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# Health and Well-being Benefits of Gardening: A Comparative Study among Gardeners and Non-Gardeners in the Philippines

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## ABSTRACT

**Aim:** This study aimed to assess the health and well-being benefits of gardening between gardeners and non-gardeners. **Methods:** A total of 400 respondents participated in the study which was equally sampled between gardeners and non-gardeners. Criterion sampling was utilized in the participant selection. The study utilized standardized questionnaires and was conducted in Central Philippines early quarter of year 2021. The study utilized a quasi-experimental post-test only design. *T*-test of independent samples was utilized in the analysis. **Results:** Results revealed that gardeners have considerably higher reports of good health (M=3.40, SD=0.48), higher resilience (M=3.82, SD=0.51) and displayed significantly higher reports of coping (M=3.82, SD=0.56) than non-gardeners. Non-gardeners on the other hand showed to be more fearful of COVID-19 than the gardener group (M=3.26, SD=0.63). **Conclusion:** Gardening activity is beneficial in maintaining a person's perceived health and well-being especially in times of distress and social isolation. People who engage in gardening activities are better at adapting to change, making them more resilient and adjusted from grief and loss of a loved one. It is recommended to incorporate gardening as an adaptive means in improving the public's health and well-being especially at times of health crises.

***Keywords: Gardening; Fear of COVID-19; Perceived Health; Resilience; Bereavement Coping; Psychological Well-Being; Philippines***

## INTRODUCTION

The COVID-19 pandemic has brought dramatic loss of human life in all facets most especially in terms of health. True in today's health, are the mental and physical stress caused by the fear to COVID-19 and lockdown, and fatigue from the prolonged community-wide restrictions. Additionally, there are reports of stressful life events. People are facing numerous challenges in this present time such as unstable work, loss of jobs and incomes, isolation and anxiety, and feelings of loss and bereavement following the death of a loved one (Ahrens *et al.*, 2021; Pietrabissa & Simpson, 2020). Undeniably these are contributory factors to mental stress while exacerbating the existing ones. As a result, people try to cope this situation through activities that were considered safe.

Gardening activities and its benefits has always been thought to be a relaxing recreational activity especially in this time of pandemic (Theodorou *et al.*, 2021). Not only does it provide a source for consumption, but studies also found this nature-based activity as a catalyst for enhancing social engagement and positive behaviors and healthier lifestyle (Dietz, 2012; Janke *et al.*, 2008). Gardening was integrated as a positive family-inclusive activity to adopt and cope mentally in the pandemic. Growing plants and vegetables in their own gardens have fostered family's creativity to express their boredom and find sense of security and fulfillment especially when health restrictions were implemented.

The healthcare community began to integrate healing therapies through gardening to facilitate it as a complementary therapy in addition to conventional ones (Soga *et al.*, 2017; Thompson, 2018). Horticultural therapies has become popular form of rehabilitation especially in nursing and occupational therapy (Mizuno-Matsumoto *et al.*, 2008). The involvement in gardening and exposure to green spaces have shown positive effects to patients suffering from depression and anxiety, cardiovascular diseases, obesity and diabetes, and neurovascular disease (Beyer *et al.*, 2014; Lachowycz &

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Jones, 2012; Maas *et al.*, 2009; Mizuno-Matsumoto *et al.*, 2008). Moreover, there are scholars who promoted the integration of green activities in coping for loss, self-healing, and recovery from grief (Machado & Swank, 2019).

While there is increasing studies on gardening benefits on a person's subjective health and well-being, very few studies tried to establish its difference among those who do not engage to these activities. This present study took the opportunity to determine the benefits of gardening to health and well-being among the general population during time of pandemic. To assess the difference of the two groups, the following is hypothesized:

H1: There is no significant difference between the gardener and non-gardener group in terms of:

A. Health
B. Fear of COVID-19
C. Perceived Stress
D. Resilience
E. Bereavement and Loss Coping

## METHODOLOGY

### Research Design

This study is a quantitative, comparative research utilizing a quasi-experimental non-equivalent post-test only group research design.

### Respondents

The overall respondents of the study composed of 400 respondents which were divided into two: the gardener and non-gardener with equal number of participants at 200 samples per group. The participants for the gardener group were recruited using convenience method bounded on the inclusion and exclusion criteria. Inclusion criteria includes: (1) legal age; (2) owns a garden in home setting for more than 6 months, (3) has lost a loved one within the past four years and is (4) willing to participate. To minimize possible bias, individuals who does gardening for a living was excluded. All participants were aged 18years and above. On the other hand, the inclusion criteria for the non-gardener group includes: (1) legal age, (2) does not own a garden at home, (4) has lost a significant other or a loved one within the past four years, and is (3) willing to participate. Excluded are those who have family members who are into gardening.

### Instruments

The researchers utilized standardized scales to gather the needed data. The following tools were used in assessing the participants health and well-being.

*Fear of COVID-19 Scale*. The FCV was a scale used to assess and examine participant's fears to COVID-19. This tool composed of a 7-item Likert scale, with a 5-point scoring system described as "strongly disagree," "disagree," "neutral" "agree" and "strongly agree". The possible lowest score is 1 and highest score of 5 for each item. The internal consistency test shown a value of =0.82 and test-retest reliability (ICC=0.72) (Ahorsu *et al.*, 2020).

*Health Orientation Scale*. To assess the participants' health, the Health Orientation Scale particularly the perceived health status scale was utilized. Originally, the scale is composed of a 5-Point Likert-scale system scored and described as 1="not at all characteristic of me" to 5= "every characteristic of me." The adapted version made for the study composed of 5-item scale focusing on the perceived health status subscale. The subscale has an acceptable internal consistency value of $\alpha$=0.79 (Snell *et al.*, 2013).

*Perceived Stress Scale.* The perceived stress scale was utilized to determine the respondents' perceived stress. The tool was originally designed to measure the degree of condition of past events to which respondents perceived it as a stressful event. The scale is composed of 10 item scale in a 5-point system Likert scale from 1="never," to 5= "very often". The scale showed acceptable internal consistency based on the Crobnach's =0.78 (Cohen and Williamson, 1998).

*Brief Resilience Scale.* The Brief Resilience Scale was used to determine the participant's ability to recover from tension and stress. The scale is consisting of 6-items in a 5-point Likert scale where the participants can score based on agreement. The scoring is between 1 to 5 described as "strongly disagree" and "strongly agree" respectively. The scale has an internal consistency value of =0.69.

*Coping Assessment for Bereavement and Loss Experiences.* This scale was used to assess the specific coping strategies to bereavement and loss experiences of the participants. The scale presents a good reliability

score of α=0.80 (Crunk *et al*., 2017). The scale is composed of 11-items using a 5-pont Likert scoring system. The participants were made to choose their level of agreement based on the following descriptors: 1 (strongly disagree), 2 (disagree), 3 (Neutral), 4 (agree), and 5 (strongly agree).

For the present study, all scales were able to display adequate to excellent internal consistency based on the Cronbach's alpha value of 0.86, 0.72, 0.94, 0.98, and 0.98 respectively.

**Data Gathering and Ethical Considerations**

This study was ethically reviewed and approved by the Visayas State University College of Nursing Research Review Committee and was assigned a code:RES-CON-S2020.08 dated March 8, 2021. Data gathering was initiated after obtaining ethical clearance. This was facilitated by the use of both online and printed questionnaires. Due to restrictions in force for COVID-19, initially online data collection was done. A web survey link was sent to the selected participants messenger app or emails. To reach the desired target samples, the researchers went to other districts without internet access and distributed printed questionnaires. The researchers ensured the validity of the participants by observing the selection criteria and counter checking the initially gathered online participants.

**Data Analysis**

The data was collated and organized using the SPSS version 23 software. The data was analyzed using Descriptive statistics such as frequency, means and standard deviations to examine and present the demographic attributes of the respondents.

To answer the hypothesis of this study, unpaired T-test was done to determine the presence of differences between the two unrelated groups. Unpaired T-test or also called as independent t-test is a type of t-test that uses the mean or average of two independent or unrelated groups to compare both group if they have significant differences. It helped in testing the null hypothesis and determine if the alternative hypothesis of the study is true. Cohen's D was also used to determine for the magnitude of difference in variables between two groups.

**RESULTS**

Table 1 presents the profile of the participants. A total of 400 respondent participated, with 200 for each group were identified as gardeners and non-gardeners. Gardener characteristics include majority between 21-30 years old. Results revealed that majority of the gardeners were female (61.5%), aging 21-40 years old (53%) married (47%), has finished undergraduate studies (69%) and are self-employed (66%). Meanwhile, the non-gardeners were also female (50.5%), aging between 21-40 years old (73.5%), and are single (68.5%), most were students (47.5%) on their college years (91%).

***Table 1: Demographic Profile***

| Variables | Gardening *(n=200)* | | Non-Gardening *(n=200)* | |
|---|---|---|---|---|
| | *f* | *%* | *f* | *%* |
| **Age** | | | | |
| 20 and below | 11 | 5.5 | 28 | 14.0 |
| 21-40 | 106 | 53 | 147 | 73.5 |
| 41-60 | 63 | 31.5 | 25 | 12.5 |
| 61 and above | 20 | 10 | 0 | 0 |
| Total | 200 | 100.0 | 200 | 100.0 |
| **Gender** | | | | |
| Bisexual | 2 | 1.0 | 6 | 3 |
| Female | 123 | 61.5 | 101 | 50.5 |
| Gay | 9 | 4.5 | 13 | 6.5 |
| Lesbian | 7 | 3.5 | 0 | 0 |
| Male | 59 | 29.5 | 80 | 40 |
| Total | 200 | 100.0 | 200 | 100.0 |
| **Marital Status** | | | | |
| Single | 85 | 42.5 | 137 | 68.5 |
| Married | 94 | 47 | 52 | 26 |
| Separated | 8 | 4.0 | 0 | 0 |
| Widow | 13 | 6.5 | 11 | 5.5 |
| Total | 200 | 100.0 | 200 | 100.0 |
| **Education** | | | | |
| Elementary | 28 | 14.0 | 0 | 0 |
| High-School | 35 | 17.5 | 13 | 6.5 |
| College | 69 | 34.5 | 182 | 91.0 |
| Post-graduate | 68 | 34.0 | 5 | 2.5 |
| Total | 200 | 100.0 | 200 | 100.0 |
| **Employment** | | | | |
| Employed full - time | 32 | 16.0 | 64 | 32.0 |
| Employed part - time | 12 | 6.0 | 1 | 0.5 |
| Retired | 21 | 10.5 | 7 | 3.5 |
| Seeking | 14 | 7.0 | 7 | 3.5 |
| **Opportunities/Unemployed** | | | | |
| Self-employed | 66 | 33.0 | 26 | 13 |
| Student | 55 | 22.5 | 95 | 47.5 |
| Total | 200 | 100.0 | 200 | 100.0 |

Table 2 presents the results of the independent sample test between the two groups. Among the key five key variables in the study, only stress did not show significant difference between the two groups. It revealed that gardeners have considerably higher reports of good health (*M*=3.40, *SD*=0.48) as compared the non-gardeners (*M*=3.07, *SD*=0.40), *t*(398)= -7.583, *p*=0.001), with an effect size of 0.6875. Similarly, fear of COVID-19 was expressively higher in non-gardeners (*M*=3.26.SD=0.63) as compared to gardeners (*M*=2.67, *SD*=0.82), *t* (398)=8.168, *p*=<0.001) with an effect size of 0.7195. Moreover, it was found that gardeners have significantly higher resilience (*M*=3.82, *SD*=0.51) than their counterparts (*M*=3.17, SD=0.48), *t* (398)= -13.419, *p*=<0.001) and effect size of 1.2745. Finally, results found notable difference in terms of bereavement coping between gardeners and non-gardeners as the former displayed significantly higher reports of coping (*M*=3.82, *SD*=0.56) than non-gardeners (*M*=3.31, *SD*=0.46), *t*(398)= -9.915, *p*=<0.001) with an effect size of 0.9107.

***Table 2: Independent Sample Test***

| Key Variables | | Mean | SD. | *t* | df | *p* | Mean Difference | SE Difference | 95% Confidence Interval of the Difference | | Glass's Delta |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Lower | Upper | |
| Fear of Covid 19 | A | 2.67 | 0.82 | 8.168 | 398 | <0.001 | 0.59 | 0.073 | 0.453 | 0.741 | 0.7195 |
| | B | 3.26 | 0.63 | | | | | | | | |
| Health | A | 3.40 | 0.48 | -7.583 | 398 | <0.001 | -0.33 | 0.044 | -0.421 | -0.248 | 0.6875 |
| | B | 3.07 | 0.40 | | | | | | | | |
| Perceived stress | A | 3.14 | 0.39 | -0.875 | 398 | 0.382 | -0.03 | 0.041 | -0.116 | 0.044 | 0.1025 |
| | B | 3.10 | 0.43 | | | | | | | | |
| Resilience | A | 3.82 | 0.51 | -13.149 | 398 | <0.001 | -0.65 | 0.049 | -0.754 | -0.558 | 1.2745 |
| | B | 3.17 | 0.48 | | | | | | | | |
| Bereavement and Loss Coping | A | 3.82 | 0.56 | -9.915 | 398 | <0.001 | -0.50 | 0.051 | -0.607 | -0.406 | 0.9107 |
| | B | 3.31 | 0.46 | | | | | | | | |

*A - gardener*
*B - Non-gardener*

Based on these results hypothesis H1 A, B, D and E was rejected respectively as it failed to show significant difference in our analysis.

## DISCUSSION

This study aimed to determine differences between gardener and non-gardeners in terms of their health and psychological well-being. It was hypothesized that there are no variances concerning the two groups in terms of health, fear of covid-19, perceived stress, resilience and bereavement coping.

The results revealed that gardeners perceived their health status way better than non-gardeners based on the significant difference in their mean scores. Results of the present study showed that the difference in terms of health among these groups suggests that gardening is beneficial to a person's perception on their general sense of health. This result is similar to the growing literature on the claims of various scholars on how gardening reduces stress, improves health and life satisfaction. This result is similar to that of the meta-analysis study of Soga *et al.* (2016), who revealed that gardeners had better health than non-gardeners. Similarly, the literature discussed how gardens and gardening help improve a persons' holistic self (Howarth *et al.,* 2020). Similarly, outcomes of the study of Machado & Swank (2019), have shown a substantial benefit of communal gardening and the formation of healthy habits which encompasses daily engagement in physical activities. Additionally, there are reports that involvement in rural community gardening provides health-related advantages, including physical, nutritional, social, and psychological benefits (Sanchez & Liamputtong, 2016). These reports suggested that the act of gardening can be translated to healthy habits such as frequent exercises, conscious eating of nutritious foods, and increase in societal interaction. When a person is engaged in such, they are better able to demonstrate

promising and favorable connections in the community through healthy lifestyle as compared to those who are not into gardening.

Moreover, it was found that non-gardeners fear the COVID-19 as compared to the gardener group. This study is the first to present the finding on the difference between those engaged in green activities and those who are not. Although there is a scarce literature to support this claim, nevertheless, gardening is found to improve a person's coping in this time of the pandemic (Rhaman *et al.*, 2020). Factors, including uncertainty on its transmissibility, viral mutations, and discrepancies on the effectiveness of available vaccines have heightened public fear towards COVID-19 (Rodríguez-Rey *et al.*, 2020). It can be surmised that e coping is enhanced by the effect of gardening, gardeners are able to deal on their fear towards covid-19 more positively.

Another relevant finding from this study is the difference in resilience between the gardener and non-gardener groups. Based on the analysis it was found that gardeners are more resilient than their counterparts. This finding is similar to the study of Koay & Dillon (2020), who found optimism and increased resilience among those who engaged in community gardening. Gardening engages a person with the natural environment and helps in boosting their physical and mental health. These benefits primarily contribute in regaining stress from mental fatigue, and acts as a safeguard for future stressful events. Resilience is improved when a person engages in doing gardening activities because it evokes feelings of calmness and pleasure which is conducive for stress restoration. For instance, literature discussed the embracing of the environment through gardening-related activities act as a form of therapy which aids in addressing depression and self-improvement (Beyer *et al.*, 2014; Clatworthy *et al.*, 2013). Other scholars have likewise discussed the role of gardening helped in building personal resilience during life crisis situation and the pandemic and its effect on psychological distress and lockdown exhaustion (Camps-Calvet *et al.*, 2021).

Finally, the study was able to find the difference between the two groups in terms of their bereavement and loss coping. Their mean scores suggested that gardeners cope better than the non-gardeners. Bereavement is known to be associated with psychological distress (Chirinos *et al.*, 2018, Prior *et al.*, 2017) and is essential to be given attention especially that the pandemic adds another challenge. The results supported the growing studies on the restorative effect of gardening towards a persons' therapeutic coping of grief. Gardening is beneficial because of the wide range of health outcomes including reduction of stress, apprehension and angst, mood stabilizing effects, encouraging exercise, and improving a person's sense of belongingness (Machado & Swank, 2019; Soga *et al.*, 2016)

### Limitations of the Study

This study has several limitations. First, the use of convenience sampling in the selection of samples is not without bias. Future researchers are encouraged to utilize a more sophisticated participant selection to minimize selection biases. Secondly, there may be other factors that could explain the difference between the two groups which were not considered in the analysis used in this study. It is therefore suggested to utilize data analysis procedure that would look into this variance.

### Nursing Implications

Based on the findings of this present study, important implications that can be established. First, gardening is a form of horticultural therapy for patients that may help in improving a person's perceptions of health and psychological well-being. Likewise, it would also be beneficial to both patients and health care provider to integrate these restorative effects of gardening as a complementary therapy since it is natural and cost effective. As most findings focus on building resilience despite adversities, this paper channels a positive outlook in life. In stressful situations or health crises such as pandemic, gardening has been found to have an impact in reducing stress, improving resilience and building up coping. Gardening may be introduced as a means to further improve physical and mental health. Plant cultivation during this pandemic may help people to improve their physical and mental health through means of stress and anxiety reduction brought by fear to COVID-19. Gardening activity can uplift the quality of life through forming healthy practices such as involving in physical activities which may contribute to an improved state of health and well-being.

## CONCLUSION

Gardening activity is beneficial in maintaining a person's perceived health and well-being especially in times of distress and social isolation. People who engage in gardening activities are better in adapting to

change, making them more resilient and increase the ability to adjust with grief and loss of a loved one. It is recommended to incorporate gardening as an adaptive means in improving the public's health and well-being especially at times of health crises.

**Conflict of Interests**

The authors declare that they have no conflict of interests.

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