



Program Evaluation of Horticultural Therapy for Victims of Domestic Violence

Final Project Report (April, 2013)

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1. INTRODUCTION

1.1. What is Horticultural Therapy?

The evolution of psychotherapy has seen the growth of a number of novel therapeutic approaches taking root in arts, dance and nature. Among these is horticultural therapy, which emerged in the 1950's as a tangent to occupational therapy, and uses a person-plant interaction framework for physical, psychological and emotional healing. Conventionally, therapy takes place in 'healing gardens', accessible spaces dominated by plant materials (Niklasson, 2007) with well defined perimeters (Coulter, 1999). Such gardening appreciation experiences allow passive healing (Ogle, 2008) whilst engaging in more active participatory activities, such as cultivation and maintenance of vegetation, enable clients to contribute more directly towards their own growth and healing (Chalquist, 2009).

Many disciplines, including psychology, now adopt the scientific paradigm where evidence-based practice forms the heart of quality care. Horticultural therapy has not received as much stringent scrutiny as mainstream therapies such as CBT, but studies that have investigated its impact and efficacy on various population groups. In the UK, horticultural therapy is most commonly used for clients with learning difficulties (Sempik & Aldridge, 2006). However, pertinent to this current proposal are studies involving individuals who have experienced long term exposure to stress or trauma at some point in their lives. For many urban dwellers, the constant immersion in metropolis is a source of chronic stress (Ulrich et al., 1991), which can be compounded by problems with anger management, often resulting in domestic

violence. Horticultural programs reduce vandalism in low socio-economic communities (Burkhart, 1972) and access to greenery, whether natural forests or man-made gardens, encourages individuals living in urban public housing to behave less aggressively and violently towards their partners (Kuo & Sullivan, 2001). In Korea, battered women in shelters also respond well to horticultural therapy with significant increases in self-esteem and reductions in depression (Lee, Kim & Suh, 2004).

Inmates, especially those with experiences of childhood abuse and domestic violence, also demonstrate lowered depression and substance use following horticultural therapy as compared to controls (Rice & Lremy, 1998). For asylum seekers or refugees, horticultural therapy helps to alleviate trauma associated with displacement and resettlement (Tristan & Nguyen-Hong-Nhiem, 1989; Griffiths, 2001). Horticultural programs also improve self-worth and mood for homeless individuals (Niklasson, 2007).

Mind Publications (2007) conducted a survey which found that 90% of people who took nature walks reported improved self-esteem and mood, and lowered anger and tension. Spending time in gardens, especially tending to plants, can also foster emotional restoration (Barnes, 1996; Betrabet, 1996). Several mechanisms have been proposed to explain the positive effects of interacting with nature. Biophilia, the idea that humans are naturally drawn to nature (Wilson, 1984), has found support in a number of studies where access to nature, e.g., viewing pictures of natural scenes, produced physiological changes that correspond to the activation of the parasympathetic nervous system responsible for relaxation (Ulrich et al., 1991).

Kaplan's Attention Restoration Theory (1995) claims that natural environment can heal individuals with 'mental fatigue' – a worn out state of mind with compromised direct/voluntary attention, caused by chronic stress or trauma. The sensory stimuli in nature attract individuals' involuntary attention, similar to meditation, and allow

individuals to recharge their direct attention and to inhibit internal and external impulses common in PTSD. Moreover, natural environments are considered as context with low arousal because the stimuli are less complex and intense (Ulrich et al., 1991), which is conducive to rapid recovery from stress. Interestingly, some studies suggested that horticultural therapy is effective because of the individual's exposure to dirt, which contains *M. Vaccae* bacterium responsible for changing brain chemistry (Gasser, Lowery & Orchinik, 2006; Glausiusz, 2007). Rats injected with this bacterium had higher activation of serotonin producing neurons in the brains, which is linked to elevated mood. Increases in self-esteem evident in many horticultural programs may be due to the opportunities for social interaction, creativity and self-expression (Parker, 2004). For victims of domestic violence, where they often feel helpless, nurturing plants is empowering and restores their sense of control (Ogle, 2008), as well as providing catharsis (Greene, 2009) and preparing them for reconnection with the world (Neuberger et al., 2006).

1.2. Harmony Garden and Therapeutic Horticulture

Established in 1985, Harmony House provides temporary immediate refuge for battered women and their children in Hong Kong. With an occupancy rate of 65, the shelter serviced 190 women and 179 children in 2011 to 2012 alone.

With the generous support of Community Chest, therapeutic horticulture was introduced into the shelter with the development of the "Harmony Garden" in June 2010. Over the course of three years, the project continuously improved and expanded the naturalistic environment within the shelter thereby creating opportunities for activities such as planting, crafts and cooking. Specialized

therapeutic horticulture groups as well as outside-shelter nature appreciation visits are also held on a regular basis. The Harmony Garden and various horticultural therapy or activities was expected to benefit battered women by providing social support, renewed self-worth, empowerment and recovery using nature as a metaphor for personal growth.

Trained by a professionally accredited therapist, the social worker-led horticultural therapy or activities took on various forms. Typically, therapy comprised of two components; group discussions where individuals shared with others their experiences and expectations, followed by a series of guided activities which participants can carry out together. These activities usually take place once a week, spanning a few months, and contain person-plant interactions, e.g., weeding, planting, watering, etc. Healing operates on two levels: meditative and self-explorative. For many women experiencing domestic violence, they are afflicted by residual trauma and struggle to find inner peace and relaxation. Thus, many of the activities required women to concentrate on the task, which was often repetitive e.g., weeding, which could induce a cognitive state akin to meditation. In this state, women would be more equipped to inhibit/manage intrusive thoughts or negative emotions. Other activities were designed to serve as a symbolic crutch to help women navigate their own healing journeys. The growth of plants was used as a metaphor for recovery, regrowth and new hope for the women. Over the weeks, participants tended to their plants, allowing them to feel connected and empowered as nurturers. This, in turn, helps to improve their confidence as mothers despite the inadequacy they may have internalised as a result of domestic violence. All this takes place within a group setting, allowing the women to form a strong social support network, which can help to buffer difficulties they may encounter as they forge the

next chapter in their lives.

This is a pioneering endeavor in Hong Kong to apply horticultural therapy to those affected by domestic violence. Urbanization in the city limits space and appreciation for nature. Horticultural therapy has only been gaining increasing local attention in the past decade. A handful of empirical studies in Hong Kong began demonstrating its effectiveness for nursing home elderly in boosting life satisfaction and social network while reducing loneliness (Tse, 2010); and for psychiatric patients in bringing down anxiety, depression and stress levels (Kam & Siu, 2010). Patients in palliative care also subjectively reported benefits in terms of their mood, relationships and coping with their illness (Kan, 2012). Therapy ranged from two to eight weeks with varying frequencies.

2. PROGRAM AIMS AND OBJECTIVES

An evaluation project was conducted to understand the effect of horticultural programs and therapeutic horticulture groups for women and children residing at the Harmony House shelter. The aims of the programs are as follows:

- a. To help participants increase their self-esteem and sense of control.
- b. To help participants relieve distressing emotions as a result of their trauma.
- c. To cultivate teamwork, community involvement, and respect for themselves, each other, and the environment.

3. EVALUATION PROCESS

3.1. Procedure and objective breakdown

The evaluation research for the proposed horticultural therapy program consisted of first a 9-month pilot study and an 18-month main study. The whole intervention process of the Project spanned for approximately 27 months.

3.2. Pilot study (November 2010 ~ August 2011)

To devise a study design and outcome measurements that can effectively examine the effectiveness of the Project, a pilot study with 25 women in the shelter was conducted. With assessments taken before and after the 6-session horticulture therapy groups, outcomes can be summarized as follows (please refer to the pilot study report for details).

1. Depression levels fell or was maintained for all participants.
2. Somatoform and psychoform dissociations decreased for those having attended 5 sessions but increased for those completing all 6 sessions.
3. Post trauma intrusion and hyperarousal decreased or was maintained for all participants.
4. Hope was maintained or decreased for all participants.

Focus group interviews with participants unveiled the benefits of horticulture therapy groups towards their emotional regulation, body-mind release, sense of achievement and sense of life direction (Figure 1).

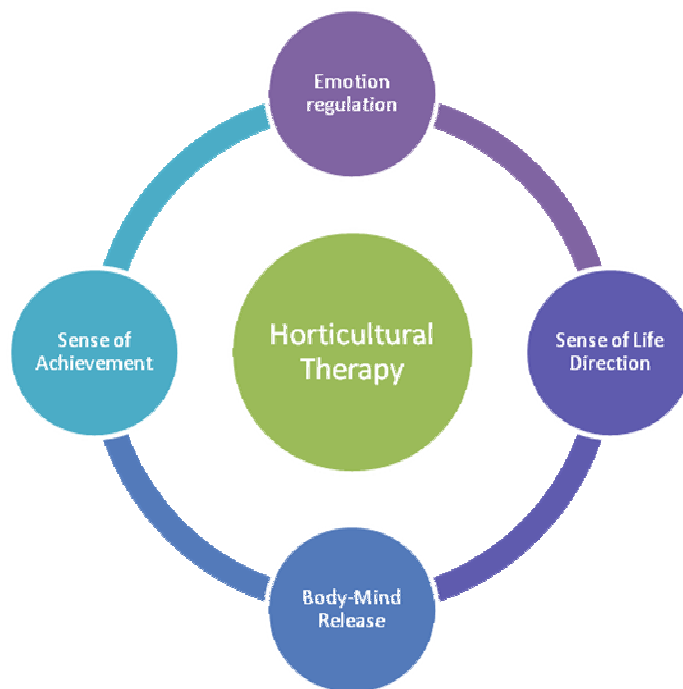


Figure 1. Themes from the pilot study focus group.

Focus group feedback offered insight to the subjective experience of participants such as emotional improvements as well as their sense of achievement which may have been missed with the use of scale measurements. The lengthiness of the questionnaire battery compounded by the difficulty in understanding questions on the Dissociative Experience Questionnaire II and Somatoform Dissociation Questionnaire led to repeated modifications of the evaluation scales selected for the main study.

3.3. Main Study

3.3.1. Participants

All women at the shelter were invited to join the horticultural programs or therapeutic groups on a voluntary basis. Children's programs and groups were also conducted. The Harmony Garden was set up as a public space within the shelter for

all to use and enjoy.

3.3.2. Study Design

Women Participants

In view of feasibility and ethical concerns in setting up a control group as well as limiting participants to receive horticultural intervention (horticultural program or therapeutic program) exclusively and not other interventions provided at the shelter, a quasi-experimental single-group pre-post study design was adopted in this evaluation study.

Pre-test / baseline assessment was conducted before the horticultural intervention and a post-test immediately afterwards. A comparison of scores between the pre and post assessments using T tests allowed us to examine changes to participants' well-being.

Participants' satisfaction with the intervention as well as focus group interviews will further help us understand the subjective benefits of the horticultural intervention for this population.

Children Participants

A similar quasi-experimental pre-post design was adopted for horticultural interventions (horticultural programs and groups) for children. Older children able to read and write (6 – 18 years old) filled out questionnaires while younger children (3 – 5 years old) were asked to draw and had assessments filled out by their mother or social workers.

3.3.3. Assessment Measures

Evaluation for Women Participants

The package of assessment measures for women, school children and young children consist of the following measurements.

1. *Demographic information* of participants including their age and education level.
2. *Compliance and satisfaction with the horticultural therapy program*
Questions tapping participants' compliance and satisfaction with the horticultural therapy program were developed through a focus group interview with an expert panel consisting of group workers of the horticultural program and social workers at the shelter.
3. *Distress and Anxiety thermometers*
As a measure of emotional regulation and ventilation two thermometers were selected from the emotional thermometers tool (Mitchell, Baker-Glenn, Granger, & Symonds, 2010) to give a simple and accurate evaluation of the user's overall distress and anxiety levels, including a list of what caused such emotions. While the anxiety thermometer has yet to be validated for the Chinese population, the distress thermometer has been demonstrated to reliably screen for distress among Chinese cancer patients (Tang, Zhang, Pang, Zhang, & Song, 2011).
4. *Patient Health Questionnaire (PHQ-9)*
The PHQ-9 is a rating of depression (Spitzer, Kroenke, & Williams, 1999) which was validated for the Hong Kong Chinese population (Yu, Tam, Wong, Lam, & Stewart).

5. *Rosenberg Self-Esteem Scale*

Self-esteem refers to positive self-evaluation and a sense of worthiness and achievement. The Rosenberg self-esteem scale is widely used measurement for self esteem in both Caucasian and Chinese populations (Cheng & Hamid, 1995; Rosenberg, 1965).

6. *Adult State Hope Scale*

The state hope scale assesses users' goal-directed energy (agency) and ways to meet their goals (pathways) on a 6-item scale (Snyder, Simpson, Ybasco, Borders, Babyak, et al., 1996). The Chinese version was translated and back translated by the team.

7. *Focus Groups*

Focus groups were conducted with randomly selected groups upon the completion of horticultural programs or therapeutic groups. Interview schedules were based on the following themes:

1. Felt changes in distress or other emotional or physical disturbances
2. Changes to their self-concepts (Sense of self-worth and accomplishment)
3. Social skills and social interaction

School children 6 and above

1. *Demographic information* of participants including their age, gender and education level.
2. *Compliance and satisfaction with the horticultural therapy program*

Questions tapping children's compliance and satisfaction with the horticultural therapy program were developed through a focus group interview with an expert panel consisting of group workers of the horticultural program and social

workers at the shelter.

3. *The Centre for Epidemiological Studies Depression Scale for Children (CESDC)*

The CESDC was adopted to assess children's depressive symptoms (Weissman, Orvaschel, & Padian, 1980; Faulstich et al., 1986). The scale has been widely used and shown good reliability and validity. The Chinese version was translated and back translated by the team.

4. *The Children's Hope Scale*

This widely used measurement assesses children's hope levels (Snyder et al., 1997). The Chinese version was translated and back translated by the team.

5. *Happiness Thermometer*

This single-item assessment was created by the team to facilitate a simple and direct evaluation of children's positive emotions.

Young children 3 to 5

As children at such a young age are unable to complete questionnaires, we adopted drawing assessments where children were asked to draw how they were feeling at that moment. This was done both before and after horticultural activities as pre-post measurements. Children were offered crayons, pencil crayons, pencils and pens as drawing medium. Pictures were assessed based on formal elements of art therapy (themes, lines, color, etc). Parents or social workers were asked to note the child's description of the drawing as well as their levels of concentration and emotionality to further substantiate observations based on the drawing.

4. MAIN STUDY PARTICIPANT PROFILES

4.1. Women participants

195 women took part in this assessment study where 189 completed the baseline pre assessments while 136 completed the post assessment. All 195 completed the compliance, involvement and satisfaction scale. The mean age was 38.15 (standard deviation 10.81) ranging from 18 to 87 years old. Most of them completed secondary education (70%) (Figure 2).

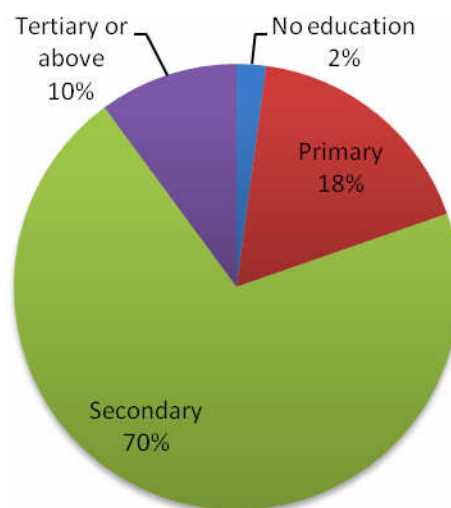


Figure 2. Education level of women participants

4.2. School children (ages 6 and above)

74 children and adolescents took part in horticultural interventions. Among them, 71 completed baseline assessments and 35 for post-intervention assessments. The average age was approximately 10 (mean age = 10.28; standard deviation = 3.25) and the majority were girls (69.4%) as shown in Figure 3. Their levels of education are

depicted in Figure 4.

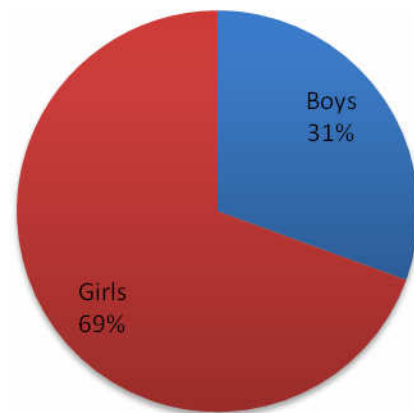


Figure 3. Gender of children and adolescent participants

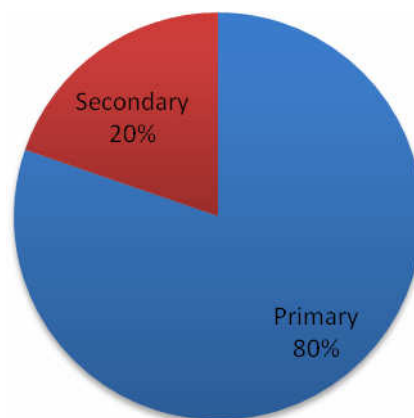


Figure 4. Education distribution of children and adolescent participants

5. OUTCOMES: WOMEN PARTICIPANTS

5.1. Women victims of domestic violence: Before and after horticultural intervention

Women participants improved in all assessed areas after horticultural intervention, including negative emotions such as depression, distress and anxiety, while elevating positive self-esteem and raising hope agency and hope pathway. Tables 1 and 2 summarize the changes to the negative and positive assessments.

	N	Pre	Post	Direction	Significance Values	Significance
Depression (PHQ)	115	12.80±6.17	9.60±5.78	↓	t(114)=5.84; p=.00	Yes
Distress (Distress thermometer)	86	8.26±2.09	5.70±2.40	↓	t(85)=10.01; p=.00	Yes
Anxiety (Anxiety thermometer)	79	8.00±2.12	5.46±2.49	↓	t(78)=8.05; p=.00	Yes

Table 1. Assessment of negative emotions

	N	Pre	Post	Direction	Significance Values	Significance
Self-esteem	76	14.63±2.30	15.22±1.98	↑	t(75)=-1.97; p=.052	Marginal
Hope: Goal directed energy	130	15.27±4.86	16.58±4.43	↑	t(129)=-3.13; p=.002	Yes
Hope: Pathways to meet goals	129	16.17±4.42	17.02±4.03	↑	t(128)=-1.95; p=.054	Marginal

Table 2. Assessment of positive attributes

5.2. Depression

Depression is highly prevalent among women under domestic violence with 84% having depressive symptoms and 64% with severe depression (Bonomi, Kernic, Anderson, Cannon, & Slesnick, 2008) with severe repercussions such as increasing the risk of further victimization and associated depressive symptoms (Lindhorst & Oxford, 2008).

Decline in the percentage of clinical depression

The Patient Health Questionnaire (PHQ-9) offers a cut-off score indicative of clinical depression risk of above 9 among Hong Kongers (Cheng & Cheng, 2007). Among the 169 women participants at baseline before horticultural intervention, a large proportion (72.2%) runs a high risk of clinical levels of depression. While such astounding levels of depression may be typical of women under domestic abuse, early intervention for these women becomes an imperative task for shelter staff.

Horticultural intervention turns out to be an effective measure to reduce levels of depression. Upon the completion of the intervention, there were 24% fewer women with clinical levels of depression. Among the 125 participants completing the post-intervention PHQ-9 assessment, less than half (48%) suffered a risk of depression.

The majority of participants had lower depression after horticultural intervention

While depression decreased in the majority of participants, approximately a third demonstrated some increase in depression despite horticultural intervention. This is expected to arise from continuous personal difficulties these women may have to face.

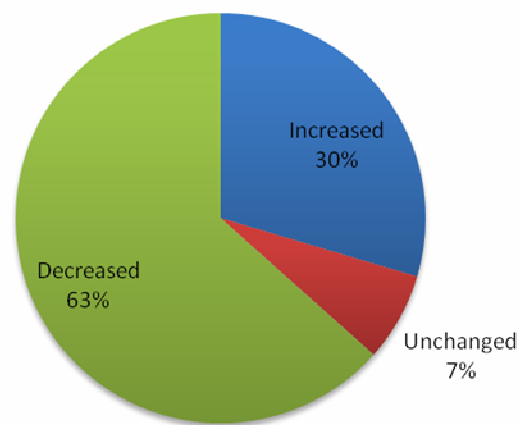


Figure 5. Changes in depression after horticultural intervention

Significant decline in the severity of depressive symptoms before and after horticulture intervention

Comparing depression scores before and before horticultural intervention found a highly significant drop ($t(114)=5.84$; $p=.00$).

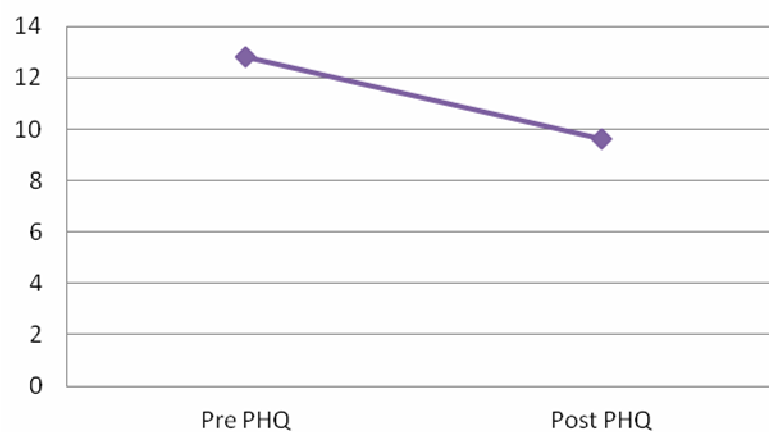


Figure 6. Changes to depression (PHQ) before and after horticultural intervention.

5.3. Distress and Anxiety

Over 70% of participants experienced a reduction in the two emotions following horticultural intervention (Figures 7 & 8).

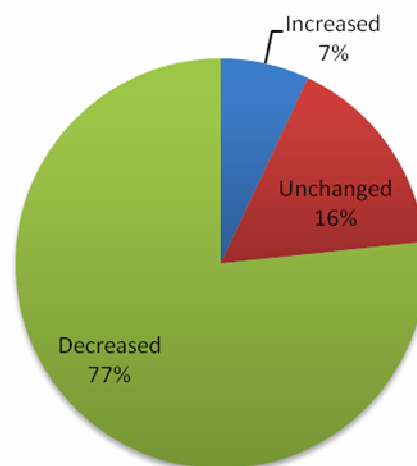


Figure 7. Changes in distress after horticultural intervention

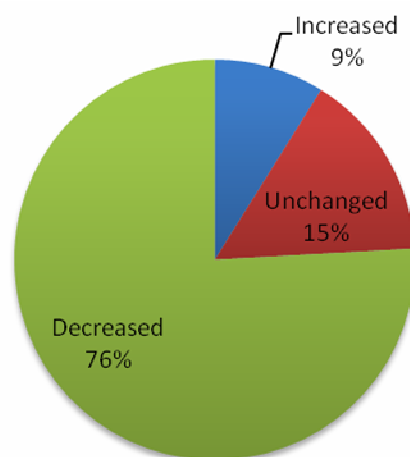


Figure 8. Changes in anxiety after horticultural intervention

Participants' perceived distress ($t(85)=10.01$; $p=.00$) and anxiety ($t(78)=8.05$; $p=.00$) both significantly decreased following horticultural intervention.

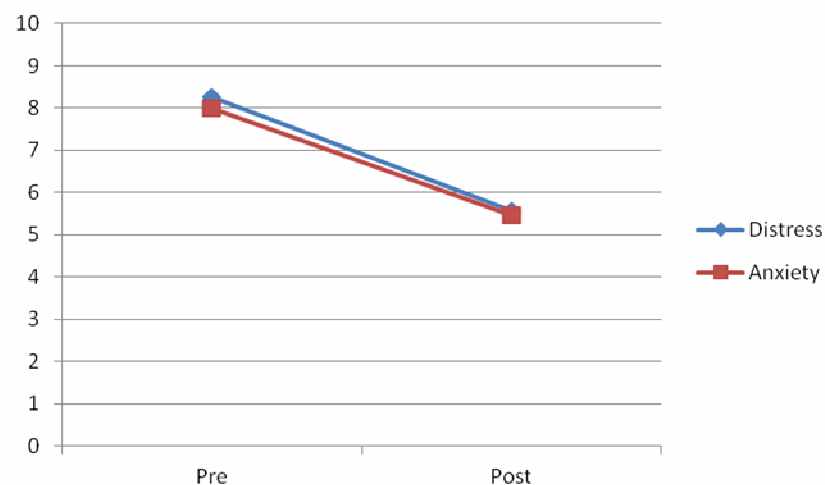


Figure 9. Changes to distress and anxiety before and after horticultural intervention.

Sources of distress and anxiety

Sources of distress and anxiety are illustrated in the figure 5. Issues related to their children (e.g. schooling, reuniting with children, parent-child relationship, custody and safety of their children), finding a place to live (loss of “home”), family relational and marital problems (broken family, decisions to divorce, addiction behaviors of their spouses or telephone harassment) and financial concerns (not being able to financially support their children on their own) are the most prevailing sources of distress and anxiety for these women. Other sources of distress or anxiety include health concerns, worries about their future, work difficulties, rumination and poor sleep, inability to share their stresses with anyone, difficulty to bear with their current problems as well as concerns about settling into the shelter.

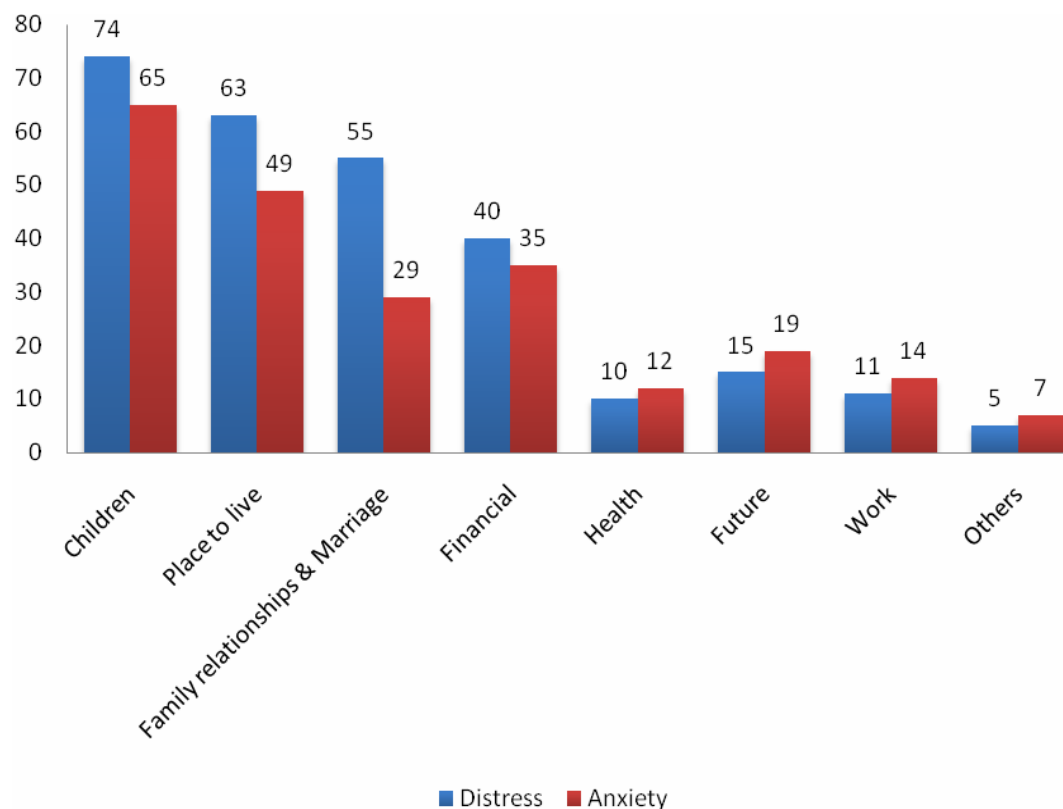


Figure 10. Sources of distress and anxiety of women participants

Knowing that their sources of distress and anxiety tend to be practical and persistent issues that cannot be directly resolved by horticultural interventions alone, it is encouraging to see their marked recovery in negative mood as a result of the naturalistic shelter environment along with the group programs or horticultural therapy.

5.4. Self-esteem

Self-esteem was raised in close to half of the participants and the increase was almost significant ($t(75)=-1.97$; $p=.052$) meaning that we can infer, to a certain degree, that horticultural intervention can raise the self-esteem of women of domestic violence.

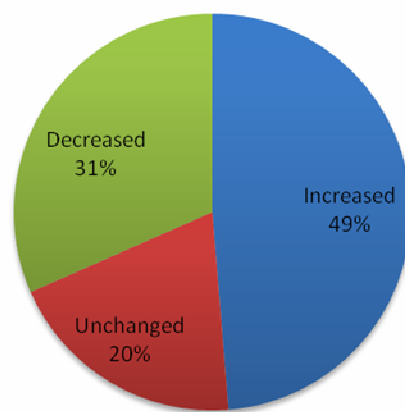


Figure 11. Changes in self-esteem after horticultural intervention

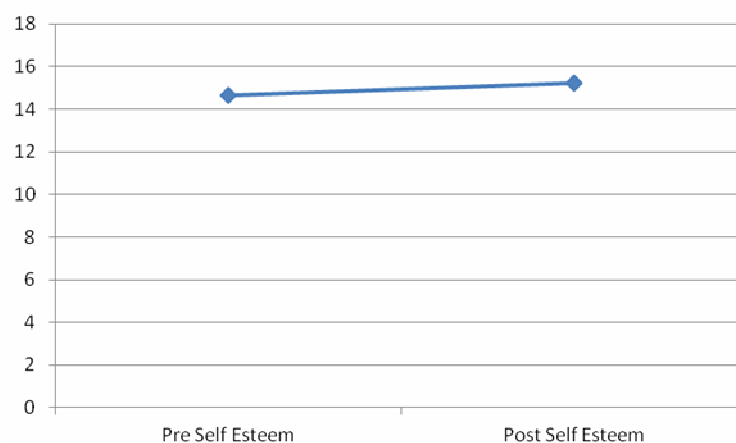


Figure 12. Changes to self esteem before and after horticultural intervention.

5.5. Hope

Hope was measured in terms of the energy directed to the goals (hope agency) as well as the ability to find ways to attain such goals (hope pathway). While the former (hope agency) was highly statistically significant ($t(129)=-3.13$; $p=.002$), hope pathways was only marginally significant ($t(128)=-1.95$; $p=.054$). Nonetheless, over half of the participants increased in both arenas of hope. After horticultural intervention, women are feeling more motivated to find solutions to their issues or to attain their goals, but may still be in the process of actively searching for ways to achieve them.

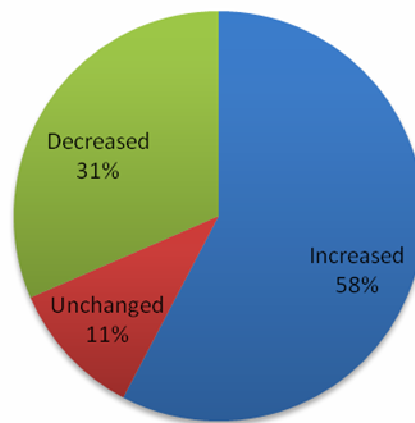


Figure 13. Changes in Hope agency after horticultural intervention

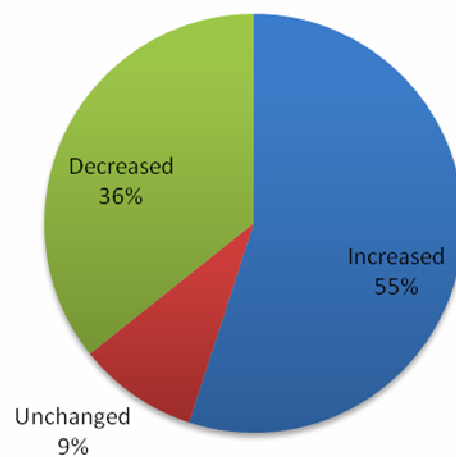


Figure 14. Changes in Hope pathway after horticultural intervention

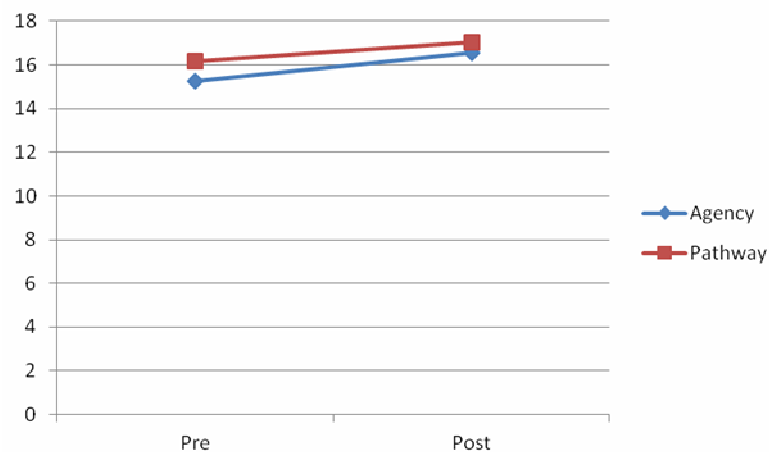


Figure 15. Changes to hope before and after horticultural intervention.

5.6. Compliance, Involvement and Satisfaction

The 195 women participants completing this survey are generally satisfied with horticultural interventions with an overall satisfaction score of 8.5 over 10. As also reflected in the focus groups, women appreciate most the naturalistic environment as well as the opportunity to communicate with others in the shelter, which could be rare if they do not participate in the shelter activities. Elements of horticultural therapy such as appreciating the beauty of nature and connection to plants scored similarly favorable scores.

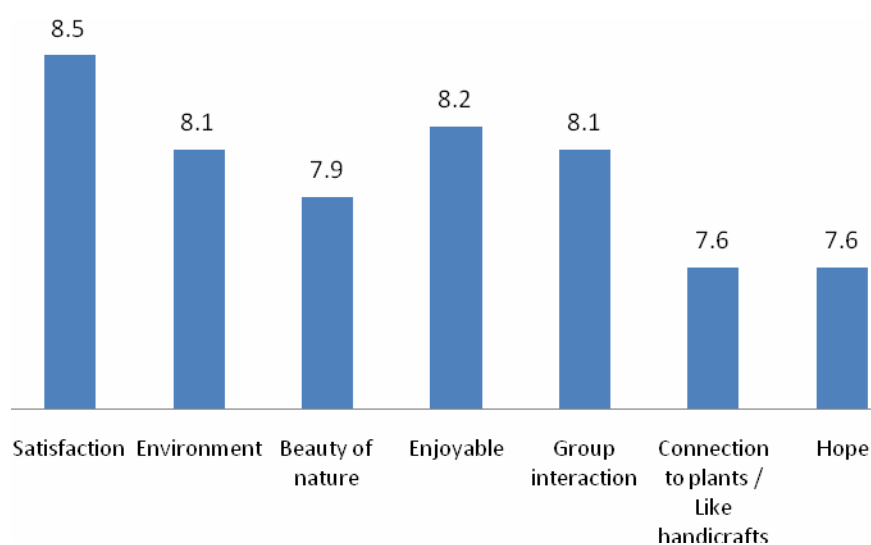


Figure 16. Feedback scores on the compliance, involvement and satisfaction scale

The vast majority of participants welcome continuing horticultural intervention activities after leaving the shelter.

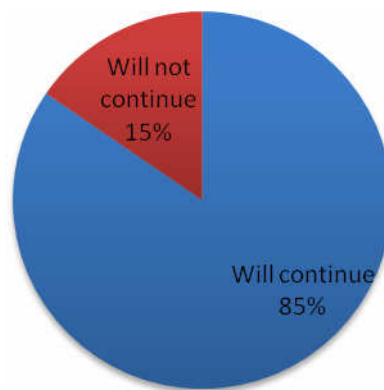


Figure 17. Willingness to continue with horticultural intervention activities upon leaving the shelter

5.7. Experience of Horticultural Intervention for Women

30 to 60-minute focus groups were held with randomly held after the completion of horticulture intervention groups. Their experience of the group is as follows:

What they enjoyed most about horticulture

For some participants, the appreciation for horticulture began the moment they stepped into the shelter with all the greenery and freshness. They were attracted to the fruit trees where they could pick fruits. Other women enjoyed seeing the gradual growth of plants and flowers blossoming – radiating a sense of life and growth. The groups imparted with them horticultural knowledge, meanwhile, they also enjoyed making potpourri bags and candles with their horticultural products. Potpourri had an additional effect of helping them sleep.

“Sometimes when I smell my hand-made potpourri sachet, it helps me fall asleep easier.”

“我們有時會聞下自己親手做的香包，便使我們更易入睡。”

What they found most helpful

One of the most compelling themes was how the horticultural intervention offered women a short-term haven from their difficult circumstances and overwhelming emotions. As we will see below, this refuge, albeit temporary, is an important relief for them, and this period of relaxation helped them to open up to others, while improving their sleep and physical health. Horticulture was an entry point for them to regain self-confidence and offered them a reason to be happier about their lives. Participants recalled aspects of the intervention which were significant to them:

Growing

A significant part of horticultural intervention involves growing. Witnessing the development of plants and tending to them fosters love for nature along with better knowledge about our environment. The growth of plants served as a metaphor of their own growth.

“When I see the flowers in the garden, I feel that we have to be like plants, we need to be a bit stronger in order to have more vitality and a better life.”

“我在公園看花，覺得我們要好像植物一樣，我們要更加堅強一點，才能有更強的生命力和更好的人生。”

Giving them an anchor to face their own experiences, the horticulture experience gave them an opportunity to see things from different perspectives. The joy over the growth of their vegetables was relaxing and offered them a temporary release of stress and negative emotions. This short break gave them a feeling that they could better control their emotions. This thereby enhances self confidence.

“Unlike before, many times we can have a bit of change in our emotions; we can learn to grow.”

“我們不像從前那樣，好多時可有一點情緒上的改變，自己可學習成長。”

Sharing their produce

Vegetables grown during the horticultural interventions are often shared amongst the women. Some of them find this helpful to improving their mood.

Nature observation

Horticultural activities included outings and nature observations. Some participants were quick to connect with the nature which offered them a means to express their feelings and inspirations on how to lead their lives.

“We are like grass; we can survive in different environments.”

“我們好像一棵草，在不同的環境下也可生長。”

“We are like green leaves and grass; like daffodils. Originally it is an onion bulb, but it can grow into beautiful flowers. Green leaves have special patterns, at the same time, they have vitality. If we cultivate it with care, it can grow into different kinds of beautiful flowers. This is like our lives, if we use our hearts to observe each and every

thing, have a bit less discrimination, we can gradually see many beautiful things.”

“我們好像綠葉和草，好像水仙花一樣，原本是一個洋蔥頭，能種出美麗的花朵。綠葉有特別的葉紋，同時自己會有生命力，如果用心培植它，便可種出不同的和美麗的花朵。這如人生一樣，用心觀賞每一樣東西，少一些歧視，我們便漸漸看到更多美好的事物。”

“Meanwhile, we are not like little birds kept in a cage; we can go out. Living here and being taken care of is like a little bird captured. I hope we can have more group activities so that we can sooth our emotions and interact more with others.”

“同時，我們不在像小鳥被困在籠中一樣，我們會出去多走動。我們住在這兒被照顧，有如被困在籠中的小鳥，希望有多一些小組活動，使我們可以舒緩下我們的情緒，大家可多些交談與溝通。”

Tea drinking

Besides being a horticultural activity, tea drinking has deep roots within the Chinese community. Inspirations from a cup of tea gave them meaning to overcoming their sadness.

“When we quiet down, we realize that life is like drinking tea. First comes a bit of bitterness, then gradually it becomes bittersweet. The unhappy things in life are like a wisp of smoke, dissipating with time.”

“當我們靜下來，覺得人生好像品茶，一開始有點苦味，然後漸覺甘甜。人生不如意的事，可如一縷輕煙，隨時間而續漸消散。”

Craft making

Learning simple skills to make new things gives participants a sense of achievement. Exchanging views through craft making or plant growing is a great opportunity to expand their social network and foster mutual support within the shelter.

Suggestions for improvement

Participants also had suggestions for improvement, such as adding more gardening activities and imparting more related skills; being able to grow a greater variety of plants or using flowers and butterflies for making bookmarks; and allowing them to have more time to talk about their negative experiences.

In short, the experience of horticultural intervention was a highly positive one with gains to oneself and peer relationship as well. In future interventions, particularly for those who would be leaving the shelter shortly, workers could consider including elements pertaining to reintegrating back into their community or independent living.

5.8. Summary of Findings According Community Chest Service Contract

	Number Completed	Percentage
Patient Health Questionnaire	115	63% decrease
Hope Scale	130 (Agency)	58% increase (Agency)
	129 (Pathway)	55% increase (Pathway)
Distress & Anxiety Thermometer (Replacing the Impact of Event Scale)*	86 (Distress)	77% decrease (Distress)
	79 (Anxiety)	76% decrease (Anxiety)
Continue Horticultural Activity	195	85% interested
Satisfied with Horticultural Activity (score above 5 out of 10)	195	93.9%
Enjoyed Environmentally Friendly Shelter Environment	195	90.3%

* Although the Impact of Event Scale measures traumatic distress, this measurement was dropped after the early parts of the main study to reduce the burden of lengthy measurements on the participants.

Table 3. Service Outcomes within the Community Chest Service Contract

6. OUTCOMES: SCHOOL CHILDREN 6 AND ABOVE

Children and adolescent participants demonstrated increased in happiness after horticultural intervention. Depression and hope levels did not change much.

Outcomes are summarized in Table 4.

	N	Pre	Post	Direction	Significance Value	Significance
Depression (CESD)	25	21.44±13.14	20.68±13.02	↓	t(24)=0.41; p=.69	No
Happiness (Happiness thermometer)	18	6.89±2.85	8.06±2.44	↑	t(17)=-2.43 p=.03	Yes
Hope: Goal directed energy	32	10.59±4.51	10.66±4.04	↑	t(31)=-.11 p=.92	No
Hope: Pathways to meet goals	32	10.22±3.91	10.13±4.10	↓	t(31)=-.13 p=.90	No

Table 4. Children assessments before and after horticultural intervention

6.1. Depression

Assessed by the Center for Epidemiological Studies Depression Scale for Children (CESDS), depression decreased after horticultural therapy for slightly over half of the participants (52%) but failed to reach statistical significance (t(24)=0.41; p=.69).

Meanwhile a comparable 44% increase in depression is observed. This means that we cannot infer at this stage that horticultural therapy is helpful to our youth in effectively lowering depression.

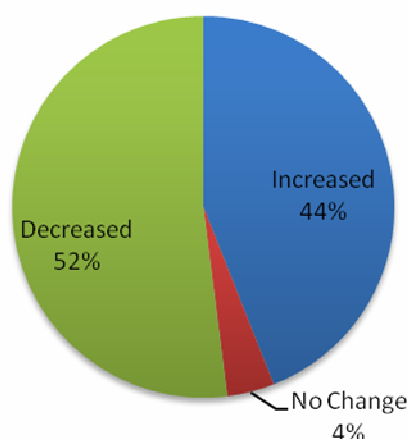


Figure 18. Percentage change s in depression after horticultural intervention

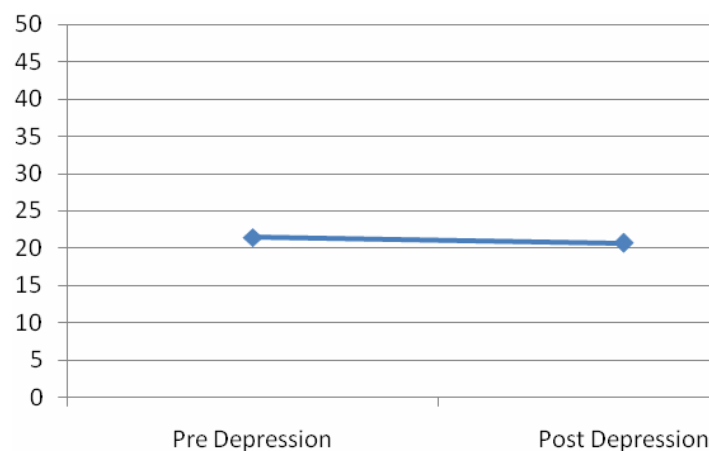


Figure 19. Changes in depression after horticultural intervention

6.2. Happiness

A third (33%, n = 6) of participants was happier after horticultural therapy. Although the majority (61%, n = 11) did not experience any changes at all, the overall increase in happiness was large enough to produce statistical significance ($t(17)=-2.43$ $p=.03$). However, these results are based on a relatively small sample (n = 17) so the outcome, though encouraging, cannot be conclusive at this point.

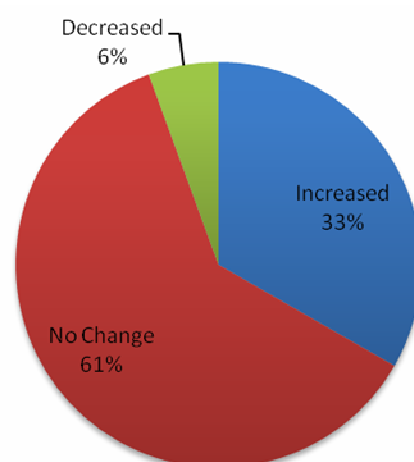


Figure 20. Percentage change in happiness after horticultural intervention

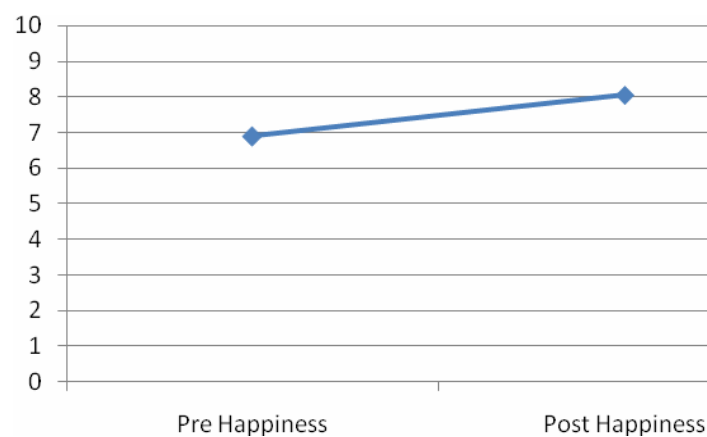


Figure 21. Changes in happiness after horticultural intervention

6.3. Hope

Hope, both goal directed energy and pathways in fulfilling goals increased in a little over a third of the children and adolescent participants. Yet, a similar percentage demonstrated decrease in hope. Therefore, overall results were still not statistically significant for Hope agency ($t(31)=-.11$ $p=.92$) or pathway ($t(31)=-.13$ $p=.90$).

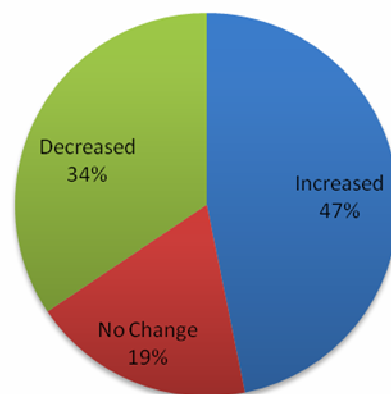


Figure 22. Percentage change in Hope agency after horticultural intervention

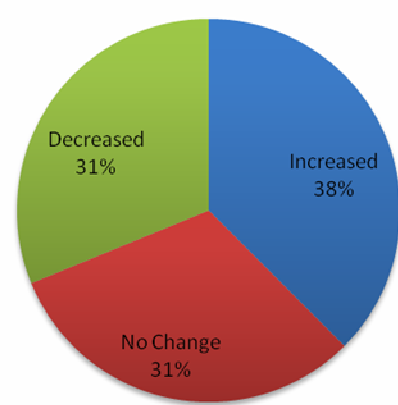


Figure 23. Percentage changes in Hope pathway after horticultural intervention

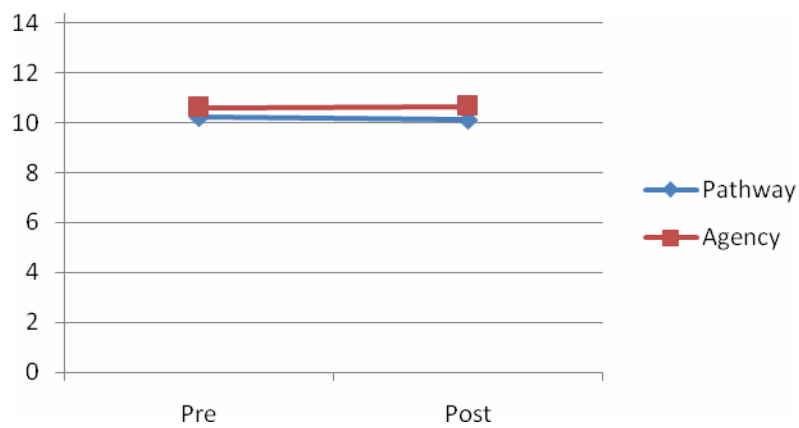


Figure 24. Changes in Hope after horticultural intervention

6.4. Compliance, Involvement and Satisfaction

The 20 participants of the horticultural interventions for children and youth were reportedly highly satisfied, scoring above 8 on the compliance, involvement and satisfaction scale. 17 of them (85%) welcomed the idea of continuing horticultural activities after leaving the shelter.

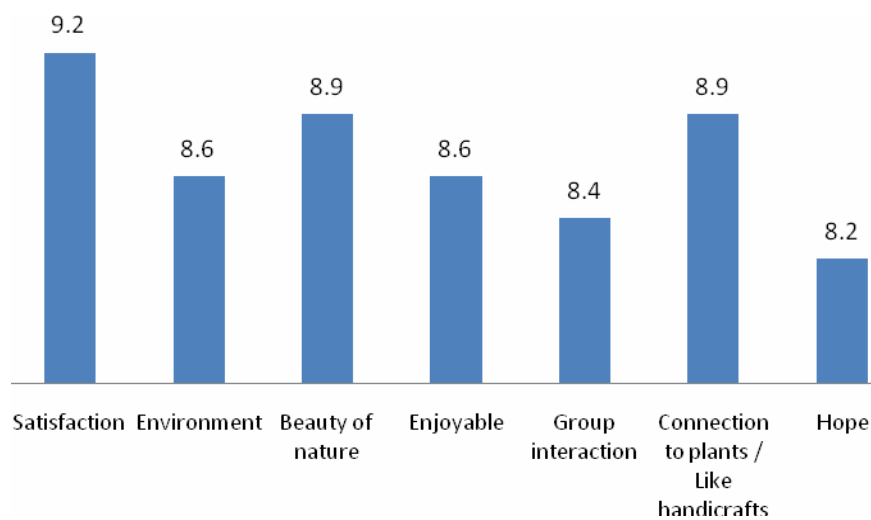


Figure 25. Feedback scores on the compliance, involvement and satisfaction scale

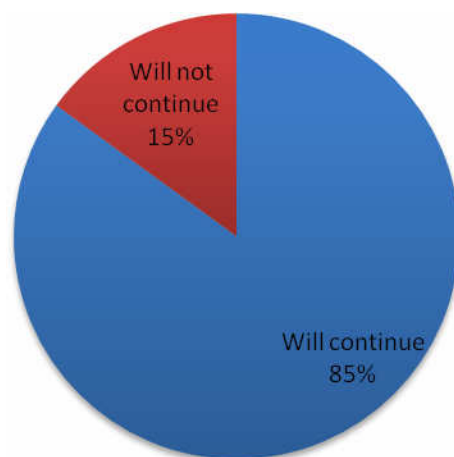


Figure 26. Willingness to continue horticulture after leaving the shelter

6.5. Summary

Horticulture intervention is very much enjoyed by children and adolescents. Some of them are happier after the activities but in general, psychological changes are not unanimously positive. It is important to bear in mind that these children are removed from an environment and people they are familiar with and their mood are highly sensitive to daily circumstances. Nonetheless, horticulture is still an enjoyable activity for them at the shelter and as some of their mothers report, they would conversely encourage their mom to take part in horticultural interventions as well.

7. OUTCOMES: CHILDREN 3 TO 5 YEARS OLD

Children were asked to make a drawing on their current feelings both before and after their horticultural interventions. 11 children's drawings were compared along with additional observations from mothers or social workers.

Based on formal elements of drawing such as the line quality, space, color and images, as well as the content of the drawing, 7 of the 11 children showed improvements in mood after the horticultural intervention. 3 of the 11 had positive emotionality both before and after horticulture and 1 particular child appeared to have emotional disturbances even after the intervention. None of the children had deteriorated mood after horticulture.

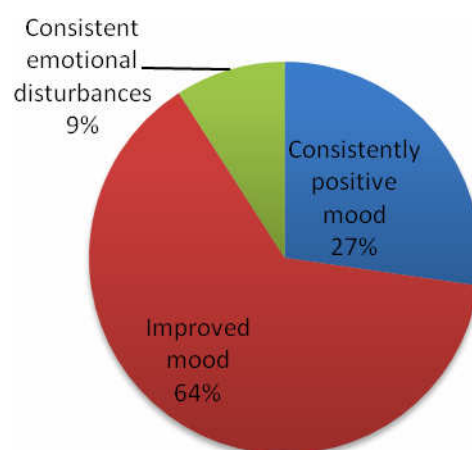


Figure 27. Art-based observations on children's mood changes

7.1. Improvements in mood

Improved color use

The use of colors in this child's post intervention drawing as well as her selection of

predominately warm colors is a sign of more positive emotions (Figures 28 & 29).



Figures 28 & 29. Pre (left) and Post (right) pictures of a child with enhanced color use.

Often, the images alone suffice to inform us of the child's thoughts. This child was disturbed due to her sister's bed wetting problem but improved in her post drawing (Figures 30 & 31).



Figures 30 & 31. Pre (left) and Post (right) pictures of a child being happier.

7.2. Representations of horticultural therapy

5 of the 11 children had representations of horticulture in their post drawing or shared that their drawing represented happiness as a result of horticulture activities. This is evidence that the intervention had an impact on those children (Figures 32 & 33, Figures 34 & 35).



Figures 32 & 33. Pre (left) and Post (right) pictures of a child showing horticulture elements (flowers and grass) in the post drawing.



Figures 34 & 35. Pre (left) and Post (right) pictures of a child showing horticulture elements (colorful flowers) in the post drawing.

7.3. Relational representations

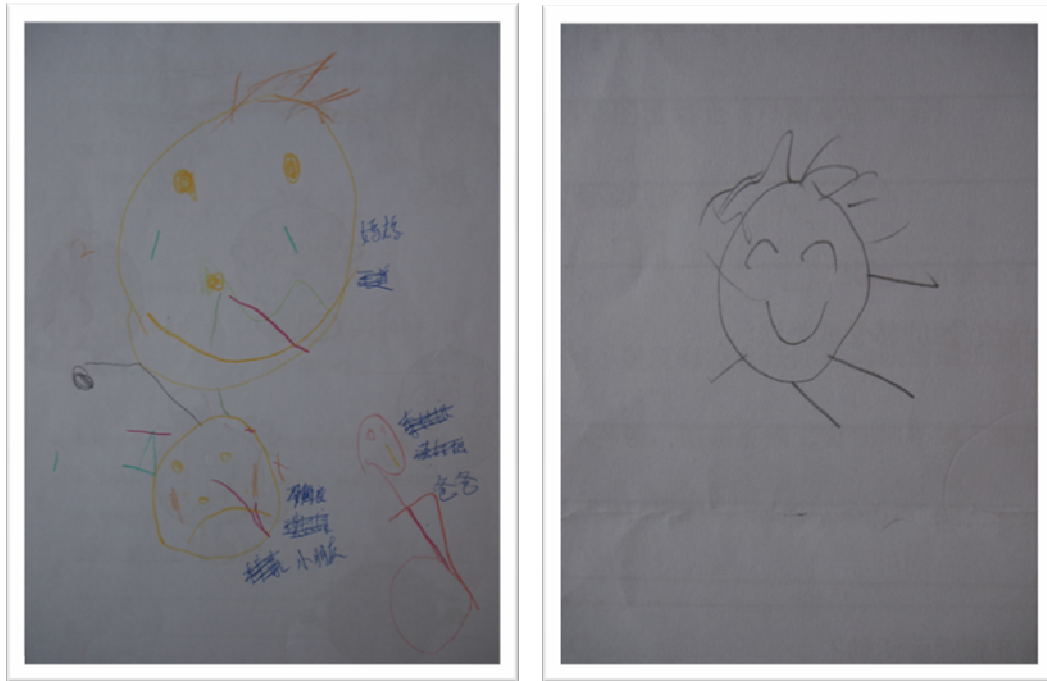
In spite of their young age, these children had their own feelings and connections to those around them, particularly their parents.

In both the pre and post pictures, this child showed ambivalent feelings (simultaneous tears and smile, rainbow and rain). Nonetheless, the content of the drawing does show higher positivity in the post picture and enhanced relational elements with her mother (Figures 36 & 37).



Figures 36 & 37. Pre (left) and Post (right) pictures of a child from a crying face to one showing her mother and herself braving the rain with an umbrella (under safety).

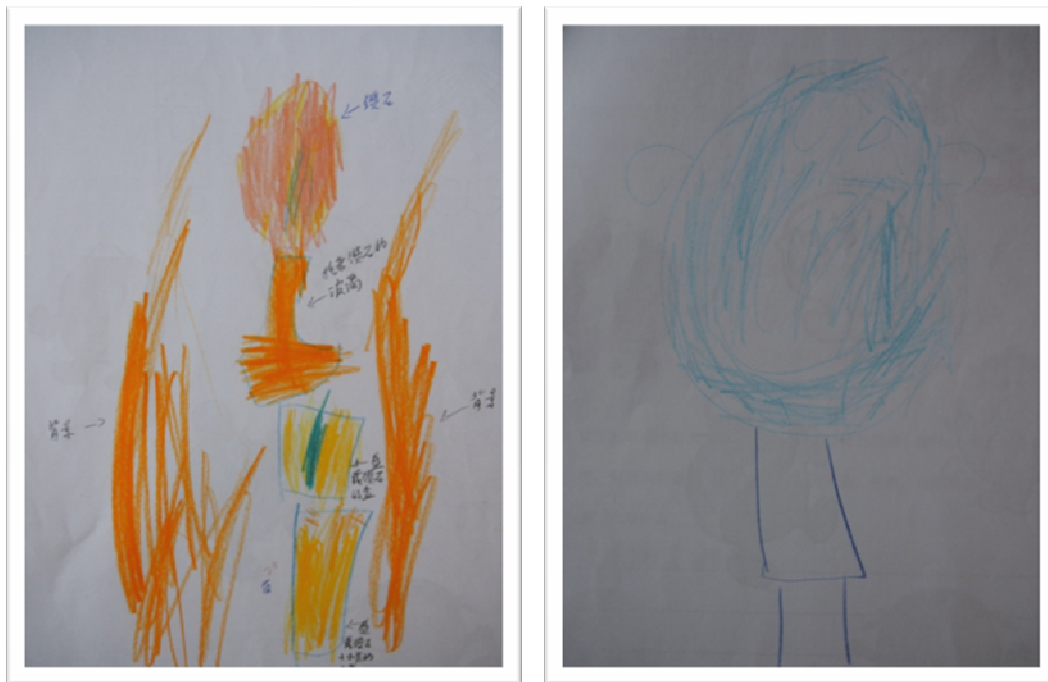
In this child's pre picture, both he and his mother were sad because his mother was hurt. His father also seems "different" from the rest of the family. In his post picture, though simple and achromatic, the happy sunshine is an indicator of his joy (Figures 38 & 39).



Figures 38 & 39. Pre (left) and Post (right) pictures of a child indicating unhappiness in the family and distance from his father (Pre).

7.4. Persistent emotional disturbances

This 5-year-old child not only lack age appropriate drawing, his repetitive lines and high arousal colors particularly in his pre drawing indicates emotional arousal or disturbances. While the color tone of his post drawing appeared calmer, the continuous use of repetitive lines suggests persistent emotional issues (Figures 40 & 41).



Figures 40 & 41. Pre (left) and Post (right) pictures of a child showing persistent mood disturbances.

7.5. Summary

Children's artwork is a window into their mood and development. While the number of children with matched pre and post drawings is limited, their drawings offered us some preliminary perspectives as to how horticulture may impact a child's mood and their feelings on their relationships.

8. SUMMARY OF FINDINGS AND RECOMMENDATIONS

Harmony House integrated horticulture into their shelter services through the implementation of the Harmony Garden as well as short-term horticultural programs and groups for women and children residents. Throughout this 3-year period, over 195 women and 85 children benefited and participated in the evaluation.

It was the simultaneous provision of the naturalistic environment alongside intervention groups or programs that led to pronounced improvements to their depression levels, distress, anxiety, hope and self esteem. Horticulture, to these domestic violence survivors, is not a solution to their problems, but an emotional refuge for them – a temporary relief from their overwhelming emotions and dire circumstances. Growing, sharing their produce, nature observation, tea drinking and craft making were significant elements in horticultural therapy groups which participants found especially helpful. Generally speaking, this program was highly beneficial and much enjoyed by women at the shelter.

It was beyond the scope of this project evaluation to track the sustained effect of horticulture throughout the women's stay at the shelter or even beyond that. Yet, with an astounding 85% who are willing to continue horticultural activities after returning home, it could perhaps lead to long-term benefits. Harmony House may play a large role in assisting this continuation which otherwise may not materialize given these women's financial limitations and a lack of adequate space. For instance, potted plants grown at the shelter or seeds could be taken home. This is important given that the mental health of abuse survivors often decline within the first 3

months after discharge from hospitals (Wright, Woo, Muller, Fernandes, & Kraftcheck, 2003). Knowing that our participants were able to metaphorically associate plants as insights into their lives, continuous horticulture intervention can be a buffer for the difficulties they will encounter when adjusting back to their community or families.

Besides improvements on a personal level, horticultural interventions offer women a means to make friends and integrate into the shelter. Some participants, notably those growing up on farmlands, found horticulture to be a pleasant reminder of their childhoods and strengths. Sharing knowledge and assisting one another in planting fosters a spirit of mutual support in the shelter.

For children and adolescents what can be concluded at this stage is that horticulture is a highly enjoyable activity for them with preliminary evidence that it can indeed make them happier. For the even younger (3 to 5-year old) kids, their artwork showed that horticultural activities not only made an imprint on their lives, but after these interventions, their mood is less disturbed and some show signs of enhanced relationships.

There are limitations to this evaluation research. In the absence of a control group which was infeasible in this setting, we cannot ascertain whether these improvements are attributable to horticultural interventions alone, or with other interventions and support offered at the shelter. In any case, the results from this investigation remain highly valuable as this is one of the first projects applying horticultural therapy to domestic violence survivors in Hong Kong.

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