8th International Academic Conference on Places and Technologies

PROCEEDINGS

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Keeping up with technologies to imagine and build together sustainable, inclusive, and beautiful cities

PLACES AND +ECHNOLOGIES 23

PLACES AND TECHNO LOGIES

2023

P+23

WORD OF THE CONFERENCE DIRECTOR

_ Aleksandra Djukic

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This Proceedings from the 8th International Conference Places and Technologies: Keeping up with Technology to act Responsively with Urban Environment, which was held in Belgrade in October 2023, contributes to the discussion about the future of society and places and the role of technology in it and discussions with respect to strategy for responsive quality environment. More than 85 papers from 20 countries were presented during the conference. The organizers of the conference were: University of Belgrade (Faculty of Architecture) and Professional Association Urban Laboratory (UrbanLab). This time we have a joint event with CIRRE conference which contributed with18 conference papers.
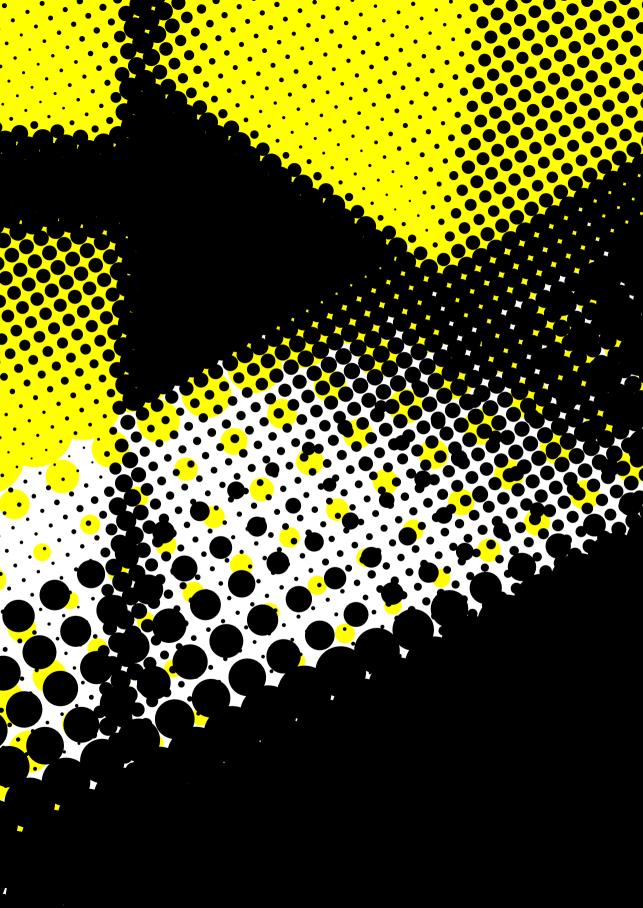
The conference aimed to raise questions about the future of cities and the environment, emphasizing the critical role of technology in designing innovative solutions to enhance urban spaces. It underscored the importance of a multidisciplinary approach, bridging engineering, humanities, and social sciences to address urban challenges effectively. New urban and building concepts predominantly rely on Information and Communication Technologies (ICT) to drive progress and responsiveness to various urban development aspects.

The conference proceedings is divided into seven main parts in correlation with the scale of planning and construction - spatial planning, urban planning, urban design, architectural design, architectural technologies, architectural education and close domains of the place and technologies, focusing on responsive spatial and urban planning, design, architecture, heritage protection, education and technological advancements in architecture. Each section delves into specific topics such as morphology, sustainable construction, cultural heritage, digital technologies, identity, teaching architecture and urban planning and climate resilience.

The event's significance lies in promoting the integration of smart technologies and modern urban concepts for sustainable city development, addressing diverse urban issues through academic research and collaboration. Different problems in the domains of urban design and planning, architectural design, building technologies, urban sociology, ICT, transport and traffic studies, resilience of place, climate change, adaptive reuse, cities and health, landscape architecture, identity, heritage etc. are presented and discussed in more than 80 conference papers made by professors, researchers, and PhD students from all over Europe and the world.

The conference serves as a platform for global researchers to enhance their academic standing, foster research networks, and initiate new scientific endeavors, contributing to the scientific advancement of Serbia and the region.

Places and Technologies conference become traditional international event gathering researchers all around the world and has provided an opportunity for them to advance their positions in the academic hierarchy, to build their research networks and to develop new scientific projects. Presentation and the quality of the papers that are results of new studies, debates and research strengthen our ambition to keep the importance of our conference among many European ones.

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8th Conference of Interdisciplinary Research on Real Estate: CIRRE 2023

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THE ROLE OF PUBLIC SPACE IN SHAPING THE QUALITY OF LIFE FOR OLDER RESIDENTS: THE CASE OF SLOVENIA

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ABSTRACT

For several decades, Europe has been undergoing a significant demographic shift characterized by population aging. Across all European Union nations, there has been a consistent rise in the number of individuals aged 65 and older. Another noticeable trend is the preference of older adults for urban living. In Slovenia, urban areas witnessed substantial growth post-World War II due to mass migration to the cities. This urbanization led to a housing shortage, prompting the construction of large housing estates primarily designed for young families. However, due to limited housing mobility and the option for residents to purchase their rental apartments after independence in 1991, the initial inhabitants still predominantly reside in these estates. Over time, these residents have aged, and the housing and public spaces designed for young families no longer meet their needs. In the Slovenian cultural context, housing is among the most important factors of quality of life, particularly for older people who spend the majority of their time at home. They develop strong attachments to their living spaces throughout their lives. The dwellings and surrounding public spaces in these housing estates constitute the primary environment for older residents, where they engage in physical activities and social interactions. Our research is based on the hypothesis that the public space in large housing estates plays a substantial role in shaping the quality of life for older residents. To assess the validity of this hypothesis, a structured questionnaire was prepared, measuring satisfaction, habits, relationships, and perceptions of the elderly regarding public spaces in their housing estates. In this paper, we present the research results and draw attention to the features that have a positive impact on the quality of life of the elderly. The conclusion develops guidelines and recommendations for adapting public spaces in large housing estates to the needs of elderly residents.

KEYWORDS _ *large housing estates, public space, elderly needs, quality of life, ageing in place, guidelines and recommendations*

INTRODUCTION

The comparison of the European population in 2022 and projections made for 2100 shows that despite the expected population decline, the share of the population aged 65 years and over is increasing in every EU Member State. Those aged 65 and over will account for 31.3% of the EU's population by 2100, compared with 21.1% in 2022. Another aspect of population ageing is the progressive ageing of the older population itself, as the share of those aged 80 years or above in the EU's population is projected to increase from 6.1% in 2022 to 14.6% by 2100 (European Commission, 2022). In addition to the general ageing of the population, the proportion of older adults living in urban environments is also increasing. Compared to older adults living in rural areas, this proportion has been gradually increasing in Slovenia since 1980 (World Health Organization, 2018). Urban environments are also characterized by housing estates constructed between the end of the Second World War in 1945 and the end of the 80s. In Slovenia, 51.8% of all multi-family buildings were built in this period known as socialist era (Surveying and Mapping Authority of the Republic of Slovenia, 2023). The socialist ideology of providing housing for all was followed by architects who aimed to design apartments that would improve the lives of the workers (Malešič, 2014). In industrial centres where a significant workforce was concentrated and the demand for housing was highest, large housing estates were constructed. This are substantial residential complexes with several thousand residential units and complementary facilities of social infrastructure, like kindergartens, shops, schools, or the shared utilization of communal services (Dimitrovska Andrews et al., 1999). The urban plans envisaged that young and healthy people would live in these large housing estates, and therefore the public space in these neighbourhoods was adapted to their needs (Železnik et al., 2020).

Their construction of large housing estates stopped after the introduction of a new sociopolitical and economic system in 1991. In a capitalist economic system residents had the opportunity to purchase their apartments. Because of this and a low mobility rate in Slovenia (see Mandič, 2015; Sendi, 2017), many original occupants of housing estates continue to live there. But during their time in the housing estate, they transitioned from being active members of the workforce to retirees, which means that their housing and public space needs in large housing estates have also changed. Public spaces in these residential neighbourhoods have become insufficient for elderly needs, as they are still adapted for younger and healthy people, as planned, rather than for the needs of the elderly. However, elderly, due to various obstacles in the neighbourhood, cannot be actively engaged within the community and the local environment, thereby increasing the risk of social exclusion among other potential consequences. This is particularly worrying for two reasons: first, institutional care facilities can only provide accommodation for 5% of people over sixty-five (Nagode et al., 2014), whereas other elderly age in their home environments, whereby only 1.7% are included in the formal homecare services (Nagode et al., 2018); second, the elderly would also like to remain or age in their home environment (the concept of aging in place) as long as possible, where they can lead their lives as independently as possible with the best possible quality of life, which is also confirmed by a number of studies (see, e.g. Baker & Prince, 1991; Gurney, 1997; Gitlin, 2003; de Jong et al., 2012). As established by Jordana Maisel et al. (2008), independent life stimulates successful ageing with improved health and life satisfaction, and increases the self-esteem of the elderly, all of which can postpone their use of institutionalized care. On the other hand, an access to good-quality, well-maintained public spaces can help improve human physical and mental health by encouraging people to walk more, engage in sports, or simply enjoy an outdoor environment. Especially older people use public spaces but not for transitional purposes, they actually live in and embrace these areas. In this case, public spaces are vital for the elderly (Altuğ Turan & Malkoç True, 2023). For that reason, it is important that the public space in large housing estates be adapted to the needs of the elderly to ensure everyone a dignified—and, first and foremost, high-quality—life in old age and active integration into the local community. Regardless of all the positive characteristics of public space for high-quality ageing mentioned above, public spaces in large housing estates are not given as much attention as public spaces in non-housing (urban) areas. Furthermore, because public spaces in large housing estates are usually

not important at the level of the entire city, they are often treated as marginal. As Ali Madanipour (2004, p. 269) points out, public spaces in large housing estates "are not on the list of priorities of local authorities to deal with, whether in terms of political legitimacy, economic competitiveness and social cohesion of the city or its image and marketability." Hence, significantly fewer studies have been conducted on public space in large housing estates (see, Atkinson, 2003; Madanipour, 2004; Carmona et al., 2005). However, the ones that were conducted revealed diverse problems, especially the inappropriate physical properties of public space, such as the spatial layout of public areas, problems connected with parking, poor maintenance, inadequate management of public spaces and their inappropriate use, conflicts between various age groups, and sociocultural differences. The listed problems indicate that large housing estates and their public spaces are often in the original state, where only partial regeneration have been carried out. These regenerations typically focus on a single issue, such as energy renovation of buildings, without considering the overall regeneration of the neighbourhood, where the changed needs of older residents would also be considered. Public space in a housing estate is of special importance to them because a) they can be limited by various impairments and cannot go far from their homes, and b) they are also accustomed to public spaces in their housing estates since most of them have lived there for a very long time. Since the proportion of older people is increasing, and more of them are living in urban areas, while a significant portion of urban environments consists of large housing estates built during the socialist era, this article is based on the hypothesis that the public space plays a substantial role in shaping the quality of life for older residents in these neighbourhoods. Thus, it is important to explore public spaces in large housing estates, with measuring satisfaction, habits, attitudes, and perceptions among elderly related to the public space.

THEORETICAL BACKGROUNDS

As mentioned in the introduction, dwellings constructed during the socialist era represent a significant share of the entire residential stock in Slovenia (Malešič, 2014). Although other European countries also faced similar challenges after the Second World War, such as housing shortage, poor living conditions, and urban population growth, the proportion of housing built during this period in Slovenia (and other former Yugoslav countries) is particularly high. Authorities saw a solution to the increasing demand for new housing by closely integrating the construction sector and industry, leading to mass construction in the form of large housing estates. Industrial production of standardized housing units provided construction companies with quick access to relatively inexpensive building materials for installation, ensuring efficient provision of housing for the rapidly growing urban population. A crucial moment for the development of housing construction in Yugoslavia was the ideological split with Stalinist Russia in 1948, which brought economic reforms, decentralization, liberalization, and the adoption of modernist concepts within architecture (Knorr-Siedow, 1998; Turkington et al., 2004; Rowlands et al., 2009; Alfirevic & Simonovic Alfirevic, 2015). The consultation of Yugoslav architects in Dubrovnik in 1950 initiated the first ideas about architecture outside the influence of the Soviet Union, leading to the early experiments in "habitology", that means exploring the limits of existential minimum in collective housing, maximizing space utilization, and optimizing functionality, all of which were required by the state as the primary investor (Alfirevic & Simonovic Alfirevic, 2015). The compilation of ideas from the architects' meeting in Dubrovnik and the reflections of other modernist trends of that period recognized the form of large housing estates, with various types of residential buildings and spacious public areas in between, as the best type of residential construction for addressing existing housing challenges (Monclús & Díez Medina, 2016; Krstić, 2018). Public space played a significant role in the design of large housing estates, as its integration among residential buildings meant a healthier environment for workers, enhanced aesthetics of neighbourhoods, and a space that facilitated social interactions for residents (Power, 1999; Engel, 2006; Hirt & Kovachev, 2006; Al-hagla, 2008; Hirt, 2014; Mantey & Kępkowicz, 2018; Tuvikene et al., 2020; Kerbler et al., 2021b). For the residents, the public spaces in large housing estates represented essential living

areas outside their homes, mainly due to specific minimum spatial standards for determining the appropriate size of the apartment for a family based on its number of members (Engel, 2006; Poposki, 2011; Alfirevic & Simonovic Alfirevic, 2015; Kristiánová, 2016). The public spaces of large housing estates were planned as the centre of residential complexes, where spaces for adults and children's playgrounds intertwined. When designing these public spaces, planners primarily considered the needs of children and young adults, who constituted the majority of residents in large housing estates (Engel, 2006; Kilnarová & Wittmann, 2017; Kerbler et al., 2021b). Like the housing estates and their buildings, public spaces also faced criticism for being monotonous in appearance (see Power, 1997; Knorr Siedow & Droste, 2003; Černič Mali et al., 2003; Turkington et al., 2004; Wassenberg, 2011; Milašinović-Marić, 2012) since the plans were often not fully realized. Most commonly, public spaces were only equipped with the most essential services, and the originally planned diversity of the public space was not fully realized. Social centres, which were meant to support social interactions among residents, were often left unconstructed (Engel, 2006; Malešič, 2015; Dinić & Mitković, 2016). Despite their monotonous appearance, the public spaces of large housing estates remain an essential area for residents to socialize and spend time close to their homes (Engel, 2006; Kerbler et al., 2021b). Therefore, the quality of public spaces has become one of the fundamental elements for ensuring the quality of life of residents in large housing estates.

A significant moment in the exploration of quality of life occurred when the World Health Organization (1998) introduced a definition for it. This step was taken in response to the absence of a universally accepted understanding of the components of quality of life prior to this point. Therefore, in the definition, they highlighted subjectivity as a crucial element and defined quality of life as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns" (World Health Organization, 1998 s.p.). This means that quality of life cannot be measured solely with objective variables and expressed only by assessing health status, economic status, and the like, but the perception of individuals and their cultural environment is essential (World Health Organization, 1998). The study by Srna Mandič (2011) has shown that, for Slovenian cultural context, housing is among the most important factors of quality of life, similarly, foreign studies also find the same conclusions for their cultural contexts (see, e.g., Erikson, 1993; Atkinson et al., 2002; Fahey et al., 2004; Domanski et al., 2006). However, as Mandič (1999) points out, the living environment is not limited only to the dwelling unit, but also covers the residential community or the local environment where the individual lives, and thus also the public space in this environment. Public space is a space in which social processes and public life take place. Thus, in housing estates public space is an indispensable area for the residents, who use it for relaxation and communication with neighbours and others (Sendi, 2007). It is the basic "material" of the community and an extension of intimate personal space, and as such is a condition for the social dimension of living (Dešman, 2008). The definition of public space can be further enriched by distinguishing between the following dimensions of such space: a) the physical dimension (home and neighbourhood), b) social dimension (relationships with others), c) emotional and psychological dimension (sense of belonging and attachment), and s) cultural dimension (connected with people's values, norms, beliefs, ethnicity, and symbolic meanings) (Iecovich, 2014). Well-planned, organized, managed, used, and maintained public spaces thus play a key role in creating an attractive residential environment and can significantly contribute to achieving a sense of strong mutual connection within the neighbourhood or community among the residents (De Chiara et al., 1995; Sendi, 2007). Richard Sendi (2007) further claims that the public space in housing estates is one of the main elements that affect the neighbourhood's reputation and consequently also residents' satisfaction with the quality of living in a particular neighbourhood. He believes that the shape and layout of the public space influence the image that the neighbourhood conveys to its residents, especially to its older ones.

However, the relationship of individuals to their living environment and thus to public space receives great importance during old age (Sixsmith, 1986; Oswald & Wahl, 2005; Dahlin-Ivanoff et al., 2007; Mandič, 2011). A suitable public space in residential neighbourhoods adapted to the needs of the

elderly can thus be of great help in ensuring quality of life in old age. A review of the existing literature on the quality of life among the elderly and the role of public spaces in this context, reveals diverse approaches to the topic. Some authors explore the impact of public space on various aspects of the quality of life of older adults (Sugiyama & Thompson, 2006), to more narrowly focused research, such as investigating the impact of public spaces on the physical activity of older adults (for example, Li et al., 2005a, 2005b; Sugiyama & Thompson, 2006; Sugiyama & Ward Thompson, 2008; Sugiyama et al., 2009; Ambrose Gallagher et al., 2012), or even more specifically, just the influence that benches have on the well-being of older adults (Ottoni et al., 2016). Yet other authors are more focused on the social and psychological aspects of the quality of life of older adults, and they explore the connections between public spaces and the social needs of the elderly (Kwok & Ng, 2008; Yung et al., 2016). Public spaces are, however, an important area of meeting and linking bonds as well as maintaining networks within a neighbourhood (Temkin & Rohe, 1998; Guest & Wierzbicki, 1999; Bolland & McCallum, 2002; Leyden, 2003; Kim & Kaplan, 2004; Lelieveldt, 2004; Young et al., 2004), which can be an important source of social support, especially for the elderly. Therefore, it is important that public spaces in housing estates, especially in large ones, are adapted to the needs of the elderly to ensure everyone a dignified—and, first and foremost, high-quality—life in old age and active integration into the local community.

METHODS

For this research, a large housing estate was defined as a substantial residential complex with a minimum of 1,000 residential units (Dimitrovska Andrews et al., 1999). Twenty-nine housing estates were identified as large housing estates in Slovenia and included into survey. A survey among older residents (aged 60+) was conducted in selected neighbourhoods. Two survey methods were used: 1) written and 2) online. The written survey was carried out between December 2021 and December 2022, and the online survey took place in November 2022. For the purpose of survey, a questionnaire as a measuring instrument was prepared. The questionnaire for both survey methods was identical. Therefore, the data from both survey methods were combined and analysed together. To verify the hypothesis, it was necessary to measure the quality of public space in large housing estates from the perspective of the quality of life of older residents. A five-point Likert scale was chosen to measure older residents' satisfaction, habits, attitudes, perceptions, and attachment related to the public space in large housing estates.

Combined data from both survey methods show (see Table 1) that the sample included 304 respondents, two-thirds of whom were women. On average, they were 73.4 years old, and 70% had lived in their large housing estates for more than 30 years. Three-quarters of them lived alone or with a partner. Just under 60% had completed secondary education. In almost half of the cases, they reported that their health was satisfactory; however, half of them faced various forms of disability, most often with impaired movement. Most of them lived on floors (86.1%). Almost half of the multi-apartment buildings in which the respondents lived did not have built-in elevators.

Table 1: Descriptive statistics of respondents in the sample

Variable	Results
Number of respondents	304
Average years of residence	35.4
Average age of respondents (years)	73.4
Average number of household members	1.9
Household type (%)	
Alone	30.0
With a partner	46.0
With a partner and children	12.3

Without a partner, but with children	4.0
In a multigenerational family with children and/or grandchildren	6.0
Other	1.7
Sex (%)	
Male	36.0
Female	64.0
Education (%)	
Primary school	7.0
Specialized high school	20.3
High school	38.3
College or university	34.3
Living floor (%)	
Ground floor	13.9
First floor	17.9
Second floor	18.5
Third floor	13.6
Fourth floor and above	36.1
Elevator (%)	
Yes	51.0
No	49.0
Health (%)	
Very poor	1.0
Bad	9.0
Satisfying	47.5
Good	34.6
Very good	8.0
Disability (%)	
Yes	50.0
No	50.0

Note: Unanswered questions (missing values) and "I do not know" answers are not included.

RESULTS

Based on existing research on quality of life and the role of public spaces in large housing estates for the elderly, our study falls within researches with a broader scope, as we have included questions in the survey that cover all dimensions of public space, as differentiated by Esther Iecovich (2014) – physical dimension, social dimension, emotional and psychological dimension, and cultural dimension. The survey covered a range of topics, including residents' satisfaction with various aspects of their neighbourhood, their engagement in outdoor activities, the sense of community and relationships among neighbours, and personal factors such as health and mobility limitations.

Satisfaction with the neighbourhood

Results in the Table 2 represent elderly residents' satisfaction levels with various aspects of their neighbourhood. Overall, the results suggest that respondents are generally satisfied with various aspects of their neighbourhood, as in 22 out of 33 categories, more than 60% of the respondents' express satisfaction with the features and characteristics of the neighbourhood. Most older residents are satisfied with grocery stores (90.7%), pharmacies (90.1%), and public transportation (85.8%) in their housing estates. The primary source of discontent among residents lies in their dissatisfaction with the parking facilities. In fact, nearly half of the respondent's express dissatisfaction with the

available parking options. A slightly higher number of respondents expressed dissatisfaction with the availability of cultural services in their neighbourhoods and the accessibility of information about local events (around 30%). In other areas, satisfaction is more evenly distributed. It's important to note that the "neither-nor" category often represents areas with potential for improvement, where respondents neither strongly agree nor disagree with the statements presented.

Table 2: General satisfaction with specific aspects and features of
the neighbourhood, according to the elderly residents' needs

	Very dissatisfied (%)	Dissatisfied (%)	Neither-Nor (%)	Satisfied (%)	Very satisfied (%)	Total (%)
General neighbourhood characteristics						
Neighbourhood's suitability for elderly living	3,6	10,4	21,6	48,6	15,8	100
Street lighting	0,4	2,5	16,9	59	21,2	100
Safety	0,7	4,6	18,9	57,1	18,6	100
Peacefulness	2,5	5,8	21,9	52,5	17,3	100
Cleanliness	2,9	10,2	24,8	51,1	10,9	100
Green areas	2,6	3,7	13,9	46,5	33,3	100
Other outdoor areas (plazas, squares, etc.)	1,2	12,7	29,9	41,4	14,8	100
Clarity of building and service signage	1,1	4	20,2	55,9	18,8	100
Traffic organization in the neighbourhood						
Traffic density	9,8	19,6	27,3	36,7	6,5	100
Parking	20,2	25,3	22,4	25,3	6,9	100
Pedestrian crossings	2,2	3,3	21,1	57,1	16,4	100
Pathway condition in the neighbourhood						
Walking paths	2,2	7	15	49,1	26,7	100
Sidewalks	2,2	6,1	14,7	57,9	19,1	100
Stairs and curbs	4	8,1	23,2	48,2	16,5	100
Ramps	3,4	6,8	27,3	46,2	16,3	100
Accessibility of services in the neighbourhood						
Public transport	1,5	3,3	9,3	45,4	40,4	100
Pharmacy	2,3	2,7	5	39,1	51	100
Bank	6,9	6,5	15,4	34,8	36,4	100
Post office	4	6,8	12	44,4	32,8	100
Grocery store	1,4	1,8	6,1	45	45,7	100
Specialized food stores (e.g., butcher shop, fruit, and vegetable store)	3,9	8,9	20,2	44,6	22,5	100
Other specialized stores (e.g., clothing store)	5,7	17,1	32,5	32,1	12,6	100
Health centre	9	15,3	14	36,9	24,8	100
Hospitality services (e.g., restaurant, bar)	3,1	8,4	24,9	43,7	19,9	100
Personal care services (e.g., hair salon)	0,7	4,1	15,7	57,7	21,7	100
Cultural services	7,2	20,4	40,7	23,1	8,6	100
Leisure activities (e.g., exercise, education)	3,5	11,8	27,2	43,3	14,2	100
Home care services	3	11,9	38,6	34,7	11,9	100
Neighbourhood amenities						
Benches	5,2	16,1	17,6	46,8	14,2	100
Recreational facilities	5,2	17,9	19,5	41,4	15,9	100
Trash bins	5,5	12	25,2	44,9	12,4	100
Information availability about the neighbourhood						

Information availability about neighbourhood events	5,6	20,3	35,7	31,2	7,1	100
Opportunity for your involvement in neighbourhood decisions	6,7	15	39	31,5	7,9	100

Note: Unanswered questions (missing values) and "I do not know" answers are not included.

Activities in the neighbourhood

Respondents were asked about the amount of time they spend outside in the neighbourhood. This question was divided into two parts, corresponding to the warm and cold halves of the year. The research results indicated that during the warm half of the year, older adults spend an average of 4.84 hours outside daily, while during the cold half of the year, they spend outside nearly two hours less per day.

The results in the Table 3 provide insights into the frequency of performing various activities among the surveyed elderly in their residential neighbourhoods. Walking emerged as a particularly popular activity, with a substantial share of respondents engaging in it frequently. Around one-third of the participants reported walking often on a weekly basis, while an even larger segment (39.1%) engaged in walking very often, nearly daily. Walking stands out as a preferred activity for older adults, even in the presence of perceived obstacles within public space of their housing estates. Surprisingly, more than two-thirds of those who perceive obstacles still choose to walk on a weekly or almost daily basis. On the other hand, cycling appeared to be less common, with a larger portion of respondents indicating that they never or very rarely engage in this activity (44.9%). This could be attributed to factors such as limited access to suitable cycling paths, concerns about safety, or personal preferences.

Socializing and chatting were also highlighted in the results, indicating a diverse range of engagement levels. While 37.3% of respondents reported occasional socializing, less than a third of the respondents reported engaging in social activities often on a weekly basis.

Table 3: Frequency of performing individual activities in the neighbourhood

	never (%)	very rarely (a few times a year) (%)	occasionally (a few times a month) (%)	often (weekly) (%)	very often (almost daily) (%)	total (%)
Walking	4,7	7,2	19	30,1	39,1	100
Cycling	44,9	11,4	16,2	15,4	12,1	100
Socializing, chatting	8,7	14,5	37,3	25,7	13,8	100
Sitting on benches	22,6	35,2	24,8	12,2	5,2	100
Walking the dog or other pets	70	6,7	5,6	4,1	13,5	100
Babysitting grandchildren at the playground	53,5	14,9	15,2	9,3	7,1	100
Shopping	2,2	4,3	24,1	45	24,5	100

Note: Unanswered questions (missing values) and "I do not know" answers are not included.

The findings related to the activity of babysitting grandchildren at the playground reveal an interesting aspect of the respondents' behaviours. A noteworthy observation is that a substantial proportion of

participants (53.5%), indicated that they never engage in this activity. This suggests that a significant segment of older adults may not be actively involved in this form of social interaction. The remaining percentages, totalling 46.5%, represent those who do engage in this activity to varying degrees. This distribution highlights the diversity in how older adults contribute to family interactions and caregiving responsibilities within their large housing estates.

Majority of the respondents answered that they never walk the dog in the neighbourhood. However, it is important to highlight that we did not specifically inquire whether they have a dog or other pets.

Finally, shopping demonstrated a notable level of engagement, particularly on a weekly basis, as almost half of respondents reported frequent participation. This suggests that shopping is a routine and essential activity for a significant proportion of the surveyed individuals, further highlighting the relevance of nearby amenities.

Residential habits and interpersonal relationships

The results presented in Table 4 provide insights into the residential habits and interpersonal relationships of elderly residents within the selected large housing estates. The data illustrates the distribution of responses on a five-point scale, ranging from "strongly disagree" to "strongly agree," regarding various aspects related to the neighbourhood public space and social interactions.

One notable finding is that a considerable proportion of respondents, 43.7%, agreed that there are no obstacles hindering access or movement in the public spaces of the neighbourhood. This suggests that a considerable portion of the elderly residents perceive the neighbourhood as having accessible and navigable outdoor public areas, which is crucial for their mobility and engagement. However, a fifth of the surveyed residents in public spaces of the neighbourhoods face or notice obstacles that limit their utilization of space and participation in various activities. Given that accessibility should provide equal access to every individual, regardless of their reduced capabilities, this insight must be considered when determining guidelines for designing outdoor urban environments in a way that enables full engagement of the elderly in society.

Regarding the availability of services that support independent living in old age, around 44% of respondents agreed that the services available in the neighbourhood cater to their needs even in the presence of poor health or reduced mobility. However, in this case as well, slightly over one-fifth of the respondents disagree with this statement. This was further confirmed by focus group discussions, where older individuals often mentioned the lack of certain basic services in their environment that they would need for greater independence.

In terms of social interactions, one-third of the respondents disagree with the availability of organized forms of socializing and engagement in their neighbourhoods, such as clubs or groups. This indicates that a notable portion of the elderly residents value and miss organized social activities within their neighbourhood.

Furthermore, the results show that assisting each other with various tasks is a not a frequent practice among residents in the selected neighbourhoods. Approximately one third of the respondents agreed that residents help each other with tasks like transportation and shopping, emphasizing the presence of mutual support within the community.

The results indicate that when it comes to socializing with other residents from the neighbourhood, chance encounters play an important role in the socialization of older residents, especially chance encounters in front of the building entrance.

The data related to who respondents spend their time outside with indicate certain trends. Slightly less than a half of the respondents concur with the statement that they typically spend time outdoors by themselves. The most significant divergence was observed in the response indicating that they

spend time outside with friends or acquaintances who do not reside in the same housing estate as they; slightly over a third of the respondents agreed with this assertion. As many as 47.5% of the respondents answered that they never socialize with relatives in the neighbourhood. However, it is important to highlight that we did not specifically inquire whether their relatives live in the neighbourhood.

Overall, the results from Table 4 underscore the multifaceted nature of elderly residents' interactions and experiences within their large housing estates. The findings indicate a mix of positive perceptions about neighbourhood accessibility, the availability of supportive services, and various forms of social engagement. Additionally, we need to consider that approximately one third of the respondents expressed a neutral stance towards each presented statement, indicating their indecision on the matter.

Table 4: Residential habits and interpersonal relationships of elderly residents in the neighbourhoods

	strongly disagree (%)	Disagree (%)	neither- nor (%)	agree (%)	strongly agree (%)	total (%)
In the outdoor spaces of the neighbourhood, there are no obstacles that hinder access or movement (e.g., flowerpots on sidewalks, illegal fencing of public areas around ground-floor apartments, etc.).	6,9	13,4	25,6	43,7	10,5	100
The services available in the neighbourhood enable independent living in old age, even in the case of poor health or reduced mobility.	9,1	16,7	30,1	37,3	6,9	100
The neighbourhood provides organized forms of socializing and engagement (e.g., in clubs, groups).	13,1	18,9	24	36,7	7,3	100
Residents in the neighbourhood assist each other with various tasks (e.g., transportation, shopping).	13,4	21,7	33,3	28,3	3,3	100
I socialize with other residents outdoors in the neighbourhood.	15,7	16,4	35,4	28,2	4,3	100
I usually socialize with other residents from the neighbourhood ...						
… on benches.	26,6	20,5	24,3	24,3	4,2	100
… in recreational areas.	30	14	23,2	26,8	6	100
… at a nearby bar/pub.	37,2	20,2	22,9	17,4	2,4	100
… in front of the building entrance.	16,9	14,9	25,3	35,6	7,3	100
… near a store.	21,1	20,3	29,9	24,9	3,8	100
I usually spend time outside in the neighbourhood ...						
… alone.	15,2	12,5	28,5	29,7	14,1	100
… with residents from my building.	25,1	16,5	29,8	22,7	5,9	100
… with residents from other buildings in the neighbourhood.	28,6	15,5	34,5	17,5	4	100
… with other friends or acquaintances who don't live in the neighbourhood.	21,6	13,6	25	30,7	9,1	100
… with relatives who live in the same neighbourhood.	47,5	17,4	18,5	12,4	4,2	100
… with relatives who don't live in the neighbourhood.	29,2	15,7	21,7	26,6	6,7	100

Note: Unanswered questions (missing values) and "I do not know" answers are not included.

Neighbourhood attachment

The results in Table 5 show the distribution of responses regarding the attachment of individuals to their neighbourhood. This suggests that a significant portion of respondents (over 75%) are attached to their neighbourhood, indicating a positive sentiment towards their housing estate. Furthermore, when considering the attachment aspect, 83.7% of respondents stated that they have not contemplated moving in recent years.

Table 5: Neighbourhood attachment

	not at all attached (%)	not attached (%)	neither-nor (%)	attached (%)	very attached (%)	total (%)
How attached are you to your neighbourhood?	2,5	8,5	13,5	51,2	24,2	100

Note: Unanswered questions (missing values) and "I do not know" answers are not included.

CONCLUSIONS

The study delved into various dimensions of public space in large housing estates for the elderly, encompassing physical, social, emotional, psychological, and cultural aspects. It illuminated residents' satisfaction with different neighbourhood features, their engagement in outdoor activities, their sense of community, and personal factors. The study's results have affirmed that various aspects of public spaces within neighbourhoods, both the positive and negative aspects, exert a notable influence on the quality of life of older adults. These findings confirm our hypothesis that the public space in large housing estates plays a substantial role in shaping the quality of life for older residents in these neighbourhoods. Despite the overall positive findings, the study also highlights areas where residents expressed dissatisfaction, such as parking facilities and the availability of certain cultural services. The latter, in conjunction with other results, also indicates a lack of opportunities for socializing among the elderly, which is crucial for their quality of life. The results also show that the opinions of the elderly regarding the quantity of social contacts are highly divided. As we age, we tend to lose social contacts, and there could be multiple reasons explaining these results. Importantly, these reasons should not be related to inaccessible public spaces that limit the elderly in using the area. These are important insights that should be considered when regenerating large housing estates and adapting their public spaces. Based on the findings of the research, we have subsequently formulated guidelines and recommendations for adapting public spaces in large housing estates to the needs of elderly residents.

Since the research has shown that the elderly encounter obstacles, it is imperative that the public space within housing estates is free of such impediments. The creation of such an environment is particularly crucial because, as observed in research by Kerbler et al. (2021a) and similar studies, the elderly tend to adapt to these obstacles over time, ultimately altering their lifestyles. They begin to use outdoor spaces less frequently and, when they do, they restrict themselves to areas that are easily accessible. This, in turn, impacts their overall quality of life. Furthermore, it is essential to provide convenient transportation options within these neighbourhoods, offering the elderly access to essential services. The research also highlights a shortage of such services within housing estates. Additionally, public spaces within the neighbourhood should be adequately lit during nighttime to ensure safety and enable greater use by the elderly, especially during the shorter daylight hours of the colder months. Special attention should be given to the areas between multi-apartment buildings, as these serve as the primary spaces for the elderly to socialize. They must be designed in a manner that encourages chance encounters among residents and other users of the space. This is particularly crucial since a significant proportion of the elderly rely on such interactions as their primary form of social contact. Encouraging these encounters is vital, requiring open vistas, rest areas, and sufficient

seating. As the research has indicated, walking is a highly popular recreational activity among the elderly. Consequently, in housing estates, walking paths and green spaces should be established and consistently maintained. The elderly should also be given opportunities to participate in decisions regarding the layout of public spaces within the neighbourhoods. Although the research suggests that older individuals understand the importance of their involvement in neighbourhood planning, active encouragement and strategies to increase their participation are necessary. Above all, they should have the opportunity to contribute their ideas, desires, and needs to bring about changes in their neighbourhoods, with their voices being heard. Additionally, effective communication with elderly residents is of utmost importance, particularly in the era of accelerated digitization. In addition to information available on websites and social networks, notices should be posted on easily accessible bulletin boards, featuring legible information about neighbourhood events. Regular updates to these notices are necessary. One of the most significant recommendations is to provide organized, guided content in the public spaces in large housing estates, enticing the participation of both the elderly and other residents. This would foster socialization and networking, particularly among those who spend less time outdoors, especially if the absence of elevators in multi-apartment buildings limits their mobility. Such initiatives would systematically promote increased activity, particularly among the elderly, who are more vulnerable to social exclusion due to inadequacies in the built environment of their neighbourhoods.

These are just a few general guidelines and recommendations for adapting public spaces in large housing estates. However, it is essential to recognize the unique characteristics of each neighbourhood. When undergoing regenerations, the distinctive attributes of each neighbourhood should be thoroughly considered, and the needs of elderly residents within each community should be taken into account.

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