MOTIVATIONAL FACTORS INFLUENCING URBAN GARDENING INTENTIONS: INSIGHTS FROM VOJVODINA (SERBIA)

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ABSTRACT

This study examines factors influencing residents' intentions to engage in urban gardening, focusing on psychological and physical well-being and key economic, social, and demographic determinants. Data were collected from 473 residents of three cities in Vojvodina (Serbia) using a structured survey. Confirmatory factor analysis validated the motivation scale, while path modeling and regression explored relationships between motivational factors, sociodemographic characteristics, and gardening intention. All motivational factors significantly predicted intention, with psychological well-being emerging as the strongest predictor, followed by healthy food, physical well-being, community engagement, and economic benefits. Women showed higher intentions than men, while younger adults (18–24) were less motivated. Urban gardening is thus primarily driven by psychological well-being, access to healthy food, and physical well-being. Targeted programs emphasizing these benefits, supported by practical guidance and educational campaigns for younger residents, can enhance participation. Gender-inclusive and community-oriented initiatives may further strengthen engagement and contribute to long-term sustainability.

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Introduction

Gardening has become an important strategy for promoting public health, environmental sustainability, and social cohesion in cities. Research shows that participating in urban gardens encourages physical activity, improves access to fresh and healthy food, and supports mental well-being, while also strengthening social ties and fostering community resilience (Haluza et al., 2025; Otieno, Namiripo, 2019). Beyond food production, urban gardens contribute to urban regeneration, educational opportunities, and social integration across diverse populations (Koroļova, Treija, 2018). They provide tangible environmental benefits, including reduced urban heat, enhanced biodiversity, and improved green spaces (Otieno, Namiripo, 2019; Luković et al., 2023). Urban gardening also helps address health disparities, offering support to aging populations and vulnerable groups (Schram-Bijkerk et al., 2018). By combining social, ecological, and health-related functions, urban gardens represent a multifaceted approach to creating more resilient and inclusive cities.

Urban gardening has increasingly attracted the attention of researchers in recent years as a specific form of social and ecological practice that simultaneously meets individual needs and contributes to the wider community. A review of the relevant literature indicates that motivations for engaging in such activities are not uniform, but layered and multidimensional, ranging from intrinsic and personal to functional, social, and ecological.

The most consistently identified drivers are intrinsic motives, such as psychological restoration, enjoyment, relaxation, and personal fulfilment. Home and Vieli (2020) emphasize that restoration represents the strongest motivational component, while Murtagh and Frost (2023) highlight inner satisfaction and a sense of meaning as key predictors of long-term engagement in gardening. Similar findings are reported by Dubová et al. (2020) and Ramirez-Andreotta et al. (2019), underlining the importance of psychological benefits.

Alongside these, numerous studies point to social motives as particularly significant. Sonti and Svendsen (2018) and Kingsley et al. (2019) describe urban gardens as a space for socialization, community engagement, civic activism, and intergenerational learning. Dubová et al. (2020) stress that community contacts and activities are a central reason for participation, while Ramirez-Andreotta et al. (2019) and Partalidou and Anthopoulou (2017) emphasize the importance of friendships and even the creation of virtual communities. Social connections, opportunities for interaction, and the building of networks regularly appear as strong motivations across other studies as well (Cattivelli, 2022; Dubová et al., 2020; Home, Vieli, 2020; Pascoe, Howes, 2017; Partalidou, Anthopoulou, 2017; Sonti, Svendsen, 2018; Kingsley et al., 2019; Nica et al., 2024). Many works also underscore the role of gardens as sites of social infrastructure, places for meeting, knowledge exchange, and public life (Dubová et al., 2020; Pascoe, Howes, 2017; Kingsley et al., 2019). In contrast, some studies (Čepić et al., 2020) do not identify social motives as primary, pointing to the heterogeneity of social drivers across contexts.

Motivational patterns also vary according to demographic and contextual characteristics. For instance, Murtagh and Frost (2023) note that intrinsic motivations are more pronounced among women, while older participants are more strongly motivated by relaxation (Dubová et al., 2020; Čepić et al., 2020). One of the most consistent themes is intrinsic motivation linked to psychological well-being, relaxation, stress reduction, fulfillment, and therapeutic benefits of being in nature (Home, Vieli, 2020; Dubová et al., 2020; Pascoe, Howes, 2017; Cattivelli, 2022; Sonti, Svendsen, 2018; Kingsley et al., 2019; Ramirez-Andreotta et al., 2019).

Food production and access to healthy, high-quality food also emerge as important motivations or additional benefits in most reviewed works (Kingsley et al., 2019; Ramirez-Andreotta et al., 2019; Grebitus, 2021; Čepić et al., 2020; Partalidou, Anthopoulou, 2017; Pantović et al., 2023). In some contexts, particularly during times of social or economic crisis, food production may become the primary motivation (Čepić et al., 2020; Pascoe, Howes, 2017). Motivation linked to sustainable practices and organic approaches also appears, but more often as part of the broader discourse on food quality than as an isolated driver (Kingsley et al., 2019; Pascoe, Howes, 2017; Nica et al., 2018).

Overall, the literature confirms that motivations for urban gardening are multifaceted and interwoven. Social interaction and psychological restoration stand out as universal drivers, while economic and cultural dimensions vary depending on context. These findings highlight the need for urban garden planning to be adapted to specific local conditions and the demographic characteristics of residents.

Based on the literature review, the following hypotheses are proposed (*Figure 1*):

H1: The physical well-being motivational factor exerts a positive effect on the intention to engage in gardening.

H2: The healthy food motivational factor exerts a positive effect on the intention to engage in gardening.

H3: The community engagement motivational factor exerts a positive effect on the intention to engage in gardening.

H4: The economic benefits motivational factor exerts a positive effect on the intention to engage in gardening.

H5: The psychological well-being motivational factor exerts a positive effect on the intention to engage in gardening.

H6: The intention to engage in urban gardening varies across age groups.

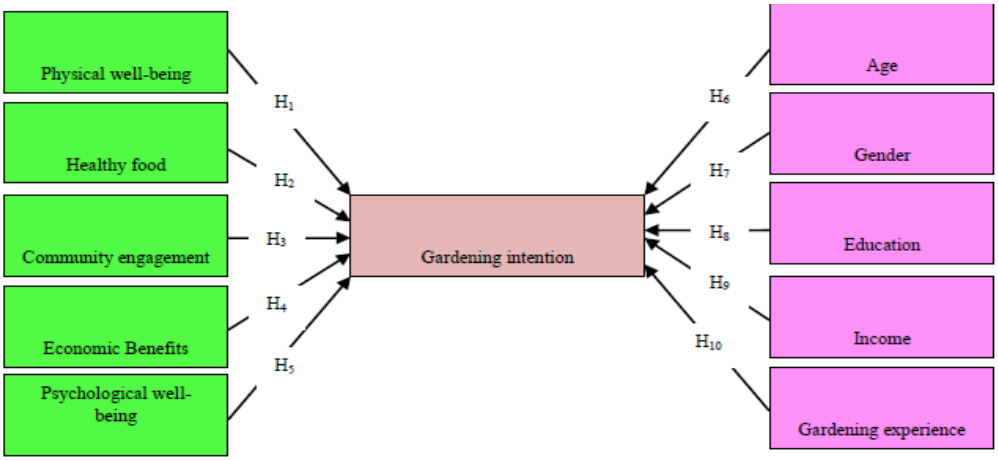
H7: The intention to engage in urban gardening differs by gender.

H8: The intention to engage in urban gardening differs by education level.

H9: The intention to engage in urban gardening differs by monthly income.

H10: The intention to engage in urban gardening differs by gardening experience.

Figure 1. Proposed model of research with defined hypotheses



Materials and methods

Instruments

The questionnaire used in this study comprised three sections. The first section collected basic demographic information, including gender, age, income, level of education, and gardening experience. The second section included 26 items designed to measure respondents' motivation to engage in urban gardening. These items were adapted and modified from several previous investigations (Kirby et al., 2021; Chen et al., 2024; Murtagh, Frost, 2023; Ruggeri et al., 2016; Ali, Vaiappuri, 2022). The third section assessed respondents' intention to participate in urban gardening and consisted of six items adapted from Campbell et al. (2024) (Table 3). All items were rated on a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

Procedure

A pilot study (Study 1) was conducted in January 2025 to evaluate the validity of the measurement instruments and the clarity of the research questions. A linguist reviewed the questionnaire items for grammatical and semantic consistency. A total of 112 respondents from Novi Sad completed a paper-and-pencil survey, and the data were analyzed using principal component analysis with Varimax rotation in SPSS 23**.**

After confirming the reliability and validity of the instrument, the main study (Study 2) was conducted between January and August 2025. The study targeted residents aged 18 and older from three urban centers (Novi Sad, Sombor, and Vršac). Data were collected online via Google Forms, distributed through emails and social media. Of 658 completed questionnaires, 185 (~28%) were excluded due to incompleteness, leaving 473 valid responses. CFA and path analyses were performed using R (lavaan and semPlot packages), while regression analysis, t-tests, and ANOVA were conducted in SPSS 23. Participation was voluntary and anonymous.

Results

Study Sample

Table 1 presents the descriptive characteristics of the sample in the initial study. The pilot survey included 112 respondents, more than half of whom were women, who had completed secondary education, and reported monthly incomes ranging from €701 to €1,500. Regarding age distribution, the largest share of participants belonged to the 45–64 age group. The vast majority of respondents had never engaged in gardening (82,1%).

Table 1. Sample characteristics of Study 1 (N=112)

Education		**Gender**	
Secondary school	37,2%	Male	41,8%
Higher school	28,9%	Female	58,2%
Faculty	26,8%	**Age**	
Master/PhD	7,1%	18-24	20,6%
Monthly income		25-44	27,8%
< 500 euro	24,2%	45-64	35,1%
501 – 700 euro	30,1%	65+	16,5%
701 – 1.500 euro	42,3%	Gardening experience	
1.501 – 2.500 euro	2,6%	Yes	17,9%
> 2.501 euro	0,8%	No	82,1%

To evaluate and validate the measurement instruments, principal component analysis (PCA) was conducted on Sample 1 in Study 1, and confirmatory factor analysis (CFA) was performed on Sample 2 in Study 2. The second sample comprised 473 respondents. The majority were between 25 and 44 years of age, with women representing 60.4% of the sample. Further analysis of sample characteristics indicated that the largest proportion of participants had completed secondary education (41.1%) and reported monthly incomes ranging from €701 to €1,500 (40.6%). The vast majority of respondents (78.1%) reported no experience with gardening (*Table 2*).

Table 2. Sample characteristics of Study 2 (N=473)

Education		**Gender**	
Secondary school	41,1%	Male	39,6%
Higher school	24,8%	Female	60,4%
Faculty	23,8%	**Age**	
Master/PhD	3,2%	18-24	30,7%
Monthly income		25-44	32,5%
< 500 euro	19,9%	45-64	28,9%
501 – 700 euro	34,3%	65+	7,9%
701 – 1.500 euro	40,6%	Gardening experience	
1.501 – 2.500 euro	4,0%	Yes	21,9%
> 2.501 euro	1,2%	No	78,1%

Study 1: Principal component analysis (PCA)

A principal component analysis (PCA) was conducted on the dataset of 112 respondents to examine latent constructs underlying urban gardening motivation. The results of PCA combined with principal component analysis with Varimax rotation (KMO = 0.837, Bartlett's test of sphericity = 2489.610, df = 298, p<0.000) suggested a six-factor solution and explained 61.87% of the variance. Internal consistency of the extracted components was satisfactory, with Cronbach's α coefficients ranging from 0.708 to 0.896, all exceeding the 0.70 threshold. The detailed factor loadings are presented in *Table 3*.

Table 3. The results of Principal Component Analysis (PCA)

Items	Economic benefits	Physical well-being	Psycho-logical well-being	Healthy food	Community engagement	Gardening intention
I1 Gardening can generate additional income.	.587					
I2 Gardening can help reduce household expenses.	.636					
I3 Gardening can develop skills that are valuable for employment.	.689					
I4 Gardening can create opportunities for small business or entrepreneurship.	.657					
I5 Gardening supports the management of body weight.		.663				
I6 Gardening contributes to overall physical health and fitness.		.687				
I7 Gardening provides meaningful physical activity and exercise.		.721				
I8 Gardening helps with coping with everyday physical challenges and enhances physical well-being.		.752				
I9 Gardening helps in managing everyday psychological challenges and improves mental well-being.			.611			

Items	Economic benefits	Physical well-being	Psycho-logical well-being	Healthy food	Community engagement	Gardening intention
I10 Gardening has a positive effect on mood.			.678			
I11 Gardening promotes relaxation and stress reduction.			.701			
I12 Gardening enhances self-confidence.			.637			
I13 Produce grown in a home or community garden is healthier than store.				.756		
I14 Gardening enables the consumption of pesticide.				.722		
I 15 Gardening ensures access to fresh, nutrient.				.625		
I16 Gardening gives me the chance to spend time with family members.					.698	
I17 Gardening offers opportunities for spending quality time with family members.					.742	
I18 Gardening facilitates interaction with other people.					.705	
I19 Gardening creates a pleasant setting for social gatherings.					.690	
I20 Gardening enables contributions to the local community.					.667	
I21 I plan to home garden.						.767
I22 Home gardening is easy.						.658
I23 I will make an effort to home garden.						.576
I24 Home gardening is convenient.						.602
I25 I have the resources to home garden.						.586
I26 I am confident that I can home garden.						.649

Study 2: Confirmatory factor analysis (CFA)

In the second stage of analysis, a confirmatory factor analysis (CFA) was carried out on data from 473 respondents. Seven items exhibiting high residual correlations (I3, I5, M12, M16, M22, M24, and M25; see Table 1) were removed, resulting in a measurement model with an acceptable overall fit (CFI = 0.962, TLI = 0.968, RMSEA = 0.065, SRMR = 0.062). The finalized urban-gardening motivation scale comprised six latent factors represented by 19 observed items, as summarized in *Table 4*.

Table 4. Confirmatory factor analysis results

Factors	Items	β	*t* Value	α	AVE	CR
Physical well-being	Gardening contributes to overall physical health and fitness.	0.832	*	0.878	0.613	0.767
	Gardening provides meaningful physical activity and exercise.	0.869	29.123			
	Gardening helps with coping with everyday physical challenges and enhances physical well-being.	0.871	28.889			
Healthy food	Produce grown in a home or community garden is healthier than store.	0.707	*	0.813	0.758	0.857
	Gardening enables the consumption of pesticide.	0.861	25.669			
	Gardening ensures access to fresh, nutrient.	0.812	21.011			
Community engagement	Gardening offers opportunities for spending quality time with family members.	0.837	*	0.848	0.627	0.712
	Gardening facilitates interaction with other people.	0.809	20.001			
	Gardening creates a pleasant setting for social gatherings.	0.785	21.021			
	Gardening enables contributions to the local community.	0.748	26.069			
Economic benefits	Gardening can generate additional income.	0.819	*	0.708	0.597	0.810
	Gardening can help reduce household expenses.	0.819	29.807			
	Gardening can create opportunities for small business or entrepreneurship.	0.698	28.998			
Psychological well-being	Gardening helps in managing everyday psychological challenges and improves mental well-being.	0.784	*	0.768	0.671	0.714
	Gardening has a positive effect on mood.	0.801	28.789			
	Gardening promotes relaxation and stress reduction.	0.827	18.167			
Gardening intention	I plan to home garden.	0.789	*	0.751	0.687	0.724
	I will make an effort to home garden.	0.821	18.021			
	I am confident that I can home garden.	0.851	24.677			

Notes: * Items fixed to 1 in CFA; β-Std. regression weights; α—Cronbach′s alpha; CR—composite reliability; AVE = average variance expected.

Scale reliability was evaluated through average variance extracted (AVE), composite reliability (CR), and Cronbach's alpha (α) coefficients. Convergent validity for each latent dimension was examined by calculating the AVE, in line with the criteria proposed by Fornell and Larcker (1981). Convergent validity is established when all item-to-factor loadings are statistically significant and the AVE for each construct exceeds 0.50. As reported in Table 4, every dimension achieved an AVE above 0.50 and a CR greater than 0.70, demonstrating strong convergent validity. Cronbach's α values ranged from 0.719 to 0.889, confirming high internal consistency across the scales. Detailed results are presented in *Table 4*.

Study 2 - The findings of the Path model analysis

To examine the effects of sample characteristics (gender, age, income, education, and gardening experience) and five motivational factors: physical well-being, healthy food, community engagement, economic benefits, and psychological well-being on gardening intention, three competing models were tested using robust maximum likelihood estimation (Satorra–Bentler correction).

Table 5. Model fit indicators of the proposed model

Model	S–Bχ2	df	χ2/df	RMSEA	SRMR	CFI	TLI
1	603.46	244	2.47	0.071	0.081	0.85	0.84
2	499.35	217	2.30	0.067	0.065	0.90	0.89
3	385.10	199	1.93	0.047	0.048	0.97	0.96

All independent variables in Model 1 were specified to predict gardening intention. Although χ^2/df was within acceptable limits (< 3) (Kline, 2015), the CFI and TLI were below the recommended 0.90 threshold, indicating a marginal fit. Inspection of standardized residuals and modification indices suggested that some predictors did not contribute significantly.

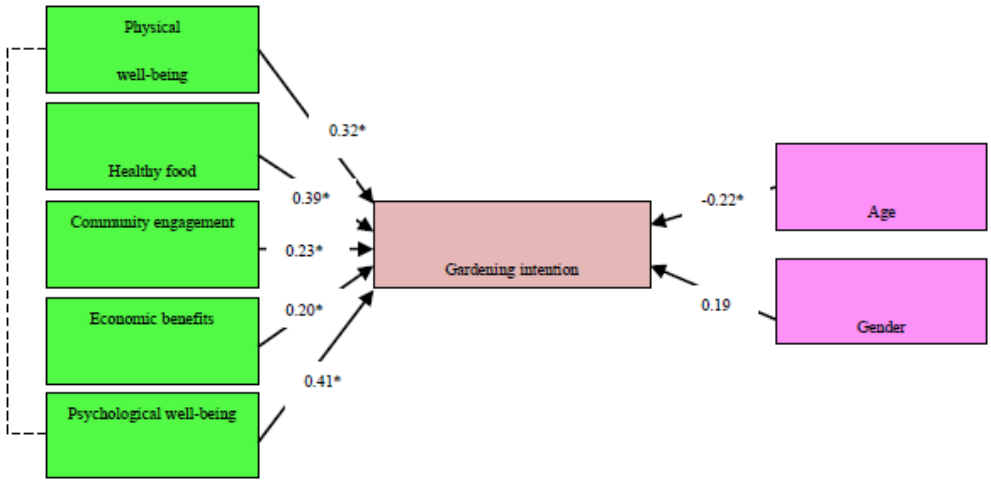
The Wald test recommended the removal of education and gardening experience (non-significant paths, $p > 0.10$). Model 2 showed improved fit, approaching the conventional cut-off criteria (CFI ≥ 0.90, TLI ≥ 0.90, RMSEA ≤ 0.06–0.08, SRMR ≤ 0.06–0.08). Refinement of the model, which involved dropping the paths with very low standardized loadings (< 0.10), specifically those from income to gardening intention, and allowing a correlation between physical and psychological well-being, yielded the optimal model fit. Model 3 met all recommended thresholds (CFI ≥ 0.95, TLI ≥ 0.95, RMSEA ≤ 0.05, SRMR ≤ 0.05), supporting it as the most appropriate representation of the relationships between motivational factors and the intention to engage in urban gardening (*Table 5*). These findings indicate that hypotheses H_8, H_9, and H_{10} were not supported.

Further analyses were conducted to examine the relationships between the categorical independent factors and the dependent variable, gardening intention. The model indicates that respondents' gender exerts a positive effect on their intention to engage in gardening. In addition, a t-test was performed to provide a more detailed explanation of this finding. The t-test results reveal that women exhibit a significantly stronger intention

to practice urban gardening ($t = 2.903$, $p < 0.01$), thereby supporting hypothesis H_7. The one-way analysis of variance (ANOVA) showed a statistically significant difference among respondents when grouped by age ($F = 6.123$, $p < 0.01$). Results of the LSD post-hoc test indicate that participants aged 18–24 are less interested in gardening compared with those aged 25–44 (MD = –0.674, $p < 0.01$), 45–64 (MD = –0.925, $p < 0.01$), and 65+ (MD = –0.908, $p < 0.01$), confirming hypothesis H_6.

To explore the relationship between motivational factors and residents' intention to engage in urban gardening, a standard linear regression analysis was performed. The results show that all motivational factors significantly influence gardening intention. Among these, psychological well-being emerged as the strongest predictor ($\beta = 0.411$, $p < 0.001$), followed by healthy food ($\beta = 0.389$, $p < 0.001$), physical well-being ($\beta = 0.316$, $p < 0.001$), community engagement ($\beta = 0.232$, $p < 0.001$), and economic benefits ($\beta = 0.198$, $p < 0.001$), thereby confirming hypotheses H_1 through H_5. The detailed results are presented in *Figure 2*.

Figure 2. The results of the Path model



Discussions

Empirical evidence consistently shows that gardening positively affects both physical and psychological well-being across diverse demographic groups. In older adults, participation in a structured five-month gardening program led to significant improvements in nature-relatedness, psychological health, and pro-environmental behavioral intentions (Jo et al., 2022). Group-based gardening therapy also enhances well-being by helping participants develop adaptive coping strategies, adopt positive behavioral changes, and gain practical life skills (Joyce, Warren, 2016). In addition, engagement in home gardening has been linked to healthier dietary patterns, higher levels of physical activity, improved mental health, and strengthened family bonds. Participants in such initiatives also reported fewer depressive symptoms and enhanced

emotional well-being (van Lier et al., 2017). Furthermore, qualitative studies with beginner community gardeners have introduced the concept of a "gardening triad," which includes three core dimensions: caretaking and nurturance, a sense of accomplishment, and connection to nature. These dimensions support continued engagement in gardening and contribute to positive social and emotional outcomes such as stronger relationships, higher self-esteem, and better mental health management (Alaimo et al., 2024).

Urban gardening also provides significant economic benefits that strongly influence people's intentions to participate. Previous research has likewise demonstrated that economic motivations are among the most prominent drivers of engagement in urban gardening. For instance, in Bangalore, participants highlighted notable economic advantages such as year-round availability of vegetables, increased household savings, and reduced expenditure on fruits and vegetables (Kishor et al., 2024). A study among minority urban gardeners in Maryland confirmed these findings. More than half of respondents (57%) cited additional household income as a key motivation, 86% reported increased farm income, and 96% gained knowledge on reducing production costs (Karki, Bhandari, 2023). In the context of Belgrade, gardeners—particularly retired individuals with low income and previous agricultural experience—demonstrated a stronger orientation toward productive and economic benefits rather than social motivations (Čepić et al., 2024). Although psychosocial factors such as attitudes and perceived behavioral control strongly influence gardening intentions, economic benefits remain essential motivators for continued participation (Lake et al., 2012).

Other studies show that community engagement significantly affects urban gardening intentions through various behavioral and social mechanisms. Subjective norms, particularly those shaped by community visibility and social expectations, have been identified as strong predictors of participation in community-based urban farming (Muhammad, 2024). Evidence from the research conducted by Brown-Fraser et al. (2015) supports this finding, showing that a university-led initiative led to a fourfold increase in participation while simultaneously strengthening social connections and promoting healthier lifestyles. Psychosocial factors have been shown to explain up to 58% of the variance in gardening intentions, with perceived behavioral control, subjective norms, and attitudes emerging as the most influential determinants (Lake et al., 2012). At the broader community level, environmental awareness and personal responsibility contribute to the formation of personal norms that significantly affect pro-environmental gardening intentions (Mamun et al., 2023). Overall, these findings suggest that successful urban gardening programs depend on strong collaboration between local authorities and residents. Such cooperation reinforces the importance of community engagement in sustaining participation and building resilient urban agricultural systems.

Research indicates that sociodemographic characteristics, particularly gender and age, influence motivations for engaging in gardening. Women tend to cultivate a greater variety of plant species compared to men (Philpott et al., 2020). Although the study conducted by McFarland et al. (2018) also confirmed gender differences in the types of motivations for

gardening, the authors did not find a significant effect of age on motivation or intention to garden, as similar intentions were reported across different generations.

Conclusions

The present study highlights that urban gardening is influenced by a combination of psychosocial, economic, and demographic factors. Among these, psychological well-being emerged as the strongest predictor of gardening intention, followed by healthy food, physical well-being, community engagement, and economic benefits. Gender differences were evident, with women showing stronger intentions to engage in gardening, while younger adults (18–24) appeared less motivated than older age groups. These results are consistent with previous research demonstrating the physical, mental, and social benefits of gardening, including improved mental health, healthier dietary habits, and stronger social connections. Community engagement and social norms were also found to play a key role in sustaining participation, underscoring the importance of collaborative initiatives between residents and local authorities. To promote urban gardening effectively, programs should highlight both physical and psychological benefits, ensure access to fresh produce, and provide practical guidance on cost-efficient gardening practices. Educational campaigns and incentive schemes could particularly target younger populations to boost their involvement. Gender-inclusive strategies may leverage women's tendency to cultivate a greater diversity of plants while encouraging participation among all groups. Overall, urban gardening offers a multifaceted approach to enhancing well-being, fostering community cohesion, and generating economic advantages. Designing interventions that address both motivational and demographic factors is essential for the long-term success and sustainability of urban gardening initiatives.

Limitations and suggestions for future research

Several limitations of this study should be acknowledged. First, it is important to note that the findings cannot be considered fully generalizable, as the data were collected using a convenience sampling method. Future research should aim to employ a more stratified sampling approach to ensure that all relevant strata are proportionally represented. In addition, the data were gathered from a single urban context, which may limit the applicability of the results to other cities or cultural settings. Finally, self-reported measures are subject to potential biases, including social desirability and recall errors.

Future research could employ longitudinal designs to examine changes in gardening motivations and behaviors over time. Comparative studies across multiple urban areas or countries would help identify context-specific factors and enhance the generalizability of findings. Incorporating qualitative approaches could provide richer insights into the personal and community experiences that shape urban gardening participation. Finally, evaluating the effectiveness of targeted interventions for younger individuals and low-income groups would offer valuable guidance for strategies aimed at increasing engagement and ensuring the long-term sustainability of urban gardening initiatives.

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Conflict of interests

The authors declare no conflict of interest.

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