

POST 9/11 COMBAT VETERANS IN AGRICULTURE:
HEALING, PEACE, AND PURPOSE

BY

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THESIS

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ABSTRACT

Many veterans suffer from depression, and symptoms of PTSD and some cannot do daily tasks without the help of others or machinery. There is a group of Post 9/11 Combat Veterans who have found agriculture provides them with therapeutic benefits as well as being a way to earn income. Luckily, some coalitions have formed to provide support and unity for these veterans. One problem is agriculture is not traditionally a kind of therapy. Also, farming is a hard business to start without capital. The benefits of both need to be researched more to provide funding and programs for veterans. Research of post 9-11 combat veterans within the agriculture field is slim. The Veteran's Administration (VHA) has conducted some surveys on the subject, but not much in-depth research has happened. The research for this study looks into readjustment. Studies exist about the benefits of animals and horticulture on people in general concerning dogs, cats, horses, and gardening. The research in this study looks directly at how agriculture can help post 9-11 combat veterans. Extension and other rural programs should form for this group. Also, groups of veterans participating in the agricultural sector will increase. Job creation is an important benefit of this study. The study conducts through veterans completing a health questionnaire, wearing a heart monitor and keeping a journal of their activities. Shining light on this subject promotes healing, peace, and purpose through agriculture for Post 9/11 Combat Veterans.

To My Children:

Kelci Ann, Andrea Kate, and Elias Henry

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CHAPTER I

INTRODUCTION

A Post 9/11 Combat Veteran steps out of his home in rural America to see his accomplishments in the field in front of him knowing that he has found healing and purpose in agriculture. There are others who share his experience. Post 9/11 Combat Veterans need recreation and rehabilitation for reintegration and readjustment. Rectifying the dwindling farmers and ranchers population due to aging could happen by utilizing Post 9/11 Combat Veterans to fill the void. Currently, agriculture workers over the age of 65 now outnumber farmers under 35 by a margin of six to one, and the concentration of American farmland is with older farmers as owners (Ackoff, Bahrenburg, & Lusher Shute, 2017).

Former service members, no matter the rank or affiliation, face challenges when returning home from combat and to civilian life. The cognitive dissonance stems from experiencing a highly structured military culture and changing to the individualistic culture of civilian life. There is also a component of service members wanting to serve others (Suzuki & Kawakami, 2016). Plants and animals provide an outlet of nonjudgement for service members who are experiencing difficulties adjusting.

Coalitions of veterans turned farmers have formed. Examples of programs are the Farmer Veteran Coalition and Beginning Farmers Military Veteran Program. Even so, there is not a lot of research backing to agriculture being therapeutic and beneficial for readjustment. Detweiler, Sharma, Lane, Kim, Johnson, & Kim (2010, p. 26) states,

Restorative natural environments, including outdoor gardens and rehabilitation greenhouses, may be effective components of interdisciplinary treatment plans for veterans with multiple medical and psychiatric problems...Yet the use of restorative

natural environments, which is supported by a modest body of literature, has been under-researched in veteran populations.

The Post 9/11 Combat Veterans in Agriculture: Healing, Peace, and Purpose study will offer the needed research to inform the creation of funding and programs where needed.

Problem

Anecdotally I have observed that Post 9/11 Combat Veterans often have trouble readjusting when returning home from deployments. Many of them have to leave the only occupation that they have ever known due to injuries. Even more of them miss the comradery formed overseas with fellow soldiers. Post 9/11 Combat Veterans may find peace, healing, and purpose in the agricultural sector if provided with the appropriate resources. Expanding programs and creating new programs is needed. Post 9/11 Combat Veterans are in need of funding and educational opportunities. Extension and other rural programs need to know. Awareness needs to happen on the issue of finding creative ways of readjustment for veterans in agriculture. There is a need for education in this field. There is a need for grants to start programs and farms. Awareness needs to happen on the issue of finding creative ways of readjustment for veterans in agriculture.

Purpose

The purpose of this study is to understand readjustment benefits of agricultural work involvement for Post 9/11 Combat Veterans. There is a need to study Post 9/11 Combat Veterans to develop more education resources through extension or other rural programs. Program and research funding and VHA recognition of therapeutic benefits of agriculture are necessary. The overall result could be more Post 9/11 Combat Veterans working in the Agricultural industry. Two central questions were developed to guide the study: 1) Do stress levels decrease when Post

9/11 Combat Veterans engage in agricultural practices? 2) Do post 9/11 combat veterans identify engagement in agricultural practices as helpful in readjustment?

CHAPTER II

REVIEW OF LITERATURE

Readjustment and reintegration are difficult for many rural Post 9/11 Combat Veterans while sources of comfort exist with animals and horticulture. Studies reviewed included areas of transitioning of rural veterans, readjustment, and reintegration of soldiers with PTSD, nature and recovery therapy for people living with PTSD, heart rate variability biofeedback, rehabilitation of disabled veterans, canine companionship, and horticulture therapy (Anderson, 2017; Besterman-Dahan, Chavez, Bendixsen, & Dillahunt-Aspillaga, 2016; Detweiler et al., 2010; Growing Veterans, 2017; Interian, Kline, Callahan, & Losonczy, 2012). Research specifically of Post 9-11 Combat Veterans within the agriculture field is lacking. In 2010, Detweiler et al. wrote in the *Federal Practitioner* about restorative natural environments as an innovative option for veterans with multiple medical and psychiatric problems. One study states that pleasant smells, colors, and shapes of plants may reduce stress (Detweiler et al., 2010). The same theory of stress reduction may be applied to animal interaction as well. Rural Post 9/11 Combat Veteran's in agricultural settings are the focus of this study to determine if stress levels drop or recovery (parasympathetic system activation) is registered during interaction with animals and horticulture.

There are organizations focused on helping veterans reintegrate. In a mixed method study by Besterman-Dahan, et al. (2016), interviews found that the majority of Veterans indicated that both their health and difficulties with community reintegration have improved since they began participating in growing veterans' activities. The Growing Veterans mission is to empower military veterans to grow food, communities, and each other (Growing Veterans, 2017). Growing Veterans (GV) research showed that 88.9% of the respondents said they have been able to find

purpose in life through the organization. GV contributed to the improvement of the mental, physical, and emotional health of veterans, as well as vocational skills, community connectedness, and interpersonal communication. The organization also helped to provide a sense of satisfaction, belonging, and support for veterans. Additionally, GV impacted the lives of veterans' families and their communities positively. One of the major concerns for rural veterans is limited access to services ultimately isolating the veteran. GV minimized isolation issues, as it serves as a hub for those seeking support emotionally, information about local resources, and chances to practice their values (Besterman-Dahan et al., 2016). GV is just one example of organizations that help veterans with integration. Reintegration and readjustment are both key components to this research.

Veteran's Affairs is also becoming increasingly interested in treatments which do not involve reliance on medications. A medscape.com article by Pauline Anderson (2017) highlights Dr. Jack Ginsberg's research on Heart rate variability biofeedback (HRV-B) has been looked at for veterans with chronic pain. HRV-B shows benefits of reducing the use of opioids. Learning to control heart rate and lower it by breathing techniques is an easy and free way to treat chronic pain which becomes elevated due to stress (Anderson, 2017). Knowledge of heart rate and stress triggers is beneficial for utilizing the therapy techniques.

Agriculture has the potential to be a readjustment stressor treatment. A 2012 article in the Journal of Psychiatric Services surveyed 157 Post 9/11 combat soldiers who have PTSD. Interian et al. (2012) stated: "Readjustment stressors are common among soldiers returning from duty with PTSD and may be more predictive than PTSD symptom levels in treatment-seeking" (p. 855). The researchers believe that overall seeking of therapy might be because of social encouragement and interference and not a person's symptom severity (Interian et al., 2012). The

more resources and availability for soldiers with PTSD the better for helping them gain treatment.

Suzuki & Kawakami (2016) conducted a study with nine males and two females who were veterans, former service members, retired service members, and active Reserve members who served in the Navy, Air Force, Army, and National Guard. All participants in the report have experienced returning to civilian life after their deployment at least once in the past. Five themes that the researchers found were freedom of choice, the contrast between the “sense of alertness” among wartime service members and “sense of boredom” among peacetime service members, discipline, comradery, and service to others. Another study in *Military Medicine Journal* found that rural veterans are at higher odds for depression than non-rural veterans (Dittrich et al., 2015).

There is research on therapy benefits with specific species of animals and horticulture. Westlund (2015) found, “As each veteran spent time in nature, he also regained lost confidence, developed a sense of purpose and meaning outside the institutional context of the military, and realized that he had a valuable role to play in his community” (p. 168). Stern et al. (2013) found similarly that veterans with PTSD frequently say that dogs love them even when they are not in a good mood. Canines may also offer a means for veterans to express their feelings or voice their thoughts without being worried about being criticized. Also, petting or playing with a dog may reduce anxious feelings. There are also similar findings with horticulture interaction. Vaccaro, Cousino, & Vatcher (1992) found that motivation increased with interaction with horticulture. The study's patients' involvement in a broad range of activities created reinforcers such as payment, public recognition and increased their responsibility. Patients reduced social isolation due to these factors (Vaccaro et al., 1992).

CHAPTER III

METHODOLOGY

The Post 9/11 Combat Veterans in Agriculture study was designed to combine heart rate monitoring results and written responses to give an idea if agriculture helps with stress management in Post 9/11 Combat Veterans. The study used physiological stress and recovery results obtained via ambulatory heart rate monitor, daily activity logs, and an electronic questionnaire to collect data.

Research Design

Research on examining stress management and therapeutic benefits of animals and horticulture were completed using Post 9/11 Combat Veterans in rural areas. The VR-12 questionnaire was input into Qualtrics for electronic administration. The questionnaire link was e-mailed to known Post 9/11 Combat Veterans living in rural areas who participate in Agriculture related activities. The distribution of the questionnaire took place in March 2018, and the final deadline for response was April 1, 2018. The participants were given scheduled reminders to complete the survey by the deadline.

In addition to the VR-12 questions, participants wore ambulatory heart monitors (FirstBeat Bodyguard 2) for four days and three nights while conducting standard day-to-day tasks which included activities with agriculture. The FirstBeat physiological stress and recovery measurement were started on a Wednesday morning and concluded the following Sunday morning. Four consecutive days was the length of the measurement. The FirstBeat Lifestyle Assessment Questionnaire and Journal were given with the heart monitors. Participants kept a daily log of activities and consumption of substances impacting heart rate and respiration. Participants noted the times they slept.

Population and Sample

The target population of this study is Post 9/11 Combat Veterans living in rural areas. The sample came from Indiana, Michigan, Missouri, and Texas. The sample is exploratory. Eleven people participated in the study ($N = 11$), and six participants ($n = 6$) finished both the physiological stress and recovery assessment portion of the research and the VR-12 electronic questionnaire.

We initiated the search for Post 9/11 Combat Veterans within the veteran community. Farmer veteran organizations and word-of-mouth of the study help to locate participants. Selected Post 9/11 Combat Veterans completed the questionnaires. We then contacted and invited veterans to participate. Snowball recruiting was used to find more participants. Social media such as Facebook was used to communicate and find participants.

Final participants of the study ended up being six ($n = 6$) male Post 9/11 Combat Veterans from four states. Their ages ranged from 31 to 48 with their mean age was 39 years old. Also, the median age of the participants was 39 years old. Body Mass Index scores for the men ranged from 25.7 to 35.3. The mean BMI for the participants was 30.45.

Instrumentation

VR-12. The Veterans Rand 12 Item Health Survey (VR-12) distributed through Qualtrics was used to obtain information on how each Post 9/11 Combat Veteran who participated in the study views their health. The VR-12 is from the Veterans Affairs Health Services Research and Development Service. Qualtrics is an online survey platform which generated and distributed the VR-12 questions to participants of this study. The survey asks how each veteran views their overall health, mood, how they react to moderate activities, and how the veteran has felt

emotionally and psychologically. The instrument shows role limitations and functioning levels for participants.

Selim et al. (2009) assessed the validity of the VR-12. The study shows that the scores vary depending on gender, select medical conditions, and psychiatric conditions. Selim et al. (2009, p. 48) stated,

Based on prior research, we specified a model in which five items (moderate activities, climbing stairs, pain and the two role-physical items) loaded on a physical health factor, four items (feeling calm, not feeling depressed, and the two role-emotional items) loaded on a mental health factor, and the remaining three items (general health, vitality, and social activities) had loadings on both factors. All loadings were statistically significant. The correlation between the factors was 0.585.

Also, participants 64 and younger, who were eligible for Medicare due to disability, had lower VR-12 scores than those who qualified and were over 65 years of age. Males showed higher scores than females. Respondents with worse conditions such as strokes showed lower scores than participants with less bad conditions like hypertension. Participants who reported depression had lower scores than those who reported medical conditions. Overall, VR-12 computation of scores is simple (Selim et al., 2009).

FirstBeat. Each participant was mailed a FirstBeat BodyGuard 2 with complete instructions on how to use the device. The FirstBeat BodyGuard is an ambulatory heart rate monitor worn discretely underneath clothing attached to the trunk of the body. The BodyGuard collects heart rate, heart rate variability, respiration, and a number of steps using an accelerometer. The FirstBeat Analysis Server is used to complete the analysis of the physiological data collected and generates a Lifestyle Assessment. The Lifestyle Assessment

includes daily snapshots from the time a person indicates they awoke from sleep to the end of the next sleep period. For a person with a “normal” schedule (not working 2nd or 3rd/night shifts) each daily analysis will start in the morning upon waking and end at the following day’s conclusion of the sleep period, typically the next morning. The FirstBeat Analysis Server calculates a total number of steps each day, calorie expenditure each day, low/average/high heart rates, recovery obtained during sleep (indicated by parasympathetic system activation and sympathetic system deactivation), and daily stress and recovery balance (ratio of sympathetic to parasympathetic system activation).

Following receipt of the BodyGuard, participants were provided access to the daily journal log via an electronic link by FirstBeat. Participants gave background information, a LifeStyle Assessment Questionnaire about their opinion of their health, and complete journals with the link. The FirstBeat heartbeat measurement was started on a Wednesday morning and concluded the following Sunday morning. The measurement tool is connected to the subject via electrodes with cables extending from the monitoring device. The device ends are then attached to the participant's right side of the body under the collarbone. The cable end is attached to the left side of the body on the rib cage.

Data Collection

Physiological stress and recovery indicators (heart rate, heart rate variability, respiration, motion/steps), demographic information, and health questions were collected from participants. Each participant was assigned a randomly generated alpha-numeric code that is their reference number for their answers for identification purposes without needing to provide their name.

Participants have access to their log for entry of daily activities through the FirstBeat Lifestyle Assessment server. Participants created an account with their name, date of birth,

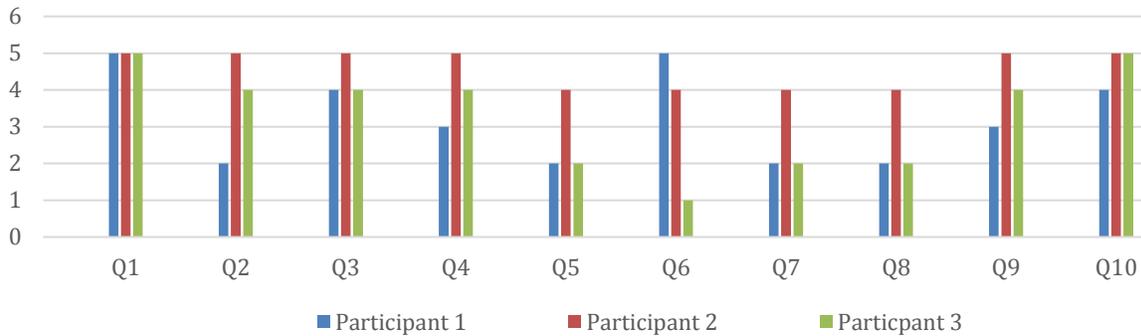
weight and contact information. Completing the daily log provides the data needed to run analyses through the FirstBeat server by a trained researcher. The data downloaded, and the randomly generated alpha-numeric code identifies the participant in future analysis. A trained research assistant collected individual questionnaires, and the files were immediately uploaded onto a laptop computer to be used for further qualitative analysis.

CHAPTER IV

RESULTS

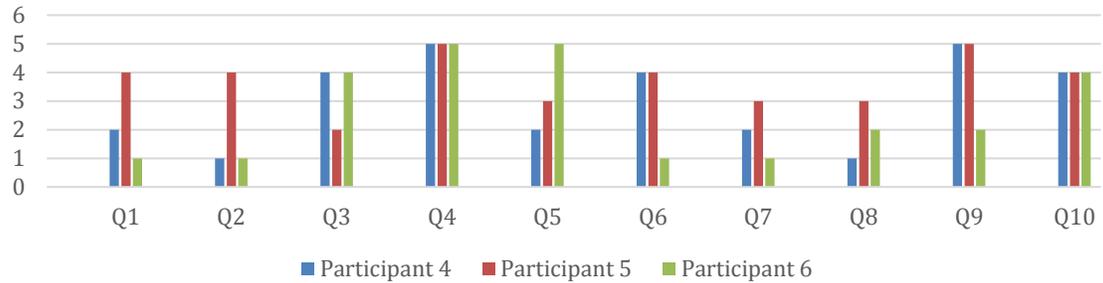
Compiling results from the FirstBeat Lifestyle Assessment, the VR-12 Rand Questionnaire, the FirstBeat Lifestyle Assessment Questionnaire, the daily logs of participants were the basis of the data for this study. Seven participants completed the VR-12 Rand Questionnaire in Qualtrics, and six participants completed wearing the heart monitor, regular record, and FirstBeat Lifestyle Assessment Questions. One participant did not have enough information to determine a Lifestyle Assessment score.

Analysis of the FirstBeat Lifestyle Assessment scores each participant in the categories of stress and recover, sleep, and physical activity. Averaging these categories together can show an overall picture of these categories combined. Two participants scored low, three moderate, and one did not provide enough information to be scored.



- Q1- I think I am physically active enough to get health benefits.
- Q2- I think my physical activity is intensive enough to improve my fitness.
- Q3- In my opinion, my eating habits are healthy.
- Q4- I feel that my alcohol consumption is not excessive
- Q5- I don't generally feel stressed.
- Q6- My days include breaks that allow me to recover.
- Q7- I usually feel rested and energetic.
- Q8- I feel that I sleep enough.
- Q9- I felt hat I can influence the things that affect my health.
- Q10- In my opinion, I feel well at the moment.

Figure 1. FirstBeat Lifestyle Assessment Questionnaire answers. This figure illustrates that responses for participants one, two, and three from the FirstBeat Lifestyle Assessment Questionnaire. Scale for answers: 1-completely disagree, 2- partially disagree, 3- cannot say, 4- partially agree, and 5- completely agree.



- Q1- I think I am physically active enough to get health benefits.
- Q2- I think my physical activity is intensive enough to improve my fitness.
- Q3- In my opinion, my eating habits are healthy.
- Q4- I feel that my alcohol consumption is not excessive
- Q5- I don't generally feel stressed.
- Q6- My days include breaks that allow me to recover.
- Q7- I usually feel rested and energetic.
- Q8- I feel that I sleep enough.
- Q9- I felt that I can influence the things that affect my health.
- Q10- In my opinion, I feel well at the moment.

Figure 2. FirstBeat Lifestyle Assessment Questionnaire answers. This figure illustrates that responses for participants four, five, and six from the FirstBeat Lifestyle Assessment Questionnaire. Scale for answers: 1-completely disagree, 2- partially disagree, 3- cannot say, 4-partially agree, and 5-completely agree.

Table 1 shows the score and grading of low, moderate or good for each category assessed on the Lifestyle Assessment. It also shows the number of steps taken. The scale is 0-100.

Table 1
Lifestyle Assessment Summary

	Stress and recovery balance	Result	Sleep	Result	Physical activity	Result	Steps range	Over all score	Overall result
Participant 1	12	Low	26	Low	30	Moderate	2238-4114	23	Low
Participant 2	56	Moderate	71	Good	29	Low	4265-8197	52	Moderate
Participant 3	-	-	-	-	52	Moderate	3072-8453	-	-
Participant 4	42	Moderate	52	Moderate	33	Moderate	594-2397	42	Moderate
Participant 5	14	Low	29	Low	31	Moderate	3804-7101	25	Low
Participant 6	7	Low	18	low	65	Good	630-4073	30	moderate

Health Effects of Physical Activity

Health and physical activity are assessed on a scale of 0-100 taking into consideration the duration and intensity of aerobic physical exercise. The average result for FirstBeat participants was a score of 42 points on a 0 to 100 scale. Scores from this study's participants ranged from 29-65. Participant number 2 was labeled “low” with the score of 29. Participant number 6 was labeled “good” with the score of 65. The other four participants were labeled “moderate.”

One of the critical factors in evaluating physical activity for each participant is to observe how many steps the participant takes each day. The average number of recommended steps was 7,500. All six participants were below average on the number of steps taken per day. The average range of steps was from 1,507 to 5,674 steps. Participant number three exceeded the recommended number of steps 2 out of 4 days with 8,313 steps and 8,453 steps.

Sleep

The restorative effect of sleep is also placed on a scale from 0 to 100. The number assessed is based on the duration and amount of sleep. The amount and quality of recovery during sleep is also a factor. Participant three did not record enough sleep data to obtain results from this analysis. Participant 2 was labeled “Good” with an above average score for his age group of 71. Average for his age group is 57. Participant number 4 was assessed as “moderate” with a score of 52. The other three veterans were assessed as having low restorative effects of sleep with scores ranging from 18-29.

Participant number 1 indicated that he thought he was getting great sleep every night. According to the FirstBeat monitor, he was only getting moderate and low recovery during his sleep. His length of sleep was 6 hours and 15 minutes to 9 hours and 12 minutes. Three out of the four nights recorded were good on the amount of sleep. The quality and recovery time was low.

Similarly, Participant number six indicated that he thought he was getting good sleep nightly. The first night of his study there is no sleep recorded. After that, the other three nights were scored low for the restorative effect of sleep.

Participant number 4 indicated he was not getting good enough sleep nightly. Interestingly, he had good sleep the first two nights of the study and low recovery for the last two nights of the study. The final two nights scored 17 and 19 versus the first two nights which had scores of 76 and 97.

Similarly, Participant number 5 also indicated that he was not getting very good sleep nightly. His results show a moderate restorative effect of sleep for three nights and low on the last night of the test. His amount of recovery during sleep was low every night except one night it was barely moderate.

Stress and Recovery Balance

Five out of the six respondents logged enough information to determine their overall stress and recovery balance. Stress reaction means an increased activation level in the body. The feedback can be positive or negative. FirstBeat gives a score from 0 to 100 for stress and recovery balance. Fifty percent is the average stress reactions in a 24-hour period. Recovery means the body is calming down. Sleep and peaceful moments during the day are essential to recovery times. The average recovery rate in a 24-hour period is 26%.

Participants for this study scored low and moderate for stress and recovery balance. The low scores were 7, 12, and 14. The moderate scores were 42 and 56. Participant number 6 had the lowest score of 7. Participant number 2 showed no daytime recovery but was the only participant who scored “good” on sleep recovery.

Alcohol Consumption

Alcohol may play a role in heart rates and should be noted. Half of the participants did not document alcohol consumption. Therefore, there is no way of knowing if it was a factor for those three participants. Participant number three did not consume alcohol. Minimal alcohol was consumed by participant number two. He drank one to three units of alcoholic beverages each day. Participant number four consumed one unit of alcohol three out of four days. In this study, the participants who consumed alcohol had good and moderate scores for the overall restorative effect of sleep. Recovery was moderate to good for participant number 2. Participant number four displayed low recovery for two nights, good recovery for one night and moderate recovery for one night.

Veteran's RAND 12-Item Health Survey VR-12

The VR-12 (Appendix) asked each participant about how they view their health. Seven participants completed the VR-12 for this study. In general, all but one participant said their health was good or better; answering good, very good, and excellent shown below in Table 2. This figure answers the question: "In general, would you say your health is:"

The participants were also asked if they were limited doing certain activities in Table 2. A response of 57.14% as "no, not limited at all" was given when asked about moderate activities such as moving a table, pushing a vacuum cleaner, bowling, or playing golf. Similarly, 42.86% responded that they did not have difficulty climbing several flights of stairs. Although, that response was more evenly distributed between answers. Two participants answered "yes, limited a lot," two responded "yes, limited a little," and three with the response "no, not limited at all."

Table 2
VR-12 General Responses

#	Field	Participant Responses	%
1	Excellent	2	28.57 %
2	Very Good	2	28.57%
3	Good	2	28.57%
4	Fair	1	14.29%
5	Poor	0	0.00%

Table 3 shows that the participants accomplished less than they would like to a little of the time or some of the time. The distribution of answers was relatively evenly when asked if they felt limited in the kind of work or other activities. No participant answered “yes, all the time” to either question.

The majority of participants did answer that they did not have problems accomplishing the amount of work or activities that they wanted to. Also, participants felt like they completed work or activities as carefully as usual.

Participants were asked how much pain interfered with normal house and out of the home work. The majority of the participants recognized that pain was a factor while participating in normal work. The responses ranged from quite a bit to a little bit with 57.14% responded that pain was a little bit of a factor when working outside the home and doing housework.

Table 3
VR-12 Responses About Physical Activity

Field	No, none of the time	Yes, a little of the time	Yes, some of the time	Yes, most of the time	Yes, all of the time	Total
a. Accomplished less than you would like	0	3	4	0	0	7
b. Were limited in the kind of work or other activities	2	2	2	1	0	7

The participants answered with the results shown in Table 4 how much time during the past four weeks that they felt calm and peaceful, had a lot of energy, and felt downhearted and blue. There was a range of answers with the responses to these questions as can be seen in the table. Participants were asked how they felt about three specific questions listed on the table.

Table 4
VR-12 Emotional Responses

#	Field	All of the time	Most of the time	A good bit of the time	Some of the time	A little bit of the time	None of the time	Total
1	a. Have you felt calm and peaceful?	0	0	0	1	2	0	7
2	b. Did you have a lot of energy?	0	3	2	1	0	1	7
3	c. Have you felt downhearted and blue?	0	0	0	1	4	2	7

The information in Table 5 references the veteran's social activities. The participants answered a range of “none of the time” to “some of the time” when asked if physical or emotional problems interfered with social activities such as visiting friends and relatives. The response of “none of the time” was given by four out of seven of the respondents. The Veterans answered how physical or emotional problems interfere with social activities.

Table 5
VR-12 Social Responses

#	Field	Participant Response	%
1	All of the time	0	0.00%
2	Most of the time	0	0.00%
3	Some of the time	2	28.57%
4	A little of the time	1	14.29%
5	None of the time	4	57.14%

There was also a balanced range of responses to this question. In Table 6, the answers given were “slightly worse,” “about the same,” “slightly better,” and one veteran responded “much better.” No participant gave the response of “much worse.” The participants were then asked to compare their present health to their health one year ago.

Table 6
VR-12 Time Comparative Responses

#	Field	Participant Response	%
1	Much better	1	14.29%
2	Slightly better	2	28.57%
3	About the same	2	28.57%
4	Slightly worse	2	28.57%
5	Much worse	0	0.00%

Lastly, participants were asked to compare their present emotional problems such as feeling anxious, depressed, or irritable to those same emotions a year ago. Four out of seven participants responded that they felt their emotional health was about the same. Two participants explained that they felt their emotional health had slightly improved since last year and one answered that their emotional health was much worse.

CHAPTER V

DISCUSSION

The findings are exploratory but show potential for a full study. The study indicates some recovery time from agricultural activities. Moreover, it demonstrates that participants potentially observe their health and sleeping habits as better than they are.

There are limitations to the research. Some participants did not document as well as needed for the analysis. Also, the number of participants, the age range of participants, and not having any participants of the female sex are also limitations.

According to Detweiler, et al. (2010), pleasant smells, colors, and shapes of plants may reduce stress. The hypothesis is that the same concept could be made about other agricultural areas such as animals. Some of the rural Post 9/11 Combat Veterans who took part in the study show some recover associated with agricultural activities. Participant number five displayed daytime recovery associated with feeding cattle. The same participant also showed no recovery when walking his dog. Showing no recovery when walking his dog would be the opposite of Stern et al.'s (2013) findings that veterans' interactions with dogs reduce stress. Similarly, participant number three showed daily recovery when working with cattle. Participant number one showed and expressed that working with livestock was stressful to him. On the other hand, working with mowing the yard and tilling his garden showed signs of recovery.

Next, it is hopeful that Agriculture can play a role in Post 9/11 Combat Veterans' health and community reintegration. Referencing question Q 12-9 on the VR-12 questionnaire, all but one participant view their emotional health better or about the same as a year ago with agriculture a part of their lives on a regular basis. The seventh participant stated that their emotional health including feeling anxious, depressed, or irritable was worse.

A key factor for the veterans who participated in the study is if they are getting enough good sleep. Participant number one indicated that he felt like he was getting great sleep every night. Unfortunately, his restorative effects of sleep were low. On the other hand, participants five and six expressed that they felt like they did not get enough good sleep, and they were correct.

The indications are that further research has the potential to lend insight to many aspects of how agriculture may help Post 9/11 Combat Veterans. Dittrich et al. (2015) found that rural veterans are at higher odds for depression than nonrural veterans. The veteran participants for this study seemed to feel calm and peaceful and not downhearted and blue.

The hope is that Post 9/11 Combat Veterans can find lost confidence, develop a sense of purpose, and realize their value in the community like Westlund (2015) found. Veterans noted in their daily journals meaningful activities in addition to farming. Such activities included track meets, playing the guitar, exercising, public events, birthday parties, and visiting family. It is good to see the Post 9/11 Combat Veterans participating in such events to show reintegration into their communities (Westlund, 2015).

There are implications from these findings. Overall pictures of Post 9/11 Combat Veteran's health can still be observed further to see how key factors such as sleep, amount of physical activity, social or natural interaction, and stress may be a factor in day-to-day life for veterans.

As policy hopefully changes to rectify dwindling farmers due to aging, Post 9/11 Combat Veterans' could step into this role which would serve a dual purpose. Farming could provide more exercise for these veterans. For the participants in this study, physical activity intense enough to improve their fitness was lacking. Farming for veterans could also provide much-

needed companionship and stress relief as seen when participants interacted with livestock. Horticulture could also play a role for veterans as one study participant felt improvement with anxiety from mowing and tilling. The overall goal would be to fund more studies and programs to develop Post 9/11 Combat Veterans into healthy farmers. Farmers who could function in good health, be financially secure, gain independence, and have a self-fulfilling role in society.

Our findings have shown the potential for further study into Post 9/11 Combat Veterans in Agriculture. The same methodology in this study could be used with a broader approach to gain more knowledge. While this study focused on male farmers, research that includes females would be valuable as well. Another approach would be to include Post 9/11 Combat Veterans with no association with agriculture to see if their experiences were similar to findings of farmers. Overall, the need exists to continue such research.

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APPENDIX
QUESTIONNAIRE

**THE VETERANS RAND 12 ITEM
HEALTH SURVEY (VR-12)**

Instructions: This questionnaire asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities.

Answer every question by marking the answer as indicated. If you are unsure how to answer a question, please give the best answer you can.

(Circle one number on each line)

1. In general, would you say your health is:

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
1	2	3	4	5

2. The following questions are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

	YES, LIMITED A LOT	YES, LIMITED A LITTLE	NO, NOT LIMITED AT ALL
--	--------------------------	-----------------------------	---------------------------------

a. Moderate activities , such as moving a table, pushing a vacuum cleaner, bowling, or playing golf?	1	2	3
b. Climbing several flights of stairs?	1	2	3

3. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

	NO, NONE OF THE TIME	YES, A LITTLE OF THE TIME	YES, SOME OF THE TIME	YES, MOST OF THE TIME	YES, ALL OF THE TIME
a. Accomplished less than you would like.	1	2	3	4	5
b. Were limited in the kind of work or other activities	1	2	3	4	5

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?

	NO, NONE OF THE TIME	YES, A LITTLE OF THE TIME	YES, SOME OF THE TIME	YES, MOST OF THE TIME	YES, ALL OF THE TIME
a. Accomplished less than you would like.	1	2	3	4	5
b. Didn't do work or other activities as carefully as usual.	1	2	3	4	5

5. During the past 4 weeks, how much did **pain** interfere with your normal work (including both work outside the home and house work)?

NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY
1	2	3	4	5

These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.

6. How much of the time during the past 4 weeks:

	ALL OF THE TIME	MOST OF THE TIME	A GOOD BIT OF THE TIME	SOME OF THE TIME	A LITTLE OF THE TIME	NONE OF THE TIME
a. Have you felt calm and peaceful ?	1	2	3	4	5	6
b. Did you have a lot of energy ?	1	2	3	4	5	6
c. Have you felt downhearted and blue ?	1	2	3	4	5	6

7. During the past 4 weeks, how much of the time has your **physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

ALL OF THE TIME	MOST OF THE TIME	SOME OF THE TIME	A LITTLE OF THE TIME	NONE OF THE TIME
1	2	3	4	5

Now, we'd like to ask you some questions about how your health may have changed.

8. Compared to one year ago, how would you rate your **physical health** in general now?

MUCH BETTER	SLIGHTLY BETTER	ABOUT THE SAME	SLIGHTLY WORSE	MUCH WORSE
1	2	3	4	5

9. Compared to one year ago, how would you rate your **emotional problems** (such as feeling anxious, depressed or irritable) now?

MUCH BETTER	SLIGHTLY BETTER	ABOUT THE SAME	SLIGHTLY WORSE	MUCH WORSE
1	2	3	4	5

PLEASE PLACE THE COMPLETED QUESTIONNAIRE IN THE ENVELOPE WE SENT YOU.
NO STAMP IS REQUIRED: SIMPLY PLACE THE ENVELOPE IN ANY MAIL BOX.

YOUR ANSWERS ARE IMPORTANT.
THANK YOU FOR COMPLETING THIS QUESTIONNAIRE.

5. During the past 4 weeks, how much did **pain** interfere with your normal work (including both work outside the home and house work)?

NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY
1	2	3	4	5

These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.

6. How much of the time during the past 4 weeks:

	ALL OF THE TIME	MOST OF THE TIME	A GOOD BIT OF THE TIME	SOME OF THE TIME	A LITTLE OF THE TIME	NONE OF THE TIME
a. Have you felt calm and peaceful ?	1	2	3	4	5	6
b. Did you have a lot of energy ?	1	2	3	4	5	6
c. Have you felt downhearted and blue ?	1	2	3	4	5	6

7. During the past 4 weeks, how much of the time has your **physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

ALL OF THE TIME	MOST OF THE TIME	SOME OF THE TIME	A LITTLE OF THE TIME	NONE OF THE TIME
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