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Patient Feedback on the Effectiveness of Auricular Acupuncture on Pain in Routine Clinical Care

The Experience of 11,406 Veterans

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Objectives: Veterans Health Administration (VHA) launched a national initiative to train providers in a specific, protocolized auricular acupuncture treatment (also called Battlefield Acupuncture or BFA) as a nonpharmacological approach to pain management. This evaluation assessed the real-world effectiveness of BFA on immediate pain relief and identified subgroups of patients for whom BFA is most effective.

Research Design: In a cross-sectional cohort study, electronic medical record data for 11,406 Veterans treated with BFA at 57 VHA medical centers between October 2016 and September 2018 was analyzed. The multivariate analysis incorporated data on pain history, change in pain level on an 11-point scale, complications, and demographic information.

Methods: A total of 11,406 Veterans were treated with BFA at 57 VHA medical centers between October 2016 and September 2018 and had effectiveness data recorded in their electronic medical record.

Results: More than 3 quarters experienced immediate decreases in pain following administration of BFA, with nearly 60% reported experiencing a minimal clinically important difference in pain intensity. The average decrease in pain intensity was −2.5 points (SD = 2.2) at the initial BFA treatment, and −2.2 points (SD = 2.0) at subsequent treatments. BFA was effective across a wide range of Veterans with many having preexisting chronic pain, or physical, or psychological comorbid conditions. Veterans with opioid use in the year before BFA experienced less improvement, with pain intensity scores improving more among Veterans who had not recently used opioids.

Conclusion: VHA's rapid expansion of training providers to offer BFA as a nonpharmacological approach to pain management has benefited many Veterans.

Key Words: pain management, acupuncture therapy, auricular acupuncture, nonpharmacological, veterans

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Over 100 million Americans suffer from chronic pain, and pain is the primary symptom reported at up to 50% of ambulatory health care visits.[1] Although providers may refer patients to many evidence-based nonpharmacological pain management approaches,[2] they have relatively limited pain management options outside of opioids or other analgesics for patients presenting with pain during the clinic visit.

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DELIVERY OF BATTLEFIELD ACUPUNCTURE

One emerging immediate pain relief therapy is Battlefield Acupuncture (BFA). The BFA procedure was developed by Niemtzow,[3] initially for use among military personnel as an adjunct therapy to manage pain in combat casualties who could be easily treated when injured through access to their ears. Although auricular acupuncture dates back to 500 BC, modern techniques have been attributed to Dr Paul Nogier, who experimented with ear stimulation to relieve lower back pain in the 1950s. BFA is noted for its ease of administration and ability to be learned by a wide variety of providers without requiring full certification in whole-body acupuncture in Veterans Administration (VA) and military settings.[4–7] The delivery of BFA involves inserting small dart-shaped semipermanent acupuncture needles into a selection of points in the ears. The points are placed in sequential order and insertion is stopped when the patient has a profound decrease in pain or up to 10 needles have been inserted. Between needle insertions, the patient is asked to walk or move around to assess for decreased pain and to note any adverse reactions such as dizziness. During the period in which the study cohort was treated, Veterans Health Administration's (VHA) recommended protocol with the semipermanent acupuncture needles was to leave them in the patient's ears until they fall out on their own or are removed by the patient if causing discomfort. VHA changed its policy as of August 2019 and needles now must be removed after 3 days to recapture the needles.

Introduction of Battlefield Acupuncture in Veterans Health Administration

Beginning in 2013, the VHA launched a national effort to implement BFA as part of routine clinical care.[4,8–10] BFA Training is conducted through a train-the-trainer model using providers with comprehensive acupuncture training or those who have successfully performed and documented over 100 BFA procedures. By March 2019, over 2400 providers across a range of disciplines have been certified in VHA to deliver BFA.[11] These include physicians, physician assistants, nurse practitioners, chiropractors, registered nurses, physical therapists, and licensed acupuncturists, if not previously certified in BFA during their clinical training.

Given that BFA is an emerging therapy, research on its effectiveness is nascent. BFA or similar auricular acupuncture techniques have been evaluated in 5 trials in outpatient or emergency department settings.[5,8,9,12] All of these studies reported short-term improvement in pain associated with BFA or other auricular acupuncture techniques, with one study reporting long-term improvements in pain relief associated with auricular acupuncture 48 hours after the treatment.[12] One small meta-analysis of BFA and other auricular techniques conducted in a variety of outpatient clinics, emergency departments, or postoperative settings concluded that auricular acupuncture had an improved analgesic effect compared with analgesics alone, although the difference associated with auricular acupuncture was small.[13] A second meta-analysis focusing on emergency department settings concluded there is limited evidence that these therapies can provide effective relief for some acute pain conditions in the emergency department.[14] The purpose of our study was to examine BFA's real-world effectiveness on patient-reported pain data during its national rollout in the VA.

METHODS

Study Setting

We identified 11,459 Veterans who received at least 1 BFA treatment between October 1, 2016, and September 30, 2018, from 57 VHA Medical Centers. Complete pre-BFA and post-BFA treatment information was available for 11,406 (99.5%) of these individuals at their first BFA treatment. These patients were identified because their provider had recorded delivery of BFA using a nationally templated note designed to collect patient-reported outcomes. Veterans who received a BFA treatment but did not have any data entered using the national template were not included in this sample. All data were extracted from VHA's National Corporate Data Warehouse between October 10, 2018, and December 7, 2018. All evaluation activities received a nonresearch determination at the VA Greater Los Angeles Healthcare as the work was conducted for VA quality improvement purposes.

Collection of Pain Intensity

At the time of each BFA procedure, providers recorded each Veteran's pain intensity level immediately before and following the BFA procedure. This data was collected using the Defense and Veterans Pain Rating Scale (DVPRS),[15] which included the 0–10 pain intensity numerical rating scale.[16] This information was collected only at the time of the BFA procedure with no long-term outcome data collected once the patient left the clinic.

Collection of Immediate Complications

Providers administering BFA were instructed to record instances where the BFA protocol was stopped due to an immediate complication. Common reasons for stopping include: the patient asked you to stop, the patient felt dizzy/lightheaded, or the patient fainted. Complications reported to the clinic after the patient has left treatment are captured through a separate note. The treatment complication field was empty for the majority of clinics and providers. As we were unable to determine if the missing information was because no complications occurred or because this field was not routinely utilized, we focus on data from one clinic (1946 procedures) that systematically recorded this information.

Demographic and Clinical Characteristics

We examined patients' baseline characteristics at the time of their first BFA visit. We extracted each Veteran's service connection and copay status, which is determined based on a Veteran's disability and income level. Each Veteran was classified as having: (1) a significant enough disability that VA waives any copay requirement; (2) a waiver of a copayment due to low income; or (3) no waiver of a copayment due to either disability or income. We adapted methods from Goulet et al[17] to identify 5 groups of chronic musculoskeletal pain diagnoses including back, joint, neck, osteoarthritis, fibromyalgia, and >1 condition using International Classification of Diseases (ICD) 9/10 codes within the 90-day period before their first BFA treatment.[18] We identified Veterans who had a

new or recurring prescription for 30 days or more supply of opioids within the prior year of their first BFA. This was based on VHA's drug class CN101 including dihydrocodeine, codeine, hydrocodone, oxycodone, pentazocine, butorphanol, fentanyl, hydromorphone, levorphanol, meperidine, methadone, morphine, oxymorphone, propoxyphene, tapentadol, or tramadol, but excluding methadone and buprenorphine.[19,20] We examined 31 chronic conditions using the Elixhauser approach.[21] In addition to depression, which is included in the Elixhauser measure, we also examined 5 additional common psychological conditions including posttraumatic stress disorder. We included these 6 psychological comorbidity variables, as well as a variable representing each patient's count of physical comorbidities, in each statistical model.

Analyses

We included only those individuals who had both pre-BFA and post-BFA treatment pain scores recorded in the electronic medical record for their first BFA treatment. Data on subsequent BFA procedures were included only if both same-day pre-BFA and post-BFA treatment pain scores were available. We stratified all analyses by examining initial treatment visits as one group, and all subsequent treatment visits as a second group. Our main analyses focus on all Veterans who received BFA; however, due to floor effects with patients who have low pain levels before being treated not having room for significant improvement, we also conducted subgroup analyses among Veterans who reported DVPRS scores ≥ 4 on the pre-BFA assessment.

We examined 2 primary outcomes: (1) absolute change in pain scores between pre-BFA and post-BFA treatment; and (2) whether the patient achieved a minimum clinically important difference (MCID) in pain reduction. The MCID was defined as at least a 1.1 or greater change in pain scored on the 0–10 DVPRS following recommendations made by Chou et al[2] and Von Korff et al.[22] We examined the magnitude of effect as defined by Chou categorizing patients into 4 groups: "Large/substantial" if the change in scores was ≥ 2.1 points on the 0–10 scale, "Moderate" for 1.1–2.0 point change, "Slight/small" for 0.5–1.0 change, and "No" effect for <0.5.

We conducted a summary analysis examining both changes in pain scores and the frequency of patients experiencing an MCID improvement in pain intensity. In multivariate analyses, we used mixed linear regression to assess factors associated with a change in pain intensity across individual patient clinical and demographic characteristics. Baseline pain scores were included in the multivariate models to account for potential associations with baseline scores and patient and clinical characteristics.[23] We accounted for clustering by the site for models of first BFA visits by including site as a random effect. The cohort of Veterans who received >1 BFA treatment was analyzed by accounting for clustering of patients who were nested within the site by including both patient and site as random effects. All analyses were conducted using Stata 15.0 (StataCorp, College Station, TX). The methods to extract the data from the VHA's Corporate Data Warehouse are available upon request of the authors. Access to the Corporate Data Warehouse can be arranged through the VA Informatics and Computing Infrastructure (VINCI).

RESULTS

Complete pain rating scale information was available for 11,406 Veterans at their initial BFA treatment and 16,054 subsequent BFA treatment visits, for a total of 27,460 BFA treatments. This represents 95.5% of the 11,459 Veterans who had a BFA treatment recorded in this template in the EHR. The reason for incomplete information on this 0.05 % of patients is unknown. Over 40% of this cohort had >1 BFA treatment during the evaluation period, with 295 Veterans (3% of the cohort) having 11 or more visits, and 81 Veterans ($<1\%$) having >20 BFA treatments.

The demographics and clinical characteristics of Veterans receiving BFA treatments are described in Table 1. While the majority of patients receiving BFA (66%) had a history of chronic pain, over one third did not have coded chronic pain conditions. We identified 32% of the patients as having filled a prescription for opioids for 30 days or more within the past year of their initial BFA procedure.

The unadjusted effectiveness outcomes of BFA are presented in Table 2. The mean pre-BFA pain intensity score at initial BFA treatment visits was 6.3 (SD = 2.1) dropping to 3.8 (SD = 2.4) after the BFA treatment, for an average change of −2.5 points (SD = 2.2). Pre-BFA treatment pain intensity scores were similar across all initial and subsequent BFA treatment visits, as was post-BFA treatment and average change, which was −2.3 points overall (SD = 2.1). Outcomes were similar among patients who were under 65 compared with those aged 65 and older. The average change for patients under age 65 across all BFA visits was identical to change among patients age 65 and older (Table 2).

These outcomes were similar when we restricted the analysis to only those the visits where pain intensity levels were reported to be moderate/severe pre-BFA treatment (≥ 4 points on the DVPRS) to avoid a floor effect. Among these visits, the mean pre-BFA pain intensity score at initial BFA treatment visits was 6.6 (SD = 1.69) dropping to 4.1 (SD = 2.31) after the BFA treatment for an average change of −2.5 points (SD = 2.10). Both pre-BFA and post-BFA treatment pain intensity scores at subsequent BFA treatment visits were similar to the full cohort. The average change among this subgroup was −2.4 points (SD = 2.00), nearly identical to the full cohort.

Overall, 79.3% of Veterans reported a decrease in self-reported pain scores; 79.0% with the initial treatment, and 76.5% with subsequent treatments. When looking at MCID, 62.3% of Veterans experienced an MCID improvement at their first BFA treatment, and 58.8% of Veterans experienced an MCID improvement at subsequent visits. Notably, nearly 43.3% of Veterans experienced a substantial improvement in pain intensity at their initial BFA treatment visit, and 36.6% of Veterans experienced a substantial improvement in pain intensity at subsequent BFA treatment visits.

In multivariate analyses, we identified only a few factors that were modestly associated with differences in the level of improvement in pain intensity (Table 3). The average improvement in pain intensity was nearly uniform across all age groups except patients in the 40–54-age group experienced slightly inferior improvement at subsequent treatments (+0.14 points, $P = 0.036$) and patients in the 70–79-age group

TABLE 1. Demographics and Clinical Characteristics Among 11,406 Veterans Receiving BFA

Demographic and Clinical Characteristics	n (%)
Age (y)	
18–39	1289 (11.3)
40–54	2649 (23.2)
55–64	2703 (23.7)
65–69	1827 (16.0)
70–79	2313 (20.3)
80+	625 (5.5)
Sex	
Male	9620 (84.3)
Female	1786 (15.7)
Marital status	
Married	6287 (55.1)
Not married	5024 (44.1)
Not reported	95 (0.8)
Race	
White	8354 (73.4)
Black	2129 (18.7)
Other	280 (2.5)
Not reported	643 (5.6)
Copay status	
Copay required	1076 (9.4)
No copay due to disability	6394 (56.1)
No copay due to means	3936 (34.5)
Geographic location	
Metropolitan/suburban residence	8456 (74.4)
Rural residence	2909 (25.6)
Pain type (chronic)	
Back	2413 (21.2)
Fibromyalgia	193 (1.7)
Joint	492 (4.3)
Neck	384 (3.4)
Osteoarthritis	134 (1.2)
> 1	3953 (34.7)
No history of chronic pain	3837 (33.6)
Opioid use in the year before first BFA treatment	
None or <30 d supply	7743 (67.9)
≥ 30 d supply	3663 (32.1)
Psychological comorbidity	
Depression	4174 (36.6)
Mood disorders	4421 (38.8)
Anxiety disorders	2463 (21.6)
Alcohol use disorders	1082 (9.5)
Substance use disorders	266 (2.3)
Trauma-related disorders (PTSD)	3379 (29.6)
No. complex chronic conditions	
None	1442 (12.6)
1	2323 (20.4)
2	2380 (20.9)
3	1965 (17.2)
4	1375 (12.1)
5	781 (6.9)
6+	1140 (10.0)
Pain severity (DVPRS score) pretreatment	
0–3	1135 (10.0)
4–6	4677 (41.0)
7–8	4096 (35.9)
9–10	1498 (13.1)
No. BFA treatments	
1	6759 (59.3)
2	1889 (16.6)
3–5	1837 (16.1)
6–10	627 (5.5)
11+	294 (2.6)

BFA indicates battlefield acupuncture; DVPRS, Defense and Veterans Pain Rating Scale; PTSD, posttraumatic stress disorder.

experienced a slightly better improvement in pain scores compared with the reference group of Veterans aged 55–64. Veterans who were married reported larger decreases (−0.10 points, $P = 0.006$) at initial BFA treatments. Veterans with a disability status within VHA reported slightly lower levels of improvement at initial BFA treatments (+0.14 points, $P = 0.044$). While many Veterans with a history of opioid use did report MCID improvements in pain scores with the use of BFA, the impact of BFA on pain scores was smaller among these Veterans after adjusting for pre-BFA pain levels. At initial BFA procedures, improvement in pain scores was 0.30 points lower among Veterans who had recent opioid prescriptions ($P < 0.001$), and at subsequent BFA procedures improvement in pain scores was 0.20 points lower ($P < 0.001$). Notably, there were no meaningful differences in BFA effectiveness among different types of chronic musculoskeletal conditions or psychological comorbidity. However, there were slight trends of BFA having modestly lower effectiveness among Veterans with multiple chronic conditions (Table 3).

One clinic systematically recorded information about complications for 1946 BFA procedures, including information about stopping the treatment for any reason. Of these procedures, 12 (0.6%) were noted as having a complication associated with the procedure, primarily that the patient requested the procedure be stopped for reasons that included discomfort or feelings of dizziness.

DISCUSSION

Treatment with BFA among this large cohort of Veterans was effective at achieving an immediate reduction in self-reported pain intensity. We observed an average improvement of over 2 points on the 0–10-point DVPRS pain rating scale among 11,406 Veterans at their initial BFA treatment visit, as well as among those Veterans who had second and subsequent BFA treatments. BFA was delivered to a wide range of Veterans including those with a history of chronic musculoskeletal pain diagnoses. We observed no patient groups for whom BFA did not achieve an MCID improvement for at least half of those receiving the treatment, including patients who had filled opioid prescriptions as well as patients with significant psychological and physical comorbidities. Data from this large and diverse cohort of Veterans highlight that the majority of Veterans who receive BFA report that it is effective for reducing pain. This finding suggests there is a considerable value associated with VHA's national efforts to train providers in offering this service.[4,11]

An evidence-base for acupuncture as an effective treatment for pain is well recognized. Meta-analyses of 39 high-quality randomized trials, representing over 20,000 research participants from the Acupuncture Trialists Collaboration, has demonstrated that a variety of acupuncture techniques perform well at pain relief compared with usual care treatment, typically with nonopioid analgesics, or compared with sham acupuncture treatments in which needles are only inserted superficially.[21] There is currently limited evidence on the effectiveness of BFA, primarily from small case series of treated patients.[4,6,12,14] Our findings are similar to smaller trials and case series reporting on the effectiveness of BFA. Niemtzow,[7] who is responsible for adapting the BFA technique

TABLE 2. Improvement in Pain Intensity Among Patients Who Received Battlefield Acupuncture Stratified by Age

	Mean (SD) and %		
Clinical Pain Scores	**First Visits (N = 11,406 Patients)**	**Subsequent Visits (16,054 Visits Among 4661 Patients)**	**All Visits Combined (27,460 Visits Among 11,406 Patients)**
All Veterans			
Pain level (pre)	6.3 (2.1)	5.9 (2.2)	6.1 (2.1)
Pain level (post)	3.8 (2.4)	3.7 (2.4)	3.7 (2.4)
Change in pain intensity	−2.5 (2.2)	−2.2 (2.0)	−2.3 (2.1)
No change in pain intensity	21.0	20.5	20.7
Slight/small change in pain intensity	16.7	20.7	19.0
Moderate change in pain intensity	19.0	22.3	20.9
Large/substantial change in pain intensity	43.3	36.6	39.4
Unadjusted proportion achieving minimal clinically important difference (overall)	62.3	58.8	60.3
	First visits (n = 6641 patients)	Subsequent visits (8435 visits among 2582 patients)	All visits combined (15,076 visits among 6641 patients)
Veterans age 18–64 y			
Pain level (pre)	6.2 (2.0)	6.0 (2.1)	6.1 (2.1)
Pain level (post)	3.8 (2.4)	3.9 (2.3)	3.8 (2.4)
Change in pain intensity	−2.4 (2.1)	−2.2 (1.9)	−2.3 (2.0)
No change in pain intensity	21.5	20.7	21.1
Slight/small change in pain intensity	16.9	20.3	18.8
Moderate change in pain intensity	19.5	22.2	21.0
Large/substantial change in pain intensity	42.1	36.7	39.1
Unadjusted proportion achieving minimal clinically important difference (overall)	61.6	59.0	60.1
	First visits (n = 4765 patients)	Subsequent visits (7619 visits among 2065 patients)	All visits combined (12,384 visits among 4765 patients)
Veterans age ≥ 65 y			
Pain level (pre)	6.3 (2.2)	5.7 (2.3)	6.0 (2.6)
Pain level (post)	3.7 (2.5)	3.5 (2.4)	3.6 (2.4)
Change in pain intensity	−2.6 (2.3)	−2.2 (2.0)	−2.4 (2.1)
No change in pain intensity	20.3	20.3	20.3
Slight/small change in pain intensity	16.5	21.1	19.3
Moderate change in pain intensity	18.3	22.3	20.7
Large/substantial change in pain intensity	45.0	36.4	39.7
Unadjusted proportion achieving minimal clinically important difference (overall)	63.3	58.6	60.4

from the lineage of auricular acupuncture, has described case series among a wide range of individuals who experienced immediate pain relief.[4,24,25] Fox et al's[12] small trial of 30 participants describe a similar difference in numeric rating scale scores on the 0–10 pain scale, with the usual care group reporting a mean score of 6.9 compared with 5.2 in the group treated with BFA.

These findings build on the single-site study reported by Federman et al,[26] which found a similar level of improvement among 284 participating Veterans undergoing 753 patient-encounters of BFA at one institution. Those data are included in this cohort. There is limited evidence on the effectiveness of a health system rollout of services such as acupuncture or auricular acupuncture. One challenge to a health system rollout of such services is variation in provider training, experience, and skill. One notable study is the evaluation conducted by Weidenhammer et al,[27] which evaluated traditional acupuncture delivered by 8727 acupuncturists to over 450,000 patients. This health system evaluation represents a real-world approach to assessing the value of an acupuncture intervention, similar to VHA's approach to establishing a data collection template for BFA. In the Weidenhammer and colleagues' evaluation, acupuncturists were asked to rate improvement at the end of the acupuncture cycle. The acupuncturists indicated that 21.8% of patients experienced substantial/marked improvement, 54.0% experienced moderate improvement, 16.1% experienced slight improvement, 3.9% had poor effectiveness, and improvement could not be judged in 4.2%.

Despite the large size of our cohort, there are several limitations to this evaluation. We only have immediate pain relief outcomes available for these individuals and these data do not provide information about the effectiveness of BFA on reducing the long-term burden of pain, although a small, uncontrolled study demonstrated some durability.[28] Because follow-up data were only collected once, immediately after the procedure, we also do not information on the duration or frequency of subsequent pain episodes. The reasons Veterans participated in BFA is not recorded in the electronic health record. Patients more favorably predisposed to respond to BFA might have preferentially sought it out as a treatment. In addition, the study does not have a comparison group, thus we are not able to compare the effectiveness of BFA to other options that patients may have been offered. Because there was not a comparison group, the immediate improvement in

TABLE 3. Changes in Pain Intensity Associated With Demographic and Clinical Characteristics

	First Visit‡		Second and Subsequent Visits§	
Demographic and Clinical Characteristics	**Coefficient**	**95% CI**	**Coefficient**	**95% CI**
Age (y)				
18–39	0.05	−0.09 to 0.19	0.12	−0.07 to 0.31
40–54	0.08	−0.03 to 0.19	**0.14**	**0.01–0.28***
55–64	Reference	—	Reference	—
65–69	−0.11	−0.22 to 0.01	−0.01	−0.17 to 0.12
70–79	**−0.18**	**−0.29 to 0.07†**	**−0.14**	**−0.23 to −0.05***
80+	0.05	−0.12 to 0.23	−0.09	−0.3 to 0.12
Sex				
Female	Reference	—	Reference	—
Male	0.07	−0.03 to 0.18	0.03	−0.10 to 0.15
Marital status				
Not married	Reference	—	Reference	—
Married	**−0.10**	**−0.18 to 0.03†**	−0.05	−0.14 to 0.05
Not reported	−0.24	−0.64 to 0.16	−0.20	−0.71 to 0.31
Race				
White	Reference	—	Reference	—
Black	−0.02	−0.13 to 0.09	−0.12	−0.26 to 0.02
Other	**0.28**	**0.04–0.52***	**0.31**	**0.01–0.60***
Not reported	0.13	−0.03 to 0.29	0.14	−0.05 to 0.34
Copay status				
Copay required	Reference	—	Reference	—
No copay due to disability	**0.14**	**0–0.27***	0.08	−0.08 to 0.25
No copay due to means	0.07	−0.06 to 0.21	−0.02	−0.19 to 0.15
Geographic location				
Rural residence	Reference	—	Reference	—
Metropolitan/suburban residence	−0.04	−0.15 to 0.06	0.02	−0.11 to 0.15
Pain type (chronic)				
Back	Reference	—	Reference	—
Fibromyalgia	−0.15	−0.43 to 0.14	−0.17	−0.55 to 0.22
Joint	−0.03	−0.22 to 0.16	−0.16	−0.45 to 0.13
Neck	0.14	−0.07 to 0.35	−0.19	−0.50 to 0.12
Osteoarthritis	−0.25	−0.59 to 0.09	0.07	−0.40 to 0.54
> 1	−0.05	−0.15 to 0.05	−0.06	−0.19 to 0.06
No history of chronic pain	0.06	−0.09 to 0.15	0	−0.14 to 0.15
Opioid use in the year to first BFA treatment				
None or <30 d supply	Reference	—	Reference	—
≥ 30 d supply	**0.30**	**0.22–0.38†**	**0.20**	**0.10–0.29†**
Psychological comorbidity				
Depression	0.02	−0.23 to 0.27	0.13	−0.16 to 0.42
Mood disorders	0.08	−0.17 to 0.33	−0.08	−0.37 to 0.20
Anxiety disorders	0.03	−0.06 to 0.12	0.01	−0.11 to 0.12
Alcohol use disorders	−0.02	−0.16 to 0.11	−0.14	−0.31 to 0.19
Substance use disorders	0.01	−0.25 to 0.26	−0.15	−0.46 to 0.15
Trauma-related disorders (PTSD)	0.01	−0.73 to 0.10	0.01	−0.10 to 0.12
No. complex chronic conditions				
None	Reference	—	Reference	—
1	−0.05	−0.18 to 0.08	−0.04	−0.21 to 0.13
2	0.02	−0.11 to 0.16	0.06	−0.19 to 0.24
3	−0.08	−0.23 to 0.06	0.06	−0.25 to 0.12
4	−0.08	−0.25 to 0.08	0.08	−0.13 to 0.28
5	0.10	−0.09 to 0.29	0.20	−0.03 to 0.43
6+	0.22	−0.17 to 0.18	0.06	−0.16 to 0.27

Bold values is the point estimate for the coefficient that is significant.
‡Clustered by site.
§Clustered by patient and site.
BFA indicates battlefield acupuncture; CI, confidence interval; PTSD, posttraumatic stress disorder.
*$P < 0.05$.
†$P < 0.01$.

pain observed from BFA may potentially be associated with expectancy by Veterans receiving the procedure.[29] For example, 2 blinded acupuncture trials exploring expectancy effects observed no statistically significant differences in pain relief for traditional acupuncture compared with sham procedures; however, these trials did observe significant differences in reported pain relief when aggregated by patient confidence regarding whether they thought they received the placebo or not.[30] In the data collected by VHA, we cannot separate true pain relief from such expectancy effects. Another limitation is that

although these data represent a diverse group of Veterans who agreed to receive the BFA procedure when it was offered, it is possible these findings can be attributed to social desirability to report a favorable outcome. It is also possible these findings may reflect additional time or energy by the provider or maybe due to other reasons why a patient may report improvement.

Nonpharmacological approaches to pain management are highly recommended as part of VHA's stepped care model for pain management,[31] in part to the low effectiveness of opioid and nonanalgesic pain medications, and in part to the substantial harm caused by opioids.[32] VHA has adopted BFA as a tool that may be offered to patients presenting with acute or chronic pain symptoms and that can be easily delivered by a range of providers in a variety of existing settings. Although these data support the finding that many patients receiving BFA report immediate pain relief, providers should continue to ensure patients are connected with treatment activities that may offer long-term benefit, as part of a stepped care model and multimodal approach to pain.[33]

In conclusion, we found that a large population of Veterans reported BFA to be an effective and safe intervention for decreasing short-term pain intensity. Whether this effect is durable or leads to improved functioning needs to be explored further, and should include additional information on subsequent episodes of pain and additional health-related quality of life outcomes.

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