Evaluating the Effectiveness of Battlefield Acupuncture on Pain and Depression in Veterans

Sinclair School of Nursing
University of Missouri Health

ELIZABETH O'BRIEN, MSN, FNP-BC, DNP Student

Sinclair School of Nursing
University of Missouri Health

INTRODUCTION

- Chronic pain and depression affect a sizeable proportion of the Veteran population and have an immense impact on quality of life and health outcomes (US Department of Veterans Affairs, 2016; US Department of Veterans Affairs, 2018).
- Standard management of chronic pain in Veterans historically involved opioids which have been linked to addiction, diversion, and death (Federman et al., 2018).
- There is a high prevalence of chronic pain in US Veterans and among the 5.7 million unique patients seen annually at the DVA, more than 50% experience chronic pain (Anamkath et al., 2018; Federman et al., 2018).
- Chronic pain may induce depression and up to 85% of patients with chronic pain are affected by severe depression (Sheng et al., 2017).
- The presence of depression in a person with chronic pain is associated with decreased function, inferior treatment response, and increased health care costs (Holmes et al., 2013).

PURPOSE STATEMENT

The purpose of this project was to evaluate the effectiveness of a battlefield acupuncture (BFA) program focused on improving depressive symptoms and pain in a Veteran population. Depression was measured with the Patient Health Questionnaire-9 (PHQ-9) and pain was measured using the Numeric Rating Scale-11 (NRS-11) which were administered pre-intervention and at a three week follow up post-intervention.

PICOT

Among Veterans ages 18-80 years with chronic pain (P), how does participation in BFA (I), compared to prior to BFA (C), affect self-reported measures of depressive symptoms and pain as measured pre- and post-intervention by scores on the PHQ-9 and the NRS-11 (O) over a three week period (T)?

OBJECTIVES

1. 5% improvement in perceived depressive symptoms measured on the PHQ-9.

2. 5% decrease in self-reported pain measured on the NRS-11.

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MATERIALS AND METHODS

Design: Descriptive, longitudinal, single group cohort with a pre-post design

Intervention: Participation in the BFA program by eligible Veterans. The BFA protocol consists of a rapid, five-point (10 needle), auricular-therapy, using semi-permanent needles (Niemtzow et al., 2015). The needles were inserted by licensed acupuncturists and a nurse practitioner employed by the VA.

Tools: BFA program was evaluated

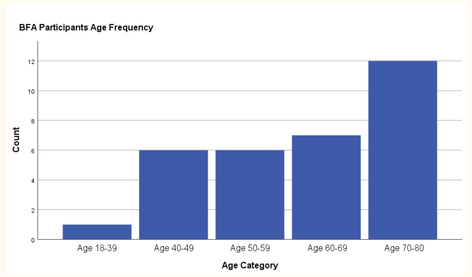
- Depressive symptoms using the PHQ-9
- Pain using the NRS-11

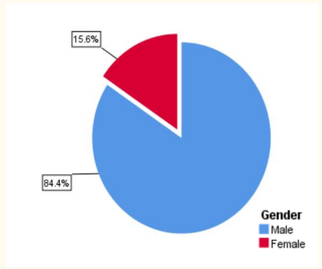
Measures: Using a paired t-test for matched pairs, a power of 0.80, effect size of 0.50, and a p of 0.05, the minimum number of subjects needed is 34 (Raosoft, 2004). However, only 32 subjects were available for the sample.

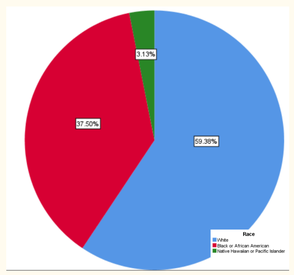
- Demographic information collected included: age, gender, race, and ethnicity.
- Nominal level data was analyzed using the Chi-square Test of Independence.
- Ratio level data was analyzed using the paired t-test.
- Cohen's d coefficient was used as an index to describe the magnitude of the effect from the intervention with values .20, .50, and .80 corresponding with small, medium, and large respectively.
- The level of significance was set at $p \leq .05$

RESULTS

Demographics







Depression Score (PHQ-9)

While not statistically significant, there was a small to moderate decrease in scores on the PHQ-9 after participation in BFA (p= .06, d = .34) with 65.6% (n = 21) noting improvement. In the sample, 12.5% (n =4) had increased depressive symptoms, while 21.9% (n =7) were unchanged. Scores on the PHQ-9 decreased from pre-BFA (M = 4.91, SD = 3.66) to post- BFA (M = 4.06, SD = 4.71), a mean decrease of 0.844.

Pain Score (NRS-11)

Most participants reported improvement in NRS-11 scores after participation in BFA, with 65.6% (n= 21) noting improvement. 9.4% (n=3) had a worsened score, while 25% (n=8) were unchanged. Scores on the NRS-11 decreased from pre-BFA (M = 6.69, SD = 1.94) to post- BFA (M = 5.47, SD = 2.55), a mean decrease of 1.29. This was a moderate to large statistically significant decrease in NRS-11 scores after participation in BFA, p < .0005, d = .71.

RESULTS

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PHQ9_Pre	4.91	32	3.666	.648
	PHQ9_Post	4.06	32	4.711	.833
Pair 2	NRS11_Pre	6.69	32	1.942	.343
	NRS11_Post	5.47	32	2.552	.451

Paired Samples Test

		Paired Differences			t	Sig. (2-tailed)
		Mean	95% Confidence Interval of the Difference Lower	Upper		
Pair 1	PHQ9_Pre - PHQ9_Post	.844	-.049	1.737	1.927	.063
Pair 2	NRS11_Pre - NRS11_Post	1.219	.599	1.838	4.014	.000

- In the sample, males with multiple areas of pain, a mood disorder diagnosis, and with an antidepressant prescribed were two times as likely to have improvement in their PHQ-9 scores after BFA, OR = 2.0, 95% CI [.751, 5.329].
- Females with multiple areas of pain, without a mood disorder and without antidepressant or opiate prescriptions were two times as likely to have improvement in their PHQ-9 scores after BFA, OR = 2.0, 95% CI [.5, 7.997].
- In the sample, males with multiple areas of pain, a mood disorder diagnosis, antidepressant prescribed, and opiates prescribed were two times as likely to have improvement in their NRS-11 scores after BFA, OR = 2.0, 95% CI [.5, 7.997].
- Females with multiple areas of pain, without a mood disorder and without antidepressant or opiate prescriptions were two times as likely to have improvement in their NRS-11 scores after BFA, OR = 2.0, 95% CI [.5, 7.997].
- There was a statistically significant improvement in the PHQ-9 and NRS-11 scores, with 53.1% (n =17) of participants noting improvement in both the PHQ-9 and NRS-11, χ^2 = 12.220, df = 4, p = .02.

CONCLUSIONS

The objective of a 5% improvement in perceived depressive symptoms measured on the PHQ-9 was met. In the sample there was a mean 17.3% decrease in scores.

The objective of a 5% decrease in self-reported pain measured on the NRS-11 was met. In the sample, there was a mean 18.2% decrease in pain scores.

There were clinically significant improvements in depressive symptoms after participation in the BFA program and statistically significant improvement in pain scores.

The results of this program evaluation support the effectiveness of BFA.

REFERENCES

Anamkath, N. S., Palyo, S. A., Jacobs, S. C., Lartigue, A., Schopmeyer, K., & Strigo, I. A. (2018). An interdisciplinary pain rehabilitation program for veterans with chronic pain: Description and initial evaluation of outcomes. *Pain Research & Management, 2018*, 3941682. https://doi-org.proxy.mul.missouri.edu/10.1155/2018/3941682

Federman, D. G., Zeliadt, S. B., Thomas, E. R., Carbone, G. F., Jr, & Taylor, S. L. (2018). Battlefield acupuncture in the Veterans Health Administration: Effectiveness in individual and group settings for pain and pain comorbidities. *Medical Acupuncture, 30*(5), 273–278. doi:10.1089/acu.2018.1296

Holmes, A., Christelis, N., & Arnold, C. (2013). Depression and chronic pain. *Medical Journal of Australia, 199*(6), S17-20. http://search.ebscohost.com.proxy.mul.missouri.edu/login.aspx?direct=true&db=cin20&AN=107805235&site=eds-live&scope=site

Niemtzow, R., Belard, J. & Nogier, R. (2015). Battlefield acupuncture in the US military: a pain-reduction model for NATO. *Medical Acupuncture, 27* (5), 344-348. doi:10.1089/acu.2014.1055

Sheng, J., Liu, S., Wang, Y., Cui, R., & Zhang, X. (2017). The link between depression and chronic pain: Neural mechanisms in the brain. *Neural plasticity, 2017*, 9724371. doi:10.1155/2017/9724371

US Department of Veterans Affairs. (2016). *VA research on depression*. Retrieved from https://www.research.va.gov/topics/depression.cfm

US Department of Veterans Affairs. (2018). *VA research on pain management*. Retrieved from https://www.research.va.gov/topics/pain.cfm

Contact: es2p8@mail.missouri.edu,
http://nursing.missouri.edu/index.php