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Horticultural therapy program for middle-aged women's depression, anxiety, and self-identify

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ABSTRACT

Objectives: The objective of this study was to investigate the effect of a horticultural therapy program on reducing middle-aged women's depression and anxiety and improving their self-identity.
Design and Setting: Participants were 36 women aged 40–59 years who attended the D Culture Center in Incheon, South Korea (control, n = 18; experimental, n = 18).
Intervention: The study was conducted in July–August 2017; the experimental group participated twice/week for 12 sessions.
Main Outcome Measures: The Menopause Symptom Index, Self-rating Depression Scale, State-Trait Anxiety Inventory, and Dignan Ego-identity Scale were used pre- and post-test. Independent sample t-tests and matching sample t-tests were performed to verify pre-evaluation homogeneity between groups; to determine the changes in depression, anxiety, and ego identity before and after the program; and to compare the efficacy between the groups, respectively.
Results: Depression and anxiety scores were significantly lower ($p < 0.001$) and self-identity was significantly higher ($p = 0.003$) among the experimental group compared to the control. The control group showed no significant changes in study variables.
Conclusions: The horticultural therapy program was effective at decreasing depression and anxiety and improving self-identity in middle-aged women.

1. Introduction

The global point, one-year and lifetime prevalence of depression are 12.9%, 7.2% and 10.8% respectively.[1] According to medical statistics information in South Korea, the number of depressed patients in 2015 was about 12% higher than in 2011, and women accounted for 67.7% of these. Women aged 50–55 and 55–60 years displayed the highest depression rates compared to other age groups.[2] Commonly, middle-aged women feel a sense of futility and loss after their child rearing role is complete.[3] Accompanied by menopause symptoms, various physical disabilities (e.g. sleep disorders), and psychological problems, middle-aged women may display low self-esteem and depression.[4] Specifically, 89% of women aged in their 50 s are experiencing menopausal symptoms,[5] which can impact individuals, families, and social organizations.[6]

The average total cost of patients with depression is US$7638 per patient-year and indirect costs (e.g. unemployment and loss of productivity) dominated the total costs.[7] The spending on health insurance for depression increased 1.2 times between 2007 and 2011, and the spending on all mental and behavioural disorders doubled during this period: 4.4% of all healthcare costs in 2011 were due to mental health problems.[8] Antidepressants can improve depressive symptoms and enhance occupational functioning.[9] However, continued use of antidepressant medication may lead to various side effects such as anxiety, nausea, weight gain, insomnia, etc.[10] Some researchers proposed to use drugs with addiction potential (e.g. ketamine) to treat depression and lead to serious side effects (e.g. urinary incontinence)[11] and ethical concerns.[12] As a result, there has been an increase in number of non-pharmacological treatment programs in recent years.[13] Previous programs targeting middle-aged women's depression and anxiety include the following: The Mindfulness Meditation Program,[14] Literally Drawing Programs,[15] Dance Movement Therapy,[16] Laughter Therapy Program,[17] REBT Group Counselling,[18] Foot Reflexology,[19] Mandala Art Therapy,[20] Horticultural Therapy,[21] and Schema Therapy Program.[22] These have shown effects on reducing depression and anxiety and improving self-identity. In addition, horticultural plants have been

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shown to alleviate anger and negative emotions and promote self-control as well as also reducing depression and anxiety.[23,24]

Further, Kohut's Self-Psychology, which is an intervention model involving deep introspection, allows individuals to discover an inner-self that they did not know, thereby reducing depression and anxiety and promoting self-identity and self-esteem.[25] The lower the self-identity, the higher the depression and anxiety experienced by middle-aged married women.[26] Kohut's self-psychological studies include Woman's Experience of Cohesive Self on the Crisis of Divorce,[27] Self-psychological Art Therapy,[28] Psychoanalysis of Shame and Narcissism,[29] and Corrective Counselling.[30] Kohut's self-psychology has been widely used since the beginning of counselling psychology and used as a treatment for pathological narcissism and adolescents' narcissistic personality disorder.[31–33] In addition, Kohut's self-concept was used in psychodynamic psychotherapy.[34]

However, there is a lack of research on horticultural therapy for depression and anxiety related to a psychological intervention model among menopausal middle-aged women. In previous studies, it was suggested that research should be actively conducted through appropriate intervention models or techniques in the field of counselling psychology or nursing to maximize the effects of horticultural therapy and guide of designing horticultural therapy program[21]; therefore, this study investigated the effects of a horticultural therapy program based on Kohut's self-psychotherapy on decreasing middle-aged women's depression and anxiety and improving their self-identity.

2. Methods

2.1. Participants

Participants were 36 women aged 40–59 years who attended D Culture Center in Incheon, South Korea. For recruitment, program details including inclusion criteria (i.e. married middle-aged women who did not receive professional hospital treatment or medication due to depression or anxiety) were posted on a bulletin board at D Cultural Center. The 36 participants recruited were randomly divided into two groups: experimental (n = 18) and control (n = 18).

This study was approved by the Bioethics Committee of Konkuk University (no. 7001355-201706-HR-189).

2.2. Horticultural therapy program

The program was conducted twice/week from July–August 2017 for 12 sessions (average 1 h/session). Participants performed horticultural therapy program in groups of 4–5 people. The attendance rate was 100% with two trained horticultural therapists. Main horticultural activities in the horticultural therapy program were planting plants, making crafts with plants, flower arrangements, etc. (Table 1).

The program was based on Kohut's self-psychology. Kohut emphasized the establishment of a 'healthy self' as a robust mental structure, and it is important to have self–object experience, to coalesce the fragmented self[35] Therefore, the program was structured to promote this experience for one's inherent self. Table 1 shows the contents of 12 sessions in the horticultural therapy program. An example of the horticultural therapy program (e.g. the 11th session) presents in the Fig. 1.

2.3. Evaluation and analyses

2.3.1. Self-rating Depression Scale (SDS)

The SDS was used to measure depression. It was developed by Zung.[36] The use of SDS alone has been reported to be a useful method for the evaluation of treatment since the probability of predicting the treatment of depression is 87%. The sub-items in the SDS are core depressive, cognitive, anxiety, somatic, and none. The standardized Korean version,[37] which is reliable and valid was used. The SDS is answered using a 4-point Likert scale: '*not at all* = 1 point', '*sometimes* = 2 point', '*usually* = 3 point', and '*always* = 4 points'. Total scores range 20–80 points: 10–49 points = normal range, 50–59 points = mild depression, 60–69 points = severe depression, and > 70 points = severe depression requiring immediate treatment. This scale is reliable: Cronbach's α = 0.83 in Jang et al.,[38] Cronbach's α = 0.84 in Ko et al.,[39] and Cronbach's α = 0.84 in the present study.

Table 1
Horticultural therapy program based on Kohut's self-psychology.

Session	Horticultural activity	Plant materials used	Therapeutic approach based on Kohut's self-psychology
1	Hydroponics	Peperomia	< Initial stage > Self-expression
2	Planting plants	Rosemary	
3	Planting plants	Fatsia japonica	
4	Making pressed flowers	Marguerite, Lobelia	< Middle stage > Healthy self-construction
5	Flower arrangement	Rose, Sea lavender, Chrysanthemum	
6	Flower arrangement	Ranunculus asiaticus, Rose	
7	Planting plants	Hoya carnosa	
8	Making terrarium	Sander's dracaena	
9	Dish garden	Assemble-planting succulents	< Later stage > Healthy relationship with others
10	Planting plants	Peace lilly	
11	Making lunch box with edible flowers	Pansy, Marigold	
12	Flower arrangement	Lisianthus, Bupleurum	

2.3.2. State-trait anxiety inventory (STAI)

The STAI was used to measure anxiety. It was developed by Spilberger and Gorsuch[40] and standardized in Korean by Hanh et al.[41] It comprises 40 items measuring anxiety at the current moment: 20 measuring state anxiety and 20 measuring trait anxiety. Each item is measured using a 4-point Likert scale from '*not at all* = 1 point' to '*very much, yes* = 4 points' (score range = 20–80; higher scores indicate more anxiety). This scale is reliable: Cronbach's αs in Hahn et al.[41,42] were 0.89 and 0.90, respectively for trait anxiety and 0.93 and 0.92, respectively for state anxiety. Further, for the total scale, Cronbach's alpha = 0 0.91 in Lee et al.[43] and Cronbach's alpha = 0.88 in this study.

2.3.3. Self-identity scale

To measure self-identity, the Dignan Ego-identity Scale,[44] which was adapted by Seo[45] was used. Following Lee,[46] a 20-item that were appropriate for middle-aged women among the subareas of Park's Korean version of the scale was used.[47] The sub-items in the scale are intimacy, initiativeness, goal orientation, identity moratorium, identity confusion, and self-acceptance. Responses were made using a 5-point Likert scale: '*not at all* = 1 point' to '*certainly yes* = 5 points' (range = 20–100; higher scores indicating higher self-identity). The questionnaire comprised 9 positive and 11 negative items, which were reversed. This scale is reliable: Cronbach's α = 0.78 in a study of 800 middle-aged women aged 40–60 years,[48] Cronbach's α = 0.86 in Song and Lee,[26] and Cronbach's α = 0.96 in this study.

2.3.4. Data analyses

Independent samples *t*-tests were performed ($p < 0.05$) to verify pre-evaluation homogeneity between groups. Paired *t*-tests were performed ($p < 0.05$) to examine group changes in depression, anxiety, and ego identity before and after the program. Data analyses were performed with SAS ver. 9.4 (SAS Institute Inc., Cary, NC, USA).

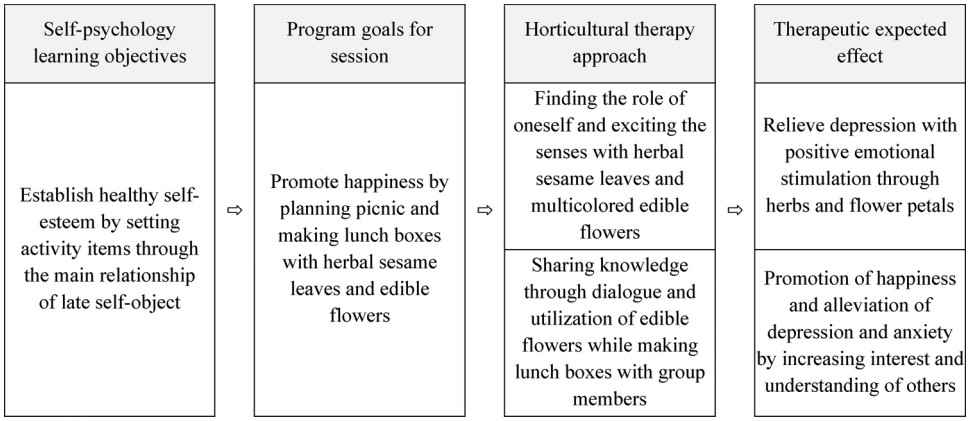

Fig. 1. An example of the 11th session in the horticultural therapy program.

3. Results

3.1. Participants' general characteristics

Table 2 shows participants' general characteristics. There were no significant differences between the physical and sexual domains of menopausal symptoms;

3.2. Comparison of control and experimental groups before and after the program

Before the program, the SDS, STAI, and DES were examined for homogeneity between groups (Table 3). Results revealed that none of the scales differed between groups pre-program, including scale sub-items. Consequently, the experimental and control groups were homogeneous.

In the experimental group, there was a significant change in depression, anxiety, and ego-identity; however, no significant changes were reported for the control group (Table 4). Especially, core depression, cognitive, and anxiety which are sub-items in the SDS were significantly reduced in the experimental group. Both state anxiety and trait anxiety were significantly decreased after the horticultural therapy program. Moreover, the sub-items in the DES such as intimacy, goal orientation, and self-acceptance were significantly increased in the experimental group. Therefore, the program seemed to have a positive effect on depression, anxiety, and self-identity.

3.3. Satisfaction with the program

After the program was completed, the satisfaction results of the experimental group showed that overall satisfaction was high concerning stress relief, pleasure, and emotional stability (‘*very much, yes*’ = 69%, ‘*yes*’ = 25%, and ‘*average*’ = 6%). Concerning social vitality, 59% of the respondents said that they were ‘*very satisfied*’. Concerning body vitality, 30% of the respondents said they ‘*very much agreed*’, 42% ‘*agreed*’, 25% reported ‘*average*’, and only 3% said ‘*no*’. Regarding helping physical activity, 30% answered ‘*very much, yes*’, 42% answered ‘*yes*’, 25% answered ‘*average*’, and 3% said ‘*no*’. When

Table 2
Participants' general characteristics.

Variable	Total		Participants				p-value
			Horticultural therapy group		Control group		
	N	%	N	%	N	%	
Total	50	(100.0)	18	(36.0)	18	(36.0)	
Age group							
41 - 45	11	(22.0)	4	(22.2)	5	(27.8)	0.64
46 - 50	15	(30.0)	6	(33.3)	5	(27.8)	
51 - 55	12	(24.0)	4	(22.2)	5	(27.8)	
56 - 60	12	(24.0)	4	(22.2)	3	(16.7)	
Marital status							
Married	47	(94.0)	16	(88.9)	17	(94.4)	0.74
Divorced of widow	3	(6.0)	2	(11.1)	1	(5.6)	
Education							
Middle school (< 9 yrs)	3	(6.0)	2	(11.1)	1	(5.6)	0.16
High school (< 12 yrs)	43	(86.0)	15	(83.3)	17	(94.4)	
Over college (> 12 yrs)	4	(08.0)	1	(05.6)	0	(0.0)	
Job							
None	44	(88.0)	17	(94.4)	17	(94.4)	0.02
Job	6	(12.0)	1	(05.6)	1	(05.6)	
Monthly income							
Less than 2 million won	2	(4.0)	1	(5.6)	1	(5.6)	0.71
2 - 3 million won	9	(18.0)	4	(22.2)	3	(16.7)	
3 - 4 million won	22	(44.0)	8	(44.4)	8	(44.4)	
Over 4 million won	17	(34.0)	5	(27.8)	6	(33.3)	

Table 3
Verification of homogeneity between control and experimental groups before program commencement.

Scale	Variables	Control group	Horticultural therapy group	p-value
Self-rating depression scale	Core Depressive	18.6 ± 0.8	17.2 ± 2.6	0.23
	Cognitive	9.8 ± 2.2	10.8 ± 1.7	0.17
	Anxiety	6.5 ± 2.1	6.3 ± 1.2	0.85
	Somatic	5.5 ± 1.7	5.0 ± 1.5	0.32
	None	4.1 ± 1.0	3.7 ± 1.3	0.28
	Total	44.7 ± 8.5	43.2 ± 6.6	0.56
State-trait anxiety inventory	State Anxiety	41.8 ± 10.3	41.1 ± 7.6	0.83
	Trait Anxiety	42.2 ± 9.7	44.1 ± 7.9	0.53
	Total	84.1 ± 19.6	85.2 ± 15.4	0.84
Dignan ego-identity scale	Intimacy	17.5 ± 3.2	17.8 ± 3.2	0.80
	Initiativeness	12.7 ± 2.3	13.0 ± 1.9	0.70
	Goal orientation	7.5 ± 2.0	7.2 ± 1.7	0.73
	Identity moratorium	11.2 ± 1.7	11.1 ± 1.3	0.46
	Identity confusion	7.8 ± 1.5	8.1 ± 1.3	0.57
	Self-acceptance	7.3 ± 0.7	7.5 ± 0.7	0.37
	Total	64.5 ± 7.4	64.9 ± 6.3	0.85

asked about whether they were interested in horticulture after experiencing the program, 68% said they were '*very satisfied*' and 25% answered '*yes*' (7% said '*average*'). When asked whether they would like to continue horticultural therapy programs, 88% answered '*very much, yes*' and 12% answered '*yes*'. These results show that participants were satisfied with the program and felt that their depression and anxiety could be reduced and their self-identity could be improved through horticultural therapy program.

4. Discussion

Depression and anxiety scores were significantly lower ($p < 0.001$) and self-identity was significantly higher ($p = 0.003$) among the experimental group compared to the control. The control group showed no significant changes in the study variables.

This study results that the program was associated with decreased depressive symptoms in the experimental group is consistent with past research (Table 4). Middle-aged women experience stress relief, emotional stability, and self-love through horticultural therapy program.[49] In addition, pleasure, self-esteem, self-confidence, knowledge, and

Table 4
Comparison of each scale before and after the program for control and experimental groups.

Scale	Group	Variables	Before	After	p-value
Self-rating depression scale	Control group	Core depressive	17.3 ± 2.7	17.7 ± 2.6	0.57
		Cognitive	10.8 ± 1.7	10.7 ± 1.9	0.86
		Anxiety	6.4 ± 1.3	6.6 ± 1.0	0.48
		Somatic	5.0 ± 1.5	4.5 ± 1.5	0.38
		None	3.7 ± 1.4	3.7 ± 1.2	0.90
		Total	43.2 ± 6.6	43.5 ± 6.8	0.90
	Horticultural therapy group	Core depressive	18.6 ± 3.7	13.3 ± 3.4	< 0.001
		Cognitive	9.9 ± 2.2	7.0 ± 1.6	< 0.001
		Anxiety	6.5 ± 2.2	4.7 ± 1.2	0.00
		Somatic	5.5 ± 1.8	4.8 ± 1.6	0.22
		Non	4.2 ± 1.0	3.5 ± 1.1	0.10
		Total	44.7 ± 8.6	33.4 ± 5.9	< 0.001
State-trait anxiety inventory	Control group	State anxiety	41.2 ± 7.6	42.7 ± 8.1	0.56
		Trait anxiety	44.1 ± 7.9	44.7 ± 7.8	0.80
		Total	85.3 ± 15.3	87.5 ± 15.7	0.67
	Horticultural therapy group	State anxiety	41.8 ± 10.3	30.0 ± 6.7	< 0.001
		Trait anxiety	42.2 ± 9.7	32.7 ± 6.6	0.00
		Total	84.1 ± 19.6	62.8 ± 12.9	< 0.001
Dignan ego-identity scale	Control group	Intimacy	17.8 ± 3.2	17.6 ± 2.9	0.83
		Initiativeness	13.0 ± 1.9	13.0 ± 1.8	0.93
		Goal orientation	7.3 ± 1.8	6.7 ± 1.4	0.31
		Identity moratorium	11.1 ± 1.3	10.6 ± 1.4	0.24
		Identity confusion	8.1 ± 1.3	7.8 ± 1.0	0.58
		Self-acceptance	7.5 ± 0.7	7.6 ± 0.9	0.85
		Total	64.9 ± 6.4	63.5 ± 5.7	0.48
	Horticultural therapy group	Intimacy	17.6 ± 3.2	20.0 ± 3.6	0.04
		Initiativeness	12.7 ± 2.3	14.0 ± 2.8	0.15
		Goal orientation	7.5 ± 2.0	8.89 ± 1.91	0.04
		Identity moratorium	11.5 ± 1.7	12.2 ± 2.8	0.41
		Identity confusion	7.8 ± 1.2	8.8 ± 1.9	0.10
		Self-acceptance	7.3 ± 0.7	8.6 ± 1.2	< 0.001
		Total	64.5 ± 7.4	72.6 ± 10.3	0.01

motivation are elevated through appropriate horticultural therapy,[50] as are improved perceived attention and decreased depression.[51] Horticultural activity also has a positive effect on reducing stress, state anger, state depression and mean purse rate in mid-aged women.[52] Ulrich[53] reported that horticultural activity can be effective in decreasing stress and increased immunity through interaction with plants. Previous study of horticultural therapy program for elderly with mental health problems also showed that cortisol level which is a stress indicator hormone decreased significantly.[54]

Depression is associated with stigma, which has a negative impact on help-seeking behavior.[55] Horticultural therapy, using natural setting, helps to reduce stigma associated with conventional antidepressant treatment and enhances help-seeking behavior. Moreover, depression is associated with obesity[56] and chronic medical diseases.[57] Horticultural therapy involves physical activity and has the potential to reduce the risk of obesity and chronic medical diseases (e.g. diabetes).[58] Horticultural therapy can be incorporated into rehabilitation program to treat depression in patients suffering from chronic diseases.[59] Furthermore, depression is associated with inflammation[60] which contribute to heart diseases.[61] Depression is associated with increase in biomarkers including urinary catecholamines[62] and pro-inflammatory cytokines.[63] Recent research has demonstrated the benefits of forest therapy on biological markers related to depression.[64] Further research is required to evaluate the effects of horticultural therapy on biomarkers including urinary catecholamines and pro-inflammatory cytokines.

The study results that the program was associated with decreased anxiety symptoms in the experimental group is consistent with past research. Anxiety is reduced due to finding ways to express negative emotions such as horticultural therapy,[65] which may stimulate interest and reduce anxiety by learning the life history of various plants.[66] In addition, horticultural therapy satisfies individuals' self–object needs, thus reducing anxiety.[67] Horticultural therapy has been reported to be effective in reducing the anxiety of female cancer patients.[68] Horticultural therapy also has a positive effect on the reduction of anxiety in low-income single parent families through relieving emotional stability and negative attitudes.[69] Park and Jeong[18] reported that middle-aged women with mild or severe depression have changed positively in depression, pain, and anxiety after horticultural activity. Previous studies have reported positive effects of horticultural activity on reducing negative emotions such as anxiety, depression, and aggression.[70,71] Another study reported that simply viewing foliage plants led physiological and psychological relaxation by reducing oxy-hemoglobin concentration in the prefrontal cortex according to measurements of prefrontal cortex activity.[72]

The results that the program was associated with increased self-identity in the experimental group is consistent with past research. The program seems to improve self-identity through the development of strong self-awareness and the foundation of a healthy and mature self-structure.[35] Quality of life is also, as is self-expression and expansion of self-preservation through creative activities.[66] Quality of life is reported to be lower for patients with depression than the general population.[73] A prior study showed that inmates of a juvenile reformatory were able to establish a positive self-image and had improved self-identity and emotional stability as well as decreased maladaptive behaviour, hyperactivity, and withdrawal after a similar program.[74] In addition, self-identity and self-love of vulnerable family children were encouraged through interaction with plants.[75] Lee et al.[21] reported that horticultural therapy using pressed flowers to middle-aged women have a positive effect on increasing self-acceptance, awareness of self-existence, and ego identity. Lee and Nam[76] reported that application of horticultural therapy to middle-school students led to significantly positive change the ego identity.

5. Summary

This study aimed to reduce the depression and anxiety experienced by middle-aged women and to improve their self-identity. Compared to the control group that participated in a pre- and post-test only, the experimental group, which participated in the horticultural therapy program for 12 sessions, showed decreased depression and anxiety and enhanced self-identity. Study limitations and recommendations for follow-up studies are as follows. Since we examined women aged 40–59 years in South Korea, the results cannot be generalized to women in other age groups or from other areas or cultural backgrounds. Therefore, it is necessary to conduct studies with more representative sampling and diverse measurement methods. Further, studies using varied intervention models or techniques should be conducted to replicate the results and determine program feasibility.

Declaration of interest

None.

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