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Research Article

PEOPLE'S REASONS NOT TO PARTICIPATE IN COMMUNITY GARDENS IN DISADVANTAGED NEIGHBORHOODS OF ROANOKE, VIRGINIA

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Abstract

Although community gardening provides numerous environmental, economic, health, and social benefits, public involvement and support are still not at the desired level for their permanency in cities. While there are numerous studies regarding people's motivations to participate in community gardening, empirical research is very limited for people's reasons not to participate in community gardening. For increased involvement and public support, knowledge about people's reasons not to participate in community gardening is important. Using a survey instrument, this research identified people's primary reasons that negatively influence their participation in community gardening in five disadvantaged neighborhoods of Roanoke, Virginia. Descriptive statistics, T-test, and factor analysis procedures were used at a 95% significance level. Results showed that the statements associated with "theft and damage", "difficult access", "too much effort", and "no personal interest" were the main reasons not to participate in community gardening. Based on these, this research brings design and maintenance recommendations for the increase of more successful community garden projects. In the long term, this can contribute to the long-term survival of these landscapes in cities by providing higher public involvement and support for community garden projects.

Keywords: Community gardening, urban agriculture, community participation, motivations, landscape architecture.

Araştırma Makalesi

ROANOKE, VİRGİNİA'NIN DEZAVANTAJLI MAHALLELERİNDE İNSANLARİN TOPLULUK BAHÇELERİNE (HALK BOSTANLARINA) KATILMAMA NEDENLERİ

Özet

Topluluk bahçeciliği diğer adıyla halk bostanları birçok çevresel, ekonomik, sağlık ve sosyal fayda sağlamasına rağmen, bu alanların kentlerde kalıcılığını sağlamak için halkın katılımı ve desteği hala istenen düzeyde değildir. İnsanların topluluk bahçeciliğine katılma motivasyonlarına ilişkin çok sayıda çalışma olmasına rağmen, insanların bu bahçelere katılmama nedenlerini araştıran bilimsel araştırma çok sınırlıdır. Artan bir katılım ve halk desteği sağlamak için, insanların topluluk bahçeciliğine katılmama nedenleri hakkındaki bilgi edinmek önemlidir. Anket çalışması ile yürütülen bu araştırma Roanoke, Virginia'nın beş dezavantajlı mahallesinde insanların topluluk bahçeciliğine katılımlarını olumsuz etkileyen başlıca nedenlerini belirledi. Bu çalışmada betimleyici istatistik , t-testi ve faktör analizi prosedürleri %95 anlamlılık düzeyinde kullanılmıştır. Sonuçlar, insanların topluluk bahçelerine katılmama nedenleri arasında "hırsızlık ve hasar", "zor erişim", "çok fazla çaba" ve "kişisel ilginin olmaması" gibi nedenlerin olduğunu göstermiştir. Bu nedenlere dayanarak, bu araştırma daha başarılı topluluk bahçesi projelerinin arttırılması için tasarım ve bakım önerileri getirmektedir. Bu bilgi ve öneriler daha fazla halk katılımı ve desteği oluşturarak şehirlerdeki bu peyzaj alanlarının uzun vadede var olmasına katkıda bulunabilir.

Anahtar kelimeler: Toluluk bahçeleri, kentsel tarım, halk katılımı, motivasyonlar, peyzaj mimarlığı

1. INTRODUCTION

Rapid urbanization and heavily industrialized food systems have resulted in numerous environmental, economic, and social negative impacts such as environmental degradation, income imbalances between farmers, and unequal living and working conditions for workers in the food supply chain. In addition, it is expected that urban land areas are expected to expand by 1.3 million km^2, and urban populations are expected to grow by 2-3 billion by 2050 (Huang et al., 2019). These global projections show that the demand for agricultural lands and the dependence on the unsustainable transport-oriented food supply chain will keep increasing possibly may worsen environmental, economic, and social imbalances, especially in disadvantaged urban neighborhoods. To minimize these negative impacts and contribute to shifting from transport-oriented food to locally produced fresh and healthy food, the importance and popularity of community gardens are increasing in cities. A view from the Mountain View Community Garden in Roanoke, Virginia (Figure 1).

Figure 1. A representation of community garden. Photo credit to Sinan Kordon (Kordon et al., 2022).

As a part of urban green space, community gardens provide a wide range of benefits such as the revitalization of vacant lots, improving neighborhood appearance, safety, and prosperity (Ohmer et al., 2009), carbon sequestration (Ellison et al., 2021), and slowing down rainwater runoff (Gittleman et al., 2017). Community gardens also provide services for their users and residents by promoting social interaction, community building, improved diet with increased vegetable intake (Litt et al., 2011), stress relief (Hayashi et al., 2008), physical activity (Gregis et al., 2021), and economic benefits for being a local and affordable food source (Kantor, 2001). Therefore, community gardens are well recognized as a community-oriented strategy for a more resilient, environmentally sound, affordable, more socially and culturally accepted healthy food system for larger communities (Feenstra, 2002). Despite the numerous benefits and great potential of community gardens, people's involvement and public support for community gardens are not at the desired level. Therefore, they have been lost to other commercial, residential, or public land uses (Kordon, 2022; Kurutz, 2004; Pothukuchi & Kaufman, 1999; Surratt, 2010; Twiss et al., 2003). Therefore, Kordon et al. (2022) claimed that to develop effective strategies to preserve community gardens and to effectively "organize people to defend the right to use the land for community gardening", increased community involvement and public support for community gardens are critical which all contributes to their acceptance and permanency in cities (Kordon et al., 2022, p. 1).

Past research showed that people's involvement and support for a landscape rely on their attitudes and perceptions which are highly influenced by people's motivation and interest for a particular landscape and the activities offered in the landscape (Driver et al., 1991; Manfredo et al., 1996). Also, people with different motivations and interests may respond differently to community garden landscapes and programs which influence their reactions toward this community practice. Therefore, knowledge regarding people's motivations to participate or not to participate in community gardening is important to better understand people's attitudes and perceptions towards community garden environments. As discussed by Kordon (2022) if a community garden is developed without considering people's reasons to participate and not to participate in community gardening, only a small group of people can

obtain a benefit which may result in the risk of failure of the community garden project in the long term due to a lack of sufficient support from the broader community (Kordon et al., 2022).

Although numerous studies discuss people's motivations for community gardening (Draper & Freedman, 2010; Lee & Matarrita-Cascante, 2019; Sonti & Svendsen, 2018; Trendov, 2018), research investigating people's reasons not to participate in community gardening is very limited. Similarly, American Community Garden Association (ACGA), Trendov, Guitart, et al., and Sonti and Svendsen highlighted the importance of future studies to continue investigating the factors influencing people's participation in community gardening (ACGA, 2009; Guitart et al., 2012; Sonti & Svendsen, 2018; Trendov, 2018). To help fill this gap in the literature and to enhance knowledge regarding people's reasons not to participate in community gardening, this study has two goals. Firstly, this study aims to contribute to the literature by developing a survey scale through an in-depth review of the community garden literature due to the lack of a comprehensive survey instrument measuring the important factors influencing people's participation in community gardening. Secondly, this study also aims to employ the survey instrument developed to identify people's primary reasons not to participate in community gardening in the disadvantaged neighborhoods of Roanoke, Virginia. Knowing what factors primarily influence individuals' decisions not to participate in community garden programs will help planners, designers, and garden managers to develop more successful community garden designs and management strategies to minimize people's reasons not to participate in community gardening and to lessen any potential opposition toward these landscapes. Community gardens are unique environments providing multiple environmental, economic, and social benefits at the same time in the same space. The findings of this study will surely contribute to the increased involvement and support of the broader community for the long-term existence of gardens in urban neighborhoods.

2. MATERIALS AND METHODS

2.1. Study Area

Considering the benefits of community gardens, their successful development and long-term permanency are more important, especially for the neighborhoods where people have suffered from low income[1] and low access[2] to grocery stores (Kordon et al., 2022). Low income and low access to grocery stores are challenging concerns for the most part the Roanoke City. Therefore, this study focuses on people from the local communities in different neighborhoods in the City of Roanoke, Virginia. Five neighborhoods including Shenandoah West, Hurt Park, Mountain View, Old Southwest, and Kenwood Neighborhoods in the City of Roanoke were chosen as the study area. These neighborhoods are located in low-income tracts. Shenandoah West, Hurt Park, Mountain View, Old Southwest, and Kenwood neighborhoods are also located in low-access tracts (USDA, 2015). There were eight community gardens within the limits of these neighborhoods. Community garden locations and neighborhood limits are presented in Figure 2.

[1] A low-income tract has a poverty rate of greater than 20 percent or has a median family income of less than or equal to 80 percent of the state's median family income USDA. (2015). *Food Access Research Atlas*. Retrieved 05/05/2018 from http://www.ers.usda.gov/data-products/food-access-research-atlas.aspx

[2] A low access tract includes at least 500 people, or 33 percent of the population living more than 0.5 miles (in urban areas) or more than 10 miles (in rural areas) from the nearest grocery store. Ibid.

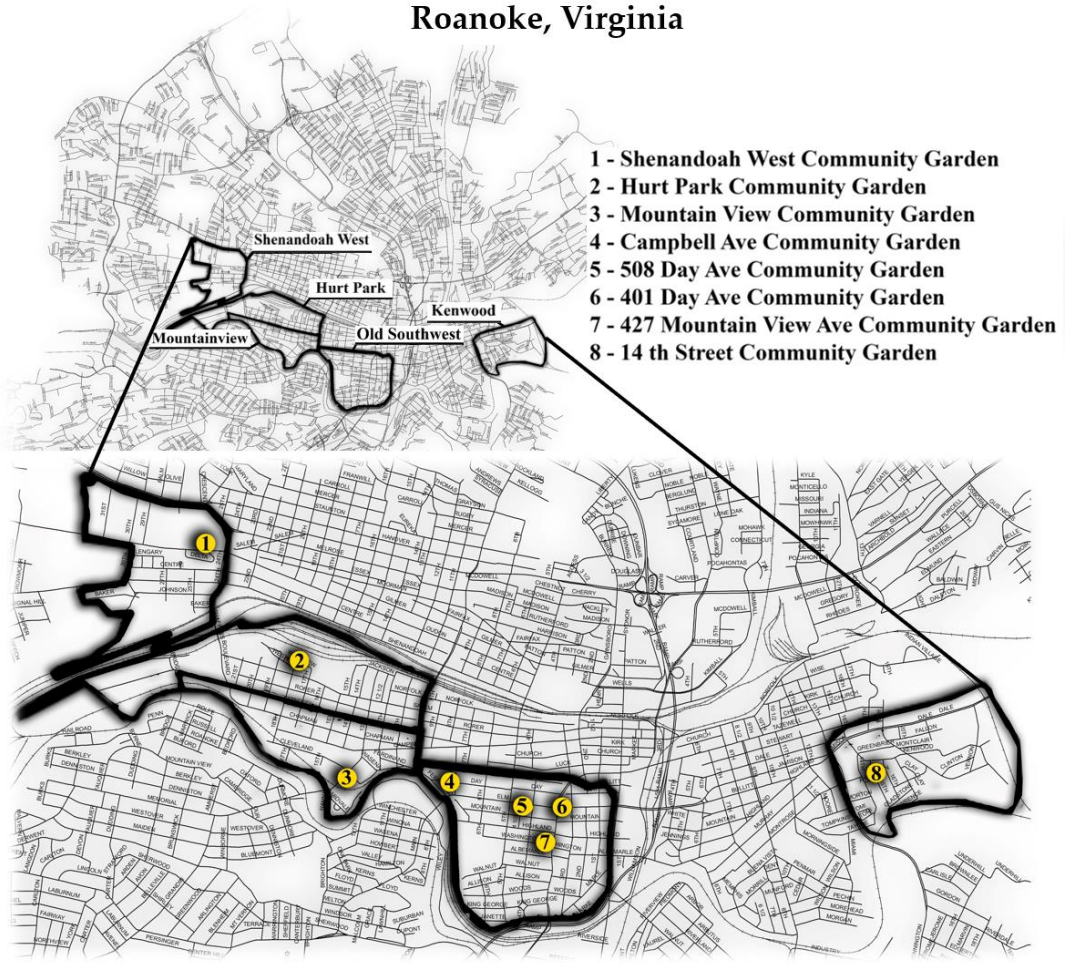

Figure 2. Map of neighborhood limits and community garden locations included in this study.

2.2. Study Participants

To understand people's potentially important reasons not to participate in community gardening, non-community gardeners were identified as survey participants.

Non-community gardeners are residents who do not participate in any of the above-mentioned community gardens but live in the neighborhoods mentioned above. They were chosen since they live close to a community garden. Thus, it was expected that these residents were aware of the availability of a community garden in their neighborhood and have a reason not to participate in it. In this study, there were two types of non-community gardeners: those who only garden at home and those who do not garden at all.

A systematic sampling method was used based on the location of the community gardens. Starting from households where the community garden is located, door-to-door visits were conducted for every household. Residents who were less than 18 years old were excluded as were those who did not respond to the door or declined to participate. The researcher also reached residents through the leaders of the neighborhood groups using their listserv and personal contacts to reach more people in the neighborhoods.

2.3. Survey Instrument

A systematic literature review was performed to identify people's potential reasons not to participate in community gardening. A survey scale was developed through the literature review for the participant group. Search terms such as "*motivations, reasons, problems, conflicts, complaints, difficulties in community gardening"* were used to identify any negative aspect of gardening, complaints about gardening or the garden environment, and sources of conflicts in gardens considering they might be a possible reason not to participate in community gardening. Electronic databases such as Google and Google Scholar search engines, Geo Base, ISI Web of Knowledge, Pro Quest, and Bio Med were used to collect the resources for this review. Scholarly peer-reviewed journal articles, theses, and dissertations were initially included in this review. Due to a limited number of studies and to minimize the risk of missing any important reason not mentioned in the scholarly peer-reviewed resources, this review was extended to the bulletins, technical reports, community garden design guidelines, and web pages to reach an increased number of possible reasons not to participate in community gardening. The intent is not to evaluate or re-analyze the results of these resources, rather the intent is to develop a survey instrument by identifying keywords regarding people's reasons not to participate in community gardening. Thus, it is considered that being a peer-reviewed published article is not necessary for selecting references. The reference lists of initially found documents were also examined to reach more references. The whole collection of articles and other documents were then searched in their entirety. Any identified reasons not to participate in community gardening were coded and categorized. Then, a synthesis of the results is organized in a spreadsheet using Microsoft Excel to develop the survey scale. The survey instrument also contains identical questions for participants about their demographics at the end of the survey booklet.

2.4. Survey Administration

Before conducting the survey, an approval for research involving human subjects from the Institutional Review Board (IRB) at the Office of Research Compliance of Virginia Tech was obtained. The survey was conducted in several ways: during community meetings, door-to-door visits, and online. During the community meetings organized by the neighborhood groups, the researcher surveyed the participants. Community meetings were also helpful for building trust within the neighborhood for door-to-door visits and reaching more people either for online or face-to-face surveys. In addition to the community meetings, the researcher made numerous door-to-door visits in the neighborhoods, starting primarily on streets where community gardens are located.

For the online version of the survey, an online survey tool called Qualtrics Surveys was used through the Virginia Tech software distribution center. The software generated a link to the survey page. During the community meeting and door-to-door visits, the researcher distributed flyers with a link to the survey. Also, the researcher contacted the leaders of the neighborhoods and requested the distribution of the survey link to their members using their listserv. During the hard copy and online survey, participants who do not participate in community gardening were asked to choose the importance level of each of the 22 statements for their decision not to participate in community gardening using a 5-point Likert scale (1= Not important, 2= somewhat important, 3= neither important nor not 4= important, 5 = very important). To obtain the data in the same format, the author manually digitized the responses of hard copy surveys using the Qualtrics Survey tool.

2.5. Data Analysis

All corrected data were transferred into a Microsoft Excel file and Statistical Program for Social Scientists (SPSS) software version 21, licensed through the Student Software Distribution Office at Virginia Tech was used for data analysis. To identify the most and least important reasons for people not to participate in community gardening, statements in the survey scales were ranked based on the mean scores using descriptive statistics. Then, a T-test procedure was applied to explore whether mean ratings significantly differ between home gardeners and non-gardeners. Following the T-Test, factor analysis was conducted to identify if participants place importance on a particular aspect of their reasons not to participate in community gardening. This procedure aims to understand broader themes regarding the factors that may negatively influence people's participation in community gardening. Finally, the outputs of the factor analysis were ranked based on their mean scores to identify the importance of each broad reason theme. All statistical analyses were tested at the 95% significance level.

4. RESULTS

The important factors that influence people's decision not to participate in community gardening were analyzed using a list of 22 statements generated after an in-depth literature review. The mean analysis revealed that the "lack of enough time for gardening" (m=3.35), is the most important factor for home gardeners not to participate in community gardening followed by the "community garden is too far away" (m=2.92), "physically demanding" (m=2.11), "do not have access to seeds" (m=2.05), and "can purchase healthy and nutritious food from the market" (m=1.91). On the other hand, the least rated statements for home gardeners are "space not available in the community garden" (m=1.51), "gardening is too much work" (m=1.46), "plants and vegetables are often stolen" (m=1.29), "difficult to access to the garden space" (m=1.25), and "gardening cost more than market foods" (m=1.15). In addition, the "community garden is too far away" (m=3.31), "lack of enough time for gardening" (m=3.04), "physical limitations (physical disabilities, cannot stand too long, etc.)" (m=2.65), "not comfortable outdoors" (m=2.63), and "I do not like gardening" (m=2.52) were the most rated statements for non-gardeners not to participate in community gardening. Conversely, "plants and vegetables are often damaged by pets" (m=1.85), "do not want to interact with other gardeners" (m=1.89), "gardening is too much work" (m=1.89), "gardening cost more than market foods" (m=1.92), and "difficult to access to garden space" (m=1.93) were least rated reasons for non-gardeners (Table 1).

Table 1. Means of people's motivations not to participate in community gardening.

	Home			Non-		
Statements	**N**	**M**	**SD**	**N**	**M**	**SD**
Lack of enough time for gardening	65	3.35	1.44	98	3.04	1.58
Can purchase healthy and nutritious food from the market	65	1.91	1.20	98	2.42	1.46
Physically demanding	65	2.11	1.31	98	2.31	1.45
Do not know how to grow plants	65	1.40	0.90	98	1.99	1.29
Plants and vegetables are often damaged by pets	65	1.77	1.09	98	1.85	1.14
Gardening is too much work	65	1.46	1.20	98	1.89	1.32
Space not available in the community garden	65	1.51	1.06	98	2.47	1.81
Physical limitations (Physical disabilities, cannot stand too long, etc.)	65	1.80	0.97	98	2.65	1.62
Plants and vegetables are often stolen	65	1.29	0.70	100	2.40	1.45
Difficult to access the garden space	65	1.25	0.59	98	1.93	1.20
The community garden is too far away	65	2.92	1.23	98	3.31	1.54
No success in the past	65	1.86	1.03	98	2.41	1.44
The garden environment is too messy	65	1.43	0.85	96	2.40	1.59
I do not like gardening	65	1.72	1.11	98	2.52	1.49
Not comfortable outdoors	65	1.62	1.17	96	2.63	1.62
Produce more plants and vegetables than I can use	65	1.63	1.17	94	2.36	1.43
Do not want to interact with other gardeners	65	1.80	1.14	94	1.89	1.40
Gardening cost more than market foods	65	1.15	0.44	96	1.92	1.40
Do not have access to seeds	65	2.05	1.14	96	2.10	1.41
Don't like to sweat and get dirty	63	1.59	0.99	96	1.95	1.33
Gardening is boring	65	1.80	1.31	96	2.20	1.34
Do not know how to cook vegetables at home	65	1.57	0.97	98	2.29	1.52

Then, A T-Test procedure was applied to explore if there is any significant difference in motivations not to participate in community gardening between home gardeners and non-gardeners. There was a significant difference between groups for most of the motivations. The results are shown in Table 2.

Table 2. Means of people's reasons not to participate in community gardening.

				%95 Confidence Interval	
Statements	**T**	**df**	**Sig**	**Lower bound**	**Upper bound**
Lack of enough time for gardening			ns		
Can purchase healthy and nutritious food from the market	-2.34	161	0.0204	-0.941	-0.08
Physically demanding			ns		
Do not know how to grow plants	-3.21	161	0.0016	-0.953	-0.226
Plants and vegetables are often damaged by pets			ns		
Gardening is too much work	-2.09	161	0.0383	-0.829	-0.023
Space not available in the community garden	-3.86	161	< 0.001	-1.454	-0.470
Physical limitations (physical disabilities, cannot stand too long, etc.)	-3.81	161	< 0.001	-1.294	-0.411
Plants and vegetables are often stolen	-5.73	163	< 0.001	-1.489	-0.726
Difficult to access the garden space	-4.27	161	< 0.001	-0.997	-0.366
The community garden is too far away			ns		
No success in the past	-2.64	161	0.0091	-0.955	-0.138
The garden environment is too messy	-4.47	159	< 0.001	-1.391	-0.538
I do not like gardening	-3.67	161	< 0.001	-1.225	-0.369
Not comfortable outdoors	-4.31	159	< 0.001	-1.472	-0.547
Produce plants and vegetables more than I can use	-3.41	157	< 0.001	-1.154	-0.307
Do not want to interact with other gardeners			ns		
Gardening cost more than market foods	-4.23	159	< 0.001	-1.118	-0.407
Do not have access to seeds			ns		
Don't like to sweat and get dirty			ns		
Gardening is boring			ns		
Do not know how to cook vegetables at home	-3.84	161	< 0.001	-1.239	-0.398

The responses to the following reasons showed a significant difference between home gardeners and non-gardeners. For instance, the non-gardeners rated significantly higher for the statement "Can purchase healthy and nutritious food from the market" compared to the home gardeners (P=0.0204). Also, the preferences for the statements "Do not know how to grow plants" and "Do not know how to cook vegetables at home" by the non-gardeners are significantly higher than that of the home gardeners (P=0.0016 and < 0.001). Another factor "gardening is too much work" is significantly different between the home gardeners and the non-gardeners not to participate in community gardening. The responses of the non-gardeners to this statement are significantly higher compared to the home gardeners (P=0.0383). Furthermore, the statement "Space not available in the community garden" is rated by the home gardeners significantly less compared to the non-gardeners (P< 0.001). Another significant statement not to participate in community gardening is physical limitations

(physical disabilities, cannot stand too long, etc.) which is responded significantly higher by the non-gardener group compared to their counterpart, the home gardeners ($P< 0.001$). Moreover, the non-gardeners responded to the reasons "Plants and vegetables are often stolen" and "Difficult to access the garden space" significantly higher than the home gardeners ($P< 0.001$). In addition, the preferences of the non-gardeners for the statements "Not success in the past" and "I do not like gardening" were significantly higher compared to their counterparts ($P=0.0091$ and < 0.001). Also, the responses to the reasons "Garden environment is too messy" and "Not comfortable outdoors" by the home gardeners were significantly less than the non-gardeners ($P< 0.001$). Finally, the results of participants' ratings show significant differences for the statements "Produce more plants and vegetables than I can use" and "Gardening cost more than market foods". The non-gardeners rated significantly higher for these motivations compared to the home gardeners ($P< 0.001$).

On the other hand, there is no significant difference between home gardeners and non-gardeners for the rest of the statements listed in Table 2: "Lack of enough time for gardening", "physically demanding", "Plants and vegetables are often damaged by pets", "the community garden is too far away", "Do not want to interact with other gardeners", "Do not have access to seeds", "Don't like to sweat and get dirty", "Gardening is boring" ($P > 0.05$).

In addition to the T-Test procedure, factor analysis was conducted to identify if participants place importance on a particular aspect of their reasons not to participate in community gardening. This test aims to understand if statements have commonalities and highlight any broader theme regarding the factors that negatively influence people's participation in community gardening. Four different reason dimensions were found, and their factor loading values are listed in Table A1. Each dimension was named based on a general theme that represents each reason in the dimension. Dimensions and their mean values are shown in Table 3.

Table 3. Ranking of dimensions of motivations not to participate in community gardening.

Dimensions	**Mean**	**Std.**
Theft and damage	2.17	0.03
Difficulty to access	2.10	0.10
Too much effort	2.04	0.28
Not a personal interest	1.83	0.07

The factor analysis and mean ratings show that there are some aspects of reasons that are important to home gardeners and non-gardeners not to participate in community gardening. According to the mean ratings, the most important aspect of the reasons is "theft and damage" (m=2.17), "difficulty to access" (m=2.10), "too much effort" (m=2.04), and "not a personal interest" (m=1.83).

5. DISCUSSION

The findings revealed that there are important factors that negatively influence people's participation in community gardening. These factors are briefly discussed along with the design and maintenance recommendations for community garden environments to overcome these challenges.

5.1. Secure the Garden Area from Outsiders

The results showed that the factors related to theft and damage are the most important reason for people's choice not to participate in community gardening. Generally, there are two reasons. First, community garden plants and vegetables are often damaged by the pets of neighbors or wildlife animals (Balčiauskas & Balčiauskienė, 2020). Second, vegetables and other plants are stolen by other users or outsiders (Aptekar, 2015; McMillen et al., 2016; Wright, 2018). The use of gated fencing is the most common approach to overcome these issues in community gardens (Milburn & Vail, 2010). However; many people support the idea that community gardens should not have fencing because the concept of community gardening is being for the community and being open to the public; therefore, the open access design of community gardens is important for the inclusion of public people in the garden site to increase the involvement and support of broader groups (Neo & Chua, 2017). As a result of this, the gardening area might be exposed to pet damage, the danger of theft, and vandalism which are all discouraging factors for participating in community gardening.

Several design recommendations can help to minimize the abovementioned issues while securing the gardening area and still providing open access for users and visitors for other garden activities. For example, while the gathering and socializing area can be located close to the entrance of the community garden and designed open to all participants, the gardening and storage area can be placed in the inner part of the site and secured using gated access for gardeners. Providing gated and open access options for different activities can help for the protection of garden produce from outsiders without blocking access to other activities for the public. Also, the use of wire fencing around the gardening area is recommended to keep wildlife animals like rodents and rabbits out of the garden site. Moreover, some people do not participate in community gardening because they do not want to interact with other gardeners. Therefore, it would be beneficial to provide individually gated or more isolated garden allotments in the community garden site for those people (Kordon 2022). Lastly, a dedicated fenced area can be helpful for gardeners and other users to keep their pets in control while they are gardening or enjoying other garden activities.

5.2. Access with Ease

The second main reason for people's decision not to participate in community gardening includes issues such as the long distance to the community garden site, lack of available plots in the gardens, and difficulty to access planting beds at the garden site. It is seen that spatial proximity and ergonomic design of planting beds are important factors for people's participation in community gardening. There are several recommendations to minimize these challenges. For example, community groups and city officials should be informed regarding the demand and the benefits of community gardening to turn possible vacant parcels into community gardens. This can increase the number of people who can access a community garden within walking distance. Also, parking lots and the width, slope, and texture of pathways in community gardens should be carefully designed to properly accommodate the use of strollers, wheelchairs, wheelbarrows, etc. for all age groups and disabled users (Bradley & Baldwin, 2013). Given the fact that there are several physical activities associated with gardening such as digging, carrying, lifting, etc. As a result, gardening seems physically demanding and requires too much effort for participants, and it might be discouraging for those with physical limitations. Therefore, a sufficient number of raised beds, benches, sitting areas, shade structures, and water sources should be available for easy access and resting. The height and structure of raised beds should be adjusted for wheelchair users and for those who have limited mobility and difficulty of bending up and down. All these recommendations can

increase the number of community gardens in neighborhoods and can improve the accessibility and the service quality of available community gardens for their users and non-gardener residents.

5.3. Move Community Gardens Beyond Food Production

The last main factor showed that planting is boring for some of the survey participants and they are not interested in gardening. Therefore, they prefer not to participate in community gardening. However, as found by Kordon (2022), there is a considerable number of people who participate in gathering and socializing activities in community gardens even if they do not have a garden spot (Kordon, 2022). Therefore, community gardens go beyond food production and become a place for individual or community activities such as block parties, gatherings, community meetings, cooking classes, film screenings, yoga sessions, art displays, etc. (Kordon et al., 2022; Petrovic et al., 2019; Spiker & Poulsen, 2014). To offer a more welcoming environment for those who are not interested in gardening but in other community garden activities, there are several design recommendations for community gardens. For example, in addition to the planting area, it is recommended to provide a gathering and socializing area equipped with proper amenities such as a kitchen, pavilion, benches, shade structures, tables, and fire pits. In addition to active group events, the presence of basic park-like physical exercise equipment, and a comfortable place for meditation for relaxation or to perform people's rituals and hobbies such as music, art, and painting is important.

From a theoretical point of view, landscapes with structures, such as shelters, benches, and tables enhance the environment's "affordability" to provide something beneficial to its users (Gibson, 2014). Therefore, people prefer to participate in landscapes where they can take benefits of them. In addition, landscapes equipped with parklike amenities enhance the spatial quality of that landscape and increase the potential for people's involvement (Kaplan & Kaplan, 1989). Taken together, the increase of opportunities offered in the landscape positively influences people's participation in the landscape (Kaplan & Kaplan, 1982). These functional additions can surely increase community gardeners' enjoyment of their time in the gardens and provide a more comfortable outdoor experience within the community garden environment. These additions, can also potentially attract public people's attention for their involvement in community garden activities. Even the non-gardener residents, including children, can come together for socializing, sharing, picnicking, community events, and other activities because of their desire to take advantage of opportunities offered in community gardens other than solely planting and gardening.

5.4. Perception Matters

Study participants picked the statement "the garden environment is too messy" as an important reason not to participate in community gardening, and this statement was statistically categorized in the "Too much effort" theme. Within a neighborhood with a messy community garden landscape, people may assume community gardening requires too much effort to keep the garden environment clean, neat, and cared, and obviously, gardeners are unsuccessful in it. This might be discouraging, and unpleasing garden scenes might be an important deterrent to nongardeners' participation in community gardening. Therefore, community garden landscapes should be tamed, well maintained, and orderly arranged to minimize the spread of the perception of "community gardening requires too much effort" among non-gardeners.

In addition, factors for a messy look community garden landscape such as overgrown plants, uncontrolled weeds, unorganized bare soil, poorly structured garden elements, vegetation debris, abandoned lots, and unkempt boxes might be evidence of neglect and abandonment that implies human care is interrupted which make the environment more prone to theft, vandalism and possible damages which is the most important reason discouraging participants of this study to participate in community gardening. On the other hand, the presence of visible crisp edges, clear paths, organized raised beds, plants in straight rows, and structures in good repair are signs of ownership and human care in the community garden landscape implying that people are involved in the place, they take care of their environments, the garden environment is under control, and people keep a close eye on the community garden property which potentially reduces crime in community gardens. Therefore, environmental perception toward community garden landscapes matters.

As also broadly discussed by Kordon 2022, any source of unappealing views should be properly maintained, removed, or hidden from the direct view of people. Also, the community garden site should be equipped with structures in good repair and kept neat, organized, and well-maintained to enhance the appearance of community garden landscapes (Kordon, 2022).

6. CONCLUSIONS

The popularity of community gardens is increasing in cities as a response to the negative impacts of rapid urbanization and heavily industrialized food systems. For increased benefits and long-term survival of community gardens, the identification of the factors that influence people's participation in community gardening is important. If a community garden is developed without identifying the barriers for people's participation in community gardening, these landscapes can serve only a small group of people which may result in the risk of failure of the project in the long term as a result of insufficient support from the broader community. Therefore, this study developed a survey instrument and employed it to identify people's important reasons not to participate in community gardening. The aim is not to generalize the results and to dictate the recommendation of this study for all community gardens and their residents rather it aims to bring design and maintenance suggestions to minimize non-gardeners' reasons not to participate in community gardening. This research provides promising results and recommendations for design professionals, garden managers, and community leaders to develop strategies for increased public involvement and support for community garden programs for their long-term survival in urban landscapes.

There are several limitations and recommendations associated with this research. First, the findings can be strengthened with the use of some of the GIS resources such as proximity of community gardens, transportation opportunities, population density, and the crime rates in the community garden neighborhoods to confirm the presence of the factors identified in the neighborhoods. Second, with the increased number of participants, comparisons between neighborhoods with single community gardens and those with multiple community gardens can help to identify possible other reasons and to narrow issues with access of gardens down to more specific factors. Therefore, this study recommends the continuation of community garden research considering the limitations of this study and enhancing the findings with the increased number of participants in different cities.

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AUTHOR CONTRIBUTIONS

Sinan Kordon: Conceptualization, methodology, software, validation, formal analysis, investigation, resources, data curation, writing - original draft preparation, writing - review and editing, visualization, supervision, project administration. **Patrick A. Miller:** Methodology, validation, writing - review and editing, supervision. All authors have read and agreed to the published version of the manuscript.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

ETHICS COMMITTEE APPROVAL

Approval for research involving human subjects was obtained from the Institutional Review Board (IRB) Office of Research Compliance of Virginia Tech with the IRB number 17-598 on 4 May 2018. Informed consent was obtained from all subjects involved in the study.

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