



## Veterans in substance abuse treatment program self-initiate box gardening as a stress reducing therapeutic modality



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### ABSTRACT

**Objectives:** To assess the experiences of a veteran initiated horticultural therapy garden during their 28-day inpatient Substance Abuse Residential Rehabilitation Treatment Program (SARRTP).

**Design:** Retrospective study.

**Setting:** Veterans Affairs Medical Center (VAMC), Salem, Virginia, USA

**Interventions:** Group interviews with veterans from the last SARRTP classes and individual interviews with VAMC greenhouse staff in summer of 2016.

**Outcome measures:** Time spent in garden, frequency of garden visits, types of passive and active garden activities, words describing the veterans' emotional reactions to utilizing the garden.

**Results:** In 3 summer months of 2016, 50 percent of the 56 veterans interviewed visited and interacted with the gardens during their free time. Frequency of visits generally varied from 3 times weekly to 1–2 times a day. Amount of time in the garden varied from 10 min to 2 h. The veterans engaged in active and/or passive gardening activities during their garden visits. The veterans reported feeling “calm”, “serene”, and “refreshed” during garden visitation and after leaving the garden.

**Conclusions:** Although data was secured only at the end of the 2016 growing season, interviews of the inpatient veterans revealed that they used their own initiative and resources to continue the horticulture therapy program for 2 successive growing years after the original pilot project ended in 2014. These non-interventionist, therapeutic garden projects suggest the role of autonomy and patient initiative in recovery programs for veterans attending VAMC treatment programs and they also suggest the value of horticulture therapy as a meaningful evidence-based therapeutic modality for veterans.

### 1. Introduction

Mental illness and substance abuse are major concerns for the American armed forces. At present, about 20 percent of active duty soldiers and 42 percent of reserve unit soldiers require mental health treatment. The consequences of stress reduction are recognized as important in the Veterans Administration (VA) Substance Abuse Rehabilitation Treatment Program (SARRTP), since the majority of veterans from all combat theaters have significant stress from anxiety disorders, mood disorders and trauma- and stress-related disorders such as post-traumatic stress disorder (PTSD).<sup>1</sup> The US Army found that 27 percent of soldiers screened 3–4 months after returning from deployment to Iraq met criteria for alcohol abuse. From 2005 to 2009, drug or alcohol abuse was involved in greater than 45 percent of non-fatal

suicide attempts and 30 percent of the Army's suicide deaths.<sup>2</sup> Moreover, VA records document that drug and alcohol dependence, accompanied by other mental illness such as PTSD and depression, increased by 58 percent, from 63,767 in 2006–100,580 in 2007.<sup>3</sup> Estimated costs of excessive alcohol consumption in the U.S. military are \$1.12 billion per year,<sup>4</sup> with an annual cost of \$425 million for concurrent medical treatment. Also, the impact on military preparedness is substantial with an annual loss of 320,000 work days, 34,400 arrests, inability to deploy 10,400 active-duty military and the separation from military duty of 2200 soldiers.<sup>5</sup>

A growing body of literature supports the reduction of stress through active or passive experience with nature, as in horticulture therapy, by modulation of the central nervous, endocrine and immune systems. This is evidenced indirectly and directly by the reports on the

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reduction of the hypothalamic-pituitary-adrenal (HPA) axis indices of stress such as the reduction of post-surgical pain and length of recovery,<sup>6</sup> blood pressure,<sup>7</sup> electromyographic activity<sup>8</sup> electroencephalographic activity,<sup>9</sup> cortisol levels,<sup>10,11</sup> and improved immunological function.<sup>12–15</sup> Significant stress to veterans and nonveterans occurs with chronic and excessive alcohol consumption, which precipitates increases in cortisol secretion similar to cortisol levels reported in Cushing's syndrome and in post-surgical trauma.<sup>16</sup> Chronic over- production of cortisol may in turn precipitate hippocampal atrophy leading to memory difficulties in chronic combat PTSD<sup>17,18</sup> and periods of dissociation.<sup>19</sup> Moreover, the long term degradative effects of stress with reduction of volume of multiple brain centers such as the hippocampus, caudate nucleus and amygdala precipitate earlier Alzheimer syndrome cognitive dysfunction requiring higher health costs for the veteran until death.<sup>20,21,22</sup>

A prior, 2014 randomized pilot study of veterans attending a 28-day SARRTP population, at the same VA site as the present study, assessed the effect of horticulture therapy (HT) box gardening versus non-horticultural occupational therapy (OT) on cortisol levels, depression, posttraumatic stress disorder symptoms, alcohol cravings, and quality of life. The HT and OT groups spent five hours per week of supervised HT and OT for three weeks. Of the 78 veterans who agreed to participate in the research protocol, 49 (averaging 46.4 years, sd = 11.9) completed the protocol. Primary outcome measures included pre- and post-treatment measures: quality of life (Quality of Life Enjoyment and Satisfaction Questionnaire Short Form (Q-LES-Q-SF); alcohol craving (Alcohol Craving Questionnaire (ACQ-NOW); post-traumatic stress indices (Posttraumatic Stress Disorder Checklist Civilian Version (PCLC); depression (Center for Epidemiologic Studies Depression Scale (CES-D); and, salivary cortisol levels at weeks 1, 2 and 3.<sup>16</sup> Repeated measures revealed that HT performed for five hours per week for three weeks was associated with a 12 percent reduction in salivary cortisol levels from week one to week three. Separate one-way analyses of covariance (ANVOCA) revealed that the cortisol reduction was greater, but not statistically significant (p = 0.43), when compared to the reduction in OT veterans' saliva levels. However, the Q-LES-Q-SF and CES-D showed a trend towards improved quality of life and fewer depressive symptoms in the HT group compared to the OT group.<sup>11</sup> This article reports the observed experiences of inpatient 28-day SARRTP veterans that self-initiated and completed box gardening activities for two successive growing seasons (2015 and 2016) after the original study in 2014.

## 2. Methods

In the summer of 2016, members of the Geriatric Research Group (GRG) at the Veterans Affairs Medical Center (VAMC) in Salem, Virginia, were informed that veterans enrolled in the inpatient 28-day SARRTP had informally continued the box gardening activities for 2 growing seasons after the original pilot project had ended in 2014. The GRG learned of this phenomenon slightly more than 2 months before the end of the second growing season. This afforded minimal time to try

to gather information from the inpatient veterans and greenhouse staff who were participating in the last months of the impromptu horticultural therapy gardening. Information was collected and recorded by the first author in group meetings with the veterans graduating at the end of their 4 week programs in June, July and August of 2016. Each graduating group included a different set of veterans. A total of 56 different members of the SARRTP classes were queried about their experiences with the horticulture activities of the veteran-initiated program. The recorded answers reflect only the input of those veterans that chose to respond to the questions during the end-of-program colloquium with the program director.

The following questions were asked of the last 3 graduating classes at their end-of-meetings: 1) how did the veterans learn about the horticulture box gardening (before entering the 28-day SARRTP or during the program) as there was no formal staff participation? 2) how many SARRTP veterans reported that they utilized the courtyard box gardens and the general garden area? 3) how often did each of these veterans go to the garden? 4) how much time did the veterans spend in the garden while they were engaging in either passive or active activities? The veterans' reflections on how the garden influenced their daily inpatient lives were also recorded in response to the following inquiries: 1) what passive activities did the veterans do in the garden? 2) what active activities did the veterans do in the garden? 3) why were the garden and horticulture activities important to the veterans? 4) how did the veterans feel upon leaving the garden?

To confirm the SARRTP veteran reports about unplanned participation in the gardens, the VA greenhouse workers were approached in additional interviews. These workers consisted of both VA employed greenhouse staff and veterans who had committed to a weekly scheduled "compensated work jobs" in which they were to work approximately 5 days a week to give them structure, purpose and as a transition to the private work force. The research team members wanted to learn the source of gardening materials and tools needed to maintain the SAARTP participants' gardening over two years, as this work was not part of the regular greenhouse workers' duties.

The primary goal of the questions for both the SARRTP veterans and the greenhouse workers was to better understand the experience of the SARRTP veterans responsible for initiating their own therapeutic modality of horticultural therapy which was no longer formally available to them. To the best of our knowledge, this veteran initiated behavior had not been previously described for other Veterans Affairs SARRTP.

## 3. Results

The questions asked of the SARRTP veterans are noted in Tables 1 and 2. As seen in Table 1, 50% (28 of 56) of the SARRTP participants in June, July and August of 2016 stated that they benefited from the veteran initiated and sustained horticulture therapy. The frequency of garden visits was often daily, and lengths of stay varied from a few minutes to approximately 2 h. Several of the SARRTP residents knew

**Table 1**  
Self-initiated therapeutic box gardening by veterans in a substance abuse residential rehabilitation treatment program (self-reported numbers).

Month of data collection	June 2016	July 2016	August 2016	Totals
Total number of vets in program	17	22	17	56
Number of vets interacting with garden	11 (65%)	10 (45%)	7(41%)	56
Frequency of being in gardening area	1–2 times/day –unknown number of vets	Daily–3 vets 3 times/week – 7 vets	1–2 times/day – 6 vets	28 (50%)
Length of stay in gardening area	Approx. 2 h- unknown number of vets	10–30 min – 7 vets More than 30 min – 1 vet	15–20 min – 1 vet	
Source of Information regarding garden	PS1 – unknown number of vets UA2 – unknown number of vets	PS1–8 vets UA2–2 vets	PS1–2 UA2–5	

PS1—from a previous stay (program of training).  
UA2—upon arrival (learned by asking others).

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