



Cultivating Change: Strengthening Community Leadership and Health through the Community Champions Urban Garden Programme

S. Izuddin Mohd zali¹, Norsyahida Md Taib¹, Nik Dewi Delina Nik Mohd Kamil¹, Muhammad Ezmeer Emiral¹, Nur Atiqah Ihsan¹, Zulkhairul Naim Sidek Ahmad¹, Azizan Omar¹, Abdul Rahman Ramdzan¹

1. Department of Public Health Medicine, Faculty of Medicine & Health Sciences, Universiti of Malaysia Sabah

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KEYWORDS Urban Gardening Community Champions Food Security Public Health Sustainability	ABSTRACT: <p>Introduction: Urban gardening has emerged as a sustainable strategy to enhance food security, environmental awareness, and community well-being, particularly in urban low-income settings. Yet, little empirical evidence exists on how such initiatives can build leadership capacity and strengthen health promotion at the grassroots level.</p> <p>Objectives: This study examines the role of 16 trained community champions in leading the Taman Kuala Menggatal Urban Garden Project in Kota Kinabalu, Sabah. It explores how guided participation, capacity-building, and mentorship enhanced their knowledge, skills, and confidence in promoting healthy lifestyles and sustainable food practices.</p> <p>Methods: A community-based participatory approach was employed between March and June 2023. The champions underwent structured training in hydroponic gardening, nutrition, and communication. Two validated instruments were used: the Household Food Insecurity Access Scale (HFIAS) and a questionnaire adopted from Pierce (2012). Pre- and post-intervention data were analysed using descriptive statistics and McNemar's test to assess changes in dietary behaviour, agricultural knowledge, and leadership skills.</p> <p>Results: Before the intervention, 95.5% of households in Taman Kuala Menggatal experienced food insecurity. Post-intervention, champions demonstrated significant improvements in all measured domains. Fruit and vegetable consumption increased from 25% to 100% ($p < 0.001$), environmental awareness rose from 25% to 75% ($p = 0.004$), and leadership indicators—such as teamwork, decision-making, and problem-solving—showed highly significant gains ($p < 0.001$).</p> <p>Conclusions: This Urban Garden Project demonstrates how structured community participation and mentorship can transform local residents into agents of health and sustainability. By fostering leadership, collaboration, and shared responsibility, the initiative offers a replicable model for integrating food security and public-health promotion in urban Malaysia.</p>
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1. Introduction

Urban gardens, which cultivate crops and raise livestock in metropolitan areas like cities and towns, have gained significant attention in promoting health, well-being, and sustainable lifestyles. They bring agriculture into the city's heart, allowing people to produce fresh and healthy food right where they live. Urban gardens can take many forms, such as rooftop gardens, community gardens, and even indoor farms. Integrating agriculture into urban environments offers numerous advantages. First, the urban garden has been associated with various health benefits. Studies have shown that engagement in urban gardens can improve nutrition by providing access to fresh and locally grown produce (Lampert et al., 2021).

Additionally, the physical activity involved in urban gardens, such as gardening and tending to crops, contributes to increased physical fitness and overall well-being (Fifolt et al., 2017). Exposure to nature and green spaces in urban garden environments has also been linked to improved mental health, stress reduction, and enhanced resilience (Koay & Dillon, 2020). Furthermore, urban gardens can promote social connections and community cohesion, fostering a sense of belonging and social support (Fifolt et al., 2017). In Malaysia, urban agriculture's relevance has intensified amid rising concerns over food self-sufficiency and the fragility of long-distance supply chains. Participation rates remain uneven despite governmental endorsement



due to space limitations, inadequate technical expertise, and financial barriers (Othman et al., 2020). Recent initiatives such as *Kebun-Kebun Bangsar* in Kuala Lumpur and *Kebun Kita* in Penang illustrate the transformative potential of citizen-driven gardens in creating inclusive, sustainable communities (Think City Sdn. Bhd., 2020).

2. Objectives

This paper examines how a structured, participatory approach to urban gardening can serve as a platform for developing community leadership and strengthening public-health action. It analyses the experience of *urban garden champions* who were key agents in implementing, managing, and sustaining the Taman Kuala Menggatal Urban Garden Project in Kota Kinabalu, Sabah. The analysis highlights how guided learning and collaboration encouraged the champions to actively promote healthy living and environmental awareness. The paper underscores the value of building local leadership as a foundation for sustainable community health initiatives.

3. Methods

Study Design and Setting

The project adopted a community-based participatory design embedded within a cross-sectional evaluation framework. It was implemented between January and June 2023 at Taman Kuala Menggatal, a residential area on the outskirts of Kota Kinabalu, Sabah. The locality comprises predominantly middle-to-low-income families.

Data Collection and Data Analysis

Two validated instruments were employed. The Household Food Insecurity Access Scale (HFIAS) (Coates et al., 2007) assessed household food security across four levels—food-secure, mildly, moderately, and severely insecure—using nine questions and a 30-day recall. At the same time, to assess changes in leadership, confidence, and behavioural competencies among champions, this study adopted the Questionnaire by Pierce (2012). The Questionnaire evaluate empowerment, leadership, and community engagement outcomes in community programmes. It captures self-perceived growth across personal development, teamwork, decision-making, problem-

solving, and community participation. Data collection was conducted face-to-face by trained enumerators. Responses were entered into Microsoft Excel and analysed using SPSS. Descriptive statistics, including frequencies and percentages, were generated to summarise demographic characteristics and response distributions for each questionnaire item. Pre- and post-intervention comparisons of categorical variables were conducted using the McNemar test to determine statistically significant changes in participants' knowledge, attitudes, and leadership indicators before and after the programme. A p -value of < 0.05 was considered statistically significant.

4. Results

Planning Process

Programme planning followed an eight-step participatory process (Figure 1). Preliminary consultations with the Kota Kinabalu Health Office and DBKK were conducted to identify priority health-promotion issues. Among several proposals considered—such as dengue prevention, elderly wellness, and adolescent health—food insecurity emerged as the most urgent and feasible area for community action. Site visits were conducted in three localities to assess readiness, infrastructure, and leadership commitment. *Taman Kuala Menggatal* was selected based on its active residents' association, supportive mosque committee, and prior engagement in community activities.



Figure 1: Stages of planning



The programme aimed to ensure sustainable access to safe and nutritious food while strengthening community leadership. Specific objectives included (1) improving knowledge of healthy diets, (2) increasing fruit and vegetable consumption, and (3) enhancing agricultural skills for self-sufficiency through community participation. Given the mosque site's limited space, a hydroponic system was selected for its compactness, efficiency, and ability to operate without soil. The Kota Kinabalu City Council (DBKK) provided the system as part of its community sustainability initiative. Officers from the Department of Agriculture supervised the installation and conducted hands-on demonstrations on system maintenance and crop management. Universiti Malaysia Sabah (UMS) provide educational components complemented by the technical setup, including nutrition talks, cooking demonstrations using harvested vegetables, and basic health screenings for residents.

Champion Development and Empowerment Process

A core feature of the programme was identifying and training **16 urban-garden champions**, comprising mosque committee members, youth representatives, and women volunteers. These individuals were purposively selected based on their motivation, availability, and commitment to serve as community role models. The champions participated in **four structured training sessions** over the first three months (April–June 2023). These sessions included:

1. **Orientation and team formation** – introduction to project goals, leadership principles, and task assignments;
2. **Hydroponic system training** – hands-on installation, nutrient management, and daily maintenance facilitated by the Department of Agriculture;
3. **Health and nutrition education** – sessions led by Universiti Malaysia Sabah public-health experts covering dietary balance, micronutrients, and household food preparation;
4. **Communication and community-mobilisation skills** – workshops on teamwork, peer education, and event coordination.

Each session lasted approximately two to three hours and combined lectures, demonstrations, and participatory group work. Universiti Malaysia Sabah facilitators provided continuous mentoring throughout implementation. Informal support was maintained through WhatsApp groups, where champions shared updates, photographs, and solutions to technical issues. Their roles and responsibilities included supervising the hydroponic garden daily, ensuring proper nutrient balance, and maintaining the overall system. They also organised rotational harvesting schedules and managed produce distribution among residents. They liaised between community members and local authorities, facilitating communication and support. Monthly meetings also allowed champions to discuss their confidence in performing tasks, teamwork experiences, and approaches to engaging other residents.

Together with Universiti Malaysia Sabah (UMS), the Kota Kinabalu City Council (DBKK), and the Kota Kinabalu Health Office, the champions jointly organised the official launch ceremony on 17 June 2023, officiated by the DBKK Mayor. The event showcased the champions' leadership and featured health-promotion activities such as nutrition exhibitions, cooking demonstrations, HPV screening, and family-oriented competitions.

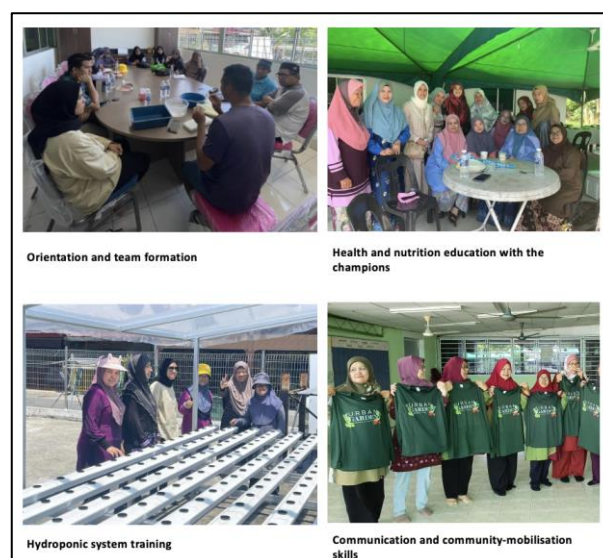


Figure 2. Capacity-building and training activities were conducted with the urban-garden champions in Taman Kuala Menggatal, Sabah.



Champions sociodemographic

Table 1 presents the baseline demographic profile of the 16 community champions involved in the Taman Kuala Menggatal Urban Garden Project. Most participants were women (75%), reflecting strong female representation. Most were 40 years and above (62.6%). Occupations were mainly housewives (37.5%) and pensioners (37.5%), followed by self-employed individuals (25%), suggesting that participants had flexible schedules conducive to volunteer work. Over half (56.3%) of the champions were from lower-income (B40) households, aligning the initiative with its goal of promoting food security and sustainable livelihoods among vulnerable urban populations.

Levels of food insecurity in the Kuala Menggatal population

When surveyed (Table 2), nearly all households (95.5%) in Taman Kuala Menggatal experienced some degree of food insecurity. One-third (33%) were classified as severely food-insecure, while 36.6% and 25.9% were moderately and mildly, respectively. Only a small proportion of households (4.5%) were considered food-secure. These findings underscore the extent of food insecurity within the community and highlight the need for locally driven strategies to improve household food access and nutritional resilience.



Figure 3. Launch of the Taman Kuala Menggatal Urban

Garden Health Promotion Programme on 17th June 2023.

Characteristic	n	%
Sex		
Male	4	25.0
Female	12	75.0
Age Group (years)		
18–29	2	12.5
30–39	4	25.0
40–49	5	31.3
50 and above	5	31.3
Occupation		
Housewife	6	37.5
Self-employed	4	25.0
Pensioner	6	37.5
Monthly Household Income (RM)		
< 2,500	9	56.3
2,500–4,849	5	31.3
≥ 4,850	2	12.5

Table 1. Sociodemographic Characteristics of Urban Garden Champions (n = 16)

Household food insecurity level	No. of household
Food-secure	5 (4.5%)
Mildly food-insecure	29 (25.9%)
Moderately food-insecure	41 (36.6%)
Severely food-insecure	37 (33%)
Total	112

Table 2: Household Food Insecurity Levels in Taman Kuala Menggatal



Level of dietary behaviour, agricultural knowledge and leadership skill

Following participation in the Taman Kuala Menggatal Urban Garden programme, the 16 community champions showed significant improvements across all three assessed domains—dietary behaviour, agricultural knowledge, and leadership skills (Table 3). Champions reported a marked increase in positive eating practices in the dietary behaviour domain. At baseline, none of the champions consumed produce from the garden or shared home-grown food with their families. After the intervention, 31.3 % had eaten garden produce and 50 % had brought vegetables home for family consumption. Similarly, willingness to try new foods increased dramatically from 12.5 % to 81.3 %, while daily intake of fruits, vegetables, and fresh foods rose to 100 %. All observed changes in dietary indicators were statistically significant ($p < 0.05$), indicating that engagement in the hydroponic gardening and nutrition-education sessions effectively enhanced healthy-eating behaviours.

For **agricultural knowledge**, participants demonstrated substantial gains in skills and environmental awareness. Before the programme, only 43.8 % had basic gardening knowledge, and 25 % understood ecological issues. Post-training, 100 % reported acquiring new cooking skills, 75 % understood more about the environment, and 62.5 % were able to teach others about gardening. The improvements in environmental knowledge ($p = 0.004$) and practical cooking skills ($p < 0.001$) were statistically significant, reflecting the value of experiential learning and hands-on hydroponic training provided by the Department of Agriculture and Universiti Malaysia Sabah facilitators.

The most pronounced transformation occurred in the **leadership skills** domain. Before the programme, fewer than half of the champions felt confident working with others (43.8 %), and none perceived themselves as leaders or capable decision-makers. Following participation in structured leadership and communication workshops, all participants (100 %) reported better teamwork, problem-solving, and a stronger sense of self-efficacy. Moreover, 81.3 % described themselves as leaders capable of influencing others and making community decisions. Every leadership indicator showed highly significant improvement ($p < 0.001$), underscoring the programme's success in developing

community-level leadership and confidence. Overall, the integrated training approach—combining hydroponic practice, nutrition education, and leadership development—resulted in significant positive shifts in knowledge, attitudes, and behaviours among the champions. These findings highlight how participatory, skill-based capacity-building can cultivate sustainable food practices, social capital, and leadership within urban communities.

Domain / Item	Pre-Survey n (%)	Post-Survey n (%)	p-value*
Dietary Behaviour			
Eaten food from garden	0 (0%)	5 (31.3%)	0.041 *
Brought food home to family	0 (0%)	8 (50%)	0.012 *
Tried new foods	2 (12.5%)	13 (81.3%)	<0.001 **
Now eat more fruits and vegetables	4 (25%)	16 (100%)	<0.001 **
Now eat fresher food	5 (31.3%)	16 (100%)	<0.001 **
Agricultural Knowledge			
New cooking skills	0 (0%)	14 (100%)	<0.001 **
Learned things about gardening	7 (43.8%)	14 (56.2%)	0.152
Could teach others about garden	6 (37.5%)	13 (62.5%)	0.089
Know more about the environment	4 (25%)	14 (75%)	0.004 *
Care more about environment	7 (43.8%)	16 (56.2%)	0.317



Leadership Skills

Work better with others	7 (43.8%)	16 (100%)	<0.001 **
More of a leader	0 (0%)	13 (81.3%)	<0.001 **
Better at solving problems without fighting	6 (37.5%)	16 (100%)	<0.001 **
Better at solving problems and making decisions	0 (0%)	13 (81.3%)	<0.001 **
Better at working on long projects	0 (0%)	14 (87.5%)	<0.001 **
More control	0 (0%)	14 (87.5%)	<0.001 **
Can make a difference	0 (0%)	13 (81.3%)	<0.001 **
Feel proud of myself	6 (37.5%)	16 (100%)	<0.001 **

Table 3. Changes in Dietary Behaviour, Agricultural Knowledge, and Leadership Skills among Urban Garden Champions (n = 16)

5. Discussion

This study highlights the central role of community champions in transforming an urban garden initiative from a food-production project into a platform for leadership, empowerment, and sustainable health promotion. The champions—local residents who underwent structured capacity-building—demonstrated marked improvements across three domains: dietary behaviour, agricultural knowledge, and leadership skills. These findings support the view that **empowering residents as active agents of change** rather than passive beneficiaries can generate lasting community impact (Laverack & Wallerstein, 2001; Zimmerman, 2000).

Champion-led community participation

The improvement observed in all leadership indicators underscores the effectiveness of a champion-based model for mobilising communities. Similar outcomes have been reported in participatory health programmes where peer educators or lay leaders have increased community engagement and adoption of healthy practices (O'Mara-Eves et al., 2015; Islam et al., 2019). In this project, the champions' roles—from hydroponic maintenance to leading nutrition demonstrations and coordinating produce distribution—reflect how distributed responsibility and ownership foster accountability and collective efficacy. These elements align with empowerment theory, which posits that confidence, decision-making autonomy, and social influence are interrelated processes leading to sustained behaviour change (Zimmerman, 2000).

Skill-based empowerment through practical learning

The champions' agricultural knowledge and dietary behaviour improved significantly after structured, hands-on training sessions in hydroponic systems, nutrition education, and community mobilisation. Experiential learning has long been recognised as a catalyst for empowerment, allowing participants to translate knowledge into tangible outcomes (Laverack & Wallerstein, 2001; Wallerstein et al., 2017). The significant rise in participants who “tried new foods” (12.5% to 81.3%) and “ate more fruits and vegetables” (25% to 100%) demonstrates not only behavioural adoption but also attitudinal shifts towards healthy eating—a finding consistent with community-garden studies that link participation to increased fruit and vegetable intake (Alaimo et al., 2008; Soga et al., 2017).

Champions are enablers for food security, social resilience, and leadership.

Baseline findings indicated that around 95.5% of households encountered varying levels of food insecurity, underscoring the necessity for regionally tailored interventions. The active involvement of trained champions helped bridge the gap between technical solutions (hydroponic cultivation) and social implementation (mobilising residents). The dual function—technical and social—is supported by international research indicating that urban gardens



enhance food security most successfully when community members simultaneously oversee operations and education (McCormack et al., 2010; Draper & Freedman, 2010). Furthermore, the participation of women (75% of champions) enhanced social resilience, as women-led food efforts frequently bolster home nutrition, solidarity networks, and local sustainability (Alaimo et al., 2008; Hale et al., 2011). The project focused on reflection meetings, peer mentorship, and engagement with several stakeholders (DBKK, UMS, and the Health Office), thereby cultivating social capital—trust, reciprocity, and cooperation—crucial for sustaining collective action (Glover, 2004). Previous research on community gardening indicates that sustained relationships and collective responsibility improve participants' sense of belonging and civic engagement (Teig et al., 2009; Kingsley & Townsend, 2006). In Taman Kuala Menggatal, the champions managed the garden and represented their community during the launch event, exemplifying visible leadership that enhances community legitimacy and pride. These roles expanded the garden's advantages beyond mere food production, including community identity and empowerment.

Limitations and future directions

Despite the findings indicating substantial positive changes, the study's limited sample size ($n = 16$) constrains generalisability. Self-reported metrics may exaggerate behavioural enhancements. Future research ought to integrate quantitative evaluations with qualitative interviews to elucidate the champions' lived experiences and long-term results. Comparative studies—such as those examining champion-driven vs. externally led gardens—would clarify the additional benefits of empowerment strategies in maintaining community health programs.

Conclusion

This study reinforces that empowering local champions is a cornerstone for successful and sustainable urban-garden programmes. The initiative transformed participants into advocates of healthy living and environmental stewardship by integrating technical training, nutrition education, and leadership development. These findings contribute to the growing evidence that community-driven models can effectively address urban food insecurity while cultivating

leadership, confidence, and collective ownership—key ingredients for resilient, health-promoting communities.

References

1. Lampert T, Costa J, Santos O, Sousa J, Ribeiro T, Freire E (2021) Evidence on the contribution of community gardens to promote physical and mental health and well-being of non-institutionalized individuals: A systematic review. *PLoS ONE* 16(8): e0255621.
2. Fifolt, M., Morgan, A. F., Burgess, Z. R. (2017). Promoting School Connectedness Among Minority Youth Through Experience-based Urban Farming. *Journal of Experiential Education*, 2(41)
3. Koay, W. I., & Dillon, D. (2020). Community Gardening: Stress, Well-Being, and Resilience Potentials. *International Journal of Environmental Research and Public Health*, 17(18), 6740.
4. Othman, N., Latip, R. A., Ariffin, M. H., & Mohamed, N. (2017). Expectancy in Urban Farming Engagement. *Environment-Behaviour Proceedings Journal*, 2(6), 335–340.
5. Think City Sdn. Bhd. (2020, September 14). *Kebun Kita(R): Penang's first self-sustaining urban farm opens at Penang Digital Library* [Pressrelease]. <https://thinkcity.com.my/about/media-centre/press-releases/kebun-kitar-penangs-first-self-sustaining-urban-farm-opens-at-penang-digital-library>
6. Castell, G. S., Rodrigo, C. P., De La Cruz, J. N., & Bartrina, J. A. (2015). Household food insecurity access scale (HFIAS). *PubMed*, 31 *Suppl* 3, 272- 278.
7. Coates, J., Swindale, A., & Bilinsky, P. (2007). Household Food Insecurity Access Scale (HFIAS) for Measurement of Food Access: Indicator Guide: Version 3
8. Pierce, M. (2012). An Evaluation of Urban Youth Gardening Program Participants' Dietary Behaviors, Agricultural Knowledge, and Leadership Skills: A Case Study.



9. Laverack G, Wallerstein N. Measuring community empowerment: a fresh look at organizational domains. *Health Promot Int.* 2001 Jun;16(2):179-85. doi: 10.1093/heapro/16.2.179. PMID: 11356756.
10. Zimmerman, M. A. (2000). Empowerment theory: Psychological, organizational, and community levels of analysis. In J. Rappaport & E. Seidman (Eds.), *Handbook of community psychology* (pp. 43–63). Kluwer Academic Publishers.
11. O’Mara-Eves, A., Brunton, G., McDaid, D., Oliver, S., Kavanagh, J., Jamal, F., ... Thomas, J. (2015). Community engagement to reduce inequalities in health: A systematic review, meta-analysis and economic analysis. *Public Health Research*, 3(12), 1–526.
12. Wallerstein, N., Oetzel, J., Duran, B., Tafoya, G., Belone, L., & Minkler, M. (2017). What predicts outcomes in CBPR? In N. Wallerstein et al. (Eds.), *Community-based participatory research for health: Advancing social and health equity* (3rd ed., pp. 371–392)
13. Alaimo, K., Packnett, E., Miles, R. A., & Kruger, D. J. (2008). Fruit and vegetable intake among urban community gardeners. *Journal of Nutrition Education and Behavior*, 40(2), 94–101.
14. Soga M, Gaston KJ, Yamaura Y. Gardening is beneficial for health: A meta-analysis. *Prev Med Rep.* 2016 Nov 14;5:92-99. doi: 10.1016/j.pmedr.2016.11.007. PMID: 27981022; PMCID: PMC5153451.
15. Draper, C., & Freedman, D. (2010). Review and analysis of the benefits, purposes, and motivations associated with community gardening in the United States. *Journal of Community Practice*, 18(4), 458–492
16. McCormack LA, Laska MN, Larson NI, Story M. Review of the nutritional implications of farmers' markets and community gardens: a call for evaluation and research efforts. *J Am Diet Assoc.* 2010 Mar;110(3):399-408. doi: 10.1016/j.jada.2009.11.023. PMID: 20184990.
17. Hale J, Knapp C, Bardwell L, Buchenau M, Marshall J, Sancar F, Litt JS. Connecting food environments and health through the relational nature of aesthetics: gaining insight through the community gardening experience. *Soc Sci Med.* 2011 Jun;72(11):1853-63. doi: 10.1016/j.socscimed.2011.03.044. Epub 2011 May 1.
18. Glover, T. D. (2004). Social capital in the lived experiences of community gardeners. *Leisure Sciences*, 26(2), 143–162.
19. Kingsley, J., & Townsend, M. (2006). ‘Dig In’ to social capital: Community gardens as mechanisms for growing urban social connectedness. *Urban Policy and Research*, 24(4), 525–537.
20. Teig E, Amulya J, Bardwell L, Buchenau M, Marshall JA, Litt JS. Collective efficacy in Denver, Colorado: Strengthening neighborhoods and health through community gardens. *Health Place.* 2009 Dec;15(4):1115-22. doi: 10.1016/j.healthplace.2009.06.003. Epub 2009 Jun 21.