Acceptability and Feasibility of a Hospital-Based Herb and Vegetable Garden for Health Care Workers

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ABSTRACT

Objective: Evaluate the acceptability and feasibility and explore the potential health impacts of a hospital-based herb and vegetable garden.

Methods: Mixed-method program evaluation assessed dietetic and food service staff health, well-being, and garden engagement. Surveys were administered at baseline and follow-up (6 months). Key informant interviews (n = 6) were conducted at 6 months to evaluate program feasibility.

Results: There was good acceptance and engagement with the garden, with 18 participants volunteering to maintain the garden. Key informant interviews identified workforce, leadership, and garden design engagement factors. Participants also noted several psychosocial benefits.

Conclusion and Implications: A hospital-based garden for staff is feasible if programmatic improvements are addressed. More robust evaluations considering challenges with measuring key outcomes with survey methodology and extended periods are warranted.

Key Words: health care, health promotion, program evaluation, health and well-being, garden (J Nutr Educ Behav. 2023;55:877–883.)

INTRODUCTION

Health care staff are a population at high risk for poor health.¹ Long hours, shift work, and the work environment make it challenging for health care staff to engage in healthy lifestyle behaviors, including fruit and vegetable consumption, physical activity, and maintaining a healthy weight.¹⁻³ Suboptimal health behaviors in health care staff are associated with increased absenteeism, burnout, noncommunicable diseases, psychological distress, errors, and poor-quality health care delivery.¹⁻⁵,⁴ These issues are reported across all health care teams (eg, nurses, physicians, administration, and food service)¹ and have been exacerbated by the recent coronavirus disease 2019 pandemic.⁵

In the general population, there is increasing evidence of the potential health benefits derived from gardening.⁶ Previous studies have demonstrated that gardening improves psychological well-being, quality of life, and social engagement, increases fruit and vegetable consumption, and reduces body mass index.⁶⁻⁹ There are several plausible explanations for these effects. Working in the garden, including planting, watering, pruning, harvesting, pest and disease management, can promote physical exercise, relaxation, and a sense of accomplishment for gardeners.⁷ Gardening programs can increase social interactions, which may counteract social isolation and give a person a sense of belonging.⁸ Exposure to sunlight improves vitamin D levels, lowering blood pressure and strengthening immunity.⁸⁻⁹ Finally, gardening increases access to seasonal low-cost fruit and vegetables, improving overall diet quality.¹⁰

Health care organizations now recognize that supporting the health and well-being of health care workers is essential for delivering quality health care.¹¹⁻¹² In response to the increasing awareness and benefits associated with gardening, many hospitals across the US have implemented on-site farms, community gardens, and programs to supplement the patient’s food supply, address nutrition insecurity, encourage healthy eating, and promote environmental sustainability.¹³⁻¹⁴ However, most health care gardens and gardening program evaluations measure the impact on patients, not staff.¹³⁻¹⁵ Given this, this study aims to evaluate the acceptability and feasibility and explore the potential health impacts of implementing a hospital-based herb and vegetable garden for hospital staff. If successful, this study’s findings can be used to expand and support the development of future health care gardens for staff.

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Conflict of Interest Disclosure: Vegepod donated the raised pods and soil used in this study. Chloe Carroll has previously collaborated with and been gifted a Vegepod. Vegepod has had no input into any aspect of evaluating the staff garden. The remaining authors have not stated any conflicts of interest.

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METHODS

The current study is a mixed-method program evaluation of the Mater South Brisbane edible garden pilot project, launched in August, 2022. Mater South Brisbane is an 880-bed metropolitan hospital campus employing approximately 6,000 staff. The staff garden was implemented to encourage social engagement and enhance health and well-being among staff. The manuscript was prepared per the Mixed Methods Article Reporting Standards.\(^1\) The Mater Misericordiae Ltd Human Research Ethics Committee reviewed and approved the research as low and negligible risk.

Staff Garden Implementation

Three raised self-watering garden beds (2 × 1 m) with protective mesh coverings were allocated to a small grower’s group of interested dietetics and food service staff for planting, care, and harvesting (Figure). The garden beds, soil, and initial seedlings were donated by Vegepod. The first plantings included a range of vegetables and herbs recommended by a horticulturist at Vegepod. These plants were most likely appropriate for the space allocated and the season. Subsequent seeds and seedlings to grow were nominated by the food services staff. The gardens were located outside, near the rear of the hospital kitchen. Dietetics and food services staff (eg, meal delivery assistants, call center staff, and dietitians) were invited to pilot the project and join the grower’s group in the first instance, given the proximity of the gardens to the kitchen and to foster cohesion among the grower’s group. The grower’s group was responsible for making early decisions about the gardens and allocating tasks, but gardening activities and produce were available to all dietetics and food services staff. The group had shared access to water, gardening materials, and tools and tended to the gardens independently. Key activities included watering, planting, and harvesting. Weeding and pest control were not issues, given the nature of the gardens. All dietetics and food services staff also had access (via a communications board) to nutritional information about what was growing, what produce was ready to harvest, and relevant seasonal herb and vegetable recipes.

Participants

All hospital food services staff (approximately n = 250) were invited to participate in a short survey at baseline (at the time of garden installation) and at follow-up (6 months after garden installation) to capture any changes in the overall workforce that may be related to the gardens. There were no exclusion criteria. Participants were notified about the opportunity to complete the survey at daily team meetings. If staff were interested in participating, a research team member provided a participant information sheet, a paper copy of the survey, or a QR code link to access the survey online. Completion of the survey was anonymous and voluntary, and consent was implied through the commencement of the survey.

Key informant interviews were conducted 6 months after the garden installation. The research team identified key informants as either part of initiating the project or as a member of the grower’s group. Snowball sampling was used to capture other key informants identified during interviews. Interviewees (n = 6) were invited to participate via staff meetings and email. Written informed consent was obtained before the interviews.

Measures

The baseline and follow-up surveys included questions on the participants’ sociodemographic characteristics, engagement with gardening, and nutrition and health indicators. Age was assessed by asking participants to report their birth year and subtracting that from the current year. Sex was determined by asking if participants were male, female, or not specified. Work type was assessed with a question asking if participants worked full-time, part-time, or casual. Garden at home was assessed (Do you [or does anyone you live with] maintain a garden at home?).

The follow-up survey contained 3 additional questions related to gardening behaviors and engagement with the garden. Visitation assessed how often staff visited the garden in the past month, with 7 response options ranging from never to every day. Participants were asked (1) how often they had taken home produce and (2) how they helped maintain the staff garden over the past 3 months, with 5 response options (ranging from none to multiple times per week). For descriptive purposes, visitation was dichotomized as once a week or more often and taken home produce and maintained garden at least once in the past 3 months.

Fruit and vegetable intake was assessed using 2 questions adapted from the Australian Health Survey: How many servings of fruit/vegetables do you usually eat daily? Participants could choose from 7 responses (ranging from 1 do not eat fruit/vegetables to ≥ 5 servings daily). Staff well-being was assessed with the World Health Organization Wellbeing Index,\(^2\) which uses a 5-item scale to determine mood, vitality, and interests. Possible scores range from 0 to 25, with higher scores indicating a greater level of well-being.

Figure. The hospital-based raised herb and vegetable gardens for food service staff.
Key informant interviews were conducted by the first author approximately 6 months after the gardens were implemented. The interviews were conducted in offices situated within the food service kitchen area. Each interview had an average duration of 15 minutes. Participants who completed the surveys and were involved in interviews did not receive any compensation. The interviews were semistructured, asking participants about their overall experience and engagement with the garden, any perceived benefits from the garden, and opportunities for improvement.

Analysis

Summary statistics (percentages, means) were calculated for participant sociodemographic characteristics and gardening engagement indicators using Microsoft Excel. Because of the poor response rates in the baseline and follow-up surveys, and given that only 5 participants completed both surveys, further analyses comparing changes in the fruit and vegetable and well-being measures were not conducted. Interviews were audio recorded, deidentified, and transcribed verbatim by the first author and checked for accuracy by 2 independent researchers. All interviews were thematically analyzed on the basis of a qualitative descriptive approach, following a 5-step process: (1) data familiarization, (2) generating codes, (3) generating themes, (4) reviewing themes, and (5) defining and naming themes. Coding schemes were developed deductively using the capacity-building conceptual framework and the community gardens and well-being model. Within line-by-line analysis, inductive codes were also created. Additional researchers cross-checked the analysis throughout each systematic step to ensure accuracy, consistency, and validity. Exemplar quotes were selected to illustrate the data within each developed theme and presented in-text. Qualitative analysis was completed using NVivo software (version 12, Qualitative Solutions and Research Pty, Ltd, 2018).

RESULTS

In total, 48 participants (response rate 19%) completed the baseline survey, 37 (response rate 15%) completed the follow-up survey, and 5 completed both surveys. At both baseline and follow-up, the average age of participants was approximately 40 years, and in both cohorts, the majority were female. Nearly half of the participants (49% at baseline, 22% at follow-up) worked full-time (Table 1). Key Informants, including managers, supervisors, food service line, and call center staff, completed the follow-up interviews.

Acceptability of Staff Garden

On recruitment, 19 staff from across dietetics and food services, including 3 team leaders, 3 dietitians, 11 food service staff, and 2 call center staff members, volunteered to join the grower’s group. This was more than the 10–15 participants that were expected. Many key informants noted the high level of interest in the group: “Most at work do have their own gardens, and I think that’s what gave them the initial wanting to participate, initial thoughts of putting themselves forward.” The survey data supported this finding, with a third of participants at baseline reporting that they have a garden at home. Despite the high level of interest initially, the key informants felt a decline in participation 6 months on: “Honestly, it was great! But then, there was a big decline.” Results from the follow-up survey (Table 2) suggested that 20% of all dietetics and food services staff reported visiting the garden weekly, and 30% reported they had been involved in maintaining it over the past 3 months.

Key informant interviews indicated that while participation declined, on the whole, the team’s perception of the garden’s acceptability improved over time. Key informants explained that although some staff members were highly enthusiastic and keen to be involved, others were more skeptical over the additional tasks to their workload. Interviewees commented that after the first harvest, staff saw the potential benefit.

I think there was a bit of skepticism from some people at the start, but I think overwhelmingly it’s been a pretty good response, especially when we did those first harvests, and we took the product in. People were like, oh, we grew this, you know, and took it home.

Some key informants described the garden as good or great: “It’s good! It, it brings the team together.”

Barriers, Facilitators, and Suggested Improvements

Findings from the key informant interviews identified 3 key themes affecting the feasibility of implementing the staff garden: workforce issues, leadership and communication, and garden design (Table 3).

All key informants identified several workforce challenges that

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**Table 1. Characteristics of Participants Responding to Baseline and Follow-up Survey**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Baseline (n = 48)</th>
<th>Follow-up (n = 37)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex n(%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>8 (17)</td>
<td>2 (5)</td>
</tr>
<tr>
<td>Female</td>
<td>37 (78)</td>
<td>33 (90)</td>
</tr>
<tr>
<td>Not specified</td>
<td>2 (6)</td>
<td>2 (5)</td>
</tr>
<tr>
<td><strong>Age, y mean+SD</strong></td>
<td>39.7 ± 11.0</td>
<td>41.9 ± 13.9</td>
</tr>
<tr>
<td><strong>Work type n(%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>22 (49)</td>
<td>16 (44)</td>
</tr>
<tr>
<td>Part-time</td>
<td>16 (33)</td>
<td>9 (25)</td>
</tr>
<tr>
<td>Casual</td>
<td>46 (13)</td>
<td>12 (33)</td>
</tr>
<tr>
<td>Missing</td>
<td>4 (8)</td>
<td>−</td>
</tr>
<tr>
<td><strong>Garden at home n(%)</strong></td>
<td>16 (31)</td>
<td>14 (38)</td>
</tr>
</tbody>
</table>

Note: Values are presented as n (%) and mean ± SD.
impacted participation and engagement with the staff garden. One of the most commonly mentioned challenges related to staffing levels: “The past 12 months has probably been the hardest from a staffing point of view that we’ve faced here in the last ten years.” Low staffing levels resulted in additional workloads and reduced time capacity for food service staff to participate and engage with the gardens: “They’re working doubles, they’re tired, they don’t have the time. We don’t have the time to be able to let them go out while we’re working.” In addition, key informants echoed the sentiment that regardless of the potential health benefits, work takes precedence over the intervention: “Our main focus is our work, and so, unfortunately, the garden has come second in that regard.”

Key informants noted that leadership and communication also influenced participation and engagement with the staff garden. The managers and supervisors described supporting and encouraging staff to get involved with the garden, which was received positively by the food service staff: “They are very nice. Like all supervisors, if they think that I want to go there and water the garden, they always step in and let me do my thing.” Key informants suggested that when the garden started, there was a lack of division of responsibilities, roles, and scheduling within the grower’s group. This resulted in the management of the gardens becoming the responsibility of the senior team: “It’s just ended up giving the senior team more things to follow up.” All key informants agreed these areas needed to be addressed moving forward: “I think somebody has to take charge of it” and “I think we should have a schedule.”

Aspects of the garden design appeared to discourage engagement with the garden. All key informants and encouraging staff to get involved with the garden, which was received positively by the food service staff: “They are very nice. Like all supervisors, if they think that I want to go there and water the garden, they always step in and let me do my thing.” Key informants suggested that when the garden started, there was a lack of division of responsibilities, roles, and scheduling within the grower’s group. This resulted in the management of the gardens becoming the responsibility of the senior team: “It’s just ended up giving the senior team more things to follow up.” All key informants agreed these areas needed to be addressed moving forward: “I think somebody has to take charge of it” and “I think we should have a schedule.”

Aspects of the garden design appeared to discourage engagement with the garden. All key informants

### Table 2. Garden Engagement of Survey Participants Responding to the 6-month Follow-up Survey

<table>
<thead>
<tr>
<th>Garden Participation</th>
<th>n (%)</th>
</tr>
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<tbody>
<tr>
<td>Visitation (once a week or more often)</td>
<td>7 (19)</td>
</tr>
<tr>
<td>Taken home produce (at least once in last 3 mo)</td>
<td>14 (38)</td>
</tr>
<tr>
<td>Maintained garden (at least once in last 3 mo)</td>
<td>11 (30)</td>
</tr>
</tbody>
</table>

### Table 3. Issues Impacting Health Care Worker Garden Feasibility as Identified During Key Informant Interviews

<table>
<thead>
<tr>
<th>Subthemes</th>
<th>Exemplar Quote</th>
<th>Suggested Strategies by Key Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workforce development</td>
<td>“So, a lot of it has been that we’re so short-staffed”</td>
<td>Foodservice leaders to explore other communication strategies to encourage and promote staff engagement with the gardens</td>
</tr>
<tr>
<td></td>
<td>“We don’t have the time to be able to let them go out while we’re working”</td>
<td>Growers group to consider: Appointing a leader</td>
</tr>
<tr>
<td></td>
<td>“It’s pretty hard because we are extremely busy. I think it’s basically because we are way too busy to go there, so we don’t have that much time”</td>
<td>Conducting regular (quarterly) meetings</td>
</tr>
<tr>
<td></td>
<td>“Some of it has kind of been put on the way-side, but it all depends on rostering as well”</td>
<td>Create a schedule with specified roles and responsibilities for each member, taking into consideration rotating rosters</td>
</tr>
<tr>
<td>Leadership and communication</td>
<td>“Someone or a couple of people have to champion it right, and I don’t think it should be senior management or supervisors”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“It needs to be like someone has to take charge of it and then really focus on making sure that it’s looked after”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Looking at maybe being a bit more specific on rotation and rosters”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“I think the way we’ve set it out at the moment just has, say, food service or dietetics, it doesn’t really give each individual a task. So, I think if we were able to do that, they’d then have more, I guess, accountability towards the garden and feel more involved as well”</td>
<td></td>
</tr>
<tr>
<td>Garden design</td>
<td>“It doesn’t need a lot, like Vegepods they don’t need a lot of attention, right?”</td>
<td>Hospital to consider: Implementing best-practice garden design elements such as shade and table settings</td>
</tr>
<tr>
<td></td>
<td>“Concrete on concrete like, it was going to be hot”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Maybe there should be a little bit more shade, than sun”</td>
<td></td>
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agreed on the simplicity and ease of managing the raised garden beds. However, the self-watering capability prevented substantial engagement: “It is just a matter of hooking it up to the mister, I guess, the watering system, irrigation system, so you don’t have to be present the whole time.” The raised beds with the canopy system seemed to limit the types of vegetables grown: “Like probably not the best plant choices as well. Like even the tomatoes couldn’t grow high.” Key informants also emphasized the location and the need for additional design elements to improve passive rather than active engagement with the gardens: “The location in the summertime, it’s quite hot cause you get that dark concrete heats up so they sort of bake from underneath” and “I don’t know, make it, make it more inviting where people might want to enjoy it and sit down there for lunch.”

Potential Health Outcomes

The key informants highlighted several health and well-being-related benefits to the gardens. Within the grower’s group, individuals worked independently or formed teams of 2, which they described as beneficial for facilitating spontaneous interactions with fellow health care professionals or fostering discussions among colleagues. One key informant shared, “When I’ve stopped and taken a couple of minutes to do stuff, and someone comes over and talks to me about this. Oh, what are you doing, and why are these here? That’s when I think, yeah!”

Furthermore, the gardening experience allowed team members to connect with co-workers they might not typically interact with in their normal daily routines. As one key informant noted, “It’s been good to get to know the staff a little differently as well.” In addition, participants shared that they desired more involvement and interactions with their colleagues, further emphasizing the value of increased engagement within the team. “More involvement. Involvement with other colleagues.” Many key informants also commented on the psychosocial impacts of the intervention: “I think just the interaction between staff has been really beneficial” and “For that 15, 15 minutes I’m out there, I find it quite relaxing.” Others noted the benefits of shared experience about knowledge, techniques, and culture: “Some staff have different methods of gardening than others, and that’s where we’ve been able to share knowledge across the board and particularly with different cultures as well.” There were few nutritional or physical benefits comments, with one key informant reporting: “Health-wise, I haven’t harvested a lot of crops to see a health benefit.”

DISCUSSION

This study implemented and evaluated the acceptability, feasibility, and potential health benefits of a hospital-based gardening intervention targeting dietetics and food services staff. Findings suggested that staff accepted and engaged with the garden, but feasibility issues did emerge. Specifically, workforce issues, communication, and garden design were issues that arose, though a supportive supervisory team made it easier for staff to engage with the garden. Key informants reported several psychosocial benefits to engage with the garden, though few comments were made about nutritional or physical benefits.

The hospital-based staff garden met several successful dimensions of capacity building that have been shown to improve the sustainability of health promotion programs, including strong partnerships, organizational and community development, resources, and intelligence. In contrast, workforce development, leadership, and communication limited garden engagement. Key informant interviews yielded several programmatic improvements to address these challenges, including appointing a leader and improving communication by creating a more structured schedule. Another implementation issue that was found to limit garden engagement was garden design.

Qualitative findings from this study suggest that a hospital-based gardening program may confer several psychosocial benefits to food service staff. Reported benefits included improvements in stress, social interactions, and shared experiences with colleagues. These findings are consistent with previous studies of health care staff. Two recent nonrandomized control trials found that taking daily breaks in a hospital garden significantly improved the psychological well-being of nurses. Psychological well-being is linked to modifiable lifestyle behaviors, including dietary intake, physical activity, smoking, and alcohol consumption. These findings are promising as they demonstrate the potential of gardening programs to improve clinically relevant health outcomes in health care staff. Surprisingly, staff made few comments about fruit and vegetable intake. This finding contradicts a significant body of existing literature that consistently reports higher fruit and vegetable consumption among individuals who participate in gardening activities.

One of the study’s strengths lies in including key informant interviews to capture more in-depth perspectives and enhance the overall robustness of the gardening intervention evaluation. Although the study was originally designed as a mixed-methods investigation, the poor response rates to the survey data precluded additional quantitative data analyses. There are other limitations to consider when interpreting the results. First, this was a feasibility study with a small sample size and no control group. Second, the self-reported questionnaire and face-to-face interviews may have introduced social desirability bias, in which respondents may have felt more inclined to report their experiences more favorably. In addition, although the small sample size of key informants enabled a more in-depth exploration of their experiences and perspectives, it may not fully represent the entire population. Thus, caution is warranted when interpreting or generalizing results to a larger context. Future research with a larger, more diverse sample is warranted. In addition, future efforts could consider implementing best-practice garden design elements such as shade and table seating to improve active and
passive participatory engagement with the gardens. Third, post–coro-
navirus disease 2019 pandemic, the health care workforce continues to
experience high rates of staff burnout, stress, recruitment difficulties,
and staff turnover, which may have influenced the outcomes of this
study. For example, increased staff burnout and stress may have affected
participation rate and engagement in the program, potentially influencing
the reported outcomes.

Similarly, recruitment difficulties and staff turnover could have intro-
duced variability in the composition of the health care team, which may
have further impacted the study’s findings. These broader contextual
factors should be considered when interpreting the study’s results.
Finally, the qualitative analysis was conducted by a team of nutrition
and dietetics researchers, which may have influenced the development of
themes and the interpretation of results presented in this paper. How-
ever, this potential bias was reduced, and objectivity was maintained by
using multiple researchers independent of this study to code, interpret,
review, and verify the data, results, and manuscript.

IMPLICATIONS FOR RESEARCH AND PRACTICE

This study provides preliminary evidence that a hospital-based garden for
staff is acceptable and engaging. That said, several challenges were identi-
fied, which, if not addressed, threaten the garden’s ongoing feasibility and
sustainability. Programmatic improvements are recommended before the
gardening program can be extended to all health care staff. Areas for improving staff engagement with the gardens include leadership, com-
munication, and garden design. In addition, more robust evaluations are
required to determine the impact of hospital gardens on the health and
well-being of health care staff. Future research may consider the challenges
with recruiting staff for completing surveys over long periods to measure
staff engagement with gardening and the garden’s overall impact on staff
nutrition and well-being.

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