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Reflections on Gardening, Volunteerism, and Wellbeing in Rural Oklahoma

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Abstract

Common sense and research both support the idea that gardening and volunteerism are good for personal wellbeing but neither body of knowledge has a strong rationale for why these activities are good for us. Using an open-ended survey and follow-up interviews, this phenomenological study set in rural Oklahoma investigated the lived experiences of local volunteer gardeners and explored how gardening and volunteering affect the wellbeing of these individuals. The resulting thematic analysis agrees in many ways with current findings, however, a new theme emerged – personal relationships and gardening – which is worthy of further study to determine how this combination may contribute to improved wellbeing. The authors propose integrating one element of these findings – intergenerational relationships and gardening – with children in local primary schools. Gardening with local older adult mentor gardeners can provide students with a means to alleviate anxiety and improve attention with nature, as well as develop and maintain personal wellbeing through meaningful relationships with older adult mentors, all of which should help improve classroom climate and student learning.

Introduction

It is commonly accepted that both gardening and volunteerism, as individual endeavors, support personal wellbeing. This study provides detailed first-person qualitative data on how gardening and volunteering affects the personal wellbeing of the volunteers engaged in local community gardening projects. More importantly, this study points to an important local application with rural schools which offers a win-win opportunity for all involved in the community: intergenerational gardening.

Literature Review

Research results from studies on gardening or volunteering individually are relatively common. An initial search found a spate of studies conducted 10-15 years ago, with the five meta-analyses cited having reviewed studies spanning the last 35 years, up to and including 2022. Across this wide range of years, results remained similar with evidence indicating that both gardening and volunteering are supportive of wellbeing. It is worth noting that the research cited, was conducted in multiple countries across the globe, as well as prior to, during, and after the COVID-19 pandemic. Important to the intent of this current research, which looked at how volunteering in a vegetable garden affects volunteer wellbeing, only one similar study was found which specifically researched volunteering in nature, with the work conducted in nature defined broadly as “coppicing, tree thinning, infrastructure improvements, removal of invasive species, footpath repair work, litter picking and the creation of new habitats or green spaces” (O’Brien et al., 2011, p. 73).

Many studies have found the act of gardening supports personal wellbeing in multiple ways, including reduction in stress, anxiety, and depression; and increases in mood, energy, self-esteem, optimism, resilience, sense of meaningfulness, ability to concentrate, sense of belonging, social inclusion, personal responsibility, and connection with nature (Clatworthy et al., 2013; Dyg et al., 2019; Koay & Dillon, 2020; Pantiru et al., 2024; Sia et al., 2022; Smidl et al., 2017). Researchers argue these wellbeing-associated mental health outcomes may result from various aspects of gardening such as exposure to greenspace and sunshine, light to moderate exercise from active gardening, and increased social interaction. These aspects bring about several physiological changes such as increased vitamin D3 production, lowered blood pressure, increased endorphin production, improved dexterity/strength, and positive changes in diet – all of which have been shown to positively affect mental health (Clatworthy et al., 2013; Koay & Dillon, 2020; Smidl et al., 2017; Thompson, 2018).

Specifically related to gardening and wellbeing, two of the most recent studies cited were conducted in Singapore; remarkably one was conducted prior to the Covid-19 pandemic (Koay & Dillon, 2020) and the other was conducted during the pandemic lockdown (Sia et al., 2022). The earlier study conducted by Koay and Dillon (2020) found those living in urban settings who engage in community gardening (i.e., multiple gardeners working small individual plots, side-by-side, in a large defined garden space), have significantly better wellbeing-related outcomes than those who individually garden or do not garden at all. In the second study, conducted in Singapore early in the Covid-19 lockdown, Sia et al. (2022) found those who garden 1-4 hours per week had the most improvement in resilience, which was especially important to wellbeing during the months-long lockdowns occurring in 2020.

Research on volunteering has shown that it, too, improves wellbeing, with reported outcomes which are slightly narrower but still similar to gardening outcomes (Jenkinson et al., 2013; Kim & Pai, 2010; O’Brien et al., 2011). As reported in the cited studies, wellbeing outcomes related to engagement in volunteerism include decreased levels of depression and risk of mortality, improved life satisfaction, social skills development, identity development, and growth of social networks (Jenkinson et al., 2013; Kim & Pai, 2010; O’Brien et al., 2011). Some researchers suggest that wellbeing-associated mental health outcomes may result from the sense of

accomplishment or purpose derived from volunteering or from developing or maintaining social networks among volunteers (O'Brien et al., 2011; Tabassum et al., 2016); O'Brien et al. (2011) argued that *volunteering while out in nature*, specifically, provides a safe space for the mentally vulnerable to reintegrate into society as they develop social skills with volunteer mentors and redefine themselves. Interestingly, King et al. (2014) found in their study of US participants (n=637) that when controlling for personality, the correlation between volunteering and improved wellbeing disappears, with higher extraversion and lower neuroticism both significantly correlated with better mental health. While these final study results are intriguing, it is important to note that this and all the other studies cited are correlational in nature, not causal, and need to be followed up with more research.

The largest study cited (Tabassum et al., 2016; n=66,343) was conducted in Britain where the authors used the General Health Questionnaire (i.e., 12-item survey with a 4-point scale assessing feelings of worthiness/worthlessness, happiness/enjoyment, stress, sleep, etc.) as a basic measure of wellbeing (i.e., lower score = better wellbeing) and found that those who volunteer generally have better wellbeing than those who do not. Interestingly, when the authors delved deeper, they found those who volunteer on a weekly basis and, separately, volunteers over the age of 40, receive the most benefit from engaging in volunteerism. Similarly, in an earlier study of US participants which used latent growth model analysis, Kim and Pai (2010) found that volunteering and the amount of time spent volunteering are both associated with lower baseline levels of depression, yet they also found that age has an effect with a faster decline in depressive symptoms for those over the age of 65 who volunteer and spend more time volunteering.

While many studies have found that gardening and volunteering each improve personal wellbeing, no causal links have been identified that clearly connect gardening to wellbeing (Clatworthy et al., 2013; Pantiru et al., 2024) or volunteering to wellbeing (Jenkinson et al., 2013; Nichol et al., 2024). Clatworthy et al. (2013) end their discussion with a call for more studies on gardening and wellbeing which have improved quality protocols, noting the importance of having measurable outcomes. Pantiru et al. (2024) agree, calling for randomized controlled trials so causal associations can be investigated. Jenkinson et al. (2013) echo this sentiment for studies on volunteerism, noting that mapped out intervention designs with clear outcomes are needed to test effects. Nichol et al. (2024) were bolder in their umbrella review, declaring that many of the reviewed studies were of mediocre quality (i.e., low-n and non-RCT) and provided little structural overlap with which to base the review. While this small study does not provide causal links as called for by these authors, it adds to the existing literature a new perspective on how gardening may provide improved wellbeing for certain individuals – and how that information might be used in rural schools to improve student wellbeing.

Operational definitions

In this study, several terms inherent to the investigation were used which have commonly understood meanings, but to ensure these terms are used consistently, they have been defined operationally.

- *Gardening* is understood to be physical outdoor work conducted to promote the growth of plants and production of fruit/vegetables, including tasks like planting, plant maintenance, watering, and harvesting.

- *Volunteering* is defined as donating personal time and effort to support a cause, and can include physical labor, mental labor, and mentoring.
- *Personal wellbeing* refers to good health, specifically related to the following areas: mental, spiritual, physical, financial, and relationships. “Other” was also provided as an option to allow for alternative forms of wellbeing.

Qualitative Methodology

This phenomenological study, which investigated how engagement in gardening and volunteerism affect personal wellbeing, took a sequential form with two waves of data, one collected after the other (Creswell & Creswell, 2017). A sequential qualitative approach was selected due to its ability to gather open-ended survey data from a larger sample of the population which was then used to create a structured interview that allowed a deeper dive into the lived experiences of a smaller portion of the original sample (Creswell & Creswell, 2017). The first wave of data was collected via online survey; the second wave of data was collected via follow-up Zoom interviews. This study was reviewed and approved by the East Central University Institutional Review Board in May 2022 and data collection was completed during June and July of that same year.

Participants

Participants for this study were targeted specifically for their participation in both volunteerism and gardening. During this study, participants engaged in a local Victory Garden project (set in southeastern Oklahoma) and/or the Oklahoma State University Extension Master Gardener Program. Participation in the [Master Gardener Program](#) is free but to “pay” for their training, participants serve their local communities (45-56 hours required) as volunteer interns who teach others to use science-based horticultural practices (Oklahoma Master Gardener Program, 2022). The first wave of data included 11 survey respondents, and the second wave included five respondents who opted to be interviewed. It is important to note that if this were a quantitative study the number of participants in each wave would be insignificant, but as a qualitative study both n’s are considered significant and this can be considered a moderate-sized study (Creswell & Creswell, 2017).

Each study participant had some background in gardening with eight of them gardening for over 20 years, seven currently volunteering in a local Victory Garden, 10 gardening at home, and six trained as Master Gardeners. It is important to note that demographic data was limited in this study to protect the privacy of this small group of participants. Table 1 summarizes the demographics of the study participants and their data wave participation.

Table 1. Summary of Demographics and Data Wave Participation

Gardener Number	Age Range (years)	Gender	Race/Ethnicity	Work Status	Wave of Data Collection
1	30-39	Female	White/Caucasian	Full-time	1 & 2
2	30-39	Female	White/Caucasian	Full-time	1
3	50-59	Female	White/Caucasian	Full-time	1
4	60+	Male	Native American	Retired	1 & 2

5	60+	Female	White/Caucasian	Retired	1
6	30-39	Female	White/Caucasian	Part-time	1 & 2
7	40-49	Female	Nat Amer & White	Full-time	1
8	18-29	Female	White/Caucasian	Full-time & College student	1 & 2
9	60+	Female	White/Caucasian	Retired	1 & 2
10	60+	Female	White/Caucasian	Retired	1
11	60+	Female	Native American	Retired	1

Wave 1 participants represented all age categories (i.e., 20s, 30s, 40s, 50s, and 60+ years), with three in their 30s and five retirees in their 60s. Only one of the participants was male. Two participants identified as Native American, eight identified as White/Caucasian, and a single participant identified as both Native American and White/Caucasian. Six worked part-time to full-time jobs with one of these also attending college, while the remaining five are retired. Considering Wave 2 demographics, one was in their 20s, two were in their 30s, and two were retirees in their 60s. The only male participant and the only college student in the study opted to be interviewed. Finally, one of the five interviewees identified as Native American.

Data Collection Procedures

This phenomenological study took the form of a sequential data collection that began with an online survey composed of open-ended items (wave 1), followed by structured virtual interviews conducted with survey participants who volunteered for the second wave of data collection. Potential study participants were contacted via an email sent by the Master Gardener in charge of the local Victory Garden Project (see Appendix A); participants were invited due to their participation in one of these two projects. The online survey consisted of four multiple-choice demographic items and 16 essay items (see Appendix B). To improve response rates, the number of open-ended response items on the survey, which started with 21 items, was reduced to 15 by pairing different aspects of wellbeing into single items (i.e., mental/spiritual, physical/ financial, and relationships/other). Thematic analysis of the first wave of data was used to inform the second wave of data collection.

At the end of the open-ended survey (wave 1), the final item invited participants to take part in a short digital interview to elaborate on their answers (wave 2); those who volunteered provided their contact information. The follow-up virtual interviews consisted of five questions derived from the thematic analysis of the combined survey responses (see Appendix C). The interviews were slated to last 15-20 minutes and the completed interviews ranged from 15-30 minutes in length. Virtual interviews were selected over face-to-face interviews for their scheduling flexibility and recording/auto-transcription capabilities. Once a machine-produced transcription was verified with the video recording, it provided improved capture of participant meaning through both verbal answers and body language.

Data Analysis Procedure

Data analysis began after the first wave of data was collected. Survey responses were analyzed item by item to find phenomenological themes across participants in relation to how gardening,

volunteerism, and the two combined affect their wellbeing. The study authors analyzed the data separately then engaged in comparative analysis to determine the final thematic results that best captured the participants' lived experiences. From these initial findings, specific questions were created for the structured follow-up interviews (see Appendix C) in the second wave of data collection. This second wave allowed for more thorough discussion with interviewees of their firsthand experiences with volunteering and gardening – and how these experiences were related to their individual experiences of wellbeing. With the second wave of data collection, each interviewee's responses were recorded and transcribed, and once again responses were compared across participants and analyzed for themes. Similarities and differences among participant responses were noted and explored. As with the first wave of data, both authors separately analyzed the second wave of data and then compared their analyses to each other. The authors then compared their findings from the second wave of data collection with the findings from the first wave to come to a consensus on the overall thematic results and interpretation of the findings.

Data Analysis, Results, and Discussion

For a study with only 11 participants, the data set was relatively representative of the general population given the demographic information collected (see Table 1). Each of the 10-year age groups (i.e., 20s to 60+) had at least one participant and the largest group was also the oldest (i.e., n=5; 60+ years), which aligns with national trends for gardening (Metz, 2012). The participant group was also relatively equally split in relation to work-status, with five full-time workers, one part-time worker, and five retirees. Researchers have found potential age effects related to volunteering (Kim & Pai, 2010; Tabassum et al., 2016), so the age-group and work-status representativeness of this small sample, through both waves of data collection (i.e., survey and interview), was seen as advantageous. Considering race/ethnicity, the White/Caucasian (n=8; 72.7%) group appeared to be more heavily represented, with the remaining three participants identifying as Native American or Native American/White (27.3%); but this is closely representative of the 2021 population estimates in southeastern Oklahoma where this study was conducted ([Unites States Census Bureau](#), n.d.). The main shortcoming of this participant group was a lack of gender diversity, but with a limited data set, the gender disparity was not surprising. Gardener 4 was the only male of the 11 total participants (9%); the most recent available data from The National Gardening Association indicates 46% of vegetable gardeners are men (Metz, 2012). It was fortunate that Gardener 4 opted to participate in both waves of data collection to provide a bit of gender variability in the responses. While there is a lack of gender diversity, the remaining demographic data of this small sample are surprisingly representative of the local population.

With only three exceptions, all participants responded to all survey items. Three different participants elected to not respond to a single survey item; each participant omitted a different item. This was viewed as an exceptional response rate given that only demographic items were required and the rest of the items, which were optional, asked for write-in responses. Survey respondents appeared to understand the questions asked and provided relatively clear answers. One exception that stands out for lack of clarity are responses to items 7 and 12 which are parallel items, with both combining “mental wellbeing” with “spiritual wellbeing” in a single prompt (see Appendix B). As noted earlier, the forms of wellbeing were combined in pairs to reduce the physical number of items on the survey, and while this was not a problem for the pairings of

physical/financial and relationships/other, where respondents clearly delineated their answers to each form of wellbeing listed, on the mental/spiritual pairing the respondents simply did not make a distinction between the two forms of wellbeing in their answers. As a result, the analysis of these two items does not distinguish between mental and spiritual wellbeing in relation to gardening or volunteerism.

Wave One Analysis: Survey Responses

Table 2 summarizes the thematic analysis of the survey responses for items 6, 7-9, 12-14, and 15. Items 7-9 and 12-14 are paired items at the heart of the wave 1 survey. These paired items are structured the same, with the first set (i.e., 7-9) focused on wellbeing and its relation to gardening and the second set (i.e., 12-14) focused on wellbeing and its relation to volunteerism. Item 15, as a follow up to the previous items looks for benefits of gardening and volunteering combined. Item 6 which asks, “How did you learn to garden?” has been included in this analysis due to the main theme of “close relationships” found in the responses to that particular item. This theme provides a lens through which to view the other item responses, particularly with respect to gardening. Dyg et al. (2019) completed a meta-study on community gardening and wellbeing and found 10 studies completed in the last 30 years which indicate that developing relationships and social connections is an important avenue through which community gardening improves personal wellbeing. The meta-theme of “close relationships” found in this study seems to support these findings that gardening with other people likely leads to improved wellbeing. Unfortunately, most of the studies cited in the meta-study (Dyg et al., 2019) appear to have only identified the improved social connections and not moved beyond to investigate how gardening within close personal relationships (i.e., family and friends) affects wellbeing. With this in mind, the majority of the analysis to follow will focus on gardening and its relationship to wellbeing through the experiences of the participants.

Table 2 Thematic Analysis of Select Survey Items in Wave 1 Data

Select Survey Items	Themes
Item 6: How did you learn to garden?	Parents/grandparents/friends School/master gardener program Self/books
Item 7: Describe how gardening affects your mental wellbeing and your spiritual wellbeing.	Sense of accomplishment/rewarding Connection with nature and/or God/ peace/happiness Resets personal perspective
Item 8: Describe how gardening affects your physical wellbeing and financial wellbeing.	Physical (+): Exercise, moving, fresh air, sunlight Physical (-): Heat, hard on back Financial (+): Supplement food to save money Financial (-): Can be expensive
Item 9: Describe how gardening affects the wellbeing of your relationships and your wellbeing in any other way that has not been asked.	Relationships: Generational sharing; shared effort with spouse; lower personal stress improves relationships Other: provides challenge/opportunity; hard work and determination are rewarded
Item 12: Describe how volunteering affects your mental	Provides (+): Joy/happiness/peace and purpose/satisfaction/ personal reward

wellbeing and your spiritual wellbeing.	Adds stress (-): one more thing in a busy schedule
Item 13: Describe how volunteering affects your physical wellbeing and financial wellbeing.	Physical: Increased activity/ get out of normal routine Financial: share with others; giving rewarded later
Item 14: Describe how volunteering affects the wellbeing of your relationships and your wellbeing in any other way that has not been asked.	Relationship (+): Meet others different from me Relationship (-): Can cause strain in relationships by taking time away from them Other: Purpose
Item 15: Are there any additional benefits you see specifically related the combination of volunteer gardening, and if so, what are they?	Teaching/learning; connection; purpose

All participants responded to “How did you learn to garden?” (Table 2; item 6). Of these, most provided more than one source for their gardening know-how. Seven discussed learning to garden from their grandparents and parents, one discussed learning from a friend, three discussed learning through the Master Gardener Program, and two noted they were exclusively self-taught. Of these four basic responses (i.e., family, friends, Master Gardeners, self-taught), three are based in the dynamic of a close relationship. While the Master Gardener Program does not fit this context at first, trainees develop strong friendships as they work and struggle together to learn gardening best practices and share them with their local community. The fact that 9 of the 11 respondents specified they learned to garden within a close relationship is likely very important to their wellbeing in many ways, as will be seen.

When asked to describe how gardening affects mental wellbeing and spiritual wellbeing (Table 2, item 7), common answers included feeling accomplished or finding it rewarding, and feeling a sense of happiness, peace, or connection with nature or God. Gardener 9 noted, “[gardening] makes me feel happy, accomplished, and quiet, enjoying a simple pleasure of life,” while Gardener 8 responded, “gardening brings my soul back to center. It reminds me of what is truly important in life.” In this study, item 12 is the parallel of item 7, with item 12 focusing on volunteering rather than gardening. The responses are somewhat similar to gardening in that volunteering also brings happiness, peace and a sense of reward to those who engage in it, but one descriptor stands out as different, with many respondents noting they find purpose in “giving back”; Gardener 4 wrote, “it’s satisfying to give back to my community and make a difference.”

As noted earlier, participants did not make a distinction between mental and spiritual wellbeing in their responses to items 7 and 12. In contrast, participants made a clear distinction in their responses to the other paired items (i.e., items 8 and 13: physical/financial wellbeing and items 9 and 14: relationship/other wellbeing. Gardener 2 was the only participant who delineated her responses to item 7 “[gardening provides a] huge feeling of accomplishment and pride mentally. I’m not a spiritual person, but it does help me feel connected to the earth and nature,” and item 12 “...not spiritual, but it does feel good to be a part of something that helps people.” While

Gardener 2 made it clear she is not spiritual, her responses still share many similarities with the rest of the gardeners who do not make this distinction.

When asked to describe how gardening affects physical wellbeing and financial wellbeing (Table 2, item 8), participants clarified between the two types of wellbeing, and also provided positives and negatives for physical wellbeing. Almost all participants agreed that physically, gardening gets them outside where they experience fresh air and sunshine while also moving around or engaging in low-level exercise. The negative aspects included Gardener 7 who noted gardening is “a bit hard on the back but worth it” and Gardener 6 who wrote that the “physical movement is good for me, although the heat not so much.” Gardener 8 wrote that gardening “is great for my physical wellbeing by bringing me outdoors and into the fresh air and sunlight” while Gardener 3 noted that taking time to stop and physically exercise is difficult with her work schedule, but “gardening pulls me outside and moving” since it needs to be done daily. Participants commented less about the financial aspects of gardening, but many noted that they garden to provide produce for their table to lower their grocery bill; Gardener 5 epitomized this, stating, “With the cost of food sky rocketing I expect to save a lot of money.” On the other side, a couple of participants noted that they spend more money putting in a garden than they get in return. Gardener 1 put it this way, “I buy too many plants... hahaha.”

In this study, item 13 is the parallel of item 8, with item 13 focusing on volunteering rather than gardening. For physical wellbeing, the findings for volunteering are similar to gardening in that most participants note it keeps them active. For financial wellbeing, the findings for volunteering are almost the opposite for gardening, with volunteering costing both money and time. Rather than see this as a loss, most participants seem to view it as an investment; as Gardener 4 noted, “I feel sharing my time is worthwhile.” Gardeners 9 and 11 agree that giving without expecting anything in return is important to personal growth while Gardeners 5 and 8 believe if they are generous with their time and money, their generosity will be rewarded later. Gardner 7 probably made the simplest comment that all would agree with when they noted the positive feelings volunteering elicits: “it can make [you] feel great to do things for others.”

When asked to describe how gardening affects the wellbeing of their relationships and wellbeing in any other way (Table 2, item 9), participants again clarified between the two types of wellbeing, and for the most part, focused on relationships. In this part of the analysis, the “other ways” from item 9 and then item 14 will be discussed first since the “relationships” discussion is much more in-depth and will take us back to the theme found in item 6 – close relationships.

With regard to how gardening affects wellbeing in other ways, two work-related motivational themes emerged; gardening provides challenge/opportunity, and it also teaches that hard work and determination are rewarded. Gardener 4 got right to the point, “[I] like the challenges and opportunity to experiment with new techniques and varieties.” Gardener 9 put it this way, “People I know say “you have a green thumb” and I assure them I don’t! Work required for gardening and a commitment to doing it. I have had MANY gardening ‘failures.’” Gardener 8 ended her discussion with how she shares gardening with her child by teaching about, “the reward of vegetables and fruit after days of watering, checking plants and helping the garden. It is a beautiful lesson for life, to always be determined with what we do, and we will be rewarded.”

In this study, item 14 is the parallel of item 9, with item 14 focusing on volunteering rather than gardening. Two themes, one for each part of the item became evident during analysis, “meet others” and “purpose.” With regard to how volunteering affects relationships, most respondents noted that volunteering gives them the chance to meet and make friends with people they normally would not “run into on a daily basis,” as Gardener 2 wrote. Several also noted that volunteering gives them a sense of purpose. Gardeners 2 and 4 discussed having a “positive impact” and “making a difference.”

Moving back to item 9 and the question of how gardening affects relationships, all but one of the respondents had something to say about the relational aspect of gardening and it may be significant that the one person who did not discuss this was the one male participant. Major themes included generational sharing of knowledge and shared efforts with a spouse, while lesser themes include interest from neighbors/friends and lowered personal stress improving personal relationships. Gardener 1 discussed struggling with functional depression for several years after a death in the family, but “[my spouse] noticed since I’ve started my big garden this year how engaging and happier I seem.” Gardeners 5 and 6 noted that gardening lowers their stress levels and Gardener 5 summarized it well, “if I am not stressed out I am much happier which makes me easier to be around.” Interestingly, while marital status was not a demographic question asked on this survey, nine of the 11 respondents note in their responses to item 9 that they have a spouse. This may seem a bit high (82%), but according to the Axiom Marketing 2021 Gardening Insight Survey: Gardening in a COVID-19 World (Hennessey, 2020), almost 72% of their gardening survey respondents were married. Many of the respondents discussed how gardening has a positive influence on their marital and intergenerational relationships; this is likely an important finding since improved social interactions are a sign of improved wellbeing (Smidl et al., 2017). Gardeners 1, 2, and 8 discuss gardening with their children, Gardener 8 says that gardening is “a wonderful way...to bond”; Gardener 11 notes that her grandchildren “have helped me plant”; Gardener 7’s “mom likes to come over to see my garden”; and Gardeners 1, 2, 3, 7, and 11 all discuss sharing positive time in the garden with their spouses. Combine these responses with those for item 6 (i.e., How did you learn to garden?) and a meta-theme of “close relationships” emerges for Wave 1.

When asked if they noted any additional benefits specifically related to the combination of *volunteer gardening* (Table 2, item 15), participants came back to the meta-theme of “close relationships” with their responses of teaching/learning, making connections, and purpose. Gardener 4 summarized it well, noting the importance of “the connections you make with people helping them be better gardeners.” Gardener 5 brought up a good point for novice volunteer gardeners, “I get to learn how to garden without the pressure of trying to keep things alive by myself.” Finally, Gardener 11 returned to family, “I have had my grandchildren help me at the garden for the needy, it’s good for them to learn to give to others who need help.”

Three different items in the survey focused on *the amount of time* participants spent on either gardening or volunteering. For gardening, items 4 and 5 (see Appendix B) asked about the average amount of time spent daily working in the garden during the warm and cool seasons, and these items were correlated with item 7 which focused on how gardening affects participants’ physical wellbeing. Year-round, all respondents spend a minimum of 30 minutes/day in the garden, and close to half spend more than an hour/day, which correlates well with respondents

describing gardening as being good for their physical wellbeing because it keeps them moving and active. Since most adults tend to volunteer their time on a weekly basis, item 11 asked about the average amount of time spent volunteering each week in the local community and was correlated with the age of participants as prior studies have indicated an age difference related to both the amount of time spent volunteering and the valence of the outcomes from volunteering – with older adults having more time to volunteer and benefiting more from it (Kim & Pai, 2010; Tabassum et al., 2016). To look at this, the stratified age groups were regrouped based on employment status into retired (i.e., 60+ group) and employed (i.e., all other age groups combined), and time spent volunteering was grouped into three volunteer/time categories: 0 hours/week, 1-3 hours/week, and 4-10 hours/week (see Table 3).

Table 3 Employment Status (Age) by Time Spent Volunteering per Week

	0 hours/week	1-3 hours/week	4-10 hours/week
Employed (20-59 years)	1	3	2
Retired (60+ years)	1	2	2

Cross comparison shows that for each time-commitment category there was an almost equal number of retired and employed so no pattern can be discerned which necessarily aligns with prior studies (Kim & Pai, 2010; Tabassum et al., 2016). However, Gardener 6's responses to two items, with respect to how volunteering affected her mental/spiritual wellbeing (item 12) and relationship wellbeing (item 14) stood out in alignment with prior studies (Kim & Pai, 2010; Tabassum et al., 2016). Gardener 6, who is in her 30s, noted on item 12 that, "[d]epending on what I'm volunteering for, it is sometimes another thing on my plate adding stress, even if it is something I enjoy and find rewarding," and continued in item 14 with, "[v]olunteering can sometimes put strain on my relationships if it takes away time I would normally spend with someone." Tabassum et al. (2016) found that a strong association between wellbeing and age did not become evident until after age 40 and this participant may shed some light on why that demarcation exists; perhaps it is simply that younger and middle-aged adults have strong demands on their time due to work and close relationships (e.g., children, family, friends, co-workers, etc.). The findings of Kim and Pai (2010) also make more sense when relationships are taken into consideration, as they found that those over 65 who volunteered were less likely to suffer from depression. As we transition from middle to old age, our children grow up, we retire and lose co-workers, and lose family and friends to poor health and death; the loss of these relationships, their time-demands, and the purpose they provide our lives leaves a void which may push older adults off into depression. It makes sense that volunteering slows the development of depression in older adults (Kim & Pai, 2010) because it fills the void with new relationships and new purpose.

As discussed, the meta-theme for wave 1 data is "close relationships." While most of the items focused on the individual and how they perceived gardening or volunteering affecting their own personal wellbeing in one way or another, items 9 and 14 asked how gardening and volunteering affected the wellbeing of each gardener's relationships, recognizing that relationships have a large impact on perceived wellbeing (Smidl et al., 2017). What is surprising is the amount of detail and agreement in the responses; for many of the gardeners, these were some of their longest write-in responses. What truly makes "close relationships" a meta-theme is the strong agreement seen in responses to item 6 (i.e., How they learned to garden) and item 15 (i.e., benefits of

volunteer gardening) and the subtleties found in the responses to items related to volunteering (i.e., items 12-14). “Relationships” dominate the responses to items 6 and 15 and a focus on “others” is found in many of the responses to the volunteer items (i.e., 12-14). While working with or helping others may seem like a default response to volunteering, there are many volunteer roles which can be completed solo, like completing administrative tasks, food preparation, sorting inventory, and card/letter writing. Since “relationship” stood out so much in the wave 1 data, most of the interview questions for wave 2 focus on this.

Wave Two Analysis: Interview Responses

Wave 1 data collection included items on gardening and volunteerism but given the survey responses and the surprise finding of a meta-theme of “close relationships” with gardening and wellbeing, the focus of the interview questions for wave 2 was predominantly on gardening. Of the 11 survey participants, five volunteered to be interviewed. Table 4 summarizes the data analysis for wave 2; included are shortened versions of the four relationship-related interview questions and the major themes found for each.

Table 4 Thematic Analysis of Select Interview Questions in Wave 2 Data

Interview Questions	Themes
Q1: Do you personally have any generational family connections with gardening?	At least 3 generations Grandparents as farmers Fond memories/good times
Q2: Relationship improvements with spouses when gardening was a common theme. Please elaborate.	Division of labor Relaxation of gender role
Q4: As an adult, why did you start gardening? Was mental or physical wellbeing a consideration or was it something you noticed after you started?	Feed family/save money Love/passion/creative outlet Mental wellbeing noticed later
Q5: “Providing perspective” was a theme found with both gardening and volunteering; please elaborate.	Purpose: Helping others Continuity: despite the vagaries of human life, the natural world continues

Question 1 (Table 4) began by asking the five interviewees if they had any intergenerational family connections with gardening and all five stated that gardening was part of family life at least as far back as their grandparents – gardening appears to be part of their family culture. Three participants recalled their grandfathers farming for a living while their grandmothers maintained a kitchen garden to provide produce for the house (Gardeners 1, 4, and 6); none of this was surprising given that the respondents all live in southeastern Oklahoma where farming was a common occupation 60 years ago and gardening is still a common practice today. All feel the need to continue this family culture of gardening, so the three that have children discussed introducing their own children to gardening (Gardeners 1, 4, and 8); and of the two without children, Gardener 9 who is over 60 discussed sharing her gardening knowledge with friends, while Gardener 6 who is in her 30s – and seems to have the least knowledge and experience with gardening – is focused on developing those skills as she finds them important to carry on for her own future family.

All five discussed enjoying their time in the garden as children. While most agreed there were times gardening was seen as work when their parent/grandparent focused on them accomplishing a particular task in the garden (e.g., pulling weeds, picking produce); all agreed that overall, gardening was seen as enjoyable when they were children, because they were allowed freedom to explore in the garden and their parent/grandparent often focused on teaching them about nature and gardening. Gardener 9, who spoke extensively on this familial dynamic said, “I have very fond memories of gardening as a child” and attributes her gardening enjoyment to “cherished childhood memories of time spent with my grandmother in the garden.” Gardener 8 had a similar relationship with her grandfather saying, “My grandfather taught me as a young child the wonders of gardening.” Gardener 1 shared a similar dynamic with her father who taught her a lot as she was growing up “about gardening and using organic matter like manure and straw...around the garden.”

Question 2 (Table 4) delved deeper into the discussion of relationships and gardening by asking interviewees to elaborate on the spousal connection and gardening. All agreed that gardening had a positive influence on their spousal relationships, even Gardener 9 who has never married, agreed because she saw this with both her grandparents and parents. All four married interviewees discussed how gardening responsibilities are shared with their spouse, generally with one growing produce and the other preparing meals from the produce, but not always. While this at first seemed to fit traditional gender roles, as the five participants discussed in question 1 how their fathers and grandfathers worked outside in the garden and their mothers and grandmothers worked inside cooking and canning what was produced, the roles appear to be in the process of loosening because the three younger interviewees, who are female, are the gardeners in their homes while their spouses do the cooking. Gardener 1 described it this way:

I'm the biggest part of the garden...I work most of it. I do a lot of the weeding and the harvesting, the watering and stuff. And my husband, he does most of the cooking <laugh> because, uh, that's what he enjoys and this is what I enjoy...he'll come out and help me, uh, if it's getting really hot and stuff...we just enjoy being outside together anyways. And we work together but, I pick everything and then bring it inside, and he cooks whatever I bring inside.

Even Gardener 4, the only male participant who is over 60, describes the division of labor in his household in a relatively egalitarian way:

[My wife's] family is from a farming background...when she was in high school and stuff, they always had a big truck garden...her mom was, you know, a farm wife. She was into the canning and the rest of that stuff. So, my wife does like that. She...she really enjoys it. And of course, she's very helpful in the garden out there. She gets out there and weeds and, you know, keeps things growing. I think together it's sort of been a very symbiotic relationship because she came from a farming family and knew how to do things and liked it. And I like growing stuff...we get excited when we hit some good crops and stuff. And of course, you know, we've learned like, I guess farmers doing anything, we've had frost take out our orchards number of years. And the heat right now is of course a big issue. So...

we work together on that stuff. And then... she likes what I grow <laugh>... it's definitely a joint effort as far as what we're gonna grow and what she's gonna can and what we're gonna put up.

Growing a vegetable garden large enough to feed a household, as these two gardeners do, requires much time and effort (i.e., planning, tilling or container preparation, planting, watering, harvesting, preparing, cooking, storing). Rather than strict gender roles being adhered to in the division of labor, as it once was with their grandparents, it appears the participants and their spouses have chosen to spend quality time together as they share gardening responsibilities and also focus their individual efforts on what they are good at and enjoy doing. Gardeners 6 and 8 have much smaller gardens but their responses are similar in the willingness to share gardening responsibilities from the start of the growing season to the end; from discussing what to plant to preparing it to be eaten, their spouses are involved in the process. Gardening is labor intensive and time-consuming and often stressful as a result, yet all five interviewees agree it has a positive impact on their own marital relationships and other familial marital relationships they have experienced – and it appears to be due to the shared yet also separate labor in which these couples engage. Gardener 4's phrase, "a very symbiotic relationship" may best encapsulate this particular phenomenon, as the organisms in this type of biological relationship support each other. He uses this phrase to describe how he and his wife work together in the garden but, more importantly, it clarifies that they each bring their own expertise to gardening and complement each other in their gardening skills and knowledge.

Question 4 (Table 4) asked participants why they started gardening and whether mental or physical wellbeing was a consideration when they started. Only one of the participants considered how gardening would affect their mental wellbeing when they started gardening as an adult; Gardener 9 noted, "I have always seen gardening as something that makes me feel happy." The lack of consideration by the other four with regard to how gardening would affect their mental wellbeing is not surprising; as noted earlier in the analysis of Question 1, gardening is likely part of their family culture so starting your own garden is just one of the things you do when you reach adulthood. None of the five discussed physical wellbeing, but all of them discussed financial wellbeing.

The main theme for this question is "providing for the family," since producing food not only feeds the family but also saves money which can be spent on other necessities. All five interviewees listed this as a reason to start gardening, but of the five, Gardeners 6 and 8 specifically noted they chose to start gardening so they could grow their own food *organically*. Buying organic food is expensive, so growing their own produce using organic methods saved money. Gardener 8 ended her discussion with, "I can taste the love in the food I grow." This leads to the secondary theme for this question which is that gardening provides an outlet for "passion or creativity." Gardeners 1 and 4 both saw this as a large reason to start and continue gardening. Gardener 4 described himself as a "mad scientist" trying to figure out "what varieties can you get to grow...what different pHs do you need...after you soil test what do you need to add?" Gardener 1 simply stated "gardening indoors or outdoors is just something I enjoy and it's a passion of mine."

Of the five, only Gardener 1 went on to explain about the mental health benefits she discovered later as she gardened. Gardener 1 noted that during the time she struggled with depression, she

also longed to garden, “having plants outside in a garden has been, it’s been something I’ve been wanting to do for the past six years since I’ve been married with my husband.” Last year they moved, and she was finally able to start her garden:

I’ve got four acres now that I can have a little bit of room to actually make a huge garden. So that’s where I wanted to get started, actually doing one...it gets me outdoors and gets me something to do that I will continue on doing...if you start a garden, you kind of keep going on with it. You can’t just stop right in the middle of it. So it kind of helps me get out and just continue on with it to keep it thriving.

From this answer it appears that Gardener 1 found having a large garden to be motivating, something she had apparently been struggling with due to depression. This makes more sense when seen in the light of comments Gardener 1 made later in the interview, when she provided a more detailed account of her depressive episode.

I lost my [sibling] seven years ago...And I went through a really bad depression for a while...I lost most of my hobbies...I [started rescuing] plants from Walmart <laugh>...these plants just really brightened up my moods [and] my husband noticed...he would, every once in a while, give me a plant that was different or unique and I would add it to my collection. And then when I started this garden this year, he definitely noticed a difference...I actually enjoyed coming home and doing things. Usually I’d come home and just either play with my kids or I’d sit down and just do nothing...[now] I’ve got this new garden and he has noticed a huge difference in my activity...I ask my kids if they wanna come help me, and they come out and we all play in the sprinklers...So I think there is a tie between grieving and gardening that, uh, helps with the grieving part.

From this excerpt, it appears Gardener 1’s need for motivation extended from the loss of her sibling and the resulting functional depression that left her amotivated to do almost anything beyond the requirements of her family and career. Nurturing plants back to health started her road to recovery, but not until she was able to start her “huge garden” did Gardener 1 – and her husband – see major improvements in her mental health. Spending hours outside in the fresh air and sunshine certainly helped, but perhaps the all-encompassing task of starting and maintaining a large garden through the eight-month Oklahoma growing season provided Gardener 2 with the long-term purpose and motivation she needed to rediscover her joy. The fact that Gardener 1’s husband and children work and play in the garden with her is testament to the meta-theme of “close relationships” being intimately intertwined with gardening and wellbeing. Without the support and active engagement of her husband, one questions whether Gardener 1, on her own, would have found the impetus to start her road to recovery via that huge garden.

Question 5 (Table 4) asked participants to elaborate on the phrase “providing perspective” since it was a theme found with both gardening and volunteering. The themes for this question are “purpose” and “continuity,” seeing one’s reason to be here, and also how one fits into the circle of life. Only Gardeners 1, 4, and 8 discussed this and each had a slightly different take on it. Gardener 4 focused on the purpose he found in his almost 50 years of volunteering in humanitarian groups, including the Master Gardener Program; he derives purpose from helping

others: “you're out there to help people solve problems and...get things...accomplished.” Gardener 8 focused on the spiritual aspect of “providing perspective,” noting that gardening “resets your brain” by helping us “appreciate the greatness of the whole around us” as can be seen when “things continue on even when life is crazy.” Gardener 1 agreed that “providing perspective” relates to both “purpose” and “continuity.”

I love watching how things progress...start with a small seed until it gets to a big plant and actually starts producing its own fruit... it's really inspiring to me and...my children... and providing this information and this education to other people and helping them get their own garden started...I've had a lot of people come in and say, I'm about to give up on my tomatoes...I keep telling them...if you keep them going...Once it starts to cool off...you'll actually start seeing some more production... it's really exciting whenever I get some people that have been able to get something back from that.

Like Gardener 8, Gardener 1 found perspective in the continuity of seeing things grow from start to finish, and like Gardener 4, she found perspective in her life's purpose. In Gardener 1's case, her purpose includes both helping others problem-solve and *motivating them to persist*, a motivational need with which she is intimately familiar.

Interpretation of Results, Future Study, and Implications

Through thematic analysis of two waves of data, this phenomenological study appears to have identified interpersonal relationships as a connection between gardening and improved wellbeing that is worth closer investigation. Several studies note that increased social interaction is related with increased wellbeing, especially as seen in vulnerable populations, but few have delved into how this occurs through social interaction (Dyg et al., 2019). Considering survey and interview responses in this study, at least two avenues *which have previously not been identified* exist between interpersonal relationships and gardening and warrant further study: spousal-type relationships and intergenerational-type relationships. The avenue of spousal-type relationships is not targeted toward finding a spouse or significant other but is rather focused on those who already have this type of relationship; however, individuals considering long-term relationships may benefit from this information. Gardening provides a common constructive goal which two adults can work toward together (like providing food for the family or others), while also nurturing their individual needs through the division of labor along lines of strength, talent, and passion. In this way, gardening has the potential to improve the wellbeing of each individual in the relationship, and therefore the relationship as a whole. This healthy spousal-type relationship dynamic leads to the discussion of intergenerational relationships between adults and children. Intergenerational relationships focused on adults actively instructing children about nature and gardening in a garden setting has a strong potential to socialize children into valuing and adopting gardening as a healthy, constructive activity that supports wellbeing and can be enjoyed throughout their lifespan. These regular, positive, adult-child experiences may also help support wellbeing by providing children with purpose, a broader perspective, and positive memories to fall back on as they age.

While “purpose” did not emerge relative to the gardening items, the fact that the study participants were volunteer gardeners indicates that “purpose” may still have some explanatory power with

gardening and close relationships and also should be investigated in the future. Purpose emerged in volunteer items 12 and 14, the combined volunteer/gardening item 15, and in the discussion of time spent on volunteer activities. “Purpose” seems to center on helping others, specifically helping them solve problems and providing motivation to move forward. Anyone who has worked with people knows it is much easier to motivate and problem-solve when you have a relationship with the person who is struggling. It is also important to consider that, even though problem-solving itself is personally rewarding, the appreciation, enjoyment, and vicarious relief one experiences when helping another person solve a problem is also a great boost to the helper’s personal wellbeing. Considering these aspects, “purpose” likely has a large component based in interpersonal relationships and should be studied further.

While “close relationships and gardening” may seem somewhat nebulous, there is at least one relatively simple way to apply this information with children which could have a large impact: integrating the intergenerational aspect of gardening in schools. This is an especially attractive idea for smaller rural schools as they are more likely to have access to the local resources needed to build a fenced-in container garden. Container gardens are relatively inexpensive, with the school providing a fenced-in space, local patrons donating topsoil and containers (e.g., empty cattle protein tubs, 5-gallon buckets, or grow bags), and local retirees sharing their years of gardening expertise. Combining efforts with a local retirement village is certainly worth considering as it would provide purpose for both the students and the retired adults. Having retired volunteers regularly work with students outside in the garden can help both get exercise, spend time outdoors, apply math and science principles in the real-world, and develop a close nurturing relationship focused on positive activities; thus providing a healthy context in which students develop personal wellbeing and learn the skills needed to maintain that wellbeing in the future.

Limitations of the Study

This phenomenological study used retrospective participant interviews to gather information on how gardening and volunteerism affects participant wellbeing. As a retrospective, the data collected cannot be viewed as longitudinal, but rather as personal perceptions of longitudinal effects. The study included 11 participants, 10 of whom were women. For a qualitative study, 11 is considered a moderately sized study (Creswell & Creswell, 2017), but low-n studies are seldom representative of larger populations. With the exception of gender, the demographics of this group well-represented the general population of southeastern Oklahoma, which was unexpected. While the findings will likely generalize well to women in Oklahoma and generalize relatively well to women in similar rural southern states, caution should be used in generalizing beyond that.

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Appendix A: Digital Survey

In this study, we are trying to answer two research questions:

- What effects to their wellbeing do people perceive when they engage in gardening?
- What effects to their wellbeing do people perceive when they engage in volunteerism?

Please respond to each of the following questions to help us answer these two big research questions.

Demographic Items

1. Age (18-29, 30-39, 40-49, 50-59, 60+ years)
2. Gender (Female, Male Non-binary, Prefer to not say)
3. Race/Ethnicity (Asian/Pacific Islander, Biracial/Multiracial, Black/African American, Hispanic/Latinx, Native American, White/Caucasian, Other ____)
4. Work Status (Part-time, Full-time, Retired, College student, Stay-at-home parent, Looking for work, Other ____; check all that apply)

Survey Items

1. What made you decide to volunteer in a Victory Garden?
2. What types of gardening do you engage in?
3. How many years have you been gardening?
4. In the spring and summer, how much time do you average each day working in the garden (yours and/or others)?
5. In the fall and winter, how much time do you average each day working in the garden (yours and/or others)?
6. How did you learn to garden?
7. Describe how gardening affects your mental wellbeing and your spiritual wellbeing.
8. Describe how gardening affects your physical wellbeing and financial wellbeing.
9. Describe how gardening affects the wellbeing of your relationships and your wellbeing in any other way that has not been asked.
10. If you have completed the OSU Master Gardener Program, what made you decide to do that?
11. Approximately how much time per week do you volunteer in your local community?
12. Describe how volunteering affects your mental wellbeing and your spiritual wellbeing.
13. Describe how volunteering affects your physical wellbeing and financial wellbeing.
14. Describe how volunteering affects the wellbeing of your relationships and your wellbeing in any other way that has not been asked.
15. Are there any additional benefits you see specifically related the combination of volunteer gardening, and if so, what are they?
16. If you would like to take part in a short interview (10-15 minutes) to elaborate on your answers, please provide your first and last name and telephone number.

Appendix B: Follow-up Interview Questions

1. Generational influence was a theme found in the responses. Do you personally have any generational family connections with gardening?

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2. Many people reported relationship improvements with spouses when gardening. Please elaborate on the spousal connection and gardening.
 3. Please elaborate on what exercise/gets me moving means to you.
 4. As an adult, why did you start gardening? Was mental or physical wellbeing a consideration or was it something you noticed after you started?
 5. “Providing perspective” was a theme found with both gardening and volunteering, please elaborate on what that means to you for both gardening and volunteering.
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