to prepare for these changes in such a way that both current and future generations of older adults can fully benefit from these strategies. A special role in this respect is played by shaping urban parks, which are the basic places for recreation and improving health and well-being for older adults in cities. Urban parks that are not age diverse, among other factors, become uninviting and exclusive.

Safety is one of the most important aspects that influence the attractiveness of urban green areas and the tendency to use them for recreational purposes. This is confirmed by the research results presented in this study. They show that most of the factors discussed from all four categories (mobility facilities, maintenance and cleanliness, visibility, and external protection) are important for the safety of all user groups and are crucial for older adults

due to the impact on their physical activity. This confirms hypothesis one. The results obtained in our study also confirm hypothesis two and show that 18 out of 19 factors related to aspects of the presence of mobility facilities, maintenance and cleanliness, visibility, and external protection are more important for older adults' sense of security as a group of park users with special requirements.

The undertaken research is the stage on which to extend the knowledge supporting the design process of urban greenery that meet the expectations and needs of various user groups, in particular, those who are at risk of exclusion, such as older adults. When designing new parks and modernizing existing parks, it is important to make choices and implement solutions that, in responding to the needs of various user groups, both increase the attractiveness of green areas for the elderly and contribute even more to encouraging them to spend time outdoors, thus improving their health and well-being. For this to be possible, recommendations based on scientific research are needed.

The lack of detailed data confirms the legitimacy of undertaking our research. It also points out that it is important to identify in detail factors that determine safety in parks, both in younger people and older adults, and then to compare them with each other to reveal the differences. Insufficient knowledge on this subject, resulting in failure to meet the expectations of groups of people with special requirements, may, consequently, expose them to exclusion from the use of green areas, which are their primary place of rest, contact with nature, and improvement of health in highly urbanized areas. Therefore, it is important to continue research on older adults, increasing both the research sample and the number of factors which may affect their perception of security in urban parks.

The presented study makes a significant contribution to the completion of some knowledge gaps and helps to understand which factors characteristic to urban parks are important and affect the sense of security of older adults. This may, therefore, contribute to the improvement of the accessibility of urban parks, facilitate older adults' engagement in physical activities, and thus enhance their health and well-being. This knowledge is needed, not only for researchers in theoretical terms, but above all it has a practical dimension and can be used as a tool supporting the process of planning and design of urban green areas to make them more inclusive, equitable, and to meet the expectations of all potential user groups, especially older adults.

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