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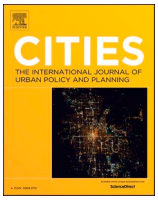

Temporary reuse in leftover spaces through the preferences of the elderly

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ABSTRACT

Leftover spaces are constitutive elements of the city structure. The accurate selection of and intervention in certain hotspots can lead to an urban development that slowly takes over. The design intervention has a special effect on preventing the transition into vacancy; hence, user preferences should be properly considered. In 2017, the global population of adults aged 60 and upper reached 962 million. To address the needs of the elderly, we need to define local relevant design approaches. This research seeks to identify the elderly's preferences, particularly their use of open spaces. Application of the mixed-methodology with the BWM-questionnaire to vacant lands resulted in: a natural landscape with diverse vegetation and other facilities, gentle leisure activities, and community gardening as essential intervention attributes, leading to an ideal environment for the elderly. The innovation is implementing a mixed approach, BWM questionnaire, and considering both experts and public preferences to represent the demands of the elderly in cities. The kind of intervention and the needs of the elderly, particularly in restricted outdoor spaces, have still not been intensively reported. As these areas are too restricted, design components will play a greater role. Consequently, temporary, flexible, and experimental responses to leftover spaces are provided.

1. Introduction

The World Health Organization has encouraged the development of age-friendly environments worldwide as a strategy to address the challenges raised by converging urbanization and population trends (Steels, 2015). The global population of people over 60 years is projected to hit nearly two billion by 2050 (UNDESA, 2013). In this regard, the global population of adults aged 60 and up reached 962 million in 2017 (Zhai et al., 2018). The neighborhood environment plays an essential role in older adults' health (Besser et al., 2017; Barnett et al., 2018 Aug: Cerin et al., 2019). Thus, many studies are concentrating on the construction of age-friendly environments, particularly in outdoor spaces, due to the growth in the older population in metropolitan areas (Lak et al., 2020). Recently, the interests of older people have been claimed as the key concern in most of the contemporary literature on aging research in numerous countries, mainly developed countries (Steels, 2015; Zhai et al., 2018). To address the needs of the elderly, we need to define local relevant design approaches. Research is likely to be especially important for designing and implementing strategies for unknown population subgroups since they are understudied and generally need methods that vary from other populations (Cerin et al., 2019; Zhai et al., 2018).

The population of suburbs has expanded in recent years, either due to the outmigration of city dwellers in pursuit of better environmental quality or as a result of those required to live on the city's outskirts due to high living costs. This resulted in fewer possibilities for family visits and a reduction in the elderly's social life potential. On the other hand, social interactions are just as important as physical health, particularly among older adults in Asia (Trinh et al., 2020). More consideration must be given to the social needs of elderly in this respect. Because the elderly have lived in these areas for many years, everything that may have an impact on their daily life is of the greatest priority (Yung et al., 2016).

Since Tehran is a metropolis, understanding users' preferences may help to extend the knowledge about culture and park-visit-related parameters, as well as guiding the future cross-cultural comparison studies. Urban Park planning in a small city with an elderly population should be adapted to meet the criteria of an integrated package of creative ideas, including socially relevant design, age-sensitive design, location-friendly design, citizen-caring of benevolent design, and compact urban-park design. They might perfectly address the geographical realities of a compact city by making efficient use of land to provide the most facilities and amenities (Mak and Jim, 2019).

Providing more public space is a challenge, especially in cities with a

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high population density. It is not easy and generally out of budget to find places for new public spaces in cities such as Tehran, and new solutions need to be available to use them differently. Small public spaces are adjacent to people's homes should be incorporated into their everyday lives, offering some of the facilities. Besides, there are only limited studies on small public spaces and how they are used and experienced (Duan et al., 2018). Hence, leftover spaces can be considered as potential spaces for the mentioned uses. These spaces are part of the infrastructure that can improve social situations and ecological conditions (Kremer et al., 2013) and present an alternative to contemporary public open spaces (Kamvasinou, 2011). In addition, a greater knowledge of the public value of leftover space is critical for any attempt to establish a stronger understanding of its importance (Kim, 2016). Modern ways of thinking often had to design macro-structural interventions to provide primary requirements and health facilities for the residents (Kermani, 2016). Since most of the built spaces have reached a stable configuration in the last decade, macro-interventions in modern cities tend to build primarily to provide new urban masses. Therefore, as long as these spaces are considered accomplished and finished, urban interventions are managed through repairing instead of reshaping (Enia and Martella, 2019). Regardless of spatial quality, vacant lands are an opportunity for balancing and stabilizing the neighborhoods through reclaiming and revitalizing the city.

These findings strongly affect the role of architecture in the construction, alteration, temporary actions (Galdini, 2020), and maintenance of the urban organism. Considering Casagrande (2015) and Jamie Lerner's (2014) ideas, a city is seen as a living organism containing specific fulcrum points or places with high potential that act as a catalyst in order to impact the whole city. Selection of certain hotspots in the urban acupuncture approach, can lead to urban development that slowly starts to disperse (A.-L. Unt and Bell, 2014).

The adaptive reuse of leftover spaces by interim usage should be situated within this context (Bishop and Williams, 2012; Dubeaux and Cunningham Sabot, 2018; Németh and Langhorst, 2014). In recent years, this issue increased the urgency for finding solutions to prevent the proliferation of leftover spaces, by trying to adapt these areas to interim uses (Carr and Dionisio, 2017) or as a temporary solution, while long-term conditions are implemented (Bishop and Williams, 2012; Lydon et al., 2015). There is no consensus on the best plan of reusing leftover spaces (Martin et al., 2019; Pearsall and Lucas, 2014) and interim use (Dubeaux and Cunningham Sabot, 2018; Pothukuchi, 2017).

Research in leftover spaces refers to users' critical roles and preferences (Thompson, 2002; Trancik, 1986); considering these preferences helps choosing the best intervention. Choosing the design intervention has a remarkable effect on preventing the transition into vacancy; hence, user preferences should be considered during the planning and engineering process (Naghibi et al., 2020).

Also, because of the demolition of valuable natural structures in Tehran, numerous problems have occurred. Thus, the case of current study addresses the Small-scale leftover sites located in Tehran, Iran. In order to enhance the relationship between characteristics of urban intervention and community preference, leftover spaces have been identified as an opportunity for interim reuse.

In a broader sense, this paper aims to contribute to greater awareness among landscape designers who study the young-old and middle-old residents' preferences about the interim interventions in Tehran's leftover spaces, considering the potential and the specific contribution in urban acupuncture projects. The following paragraphs provide the theoretical background to answer the question: What are the significant intervention factors in young-old residents' priorities and preferences regarding interim reuse? The study uses a BWM method to determine the weight per intervention initially. The results will help understanding the user preferences in public spaces and discuss each factor's impact on prioritizing the decision criteria' design. Various social and individual characteristics-including gender and social class positions-, impact the diversity of resources, opportunities, and vulnerabilities. Therefore, any worldwide, active research foundation on aging is critical for developing knowledge and its application, which will lead to more opportunities for vulnerable groups. O'Loughlin et al. (2017) argue that global aging and national aging should be factored into long-term policies. The Intergenerational Reports on Aging must also be critically evaluated, not just in terms of their long-term forecasts but also in terms of their short-term political aims, such as tactical instruments.

This research provides ideas on how to respond to older people in such metropolitan cities positively, as well as highlighting some significant contributions to progressive thinking on global aging (Kendig et al., 2013). It also contributes to various developments in Asia. Good initiatives can eventually establish their usefulness and be adopted by larger public coalitions, influential interest groups, governments, and political leaders. When they are tested and adopted by interest groups and the broader population, ideas can contribute to social changes, opening new possibilities for aging cities (O'Loughlin et al., 2017). In addition, urban acupuncture intervention has rarely been studied in a specific group. The current study is innovative in employing designed cases in four categories (social, ecological, economic, and aesthetical), applying BWM in urban landscape spaces, considering both experts' and public opinion, and introducing urban acupuncture as a strategy for nature-based solutions.

This study is structured into five sections: The Literature Review (Section 1) deals with urban acupuncture as an intervention approach, interim uses, and Elderly-friendly open spaces. In Methodology (Section 2), the case study, data collection instruments, and procedures are described. The findings are analyzed in Section 3. In the Conclusion section, key findings concerning the vacant land's central research question, interim reuse, and future works are addressed (Section 4).

1.1. Urban Acupuncture

There is an assumption in the 21st century that cities' minimal interventions are the most relevant design strategies of urban developments (Enia and Martella, 2019a, 2019b). In this regard, the concept of urban acupuncture presents small-scale interventions (Colorni et al., 2017). Urban Acupuncture is a bio-urban healing method that combines the traditional Chinese medical theory with sociology and urban design. It focuses on tactical interventions as a design approach to improve the city's efficiency through small interventions in crucial sections (Casagrande, 2015a, 2015b).

This study has conducted a systematic review to investigate the terms researchers have used to introduce "Urban acupuncture." The search was performed on Scopus, SAGE, Science Direct, Taylor & Francis, WOS databases. Considering the titles, keywords, abstracts of the articles, and removing duplicates, 52 related references were studied for qualitative review. Then the main terms related to Urban acupuncture are extracted. Based on the previous studies, most of the definitions in urban acupuncture will be Intervention and Approach (Fig. 1).

Public spaces are the heart of a city (Madanipour, 1996) with tangible qualities (Carr et al., 1992). Functional rather than structural, urban acupuncture proposes a soft approach to work with every specific project's local effect and establishes a network of hot points in the city (Tortosa et al., 2010). In public areas, to seek intervention potentials in whole areas, the holistic approach of urban acupuncture in public spaces was adopted by a growing number of projects (Enia and Martella, 2019a, 2019b). Based on the literature review, in the process of dealing with landscape spaces through small-scale operations, the essential intervention features should be as the following:

In the case of metropolitan cities of developing countries (Sanches and Pellegrino, 2016), applying the urban acupuncture approach in vacant lands can allow a convenient opportunity to revive the city. Leftover spaces are part of the infrastructure that have the potential to improve the process of social situations (Pallagst et al., 2017; Zhang et al., 2019), ecological conditions (Kremer et al., 2013a, 2013b; Sanches and Pellegrino, 2016a, 2016b), Economic (Drake and Lawson,

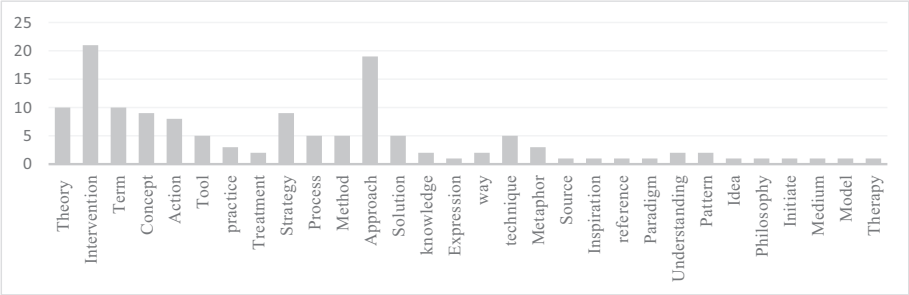


Fig. 1. Definitions of the urban acupuncture.

2014; Loures et al., 2016), and Aesthetics (Dall'Ara et al., 2019; Jorgensen and Tylecote, 2007).

There is still a need for research on how to intervene in the different areas, management practices, and interim uses (Kremer et al., 2013a, 2013b).

1.2. Interim use

Interim use can be seen in Berlin's Tiergarten after WWII, Los Angeles' first community gardens, and so many other cases. In Germany, temporary use was a formal city development policy in the late 1990s (Heck and Will, 2007). Interim land use is celebrated as a cost-effective approach to tackle urban decay and shrinkage (Rall and Haase, 2011). As shown by examples in Leipzig, Berlin, and Basel, interim uses can enhance the aesthetics and perceptions of run-down regions, expand the number and variety of opportunities for green spaces and pedestrian paths, and build new spaces for innovative performances (Gstach, 2007).

Several experiments on the interim reuse of leftover spaces have demonstrated that they also have the potential to improve the vacant lot's environmental quality (Rall and Haase, 2011); They are innovative approaches to reimagining public space and reactivating social life (Bishop and Williams, 2012), as well as involvement in the arts and urban culture (Oswalt et al., 2013; Shaw, 2014; Till, 2011), and reducing crime rates (Kondo et al., 2016). Moreover they have part in developing new effective environments in previously unused urban spaces (Ebbensgaard, 2017; Gandy, 2013), and they provide access to less processed food (Pothukuchi, 2018). However, interim reuse may cause gentrification (Maantay and Maroko, 2018), if the user preferences have been neglected. According to interim uses, leftover spaces have been considered small-scale, incremental initiatives such as temporary parks, playgrounds, and market places, which promote social and environmental values (Galdini, 2020).

The current study has adopted K.E. Till's (2011) ideas to advance the 'interim reuse' concept. Although 'interim' is connected to space and time (Madanipour, 2017),' reuse' means that current systems are reused. Thus, interim reuse refers to the use of abandoned spaces by processes that can be both temporary/intermittent and permanent/consistent between past discontinued use and possible use (Costa et al., 2021). However, this issue has never been widely analyzed before, neither have the residents' perceptions and preferences regarding interim use sites. Recent city "wilderness" debates (Rink, 2005; Matthey & Rink, 2010) have highlighted essential factors in accepting vacant lands, but how do these results compare with a particular type of vacant land, an interim site for use?

1.3. Environmental gerontology (EG)

It has long been accepted that the physical environmental factors affect - indeed, shape - every individual's behavior, physical and mental health, quality of life, and well-being, especially in old age. Lawton, 1983; Satariano, 1997; Shipp and Branch, 1999; Evans, 2003; Rowles et al., 2016). The environmental context of aging has been more relevant in gerontological theory, research, and practice during the last four decades. EG has focused on the description, explanation, and adjustment or optimization of the aged person's relationship with his or her environment (Lawton, 1977, 1999; Scheidt and Windley, 1985; Wahl and Weisman, 2003). EG concepts and findings have also been implemented at various scales, ranging from evidence-based design at the micro-level of house renovations, to suggestions for age-friendly communities or even countries.

For at least the last two decades, policymakers have debated the notion of "aging in place" (Boldy et al., 2011). According to research, most elderly choose to live in their own homes rather than in institutions (Chan, 2014). Oswald et al. (2010) Mark the significance of EG in aging in place (Jayantha et al., 2018). According to Wiles et al. (2011), community and neighborhood components have been identified as critical factors in the capacity of the elderly to stay in their homes. The elderly are more attached to their local community. Hence, neighborhood environment and residence longevity would be positively associated (Glass and Balfour, 2003). As a result, Wahl and Weisman (2003a, 2003b) emphasized the need to improve recreational transportation possibilities to increase physical exercise and social contacts.

Rowles (1978) noted that as people age, they become increasingly concerned about and sensitive to their social and physical environments (Jayantha et al., 2018). The importance of the physical environment on aging processes and its consequences has traditionally been emphasized within EG (Lawton, 1977; Scheidt and Windley, 1985, 2003). Because of this diversity of items that have impact on the elderly, EG's theoretical and empirical research methodologies must cover a wide range of analysis in terms of place type and scale of social aggregation (from house to the city), as well as a wide range of procedures (e.g., perceptual, cognitive, and affective). The use of empirical research to expand the various study designs is encouraged (from descriptive and open field studies to experimental controls). Issues concerning research and its application are presented within quite distinct means, goals and structures (Wahl and Weisman, 2003a, 2003b).

Rapidly aging society is a global issue with significant socioeconomic consequences. Previous research focused on socio-physical settings at the macro-scale (Coward and Krout, 1998; Wahl and Weisman, 2003a, 2003b). However, a more thorough and refined strategy at the micro and macro dimensions are required to ensure the successful implementation of aging. The notion of "Aging in Place" reflects the desire to age in a familiar place while maintaining some dignity and independence (Jayantha et al., 2018).

The primary notion behind the life-space concept is that the lives of older adults take place in various locations, ranging from within one's own home to outside one's town, province, and beyond (Kendig, 2003; May et al., 1985; Peel et al., 2005; Rowles, 1983; Stalvey et al., 1999; Tinetti and Ginter's, 1990). As a result, an older adult's geographical life-space is divided into distinct levels. The life-space construct emerged from gerontological research, concentrating on the link between the older adult and their surroundings (Douma et al., 2021; Hodge, 2008; Liddle et al., 2014; Rowles, 1978). The elderly is one group for whom

attachment is commonly regarded as essential (Neugarten, 1974). Growing old is connected with the intensification of emotional attachment to a place.

Attachment to place is a multifaceted phenomenon encompassing physical, social, and psychological components, each of which can function independently and appear differently in different age groups. A fundamental shift in viewpoint about the nature of older adults' interactions with their surroundings is also required. This reorientation necessitates a shift in focus away from old people's function as mere older adults' in their immediate surroundings and its architectural form toward their more active role in creating and imbuing spaces with significance (Rowles, 1983).

1.4. Elderly-friendly open spaces

The focus on aging population in cities is an evidence that in recent years, the urban environment has presented a rigorous setting to promote older people's wellbeing and contribution to society (Who, 2007). However, aging population is not limited to the developed world: it is anticipated that over 80% of the world's elderly population will be living in developing nations in, five decades. (UNDESA, 2009). It is also stated that elderly prefer to completely avoid or reduce their frequency of park visits (Bedimo-Rung et al., 2005). Therefore, seniors tend to do passive activities at home rather than participate in outdoor environments (Król-Zielińska et al., 2011; Yen et al., 2018).

Urban areas are crucial multifunctional public spaces used for a wide range of activities (Hami et al., 2014). Areas of urban living are places of "outdoor spaces and buildings; transportation; housing; social engagement; respect and social inclusion; civic activity and employment; communication and information; and community support and health services," according to World Health Organization (2002). Therefore, an elderly-friendly open space is characterized as an open space in residential areas where old people are actively involved. Places such as streets, public squares, pocket parks, community parks, and connected places, that are successfully tailored to meet their preferences. The research indicates that older adults need open spaces in order to: highlighted physical activities (Levy-Storms et al., 2018), improving engagement (Wen et al., 2018), encouraging social interactions (Yung et al., 2016), and aesthetical aspects (Wen et al., 2018).

To promote the elderly's well-being and active aging, it is vital to express their social requirements and preferences through community engagement activities in designing public open spaces. A user-centered approach should be used since the elderly have distinct social demands that should be considered during the planning phase. More engaging leisure activities are recommended, as long as they maintain close contact with the natural environment and social interactions (Yung et al., 2016). Furthermore, older, more established areas are going to face significant issues. As the population of such neighborhoods is aging - in - place, it is becoming growingly frail (Rowles, 1986). According to Schmidt et al. (September 01, 2019), open spaces are built for relaxation, social interaction, entertainment, leisure, and older people.

Social interactions can be helped by living in more age-friendly communities with sufficient possibilities. Yung et al. (2016) found that the satisfaction of the elderly was influenced by proximity, accessibility, social inclusion, social interaction, support services, and connection with nature. According to Barnett et al. (2017), physical behaviors of the elderly are likely to be linked to proximity to parks, fun natural and aesthetic scenery, and role-playing recreational facilities.

The current gap is a deep understanding of elderly's preferences in the theoretical findings and the practical age-friendly design of open spaces (Lak et al., 2020). Therefore, this paper aims to address this by examining the elderly's environmental interests in order to strengthen their social involvement in the city of Tehran and also aims to classify the interests of the elderly in open spaces.

2. Methodology

This section is divided into Procedure, Case study introduction, Expert's interview, BWM methods, and Data sources and collection.

2.1. Procedure

In phase one, to include the sites as leftover cases, preliminary interviews were conducted with the elderly, with the aim to ask them to address the leftover sites in their neighborhoods that can transform into small parks. The mentioned sites were pinned on the map. After categorizing the selected areas, the types of leftover spaces, which have been selected most and had the possibility for change, were chosen in this study. Thus, the criteria for choosing the leftover cases in the present research include: spaces with less than 1 acre size (Naghibi et al., 2021), proximate to neighborhoods, believed to be leftover spaces by neighbours, with the possibilities of change based on the elderly preferences, which were remained underused. In phase two, the researchers chose 138 photos of urban interventions in different countries, redesigned them for the selected leftover space. The frequency of the most selected scenes by experts was recorded. These selected scenes were classified into four categories of social, ecological, aesthetical, and economic.

In phase three, to check the questionnaire's validity and evaluate the significance of various interventions, the main intervention variables were confirmed by six experts. Then, to determine the best and worst interventions, this study used the BWM method. The Test-Retest method was used to determine the reliability of the questionnaire. Thus, in the pilot study, respondents were responded twice at the intervals of several days. Finally, the results were compared by *Z*-test, in which the answers were not different. Finally, the questionnaire was sent to the respondents. The average time to complete the questionnaire was 7.5 min, as predicted. The structure of the research process is illustrated in Fig. 2.

2.2. Case study

Due to the concept of interim use, the idea behind this study is mainly to investigate urban acupuncture interventions on micro-leftover areas in Tehran, Iran. As Tehran is a metropolitan city with lack of space, considering urban acupuncture in leftover areas could be useful. Tehran has a population of 8.7 million people who live in a 15-million metropolitan area (Fig. 3). The city's rapid growth has frequently been unequal, causing many voids in the urban fabric. Land plots are occasionally left undeveloped due to a lack of resources, the absence of owners, or the site's unique development challenges, such as problematic terrain or form. As the city of strangers has had to accommodate a steady flow of immigrants throughout the country and overseas, its cultural identity has been challenged. It is possible to discover social exclusion in cultural domains (Madanipour, 1998). Accordingly, Tehran was chosen as a research area because of its unique cultural and geographical characteristics. It is, first and foremost, an ultra-compact metropolis with densely populated residential neighborhoods. Second, the amount of parkland and urban green space available is quite limited. Third, a synthesis of eastern and western cultures and customs characterizes it.

Thus, it is crucially important to achieve a hierarchy among different interventions in micro-leftover areas and distinguish the key factors that express the elderly's preferences in public spaces. This strategy will help measure the effects of the upgrading interventions in both neighborhood and city scales and investigate its repeatability in other contexts (Mondini et al., 2018). The leftover areas selected for this study include spaces in Tehran, Iran's capital. The city is located between the Alborz Mountains to the north and desert to the south. The researchers chose Tehran as a research area because of the range of leftover varieties in the city, which fits the study's goal. As illustrated in Table 2, in-between spaces and lots were selected as the case study:

The criteria for selecting this study's case include in-between, and

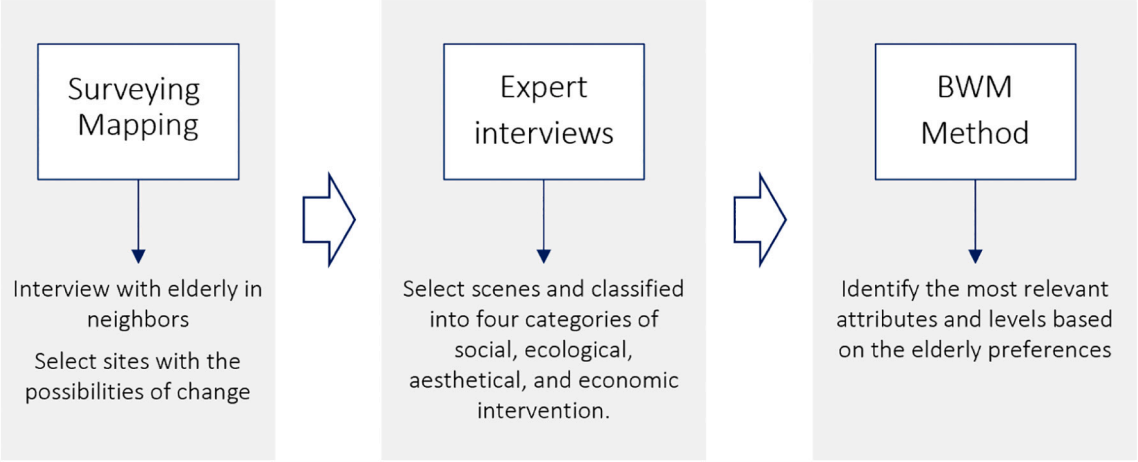


Fig. 2. The structure of the research process.

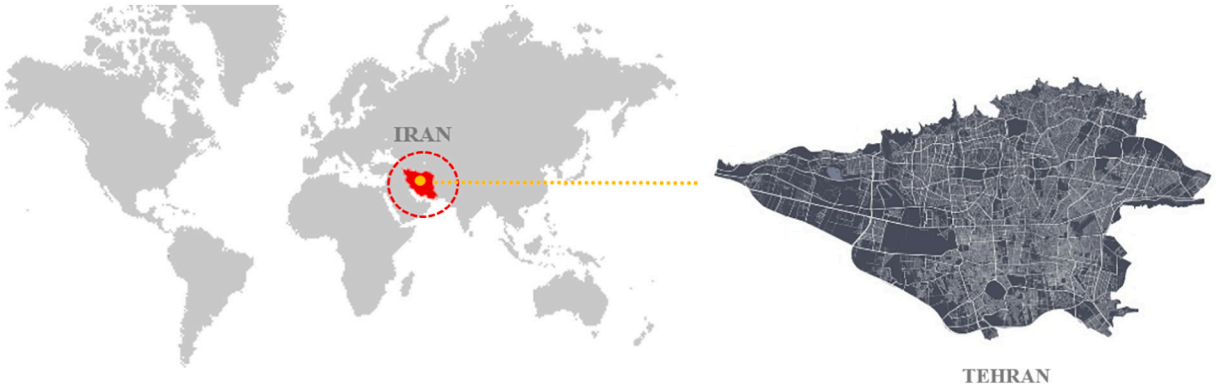


Fig. 3. The location of the case studies, Tehran, Iran.

lots spaces (Fig. 4), close to the neighborhoods, believed to be leftover spaces by neighbours and remained underused. Preliminary interviews were conducted with citizens to select the site as a leftover space.

2.3. Expert interviews

In the first phase, 138 photos of urban interventions in different urban spaces, which could be redesigned for the selected leftover space, were chosen by the researchers.

In the decision-making process, six professionals with at least nine years of related expertise (including three architects, one urban designer, and two landscape architects) were asked to identify the landscapes (Shahhosseini et al., 2015) that best reflected the acupuncture aspects according to the definitions in Table 1. 93. Scenes then were chosen in the first round. The frequency of the most selected scenes by experts was recorded. Each feature, which occurred at least four times, was selected. These selected scenes were classified into four categories of social, ecological, aesthetical, and economic.

2.4. BWM method

In this section, at first, the best-worst multi-criteria decision-making approach (BWM) is explained in depth. Afterward, the steps of prioritizing the main intervention variables are highlighted.

In 2015, BWM was introduced by Rezaei as one of the newest approaches for solving decision-making problems with various parameters. In this process, the decision-maker first selects the best (e.g., most desirable, most important) and the worst (e.g., least desirable, least significant) parameters. Each of these two criteria (best and worst) and the other criteria should be compared pairwise on the BWM questionnaire. A maximum issue is formulated to assess the weight of decision-making requirements. A consistency ratio is proposed for the BWM to verify the reliability of the comparisons. This method was used in our proposed strategy (Rezaei, 2015). The steps of BWM for deriving the weights of the criteria are defined in this part:

Stage 1. It is essential to determine a set of decision criteria for {c1, c2, … cn}.
Stage 2. The decision-maker determines the best and the worst parameters in general.
Stage 3. The choice of the best criterion over all other criteria using a number between 1 and 9 should be determined based on the BWM questionnaire. The best-to-others resulting vector will be:

$$AB = (aB1, aB2, \ldots, aBn) \quad (1)$$

Stage 4. The preference of all the criteria over the worst criterion using a number between 1 and 9 must be determined. The resulting others-to-worst vector would be:

$$Aw = (a1w, a2w, \ldots, anw) \quad (2)$$

Stage 5. Finding the optimal weight by solving Eq. (3). The optimal weight of the criteria is the one where each pair of $aBj = \frac{WB}{Wj}$, $ajw = \frac{Wj}{Ww}$. The following problem results, given the non-negativity and sum condition for the weights:

Fig. 4. In-between spaces, and lots in Tehran, Iran.

Table 1
Features of urban acupuncture intervention (Naghibi et al., 2020).

No.	Feature	Reference
1	Small scale micro-intervention	(Marzi & Ancona, 2004) (Radstaak, 2012) (Bugaric, 2018) (Colorni et al., 2017a, 2017b) (Campelo & Fontenele, 2017) (Rau & Hutchison, 2019) (Casagrande, 2015a, 2015b) (Acebillo, 2006) (Cerro, 2018) (Aouad, 2016) (Daugelaite et al., 2018) (Grifoni et al., 2017) (Cheng & Niu, 2010)
2	Accuracy, Subtle	(Shieh, 2006) (Campelo & Fontenele, 2017)
3	Catalytic for the whole surroundings	(Solà-Morales 1999) (Shieh, 2006) (Colorni et al., 2017a, 2017b) (Campelo & Fontenele, 2017) (Grifoni et al., 2017) (Cheng & Niu, 2010)
4	Implementable within a short period of time	(Marzi & Ancona, 2004) (Colorni et al., 2017a, 2017b) (Enia and Martella, 2019a, 2019b)
5	Low cost	(Rau & Hutchison, 2019) (Cheng & Niu, 2010)
6	Bottom-up	(Bugaric, 2018) (Campelo & Fontenele, 2017) (Aouad, 2016) (Unt and Bell, 2014) (Catling, 2015)
7	Local	(Houghton et al., 2015) (Aouad, 2016) (Tortosa et al., 2010) (De Wit, 2014) (Casagrande, 2015) (A.-L. Unt and Bell, 2014) (Lastra & Pojani, 2018) (Grifoni et al., 2017)
8	Tactical	(Unt and Bell, 2014) (Catling, 2015) (Aouad, 2016) (Houghton et al., 2015) (Lastra & Pojani, 2018) (Casagrande, 2015a, 2015b)

$$Min \max j \left\{ \left| \frac{WB}{Wj} - \mathrm{aBj} \right|, \left| \frac{WB}{Wj} - \mathrm{a}jw \right| \right\} \tag{3}$$

$$\sum Wj = 1 \ \mathrm{Wj} \geq 0; \mathrm{f\ for\ all\ j}$$

The consistency ratio can be determined by using ε^*. It is obvious that the greater the ε^*, the higher the accuracy ratio would be, and the less accurate the comparisons are (Rezaei, 2015). It is necessary to obtain the consistency ratio from the formula below:

$$\text{Consistency Ratio} = \frac{\varepsilon^*}{\text{Consistency Index}} \tag{4}$$

In the face of uncertainty, the lower and upper bounds of the weights of criteria j based on the grey systems are calculated using the following two models:

$$\underset{st}{Min} \varepsilon$$

$$\left| \frac{WB}{Wj} - \mathrm{aBj} \right| \leq \varepsilon, \mathrm{f\ for\ all\ j} \tag{5}$$

$$\left| \frac{WB}{Wj} - \mathrm{a}jw \right| \leq \varepsilon, \mathrm{f\ for\ all\ j}$$

$$\sum Wj = 1 \ \mathrm{Wj} \geq 0; \mathrm{f\ for\ all\ j}$$

For each criterion, the optimal weights can be calculated as interval values by resolving these two models. The middle of the interval can be used for rating the criteria (Rezaei, 2015). As the criteria were more than

Table 2
The selected types of leftover spaces and their characteristics.

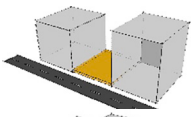
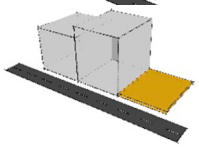
Typology	Definition	Examples	Form	Management
Space In-between	Vegetated land that is not currently being utilized for residential or commercial uses; none or very minimal removal and maintenance of plants; public access, frequently with limited usage.		Block	Irregular veg. removal, long removal intervals; governmental stewardship
Lots	Vegetated lots not currently utilized for residential or commercial uses; typically, vegetation removed to the ground cover if maintained; public access and limited use. Vacant lots, abandoned lots, Previous developed site		Block	Irregular veg. removal, medium to long removal intervals; private stewardship

Table 3
The socio-demographic information of elderly.

	Overall
Age	
64–69	45
70–75	43
76–81	14
Gender	
Female	52
Male	50
Education	
Associate Degree	20
Undergraduate	40
Master	23
PhD	19
Occupation	
Employed	37
Retired	34
Housewife	8
Unemployed	23

9, by adding one level to the hierarchy of the problem, the criteria were clustered into several clusters. For meaningful clusters, the main Themes were adopted from the literature review. Thus, the study makes sub-sets of the criteria: Ecological, Social, Aesthetical, and Economic. Suppose that three criteria (out of 18) were put under Ecological, 7 (out of 18) under Social, 5 (out of 18) under Aesthetical, and the remaining 3 (out of 18) under Economic. The Four sub-sets were analyzed respectively. Then, a pairwise comparison was made among the sub-sets (or main criteria: Ecological, Social, Aesthetical, and Economic). In the end, each criterion's weight belongs to each sub-set multiplies by the weight of the whole sub-set to get the "global" weight of the criteria. The sum of the global weights of all the 18 criteria becomes 1.0.

2.5. Data sources and collection

Before adopting the final full-scale study, to conduct a comprehensive survey, an additional pilot testing was conducted to refine the attributes. The anonymous questionnaire was sent to the respondents. Running the online questionnaire did not require installations or applications. The respondents were selected using a virtual snowball technique. Asking the elderly to participate in a survey and the COIVD-19 situation made too many limitations. Also, during the preliminary interviews with the elderly, we found that older adults were not convenient to spend more time with strangers in COVID-19 quarantine time. Thus, we decided to select online questionnaires. Virtual snowball sampling facilitates access to a "hard to reach" population and can expand the sample size and the scope of the study and reduce costs and time (Evans and Mathur, 2005).

A message was sent to 161 young-old residents randomly through WhatsApp, Email, and Telegram. Based on a virtual snowball selection technique, these respondents were also requested to forward the link to other interested residents in the neighborhoods. The first section of the questionnaire comprised residents' demographic characteristics (Table 3 - residents' characteristics and open space usage). The second section included a preference with the BWM method assessment, divided into four sub-sets of the criteria: Ecological, Social, Aesthetical, and Economic.

As shown in Table 3, the questionnaire was sent to more than 300 people, and the survey yielded 123 responses, of which 102 questionnaires were valid, including 52 females and 50 males. The respondents were aged between 64 and 80 (Under 69: 44.1%, 70–75: 42.4%, over 76: 13.7%). The older adult population can be divided into three life-stage subgroups: the young-old (approximately 65–74), the middle-old (ages 75–84), and the old-old (over age 85) (Little, 2016).

Table 7
Weighting criteria of the ecological area.

Criteria	Diversity of species	Density	Planting
Weights	0.575	0.325	0.1
Rank	1	2	3

3. Results and discussions

This study considered only the young-old and the middle-old subgroups. 49 persons of the elderly attended public spaces in the afternoon, 18 persons in the morning, and 17 persons never used these

Table 6
Independent samples test.

	Levene's test		*t*-Test for equality of means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% Confidence interval of the difference	
								Lower	Upper
Equal variances assumed	1.950	0.166	−3.474	100	0.001	−0.745	0.215	−1.171	−0.320

Table 8
Weighting criteria of the social area.

Criteria	Relaxing	Playground	Leisure in a café	Gallery	Table-top games	Exercising	Attending Events
Weights	0.31296	0.069956	0.209867	0.083947	0.083947	0.209867	0.029455
Rank	1	4	2	3	3	2	5

Ksi* = 0.10.

Table 10
Weighting criteria of the Economic area.

Criteria	Community garden	Market	Rent to different activity	Renewable energy panel
Weights	0.543307	0.165354	0.070866	0.220472
Rank	1	3	4	2

Ksi* = 0.11.

spaces. Among 102 participants, 46 persons attended public spaces Once or twice a week. Kolmogorov-Smirnov test indicates that data sets are normally distributed.

About 49 persons of the elderly use the spaces in the afternoon. Based on Spearman's rho, there is an inverse relationship between "Preferred time of the day", "number of days people spending their time" rate, and "Approximate time which people spending their daily hours". It means that the elderly, who attend urban spaces in the morning, spend more time than those who attend at night.

However, there was no difference between the age groups of elderly and the "preferred time of the day" (morning, noon, evening, night). Also, there is a relationship between gender and the "approximate time which people spend their daily hours" in public spaces. In contrast, according to Mitra et al. (2021), Transportation planners and policy-makers should be aware of gender and other socio-demographic characteristics in old-people mobility. As a result, it will close the gender gap by understanding and addressing specific target groups' mobility characteristics and requirements (Table 4).

Analysis of Variance (ANOVA) was used to compare differences between elderly groups. Results indicated that aging does not reduce participation in public spaces. The Education between the "preferred time of the day" and the "approximate time which people spending their daily hours" were then subjected to ANOVA test. The results indicate that education significantly affect the "preferred time of the day", and the "approximate time which people spending their daily hours" ($p < 0.05$). More educated people spend more approximate time in each visiting ($p < 0.000$). In addition, the regression estimations revealed that education can predict up to 18.5% (R2 = 0.185) of the variance of the "approximate time which people spend in their daily hours" in urban spaces (Table 5).

The "number of days people spending their time" between age, gender, and education was then subjected to an Analysis of Variance (ANOVA) test. The results indicated that gender was the most significant ($p < 0.005$, Unstandardized Coefficients B: 0.690).

The Independent samples *t*-test of gender and its impact on "number of days people spending their time" are highlighted in Table 6. Homogeneity of variance was checked using Levene's test, which means the lower mean between females.

Table 11
Global weights and rank for all criterion.

Sub-set	Weights	Rank	Criteria	Global weights	Global rank
Ecological	0.594758	1	Diversity of species	0.341986	1
			Density	0.193296	2
			Planting	0.059476	5
Social	0.191532	2	Relaxing	0.059942	4
			Playground	0.013399	14
			Leisure in a café	0.040196	6
			Gallery	0.016079	11
			Table-top games	0.016079	12
			Exercising	0.040196	7
			Attending Events	0.005642	18
Aesthetical	0.060484	4	Color	0.027074	9
			Pattern	0.014977	13
			Sculpture	0.007488	16
			Installation	0.007488	17
			Mural	0.003456	19
Economic	0.153226	3	Community Garden	0.083249	3
			Market	0.025337	10
			Temporary activity	0.010859	15
			Renewable energy panel	0.033782	8

3.1. Weighting criteria with BWM

Because of its advantages, BWM was chosen for weighting criteria that require fewer comparison data combined with more consistent comparisons and more reliable performance.

Stage 1. The experts determined a set of decision criteria.
Stage 2. Ecological sub-set: Diversity of species was determined as the best criteria, and Planting was determined as the worst one. Social sub-set: Relaxing was determined as the best criteria, and Attending Events was the worst one. Aesthetical sub-set: Color was determined as the best criteria, and Mural was determined as the worst one. Economic sub-set: Community Garden was determined as the best criteria, and Temporary activity was determined as the worst one.
Stage 3–4. The elderly residents subsequently decided the best criterion's choice over all other criteria and the criteria's preference over the worst criterion.
Stage 5. The criteria's rating, the weights, and evaluating key factors are considered; The process of prioritizing critical factors of urban acupuncture intervention through multiple-criteria analysis.

Table 4
Spearman's rho for the preferred time of the day (morning, noon, evening, night), gender, and the approximate time which people spending their daily hours.

		Number of days people spending their time	Preferred time of the day	Approximate time which people spending their daily hours
Preferred time of the day (morning, noon, evening, night)	Correlation Coefficient	−0.433**	1.000	−0.477**
	Sig. (2-tailed)	0.000		0.000
Gender	Correlation Coefficient	0.326**	−0.077	0.220
	Sig. (2-tailed)	0.001	0.443	0.076
Approximate time which people spending their daily hours	Correlation Coefficient	0.554**	−0.477**	1.000
	Sig. (2-tailed)	0.000	0.000	

Table 5
Regression analysis of preference for the preferred time of the day and the approximate time which people spend in their daily hours.

Coefficients					
Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. error	Beta		
Dependent variable: preferred time of the day	−0.271	0.123	−0.215	−2.207	0.030
Dependent variable: approximate time which people spending their daily hours	0.294	0.077	0.430	3.812	0.000

As shown in Fig. 5, findings indicate that the elderly perceive the Ecological sub-set as the most critical area for reimaging leftover spaces. It is rather interesting to find the Aesthetical sub-set as the least important areas. Existing studies indicate that while interviews showed that respondents liked the wall painting chosen, they were not satisfied with the real one (Naghibi et al., 2020).

The diversity of species could attract people and promote perceptions of vitality and biodiversity. In this regard, Deng et al. (2020) mentioned that birdsong Results in more engagement with the ecosystems; improves the perception of landscape experience. As indicated in Table 7, the preferences of the elderly are consistent with previous urban studies and include insightful suggestions about how to create a healthier environment—the inclusion of diverse vegetation, supporting restorative experiences, and attract animals, birds, and butterflies. "Biodiversity" appears to be a critical feature of restorative ecosystems in this research, resulting in landscapes with greater compositional diversity or increased complexity. Green areas should create to make peace and security. High-density spaces can cause insecurity, so people intend to participate in choosing the type of vegetation.

Ksi* = 0.075.

To attract elderly involved in different activities, age-friendly outdoor development should consider both individual and group activities, active and passive uses of space, and ensure the balanced relationship of quietness and liveliness (Table 8). Regarding the facilitation for physical activity, appropriate fitness equipment suitable for seniors' physical condition should be designed and sufficient sets of tables and seats should be planned to promote mind recreational table games. The availability of adequate basic facilities with regular maintenance, such as drinking fountains, toilets, and cafes, must also be accompanied. Wang and Rodiek (October 10, 2019) also mention that the elderly prefer amenities such as shade structures, toilets, and seating along walkways. Moreover, providing appropriate and high-quality seating and natural spaces can enhance relaxation and promote potential opportunities for communication for seniors by interacting with others in different activities. In addition, Leisure in a café as the second priority will contribute to economic development and social integration.

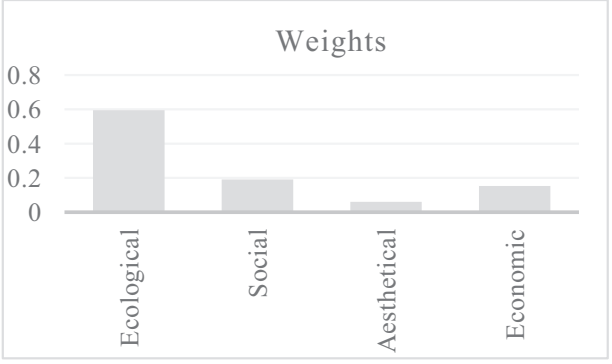


Fig. 5. Weighting sub-sets of the main criteria (Ksi* = 0.17).

Based on the quality of contemporary sculptures and murals in Tehran, this option will be the respondents' last priority. As most respondents use mini-parks in the evening and night, darkness and lack of visibility may be another possible explanation for not choosing these types of approaches, based on the questionnaire study (Table 9).

Findings indicate that the elderly are conscious of the benefits that they, their neighborhood, and the city as a whole will derive from community gardens (Table 10). These findings confirm that community gardens are critical places to consider in landscape planning, policy-making, and environmental studies. It validates our assumption that individuals who have grown up close to nature are more likely to be dedicated to community gardens. Our results are consistent with Torres et al.'s (2018) findings, demonstrating the value of past landscapes as elements of environmental autobiography. In this regard, land should be both available and accessible for residents.

Renewable energy panel ranked as the second criterion of the Economic area. This intervention could be necessary for the local economy. However, several environmental effects are associated with such energy projects, which may be harmful to landscape, wildlife, and economic activities, such as those focused on natural urban tourism. Moreover, aesthetical issues such as visual pollution should be considered.

As shown in Table 11, the weight obtained for each criterion belongs to each sub-set multiplied by the weight of the whole sub-set to get the "global" weight of the criteria. Most of the Aesthetical criteria were ranked as the least priorities. The reason could be because they may not suit residents' taste., residents' would better understand the more temporary and changeable artworks. According to Naghibi et al. (2020), it is crucial to consider whether the aesthetical intervention is permanent or temporary. People were more involved in installation art because of its' temporary nature.

For the development of high-quality urban spaces, biodiversity is a critical quality. Our data indicate that a natural landscape with diverse vegetation and resting facilities, and gentle leisure activities were identified as essential intervention attributes, maybe an ideal environment for the elderly. Based on previous studies, vegetation with low and medium Density creates security in the environment (Naghibi et al., 2015). As Density is rated as the second criterion, elderly aesthetic preferences regarding enclosures should be considered in such spaces.

As Community gardens are rated as the third criterion, social-ecological issues should be considered more. This practice on vacant lands is also focused on the fact that it is a temporary practice on temporarily available land. Thus, technical assistance and particularly access to land can be temporarily supportive for community gardens.

According to Ian H. Thompson, aesthetical sub-sets may be divided along a spectrum of approaches that put maximum emphasis on unspoiled nature and approaches that sanction the manipulation of nature in the interests of social needs. Aesthetical discourses include a variety of satisfactions, not just residents' innate responses to aspects of the environment, but also our responses to designed objects and works of art based on cultural associations, symbolism, and meanings. As the landscape has at least the potential to be one of the great arts, further studies are needed to support aesthetical interventions.

Table 9
Weighting criteria of the aesthetical area.

Criteria	Color	Pattern	Sculpture	Installation	Mural
Weights	0.447619	0.247619	0.12381	0.12381	0.057143
Rank	1	2	3	3	4

Ksi* = 0.04.

3.2. International directions in aging

According to the WHO (2007a, 2007b), being age-friendly involves adopting more inclusive action and responding to aging-related needs and preferences. Listening to individuals, especially older people, to understand what they want and need as they age is a perfect way to start (Bhuyan et al., 2020). Thus, the qualitative data from an open-end question survey following the BWM questionnaires were used to complement the study.

Many studies on the social and psychological demands of the elderly have been conducted in the social science area (Michael et al., 2006; Wiles et al., 2009; Yung et al., 2016). Also, research on the Vietnamese elderly has also been undertaken, with the majority focusing on healthcare, economics, and social welfare (Trinh et al., 2020). Few studies consider older adults' satisfaction as a significant indicator of life quality (Chaonan, 2001; Meggiolaro and Ongaro, 2015). However, in the built environment, urban designers and planners appear to place a greater emphasis on the physical comforts and demands of the elderly (Fadda et al., 2010; Turel et al., 2007). Also, most planning criteria of supply in certain nations, such as Hong Kong, have not been evaluated in more than 15 years, meaning that the rules are based on leisure habits and recreation preferences from 20 years ago. As a result, users' actual demands should be extracted rather than perceived by planners and designers (Yung et al., 2016). Thus, the goal of this study is to explore elderly preferences that might be used in public open space planning and design.

As urban space and society are in a dialectic relationship (Lefebvre, 1991), older persons' perceptions and preferences of their environments are essential factors to consider when co-designing age-friendly environments (Buffel et al., 2018). So, it is essential to look at the functions that open spaces may play in promoting active aging (Yung et al., 2016). Furthermore, older individuals' perspectives are seen as critical to any understanding of an age-friendly area. Plouffe and Kalache (2010) state that older people are valuable in creating age-friendly urban settings (Bhuyan et al., 2020), which was the main aim of this study.

Although elderly leisure activities like walking and Tai Chi in Hong Kong are generally passive and lack social interaction (Chou et al., 2004; Wong, 2009; Zhao and Chen, 2013). This study seeks to study elderly preferences in terms of both active and passive engagement—the relaxing space, leisure in Café, and exercising are ranked as the most preferred ones. In contrast, attending events is considered as the least. Evidence shows that the elderly's ability to maintain an active physical and social lifestyle has been limited by the lack of variety in the leisure patterns of the public spaces (Yung et al., 2016). However, according to Lo and Jim (2010), elderly inhabitants are more likely to increase their living space by visiting nearby urban green spaces. The physical and safety concerns of the elderly are usually prioritized in open space planning and design, whereas social needs and preferences are rarely addressed (Scheidt et al., 1999). Based on the elderly preferences of urban green spaces, this study proposes Community Gardens as places for ecological and social interaction. It is not just a matter of giving enough open space. Instead, it is about providing a sense of place, being inviting and compassionate to its citizens, particularly the elderly who live in urban regeneration regions (Yung et al., 2016). Community gardens make the elderly feel like part of something bigger and increase motivations for community participation as a practical engagement.

Some similarities and differences have been identified when comparing to other studies, such as retired people's visiting patterns, individual nighttime park patronage, and preference for a family visit (Jim and Chen, 2006; Mak and Jim, 2019; Özgüner, 2011; Reichert et al., 2007; Wong, 2009). Jayantha et al. (2018) investigated common facilities in housing estates in order to satisfy the specific requirements of the elderly. They questioned the facilities' inappropriate placement and design and the lack of public seating, oppression, and cleanliness in common areas. The inappropriate designs do not meet the elderly's functional demands (Tian et al., 2021).

According to Yung et al. (2016), public open space design in urban renewal districts should consider the highly concentrated elderly community. As metropolitan cities have many renewal districts, the design should be adapted to meet socially relevant, age-sensitive, and citizen-caring design. According to Temelova and Slezakova (2014), different generations have varied perspectives on how public places should be investigated.

Regnier (1983) argued that an older person's public image is more closely linked to the social and interactive activities that define neighborhood life than the surroundings' visual structure. Other findings show that the most significant demands for elderly people are "social and physical activities", "community life facilities and services," and "social network," as well as a "clean and attractive environment" (Yung et al., 2016). In addition, participants utilized five critical qualities to characterize an age-friendly area in Singapore: inclusion, social environment, physical environment, sense of place, and safety (Bhuyan et al., 2020). Other studies have raised concerns about the need for aging-community residents to retain and preserve access to diverse retail, services, and recreational areas (Regnier, 1983). However, this study emphasizes the importance of the ecological aspect as the highest preferred intervention followed by the social aspects. As a result, according to Naghibi et al. (2021), even small-scale elements like shrubs, bushes, and trees may improve the appeal of residual spaces. It is not required to redesign the entire space to encourage participation. Simply selecting the proper vegetation may make a significant difference in the space atmosphere.

This research responds to a developing awareness that vacancy knowledge might help policymakers adapt to urban shrinking and uncontrolled expansion (Buitelaar et al., 2021; Burkholder, 2012). This view is consistent with the adaptive reuse problems raised in other recent research from opposite ends of the world. Grodach et al. (2017) criticize the removal of small manufacturing from the inner city due to land-use zoning re-designation in Australia (Armstrong et al., 2021). Clifford et al. (2018) and Grodach et al. (2017) emphasize the necessity of understanding vacancy and how it is distributed inside buildings and across cities to avoid unexpected economic and social effects.

The recent study could coincide with long-standing policymakers' demands for practical but research-based tools to address public policy decision-making and to apply data-informed policy (Goldsmith and Crawford, 2014), both regionally and globally. Given older people's specific abilities and circumstances, the first suggestion to policymakers at both local and global levels is to explore approaches for retaining or making life-space as proper as possible to complete life-space activities. In this approach, older individuals' favorite activities in geographical life-space may be made as simple as feasible. We propose considering older people's options, situations, and preferences, recognizing that life-space is a personal choice.

Liddle et al. (2014) indicated that there is no optimal size of life-space because the individual mainly defines it. As a result, this study about restricted spaces is critical to find the elderly preferences and whether they can still meet their needs in small urban areas. In addition, this research aims to highlight if the demands of the elderly in terms of using public open spaces in metropolitan areas are addressed in standard planning and design standards.

Cities such as Berlin and Leipzig are leading urban politics by including interim uses to limit shrinkage. However, the reality of the growth in shrinking cities phenomenon can be observed by monitoring the formation of resurgent cities and their impacts on interim uses (Dubeaux and Cunningham Sabot, 2018), which are more and more becoming mere ephemeral uses with no actual impact on places and society.

According to Brandstetter et al. (2005), "the opposite of shrinkage is not growth but adaptation." According to them, "urban politics must emphasize adequate adaptation while protecting individual identity." According to this perspective, increasing interim uses still needs to investigate residents' preferences and the identity of the place.

Buitelaar et al. (2021) suggested that ad hoc public policies are frequently used to address urban vacancy. To proceed toward a more anticipative policy framework, the problem of vacancy data availability and lack of debate must be addressed in research and policy (Armstrong et al., 2021). This research is an initial attempt to comprehend the aging process, concentrating on the growing symbiotic interaction between human and their environment. This study considered both experts' and public opinions regarding the urban acupuncture intervention and how it works for the elderly, which was not explored in previous studies. Urban acupuncture's features and criteria studied in this research can be applied in urban design by policymakers and planners.

Planners should give special attention to the elderly, who spend a more significant proportion of their time in public open spaces in older neighborhoods than other age groups (Yung et al., 2016). Furthermore, they have lived in the old regions for many years and have formed a strong sense of community and belonging (Mohammad-Moradi et al., 2020). As a result, intervention may have a more significant impact on them than on other age groups. Public open space planning should be thoroughly investigated and enriched to improve the elderly's social network and social well-being. They ensure inclusive city life for people of all ages, which encourages older people to participate in all parts of planning and government.

4. Conclusion

This study's innovation is implementing a mixed approach, applying BWM in urban landscape spaces, and considering both experts and public preferences to represent the primary needs and demands of elderly in the design and planning of open space. The kind of intervention and the needs of the elderly, particularly in limited outdoor spaces, have still not been intensively reported. As these areas are too limited, design components will play a greater role. In addition, this study proposes urban acupuncture as an immediate and well-targeted intervention for the elderly environment, which was not studied comprehensively before. The purpose of this research is to bridge the gap between previous research and current developments in open space by analyzing elderly's activity patterns and preferences in open spaces. Since urban acupuncture is sensitive to societal needs and economic values, and this study emphasized ecological solutions, we can use this knowledge to turn challenges into actions for nature-based solutions. Also, future scoping needs to change the mentality of having an economy to lead our decision-making.

Compared to studies on small parks in Asian and Western European cities, studies on socio-demographic and visit-related features of users in those spaces in Tehran are almost novel topics. Similar research might be conducted in other developing metropolitans to improve the advantages of small green spaces to inhabitants. Studying the case of Tehran as a showcase, the research will raise awareness and knowledge among policymakers about the elderly preferences to benefit aging in place, increase life satisfaction, take additional improvement, and employ future policy. As a result, the elderly must be included in planning and development stages to create an age-friendly environment. The findings would also raise public awareness of the importance of the aging issue in society.

In metropolitan cities, the higher land prices, higher densities, and a changing lifestyle have all complicated the maintenance of private green spaces, leading to decreased social interactions between neighbours. However, the most preferred intervention was an ecological one, emphasizing the importance of the subjective landscape for the elderly. As Tehran was once known as the city of plane trees, this study highlights the subjective landscape of cities, which should be considered more. Furthermore, Karaman and Selçuk (2021) propose that the biophilic design criteria positively affect the elderly regarding the equal social opportunity. Thus, the biophilia hypothesis, biophilic design, and universal design patterns might be critical in future infrastructural studies.

The hierarchy given here could refer to developing modern, practical age-friendly outdoor spaces; also improving the current urban parks with age-friendly designs. In addition, community gardeners should understand more broadly that public support is necessary for their gardens to thrive, attend to residents' views, and incorporate them into the conception and management of gardens. This study demonstrates that a natural landscape with diverse vegetation, resting facilities, and gentle leisure activities, identified as essential intervention attributes, may be ideal for the elderly. As urban acupuncture is a bottom-up approach, and aesthetical discourses include various satisfactions, these interventions needed more extensive studies.

The interim usage strategy with urban acupuncture intervention can be seen as an instrument for reactivating leftover spaces and prioritizing urban regeneration. Recent trends indicate that urban regeneration initiatives have increasingly changed to being people-oriented. The analysis reflects the ecological, Social, and planning dimensions of the various interim practices being enacted in the contemporary urban spaces. Lastly, new unforeseen urban threats have recently emerged (e.g., the COVID pandemic), increasing the need for immediate intervention (Armstrong et al., 2021; Green, 2020) like urban acupuncture to generate a rapid shift in cities.

CRediT authorship contribution statement

Maryam Naghibi: Conceptualization, Methodology, Software, Investigation, Resources, Formal analysis, Writing – original draft, Visualization, Writing – review & editing. **Mohsen Faizi:** Conceptualization, Validation, Writing – review & editing, Supervision.

Declaration of competing interest

The authors declare no conflict of interest.

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