Evaluating Sustainable Neighborhood Development for the Elderly with Emphasis on Physical and Social Sustainability: Case Study: Neighborhoods in District 8 of Tehran

Ali Sheikhazami [a], Soha Aliakbari [b,*]

[a] Department of Geography and Urban Planning, North Tehran Branch, Islamic Azad University, Tehran, Iran

[b] Departmentof urban engineering, Oloom va Fonon Daryayei, North Tehran Branch, Islamic Azad University, Tehran, Iran

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Abstract

The aging process starts from birth. According to the American Nutrition Association, old age refers to natural, progressive, and irreversible physiological changes. One of the criteria for assessing the quality of space is the presence of special social groups. The elderly are also part of this group that, with their presence, can contribute to the sustainability and vitality of urban spaces and thereby improve their quality. The city and the permanent neighborhoods are a place where the organization and refurbishment of all services are tailored to the needs of the elderly and it provide sustainable environment for the next elderly generation. The purpose of this study was evaluation of sustainable neighborhood development for the elderly with emphasis on physical and social sustainability of District 8 of Tehran. The research method is descriptive-analytical and of a practical type. Through the library method, 384 questionnaires have been completed based on the formula for determining the sample size by elderly people through field studies. The data was analyzed by SPSS software and related assumptions were analyzed through single-variable t-test. The results obtained from the viewpoint of the elderly are related to physical criteria only to meet their basic needs and social indicators below the standard considered in the research (2.5). Therefore, both dimensions are far from reaching the standard status. Finally, in line with the shortcomings and weaknesses of the region, suggestions are presented.

***Keywords*:** The Elderly, Physical Dimension, Social Dimension, Sustainable Neighborhoods

1. Introduction

The world's population is rapidly aging, and this change has mainly occurred in the first century of the third millennium in developing countries (Ghanbari, 2019; 65). Human daily life involves relationships, social interactions, and activities in a form of built spaces (Kheyrossadat,2020,1) and sustainable development must continue in line with this trend. In the past two decades, sustainable development has been considered a political, professional, and academic issue (Zhang et al., 2019; 1). Sustainable development has several dimensions, one of which is sustainable social development, and issues related to the elderly are important in sustainable social development. Furthermore, urban areas are the main centers of economic, social, and political growth in any country and they are regarded as the most attractive sites for creating wealth, employment, creativity, and innovation (Samadi Ahari and Sattarzadeh, 2019, 41).

The aging process begins at birth. According to the American Nutrition Association, aging covers natural, progressive, and irreversible physiological changes. Iranian employees retire at the age of 60, and old age begins after this age (Asefzadeh, 2008; 85). The presence of the elderly in the community as a social group is one of the criteria for the qualitative evaluation of space. The presence of the elderly could make urban spaces sustainable and improve their quality.

*Corresponding author Email address: soah.aliakbari@gmail.com

Sustainable development on the neighborhood scale is defined as the improvement of the quality of life in these environments, which involves environmental, cultural, social, and economic components without limiting the future generations' facilities (Katza, 2001). The ultimate goal of neighborhood sustainable development is to establish a link between social and physical capital, because of which social processes are applied to enhance physical identity and structure, while building the capacity for future development. In other words, planning with people rather than for people is the key element in neighborhood development (Ehterami, 2009; 124). As such, the development of urban spaces and neighborhoods in proportion to the needs of various social groups is considered a major task of urban planners and designers, which has unfortunately been overlooked so far.

The increment in the aging population of the world is undeniable, which is more evident in developing countries (e.g., Iran) more than developed countries. Today, approximately two-thirds of the elderly population across the world live in developing countries, and it is expected that the largest growth in the elderly population of the world will occur in these countries in the near future. Based on the current rate of elderly population growth, the elderly population in developing countries will account for 80% of the world's elderly population by 2050. In addition, 8.1% of the population in Iran involves the elderly aged above 60, which is expected to reach 26%

within less than four decades (Darvishpour Khaki, 2013; 9)

Today's large youth population results in larger elderly populations in the coming decades. Currently, one million elderly individuals live in Tehran (Iran), constituting 7.3% of the population in this capital city. According to statistics, 20% of the population will be elderly within the next 50 years, and there will be more than 26 million elderly individuals aged 60 within the next five decades (Alipour, 2013; 152). The growing aging population across the world is considered a more pressing issue in developing countries (e.g., Iran) than developed countries. Today, almost two-thirds of the elderly population live in developing countries, and the greatest increase in world's elderly population in the near future is expected in these countries. Considering the current population growth rate of the elderly, the elderly in developing countries is predicted to constitute 80% of the elderly population in the world by 2050.

Our study focused on the neighborhoods in District 8 of Tehran, which had 59,640 elderly residents aged above 60, including 29,045 males and 31,415 females. The present study aimed to evaluate sustainable development in the neighborhoods of District 8 in Tehran with an emphasis on physical and social sustainability since social satisfaction results from the observance of the rights of the elderly (Rabbani Khourasgani et al., 2009; 3). Considering the elderly population growth, further research in this regard could effectively address the diverse needs of the elderly in the near future, changing their living spaces into the sustainable neighborhoods that are tailored to their physical and psychological needs.

In general, the main objective of the current research was to assess the criteria for the needs of the elderly in the physical and social dimensions in urban neighborhoods using the sustainability approach. The other objectives included the evaluation of the mental health promotion of the elderly based on their needs, encouraging and inviting the effective presence of the elderly in urban neighborhoods, identifying the needs of the most important community, establishing social justice, and achieving sustainable neighborhoods for the elderly today and in the coming years in accordance with their physical and psychological needs. In addition, the level of fit of the urban neighborhoods in District 8 of Tehran to the physical, social, and cultural needs of the elderly was assessed to better direct the study.

The phenomenon of aging is a natural process, in which physiological and psychosocial changes occur in the body. However, it is less likely that physiological aging occurs simultaneously with mental and social aging in an individual. This is mainly due to the fact that an individual might regard themselves as psychologically young despite being recognized as an elderly in terms of their physical and biological conditions (Brand Frye, 2004; 97). Therefore, aging is a phenomenon associated with various biological, psychological, and social aspects, and while an individual may be physically and physically old, they may be considerably younger and happier compared to their peers psychologically (same: 99).

Aging increases the reliance of the elderly on their home and neighborhood. Consequently, the physical changes in these environments (especially if obvious) may cause damage to the social spaces created in these physical spaces (Zabetian, 2009; 63-65).

Since the 1980s, sustainable development has been considered a key concept in the UN Global Protection Strategy and Brundtland Report, in which sustainable development has been defined as the development that meets the needs of the present without compromising the ability of the future generations to meet their own needs (Nastaran et al., 2013; 157). The three basic principles of sustainable development are the economic, social, and environmental principles; besides, their balance should be maintained (Mak and Peacock, 2011; 2).

According to Robert Cowan, a sustainable neighborhood is a neighborhood that includes human-scale buildings and spaces, a network of streets and local squares, a combination of mixed local uses for the vibrancy of the neighborhood streets and open spaces, and everyday facilities and services, with the least negative impact on the environment, creating a sense of belonging to a place and providing the tools to encourage the sense of responsibility toward the neighborhood (Cowan, 2005; 387).

Neighborhood sustainable development is defines as the improvement of the quality of life in the neighborhood, encompassing the environmental, cultural, social, and economic components without creating obstacles for the future generations (Katza, 2001). Urban environmental quality is difficult to quantify, as it is a function of natural factors that vary over wide spatial scales; it also involves local factors of the man-made city infrastructure (sheikhazami and razavian , 2013 , 43). The components of a sustainable neighborhood are divided into eight categories, including physical, sociocultural, transportation and communication, services, economic, political-administrative, environmental, and human components (Mofidi Shemirani, 2014; 64).

There are various architectures in sustainable neighborhoods, with a variety of buildings that are properly designed and implemented. Buildings could be multi-functional and have energy-efficient systems. In such neighborhoods, buildings are generally more dense and have multiple, combined functions. In addition, they are self-sufficient, and attempts have been made to protect public spaces.

In sustainable neighborhoods, valuable businesses are located near residential regions, and business services, transportation stations, and schools are located at a five-minute distance. Most importantly, in the physical design of these neighborhoods, it is essential to consider the capacity of the neighborhood. For instance, high-density buildings should not be located near a narrow alley. In sustainable neighborhoods, adaptation to social changes must be taken into account as well. The public spaces in these neighborhoods should be provided with comfortable furniture and absorbent elements for all the classes of the residents. Furthermore, appropriate infrastructures should be available to pedestrians and in roads, and attention

must be paid to the mobility of the individuals with disabilities in the neighborhood (Mofidi Shemirani, 2014; 64).

The needs of the elderly must be addressed in terms of the physical dimensions of urban spaces, such as the provision of urban facilities, open neighborhood spaces, roads, and access to public spaces and buildings, each of which encompasses the mentioned indices. In the current research, the sustainability indicators of the physical criteria with regard to the proposed components were evaluated based on the needs of elderly citizens. The World Health Organization (WHO) has proposed the guide to Global Age-friendly Cities, which states that appropriate physical environments could improve the performance of the elderly and move them beyond their disability threshold (World Health Organization, 2007; 6).

In 2002, Thin et al. introduced the four main criteria of social justice, social solidarity, participation, and security for sustainable social development (Thin, Lockhart, and Yaron, 2002; DFID, 2002). In addition, Weingaertner and Moberg defined social sustainability as a set of specific indicators, including accessibility, social capital, health and welfare, social solidarity, fair distribution of employment and income, local participation, cultural heritage of education, housing and community stability, communication and movement, social justice, and sense of belonging to a place (Weingaertner and Moberg, 2011; 5). According to Colantonio, social sustainability integrates traditional social policies and principles (Colantonio, 2008b). On the other hand, Glasson and Wood believe that the concept of social sustainability has shifted towards social networks, participation, sense of place, and security (Glasson and Wood, 2009; 284).

Social sustainable development is equivalent to the use of all the community capacities, thereby increasing the ability of the community to improve its status and enhance the quality of life of the current and future generations. Furthermore, social sustainable development encompasses social justice (e.g., fair distribution of service quality), public participation, and freedom of choice, and most importantly, planning for meeting the needs of people. Some of the main criteria involved in this issue include education and raising public awareness, focusing on culture, social relations, health, welfare, vitality, and safety. Therefore, planning for sustainable development is not possible without paying attention to the development of life in the community (Bazrafkan, 2011: 2).

According to Farako, the elderly have variable standards in terms of the quality of life. Some of the important criteria for the appropriate quality of life in this population include good family (children), social communication, health, mobility, proper financial conditions, daily activity, happiness, presence of the youth, and living environment. In addition, the assessment of the quality of life in the elderly is based on their expectations, which are formed in accordance with their life experience. The elderly often compare their experiences and lives with the experiences and lives of their peers. As such, their quality of life involves subjective and objective dimensions.

Some of the key influential factors in the quality of life of individuals are the physical and social environment, socioeconomic and cultural factors, individual autonomy, and physical and mental health. Moreover, the quality of life of the elderly is influenced by the relations with family and friends, social relations, physical and emotional health, autonomy, mobility, material and spiritual conditions, leisure time, and domestic environment (Rezvani et al., 2013; 305).

According to Burton's theory, providing appropriate outside environments that are accessible to every age group is challenging, yet imperative. When streets are not designed to address the needs of the elderly, most of these individuals (especially those with special weaknesses or dementia) will be imprisoned at home. Experts believe that any attempt to eliminate the sense of loneliness in the elderly could contribute to the eradication of the widespread mental problems in this population and improve their self-esteem (Validad, 2014; 2; cf. Burton, 2011; 50). In terms of environmental ergonomics, it is essential to create spaces that commensurate with physical limitations and environmental rehabilitation in order to eliminate the obstacles against the realization of active aging, provide appropriate physical grounds for the effective presence of the elderly in the community, and prevent their early attachment (Isalou, 2017; 15-14). Furthermore, Ghale Noei believes that a city is a human-made phenomenon, with the physical spaces serving as the physical expression and symbolic realization of the urban culture to make it visible. Urban spaces should be social and humanistic and form the city skeleton, providing the possibility of establishing urban activities and social interactions. In addition, they should provide social, economic, environmental, and physical sustainability in the city, which play a pivotal role in the formation of urban and neighborhood spaces as an external representation of the sustainable development approach (Ghale Noei, 2014; 40).

Varnes (1982) believes that physical access is a major concern of the elderly and disabled. In many cities, physical barriers, fences, and shields cause problems for the passage of the elderly. On the other hand, factors such as urban roads with many obstacles in pavements, inappropriate slopes and widths, distant bus stations and restrooms, and inappropriate lighting inadvertently make the elderly and disabled isolated, leading to their reluctance to use urban spaces and spend time outside of their homes (Iranshahi, 2017; 2).

With regard to social sustainability, Griessler and Liting focused on basic needs, such as housing and income, individual capacities (e.g., diverse job opportunities and recreational, cultural, and leisure facilities, and programs with minimum costs), and social capacities (e.g., identity, participation, and available places for artistic and social activities) to develop social organizations and strengthen their balance. The researchers also introduced four principles for effective personal and collective capacities, including equality and social justice, social equilibrium,

security, and compatibility (Nastaran, 2013; 162-161, cited in Griessler and Liting, 2005). According to Power, some of the key components in the development of sustainable environments are meeting the needs of the current and future generations, creating balance between the environmental, economic, and social components of neighborhoods, respecting and accommodating the needs of other neighborhoods on a wider scale, adopting a comprehensive approach for making the neighborhood sustainable, and meeting the needs of each individual in these neighborhoods. Moreover, Power believes that sustainable neighborhoods are diverse that portray local conditions and features, exploit local potentials to achieve their quality goals, illustrate the climate, structure, features, and morale of the community and inhabitants. Sustainable neighborhoods also facilitate public partnerships to attain common goals. Among the other components of sustainable neighborhoods are flourishing, progressive, and proportional factors, representing an economic and healthy environment, so that individuals could enjoy general health and comfort, liveliness, and dynamism in the neighborhood, as well as effective management and effective, voluntary participation in various activities as individuals or groups (Mofidi Shemirani, 2014; 61, cf. Power, 2004; 18-4)

2. Materials and Methods

District 8 of Tehran covers an area of 13,215 hectares, with a population of 377,964; it is located in the eastern part of Tehran. District 8 is located on the slopes of northern Alborz Mountains (a mountain with three hills). Its borders on the north and northeast stretch toward the municipality of District 4, while the borders on the south lead to the municipality of District 13, and the borders on the west lead to the municipality of District 7 (Strategic Regional Development Document, 2013; 14). District 8 of Tehran is divided into three districts and 13 neighborhoods based on the official and approved borders (Development Model of Tehran District 8, 2006; 107). Figure 2 shows the location of District 8 in Tehran and its neighborhood divisions.

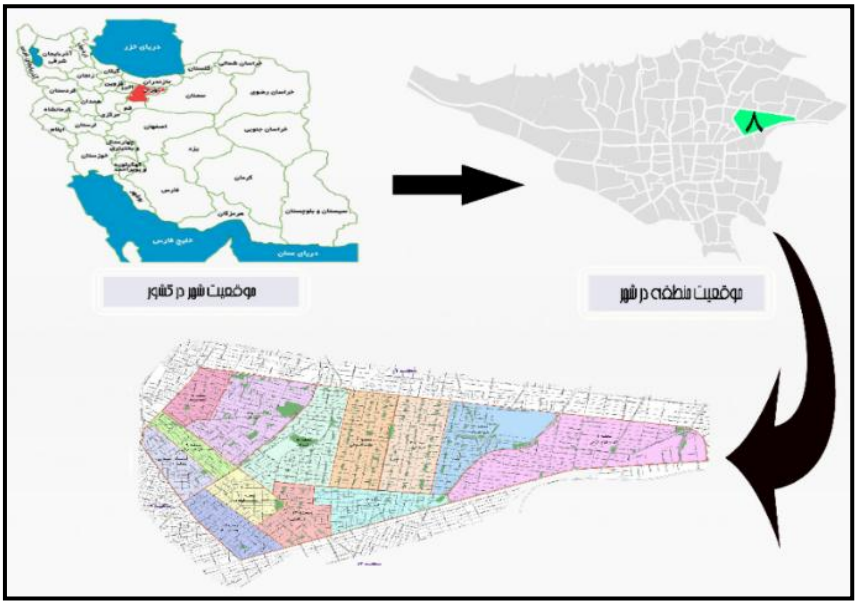

Fig.1. Location of Study Area

This applied, descriptive-analytical research was performed using library and documentary methods and the articles published in Iran and other countries regarding the theoretical foundations and relevant sustainability criteria of urban neighborhoods, as well as the evaluation of the physical and social indicators based on the WHO standards. In a field survey, 384 questionnaires were randomly distributed among the elderly aged above 60 living in District 8 of Tehran. The number of the questionnaires was determined using the Cochran's alpha formula.

The items in the questionnaire were scored based on a five-point Likert scale (Totally Disagree=1, Disagree=2, Do Not Know=3, Agree=4, Totally Agree=5). The questionnaire had four components of physical dimension, including urban facilities (11 items), open spaces (eight items), passages and access (11 items), and public buildings and places (five items), and one component of social dimension (social status; 18 items). The reliability of the questionnaire was confirmed at the Cronbach's alpha of 0.8.

In order to respond to the items of the questionnaire and test the research hypotheses, the normality of the data was assessed using the Kolmogorov-Smirnov test and one-sample t-test, and the mean and probabilities of the physical and social parameters were determined through computing the relevant components in SPSS.

Figure 2 shows the model of a sustainable neighborhood for the elderly, in which the associated physical and sociocultural concepts, as well as the relevant criteria and sub-criteria, have been presented based on the theoretical studies of the proposed definitions and theories. The integration of these concepts ultimately leads to the development of a sustainable neighborhood tailored to the

needs of the elderly. The model is based on the criteria for sustainable neighborhoods in terms of the physical and sociocultural dimensions and needs of the elderly in urban spaces.

Considering that the research population consisted of the elderly, the population of the individuals aged above 60 was estimated at 59,640 (29,045 males and 31,415 females) (Statistical Yearbook 201 7). The ageing index in Tehran is 13.27%, and the ageing index in District 8 of Tehran is 16.09%, which is ranked fourth compared to the other 22 districts of Tehran (10-year report on the performance of District 8, 2015; 6).

3. Data Analysis

According to the descriptive statistics, among 384 elderlies who completed the questionnaires, there were 214 females and 170 males. In terms of age, 25%, 34%, 20%, and 20% of the respondents were aged 60-65, 65-70, 70-75, and above 70 years, respectively. More than 55% of the respondents had an associate degree and academic literacy to some extent. Therefore, the responses were considered reliable, and the questionnaire results were considered practical. The following tables separately show the results of the indicators regarding the physical and sociocultural dimensions of the development of sustainable neighborhoods for the elderly.

From the perspective of the elderly, access to open neighborhood spaces, public places, and buildings were more appropriate in the studied area compared to passages and access to urban facilities. However, they believed that their social needs, social status, and cultural factors in the studied region were not suited to their leisure time

The highest percentage (45.6%) of the options 'Totally Agree' and 'Agree' belonged to item 44 of the questionnaire, and the highest percentage of the options 'Totally Disagree' and 'Disagree' belonged to item 33. The mean value of this index was determined to be 3.1, indicating its relatively acceptable status in the viewpoint of the elderly

In the questionnaire, 11 items were dedicated to the evaluation of the indicators of urban facilities as a key physical criterion in urban neighborhoods. According to the obtained results, the highest percentage of the 'Totally Agree' and 'Agree' responses was 60.4% for the first item, while the highest percentage of 'Totally Disagree' and 'Disagree' options was estimated at 61.2% for the fourth item. The mean value of this index was determined to be 2.1, indicating that the facilities and equipment required by the elderly in the studied urban neighborhood and spaces was not assumed to be appropriate

According to the information in Table 2, the highest percentage (45.6%) of the responses 'Totally Agree' and 'Agree' belonged to item 19 in the questionnaire, and the highest percentage (60.7%) of the options 'Totally Disagree' and 'Disagree' belonged to item 18. The mean value of this index was determined to be 3.1, indicating the relatively acceptable status in the viewpoint of the elderly.

According to the information in Table 3, the highest percentage of the options 'Totally Agree' and 'Agree' belonged to item 30 of the questionnaire, and the highest percentage (57%) of the options 'Totally Disagree' and 'Disagree' belonged to item 28. The mean value of this index was estimated at 2, indicating its unfavorable status in the viewpoint of the elderly.

According to the information in Table 5, the highest percentage (45.6%) of the options 'Totally Agree' and 'Agree' belonged to item 58 of the questionnaire (72.9%), and the highest percentage of the options 'Totally Disagree' and 'Disagree' belonged to item 56 (79.8%). The mean value of this index was estimated at 2.4, indicating its unfavorable status in the viewpoint of the elderly.

Based on the two research questions, two hypotheses were considered regarding the physical and social dimensions. The questions relating to each dimension were initially computed in SPSS in order to calculate the score of each dimension from the perspective of the elderly. In addition, the mean score of each dimension was estimated, which had an interval scale with a number within the range of 1-5. Therefore, the mean scores of more than 2.5 for each dimension were determined as the relative acceptance of the criteria by the elderly and its development in the urban neighborhood of District 8. It is notable that the mentioned mean value was considered standard based on the conditions of the elderly. However, the mean scores of ≤ 2.5 indicated the lack of the standard status of the criteria from the perspective of the elderly. According to the rules of probability (Sig.), if the probability value is less than 0.05 in performing the tests at the significance level of 0.05, the null hypothesis will be rejected. On the other hand, if the probability value is ≥ 0.05, the null hypothesis is not ruled out

hypothesis was rejected, and the test value was negative, the mean value would be <2.5, showing that the index was not standard. If the null hypothesis was not rejected, and the test value was positive, the mean value would be ≥ 2.5, indicating that the index was standard. It is notable that the Kolmogorov-Smirnov test was used before testing the research hypotheses in order to ensure the normality of the data.

Null hypothesis: The mean score is not 2.5.

Counter hypothesis: The mean score is 2.5.

Research Question 1: How much do the urban neighborhoods in District 8 of Tehran correspond to the physical needs of the elderly?

H0-1: It seems that the urban neighborhoods in District 8 of Tehran do not correspond to the physical needs of the elderly.

H1-1: It seems that the urban neighborhoods in District 8 of Tehran correspond to the physical needs of the elderly.

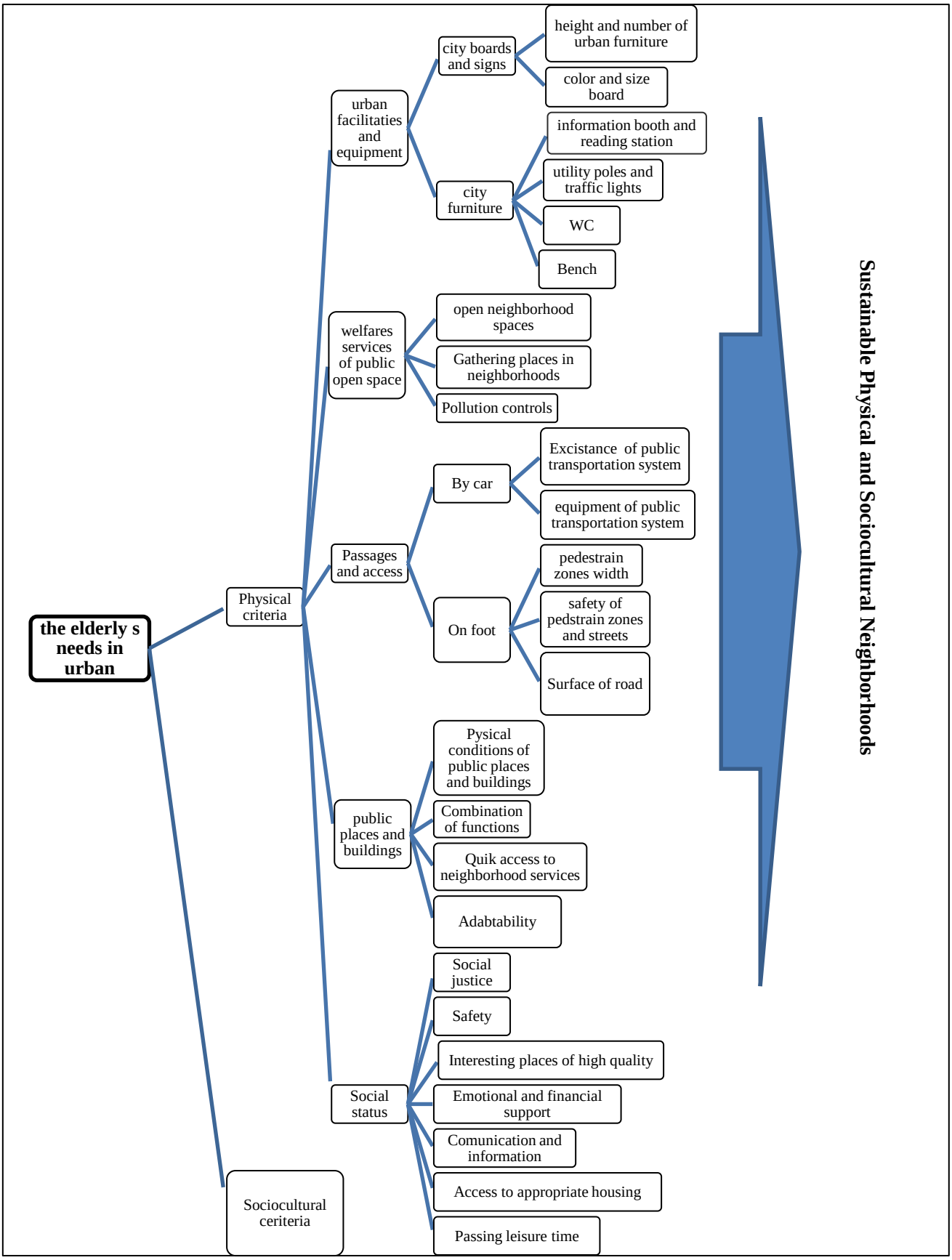

Fig. 2. Conceptual Research Model

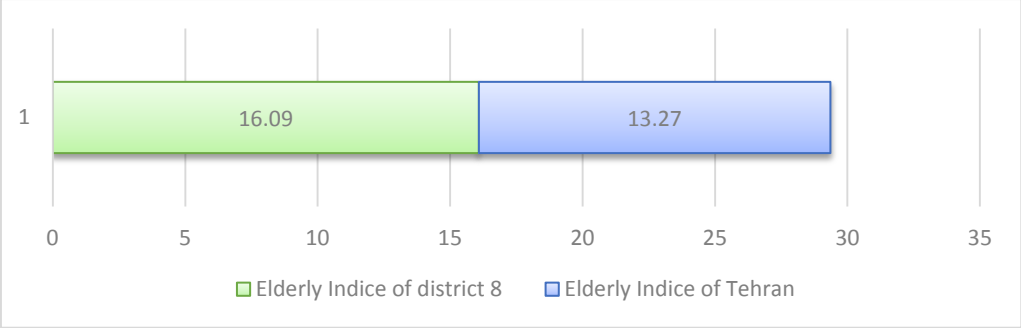

Fig 3. Ageing Index in Tehran and District 8 of Tehran (10-year report on performance of District 8, 2015; 6)

Table 1
Test Results on First Research Hypothesis (Source: author, based on SPSS outputs)

Results of T-test on Comparison of Means and 2.5 (95% confidence level)				
Result	**Sig.**	**t**	**Mean**	**Component**
Rejected	0.000	21.73	2.6	Physical

The hypothesis was tested considering the probability value. According to the information in Table 7, the probability value (Sig.) was 0.000, which is significantly lower than 0.05, so that the first null hypothesis was rejected at 95% confidence level and significance level of 0.05. In fact, the H-0 hypothesis was rejected in favor of H-1. In addition, in the viewpoint of the elderly, the physical criteria proposed in the current research (urban facilities, passages and access, public neighborhood spaces and buildings, and open spaces) could address the basic needs of the elderly in the urban neighborhoods of District 8 although they were below the standard level (≥4).

Research Question 2: *How much do the urban neighborhoods in District 8 of Tehran correspond to the sociocultural needs of the elderly?*

H0-1: It seems that the urban neighborhoods in District 8 of Tehran do not correspond to the sociocultural needs of the elderly.

H1-1: It seems that the urban neighborhoods in District 8 of Tehran correspond to the sociocultural needs of the elderly.

According to the information in Table 1, the significance level was considered at <0.05; therefore, there was no strong reason to reject the null hypothesis. From the perspective of the elderly and based on this hypothesis (95% confidence level), the social indicators could not meet the basic needs of the elderly. In other words, the elderly living in the urban spaces and neighborhoods of District 8 of Tehran had low social status, and their dignity was disregarded (2.4<2.5) indicating that this dimension was below the standard level.

Table 2
Test Results on Second Research Hypothesis (Source: author, based on SPSS outputs)

Results of T-test on Comparison of Means and 2.5 (95% confidence level)				
Result	**Sig.**	**t**	**Mean**	**Component**
Accepted	0.004	-2.907	2.4	Social

4. Discussion and Conclusion

The growing population of the elderly across the world is undeniable. Public spaces in urban neighborhoods could facilitate social interactions and citizenship and they play a key role in performing various activities by citizens, especially vulnerable social classes, such as the elderly. Creating an outside environment that is accessible to all age groups and individuals with variable potentials is considered challenging, yet imperative. As such, the assessment of the status and recognition of the neglected needs of the elderly in the physical and social dimensions in urban neighborhoods in the viewpoint of these individuals is of paramount importance, which was the main objective of the current research. The results obtained by the questionnaires in the present study could provide insight for the effective decision-making of urban managers to improve the quality of the services provided

to citizens, especially the vulnerable elderly, by considering their priorities and needs.

District 8 of Tehran is located in the eastern part of this city. According to the results of the field surveys, the elderly residents of the studied area believed that the indicators of the physical dimension in the district were partly tailored to their needs (2.6> 2.5); however, these indicators were below the standard level (≥4 or 5). As for the social dimensions, the indicators were below the standard level proposed in the current research (2.4<2.5), and the respondents believed that no attention was paid to their social status in their neighborhoods. The mean scores of these indicators were below than standard level, suggesting that both the physical and social dimensions should reach the maximum score of 4 or 5 in order to achieve the standard status. Failure to comply with the appropriate standards for the elderly causes these individuals to have a sense of disability and inefficiency. Although the observance of these standards may be time-consuming in every city, standardized spaces must be provided for these individuals, so that they could be properly involved in the community. The elderly could properly use a space when they are assured that the space responds to their needs. Ensuring the safety and security of the elderly in the environment increases their sense of trust and independence, as well as their involvement in these spaces.

To sum up, a sustainable city or neighborhood is where the organization and refurbishment of all services are tailored to the needs of the elderly, while providing sustainable neighborhoods and cities for future elderly generations. Evidently, urban planning should address the needs and abilities of all social classes. In fact, social justice is the core of urban planning, and an elderly-friendly city favors other populations, such as children and families. Finally, the ultimate goal of sustainable neighborhood development is to link social and physical capitals. In other words, social processes are used to improve identity and physical structure, while creating capacity for future development. A key element of neighborhood development is planning with the people, rather than planning for the people.

5. Recommendations

The present study and the results of hypothesis testing revealed that the neighborhoods of District 8 in Tehran are far from the standard status of urban spaces for the elderly. In order to eliminate the limitations in this regard, improve the quality of life, and develop sustainable neighborhoods, the following recommendations have been provided in terms of the physical and sociocultural dimensions based on the research approach:

• The elderly need to be involved in the community and have their specific recreational activities. Therefore, creating spaces such as educational classes could help these individuals share their experiences with others. Moreover, the elderly need spaces where they could gather and have conversations with each other and recount memories, as well as places where they could hold self-employment workshops to earn money from manual tasks.

• The indicators of social justice must be promoted in urban environments.

• High cultural capital is an important influential factor in social isolation. Therefore, the establishment of specific cultural centers for the elderly to spend their leisure time and interact not only plays a key role in the reinforcement of their mental health, but also it increases their cultural capital, resulting in their vitality.

• Using the experiences of the elderly in the management and promotion of neighborhoods based on their needs could be highly beneficial.

• Citizens should be provided with proper training regarding the respect for the elderly.

• Social work centers or local NGOs should be established in order to support and help the elderly and their families to cope with their life problems and achieve high self-confidence, thereby not feeling discouraged or abandoned by their families.

• Memorable elements tailored to the ideas and customs could be used for the development of elderly-friendly neighborhoods.

• Daily elderly clubs should be established for the elderly who are alone at home, so that they could spend their leisure time with their peers.

• Travel centers with special transportation systems should be established for the elderly in proportion to their financial conditions.

• Providing green outdoor spaces in neighborhoods seems more enjoyable through improving the light, sound, space, and variety of plant species.

• Various programs could be performed for the elderly, so that they could run their special gatherings.

• Buildings or spaces should be provided in parks or urban neighborhoods for the elderly as a recreational facility for their communication and interaction.

• Gatherings spaces should be provided for the elderly in parks through navigating stations for activities such as reading and listening to the radio.

• Restrooms services should be available in neighborhoods considering the physical needs of the elderly.

• Special seats should be designed for the elderly, such as bus seats for the disabled.

• Buses and subways should be equipped with wheelchairs and carts.

• Large, legible, colorful, and bold maps with contrasting colors, writing, and backgrounds should be provided in buses and other public transport stations for the proper navigation of the elderly.

• Sidewalks should be improved in terms of unevenness and roughness in order to facilitate the passage of the elderly.

• In the design of sidewalks, physical features (e.g., width and slope) should fit the conditions of the elderly.

• Proper laminates should be used in relatively large sizes to prevent confusion and dizziness of the elderly while walking on the street.
• Escalators should be installed next to pedestrian bridges.
• Gardens and public spaces should be improved and secured, so that they would be more accessible with appropriate passages.
• Special transportation services should be provided for the elderly, especially in public and pilgrimage sites.
• Smart pedestrian lights should be installed at intersections.
• Night lighting should be enhanced by increasing the number of light bulbs or providing special lighting in neighborhoods.
• Measures in terms of audio systems for the elderly should be taken, so that the elderly could easily read and understand essential signs and boards (e.g., restroom signs). In addition, such signs should be installed near the entrances, preferably with accessible or touchable audio buttons.
The number of city boards and service booths should be increased to facilitate routing.
• Proper signs should be installed with an appropriate height based on the skyline in order to facilitate routing for the elderly.
• Suitable furniture or equipment should be made available for sitting, standing up, running, and moving.
• Special places should be designed for the leisure time and communication of the elderly.
In addition to municipalities, the development and preparation of proper urban neighborhoods for the elderly directly or indirectly concern such organizations or institutions as the welfare organization, health management department, and roads and urban development management departments. Furthermore, the development of education, research, and investigations to determine the quantity and quality of urban neighborhoods and specify the appropriate standards based on various genders and age groups, including the active elderly (aged 60-70 years), relatively active elderly (aged 70-75 years), and passive elderly (aged more than 75 years) could be a valuable step towards the advancement of human and civil rights.
Evidently, surveys of the elderly groups before the implementation of any plans or programs in this regard could not only reduce the possible errors, but also it contributes to systematic and sustainable planning. Therefore, the proposed and evaluated strategies, proposals, deficiencies, and limitations could be effective in developing the status quo of the region, providing social security, and economic wellbeing and promoting the quality of life. Furthermore, the environmental status could remarkably improve. As a result, District 8 of Tehran could play a key role in the sustainable development of urban spaces for the elderly and other citizens of this region.

References

1) Alipour, F (1392). The study of the relationship between social support and quality of life of elderly people in the 2nd district of Tehran, University of Social Welfare and Rehabilitation Sciences.
2) Asefzadeh S.; Qodvsian A.; Najafipour R. (2008). The situation of elderly people in Qazvin in terms of leisure time and intervention in the use of abilities, Journal of Qazvin University of Medical Sciences, 2009 (Issue 2), Summer 2009.
3) Barton, H (2000), Sustainable communities. The potential for Eco-Neighbor.
4) Bazrafkan, K, Gachkoob, M (1390). Investigating the role of public spaces in the formation of social interactions in order to create social sustainability in cities. National Conference on Civil Engineering, Architecture, Urban Planning and Energy Management. Islamic Azad University Ardestan Branch, February 2011.
5) Brandy Faye, e (1383). "Urban Design" by Hossein Bahreini, Tehran, Publication Processes and Urban Planning.
6) Cowan,Robert (2005) The Dictionary of Urbanism, Streetwise press, pp.: 256 , 383.
7) Darvishpour Khaki, M; Abed Saeedi, J (1392). Study of Factors Affecting the Quality of Life Affected by Elderly People in Tehran, Scientific and Research Journal of Nursing and Midwifery Faculty, Shaheed Beheshti University of Medical Sciences and Health Services. Volume 23, Issue 82, Autumn 2013, Pages: 16-8.
8) Ehterami, M (1388). Sustainable Social Organizations at Local Levels, Proceedings of the Conference on the Development of Localities 4, Tehran, New Design.
9) Ghanbari, Abolfazl, 1989, Analyzing and Analyzing the Desired Elderly City Indicators: A Case Study: Tabriz City, Journal of Urban Planning Geography Research, Volume 7, Number 1
10) Iranshahi, A; Qala-e-Kindi, M. (1396). Evaluating the Accessibility of Elderly People with Physical Disabilities to Necessity in Urban Spaces Case Study of Chahar Bagh Abbasi Street, Isfahan University of Medical Sciences, Journal of Disability Studies, No. 7, August 2012.
11) Isa Loo, Sh. Juma Pour, M.; Rafsanjani Khaksari, AS (1396). Needs and problems of the elderly in the urban spaces of the city of Qom, The Journal of Social Work, Second year, No. 6, Winter 2013.
12) Katza, P. (2001). The New Urbanism: Toward architecture of community. New York: McGraw-Hill Professional.
13) Kheyrossadat, Akramolsadat ,2020 , Explanation of the Qualitative Values in a Space

with a view on the Capabilities of Vernacular Architecture: Case Study: Context-Based Architectural Schools, Space Ontology International Journal, Vol. 9, Issue 1, p 1-11

14) Littig, B. and E. Griessler (2005) "Social Sustainability: a Catchword between Political Pragmatism and Social Theory." International Journal of Sustainable.
15) Mak, M. and Clinton J Peacock. (2011) Social Sustainability: A Comparison of Case Studies in UK, USA and Australia. Poster presented at the 17th Pacific Rim Real Estate Society Conference, Gold Coast.
16) Mofidi Shemirani, M; Mozartzadeh, H (1393). Compilation of Sustainable Urban Neighborhood Criteria. Scientific-Research Papers. Research Center for Architecture and Urban Design. Comment, No. 29, Year 11, Summer 2014.
17) Nastaran, M., Ghasemi, and Hadizadeh Zargar, P. (1392). Evaluation of Social Sustainability Indices Using Network Analysis Process (ANP), Journal of Applied Sociology, 2006, No. 51, Issue 3, Autumn 2013.
18) Pattern development of area 8, Center for Study and Planning of Tehran, October 2005.
19) Power, A (2004). Sustainable communities and sustainable Development. London: Sustainable Development commission.
20) Qalaenoyi, M.; Dehghan Najjad, S. (1393). Assessing the physical qualities of urban spaces with sustainable development approach, case study, National Park of Shahreza. Quarterly Journal of Urban Sustainable Development Research, First Prize, Winter 2014.
21) Rabbani Khorasgani, AS; Sadiq Orahi, Kh. Kh., M (2009). Social capital and factors affecting its formation at the neighborhood level, Journal of Social Sciences, Faculty of Literature and Humanities, Ferdowsi University of Mashhad, 6th year.
22) Regional Development Strategy Document 8, District Municipality 8, Winter 2013.
23) Rezvani, M., Parvani Horheh Dashteh, S. Safariyan, H. (1394). Measuring the Effective Factors Affecting the Quality of Life of the Elderly in the Cities of Neyshabour and Ashgabat, Geography Magazine and Urban Space Development, Year 2, No. 1, Spring and Summer 1394, Issue 2.
24) Samadi Ahari , Aynaz and Sattarzadeh , Dariush , 2019 , Evaluating Quality of Life in a Different Social Setting (Case Study: Magsudiyeh District, MollaZeynal District, and Roshdiyeh District in Tabriz, Iran), Space Ontology International Journal, Vol. 8, Issue 3, 41-51
25) Sheikhazami , ali & Razavian , Mohamadtaghi . 2013, analysis moving towards sustainable development of a city with emphasis on the quality of urban life : the case of noor , environment and urbanization ASIA 4(1) 31-56
26) Thin, N. and C. Lockhart G. Yaron (2002)" Conceptualizing Socially Sustainable Development. Paper prepared for DFID and the World Bank, DFID. Mimeo.
27) Walidad, M., Mojtaba, M., Shahsavari, N (1393). Elderly City Friendly (Adaptation of Neighborhoods Centers for the Elderly), National Conference on Architecture, Urban Development and Sustainable Development, 9th Symposium on Advances in Science and Technology, Mashhad, Nov. 29, 2014.
28) Weingaertner, C. and Å. Moberg (2011) "Exploring Social Sustainability: Learning from Perspectives on Urban Development and Companies and Products." Sustainable Development.
29) World Health Organization. (2007). *Global Age-Friendly Cities*: a guide
30) Zabetian, A; Taghvaie, AS (1388). Indicators for fitting the aging city-friendly spaces using collaborative approach. Journal of Housing and Environment of the Village, Volume 28, Number 128.
31) Zarghani, E Kharazmi, A; Mohairi, L (1394). Evaluation of physical-spatial indices of Mashhad in order to become a friend of the elderly, Journal of Geography and Urban-Regional Development, No. 15, Summer 1394.
32) Zhang. Qi , Hiu Kwan Yung .Esther and Hon Wan Chan. Edwin,2019, Towards Sustainable Neighborhoods: Challenges and Opportunities for Neighborhood Planning in Transitional Urban China , Sustainability 2018, 10, 406

Appendices

Appendix 1

Problem Statement

The increase in the ageing population of the world is an undeniable fact, which is considered a more pressing issue in developing countries (e.g., Iran) compared to developed countries. Senior citizens have abundant leisure time compared to other populations due to their age and relative decline in occupational activities. Therefore, they require more space in urban areas for voluntary and social activities than other social classes. However, urban spaces are not properly responsive to the needs of senior citizens, as well as other normal populations.

A major criterion for the assessment of the quality of spaces is the presence of special social groups, including the elderly, whose presence could contribute to the sustainability and vitality of urban spaces and improve their quality. Sustainable development on the scale of neighborhoods requires the improvement of quality of life in the area, which encompasses environmental, cultural, social, and economic features and other components without impeding the life of the future generations. Therefore, the development of urban spaces and neighborhoods in accordance with the needs of various social groups is considered a key task of urban planners, which has so far been neglected.

In the present study, the neighborhoods of District 8 in Tehran were evaluated in this regard. The population in this area includes individuals aged above 60 years (n=59,640; 29,045 males and 31,415 females). This study aimed to assess the physical and sociocultural indices of the neighborhoods in this district. In the development of sustainable neighborhoods for the elderly, the public spaces in urban neighborhoods must be considered important since they are places for the social engagement and interactions of the community members and they play a pivotal role in the ability of citizens to perform various activities, especially the vulnerable social strata (e.g., the elderly). This is an important issue since it is impossible to expect social groups, especially the elderly, to balance the presence of all social strata without comprehensive presence. As a vulnerable social class, the elderly must have equal public urban areas in order to act and create social cohesion to assert their rights in terms of the quality of life, which eventually results in social satisfaction. Therefore, the growth in the population of the elderly requires further research in this regard in order to address the diverse needs of these individuals in the near future and turn their neighborhoods into stable places in proportion to their physical and psychological conditions.

In general, the main objective of the current research was to assess the needs of the elderly in terms of the physical and social dimensions in urban neighborhoods using a sustainability approach. The other objectives of the study were to promote the mental health of the elderly based on the recognition of their needs, encourage and invite the effective participation of the elderly in urban areas, identify the needs of the most populous society, establish social justice, and achieve sustainable neighborhoods for the elderly of the current and future generations in line with their physical and psychological needs.

This was a descriptive-analytical research with an applied design. Using bibliographic studies, internal and external literatures, surveys, and compilation of theoretical studies, and the related components, the sustainability criteria of urban neighborhoods and physical and social indicators were evaluated based on the standard indicators proposed by the WHO. Following that, field studies were performed, and 384 questionnaires were randomly distributed among the elderly aged above 60 using the Cochran formula in District 8 of Tehran, Iran. The items in the questionnaire were scored based on a five-point Likert scale (Totally Disagree=1, Disagree=2, Do Not Know=3, Agree=4, Totally Agree=5). The components of the physical dimension included urban facilities (11 items), open spaces (eight items), passages and access (11 items), and public buildings and places (five items), while the social dimension included only one component of social status (18 items).

The reliability of the questionnaire was confirmed at the Cronbach's alpha of 0.8. To respond to the questionnaire items and assess the research hypotheses, the normality of the data was evaluated using the Kolmogorov-Smirnov test. In addition, the mean and the probabilities of the physical and social parameters were analyzed by the computation of the component scores in SPSS.

The conceptual research model showed the physical and sociocultural components, as well as the related criteria and sub-criteria, based on the theoretical studies regarding the definitions and theories. The integration of the two concepts ultimately resulted in the development of sustainable sites fitting the needs of the elderly. The model was also adjusted in accordance with the criteria for a sustainable neighborhood in terms of physical and sociocultural dimensions and the needs of the elderly in urban neighborhoods.

Analytical Findings

Based on the two research questions, two related hypotheses were proposed regarding the physical and social dimensions. To calculate the score of each dimension from the perspective of the elderly, the items in each dimension were first analyzed in SPSS, and the mean value of each dimension was calculated on a distance scale. Naturally, the obtained value was within the range of 1-5. If the mean score of each dimension was >2.5, the indicator was considered relatively acceptable to the elderly in the urban neighborhoods of District 8. Considering the standard level of each dimension, if the mean value was ≤2.5, the variable was considered substandard in the viewpoint of the elderly. It is also notable that the probability value (Sig.) was considered in the tests to be performed at the significance level of 0.05; if the test probability value was <0.05, the zero assumption was rejected, and if it was ≥0.05, the zero hypothesis was not ruled out. In the present study, the Kolmogorov-Smirnov test was performed before testing the assumptions in order to ensure the normality of the data.

- The first research question was related to the test hypothesis: *How much do the urban neighborhoods in District 8 of Tehran fit the physical needs of the elderly?*

The hypothesis was tested based on the obtained probability criterion. The probability value (Sig.) was estimated at 0.000, which was significantly lower than 0.05. Therefore, the hypothesis was rejected at 95% confidence level and significance level of 0.05. In fact, the H-0 hypothesis was ruled out in favor of the H-1 hypothesis. In addition, the other physical criteria proposed in the research (urban facilities and access roads, public spaces and buildings, and open spaces) were perceived to be remarkably substandard in the viewpoint of the elderly in the urban neighborhoods of District 8 regarding their basic needs and they had to reach the standard level (≥4).

- The second research question was related to the test hypothesis: *How much do the urban neighborhoods in District 8 of Tehran meet the sociocultural needs of the elderly?*

According to the obtained data at a significance level and considering that the probability value was less than 0.05, the zero hypothesis could not be ruled out. At 95% confidence level, the elderly in the urban spaces and neighborhoods of District 8 in Tehran believed that their sociocultural needs were not properly addressed in this urban area as they lacked social status and proper dignity (mean 2.4, less than 2.5). Therefore, the quality of this dimension was considered poor, requiring proper measures in order to reach the standard level.

Discussion and Conclusion

Development of accessible outdoor environment for individuals of all ages with various abilities is considered difficult, yet imperative. In this regard, the assessment of the status and recognition of the neglected physical and social needs of the elderly in urban neighborhoods from the perspective of these individuals was the main objective in the present study. The findings of the current research could lay the groundwork for effective decision-making by urban managers in order to improve the quality of the provided services to citizens, especially the vulnerable elderly based on their priorities and needs.

The studied area in the current research was District 8 in Tehran, which is located in the eastern part of this city. According to the findings of the field studies, the physical components of a sustainable neighborhood were proportional to their needs in the viewpoint of the elderly (mean: 2.6, 5.2), while they were below the standard level (≥4 or ≥5). With respect to the social dimension, the indicators were also considered to be below the standard level proposed in the current research (2.4<2.5). Therefore, special attention must be paid to the social status of these individuals, as well as the suggested indicators in the research. Therefore, proper planning is required on behalf of urban planners for the components of these dimensions to reach the maximum score of 4 or 5 in order to achieve the standard status. Failure to comply with the appropriate standards for the elderly leads to the lack of inefficiency in these individuals. Although achieving such standards requires significant time and organization, and standard, spaces should at least be made available for these individuals to spend leisure time properly in the community.

The elderly expect their environment to be responsive to their various needs. Ensuring the safety and security of the elderly in the environment increases their sense of trust and independence, as well as their presence in these spaces. Cities and urban neighborhoods are places where the organization and refurbishment of all the services are tailored to the needs of the elderly, providing sustainable neighborhoods and cities for the future elderly generations. Undoubtedly, urban planning should vary depending on the needs and abilities of community members. In fact, social justice is the core of urban planning, and an elderly-friendly city favors children, families, and other populations. The ultimate goal of sustainable development is to create areas for communication between social and physical assets. In other words, social processes are used to improve identity and physical structure and create capacity for future development. A key element in this regard would be planning with the people, rather than for the people.

Appendix 2

Neighborhoods of District 8 in Tehran

The present study aimed to assess the physical and sociocultural criteria of the needs of the elderly in urban neighborhoods for the development of sustainable neighborhoods. The items in the applied questionnaire were focused on urban neighborhoods in the viewpoint of the elderly, so that the results could contribute to improving the quality of the environment and urban neighborhoods for the elderly.

Thanks in advance for your sincere cooperation.

1	**Age (year)**	60-65		65-70		70-75		>75	
2	**Education Level**	Primary and Diploma		Associate Degree		Bachelor's Degree		Master's Degree/PhD	
3	**History of Residence in District 8 (year)**	≤5		6-10		11-15		>15	
4	**Gender**	Female				Male			
5	**Neighborhood Name**								

Your information would affect the research findings. Please answer the questions carefully and without bias.

1. What are the main problems of the elderly in District 8 of Tehran?
2. Where is the most important gathering place for the elderly in District 8 of Tehran?
3. Based on the second question, why do the elderly gather in these places?
4. What are the basic needs of the elderly in the urban spaces of District 8 of Tehran? (in priority)
5. Have the authorities ever adopted measures to improve the quality of District 8 of Tehran for the elderly residents?

	-How much do the urban neighborhoods in District 8 of Tehran correspond to the physical needs of the elderly?		**Totally Agree**	**Agree**	**Do Not Know**	**Disagree**	**Totally Disagree**
	Components	**Items**	**1**	**2**	**3**	**4**	**5**
Physical Dimension	Urban Facilities	1. The elderly can recognize colors and signs.					
		2. The readability and clarity of the texts written on urban boards match the visual ability of the elderly.					
		3. The height of signs installed in urban neighborhoods is coordinated.					
		4. There are plenty of signs and boards in the city to show the right path and information to the elderly.					
		5. There are information and service bureaus to respond and guide the elderly.					
		6. There are reading stations (e.g., newspapers and books) and radio stations in urban neighborhoods and public					
		7. There is sufficient light on the streets and sidewalks at night.					
		8. In pedestrian lights, there are audio signals for the blind and visually impaired elderly to cross the streets safely.					
		9. There is quick and convenient access to public health services in public spaces and urban roads, and they are properly					
		10. In parks, there are comfortable seats that fit the physical status of the elderly, and they are properly maintained and					
		11. There are plenty of places in parks and walking paths to accommodate the elderly.					
	Open Neighborhood Spaces	12. The neighborhood is pleasant and clean.					
		13. In open green spaces, especially in parks, there are shaded and shadowed places with sufficient benches at regular distances.					
		14. There are places and elements in the space that bring back memories.					
		15. Natural elements and trees surround public and urban open spaces.					

		16. Public spaces are equipped with cultural, sports, and safety items in case of emergency.					
		17. In the neighborhood, there are quite friendly and intimate spaces for leisure time.					
		18. There are open spaces for the elderly to gather for celebrations and social activities.					
		19. Park entrances are unsuitable for wheelchairs.					

	-How much do the urban neighborhoods in District 8 of Tehran correspond to the physical needs of the elderly?		**Totally Agree**	**Agree**	**Do Not Know**	**Disagree**	**Totally Disagree**
	Components	**Items**	**1**	**2**	**3**	**4**	**5**
Physical Dimension	Passages and Access	20. There is the possibility for public and integrated access (e.g., buses, subway, and taxis) to public spaces.					
		21. At stations and public transportation systems, there are comfortable and safe seats for the elderly.					
		22. There are leveled entrances and easy access to stations and stops for the elderly with physical disabilities.					
		23. There is suitable equipment for the elderly, especially the wheelchair-bound, at terminals and transportation stations to move around.					
		24. Public transportation systems have turned-on signs to show the destination.					
		25. The elderly have easy access to public transportation and navigation information.					
		26. Sidewalks are wide, and there is the possibility of walking, exercise, and speaking for the elderly.					
		27. Sidewalks are suitable and without slopes to be used by the elderly with wheelchairs and shopping carts.					
		28. Sidewalks have no obstacles and are integrated, with flat surfaces and no slopes.					
		29. There are special and safe paths for the blind elderly and wheelchair-bound pedestrians.					
		30. There are stairs and elevators to use as lifts or underpasses.					
		31. The public buildings are equipped with elevators, escalators, steps with low slopes and height, fences and non-slippery surfaces, and places to cross over higher levels.					

	Public Places and Buildings	32. There are plenty of places for rest with comfortable seats in public buildings and areas.					
		33. Facilities are combined that increase social encounters and interactions.					
		34. There is no usage inconsistent with the neighborhood scale.					
		35. There is easy access to basic service applications for the elderly in urban neighborhoods.					

	-How much do the urban neighborhoods in District 8 of Tehran correspond to the sociocultural needs of the elderly?		**Totally Agree**	**Agree**	**Do Not Know**	**Disagree**	**Totally Disagree**
		Items	**1**	**2**	**3**	**4**	**5**
Sociocultural Dimension	**Social Status**	36. The neighborhood accommodates a wide range of audiences, including the elderly.					
		37. Urban spaces are developed based on the preservation of mental health.					
		38. The neighborhood could be protected in case of crime.					
		39. Color combinations, variety, and environmental beauty (e.g., lighting at night) in the neighborhood ensure vitality and interest in open spaces.					
		40. The elements and components used in the public and open spaces of the city are readable and harmonious and bring calmness.					
		41. The applied elements are in harmony with the culture and customs of the region, evoke memories, and bring about a sense of belonging to the					
		42. After retirement, the elderly have the opportunity to use their experiences and ability to earn money.					
		43. There are state organizations (NGOs) supporting the elderly.					
		44. The elderly are involved in district council decisions.					
		45. There are ageing associations or centers in the neighborhood for the participation of the elderly.					
		46. There is a special hotline to provide consultation to the elderly.					
		47. There are courses on the topics of interest by the elderly (e.g., computers and the internet).					
		48. The elderly are aware of the technologies used to provide services (e.g., banking services) and could easily use them.					
		49. The elderly enjoy affordable and adequate housing.					
		50. The elderly receive appropriate services in their own homes based on their needs.					

		51. There are special service units to organize special trips for the elderly proportionate to their income.					
		52. In state cultural centers (e.g., cultural offices, libraries, and amphitheaters), the elderly receive a discount on cultural services and sports.					
		53. Sports trainers participate in morning sports programs held in parks and gardens to train and conduct exercises and provide special relaxation					