Use of Non-Pharmacological Pain Treatment Modalities Among Veterans with Chronic Pain: Results from a Cross-Sectional Survey

Sara N. Edmond, Ph.D.[1,2], William C. Becker, M.D.[1,3], Mary A. Driscoll, Ph.D.[1,2], Suzanne E. Decker, Ph.D.[2,4], Diana M. Higgins, Ph.D.[5,6], Kristin M. Mattocks, Ph.D., M.P.H.[7,8], Robert D. Kerns, Ph.D.[1,2,9], and Sally G. Haskell, M.D.[1,3]

[1]Pain Research, Informatics, Multimorbidities, and Education (PRIME) Center/11ACSLG, VA Connecticut Healthcare System, West Haven, CT, USA; [2]Department of Psychiatry, Yale School of Medicine, New Haven, CT, USA; [3]Department of Internal Medicine, Yale University School of Medicine, New Haven, CT, USA; [4]New England Mental Illness Research Education and Clinical Center, VA Connecticut Healthcare System, West Haven, CT, USA; [5]Anesthesiology, Critical Care, and Pain Medicine Service, VA Boston Healthcare System, Jamaica Plain, MA, USA; [6]Department of Psychiatry, Boston University School of Medicine, Boston, MA, USA; [7]VA Central Western Massachusetts Healthcare System, Leeds, MA, USA; [8]Quantitative Health Sciences and Psychiatry, University of Massachusetts Medical School, Worcester, MA, USA; [9]Departments of Neurology and Psychology, Yale University, New Haven, CT, USA.

BACKGROUND: Despite strong evidence for the effectiveness of non-pharmacological pain treatment modalities (NPMs), little is known about the prevalence or correlates of NPM use.

OBJECTIVE: This study examined rates and correlates of NPM use in a sample of veterans who served during recent conflicts.

DESIGN: We examined rates and demographic and clinical correlates of self-reported NPM use (operationalized as psychological/behavioral therapies, exercise/movement therapies, and manual therapies). We calculated descriptive statistics and examined bivariate associations and multivariable associations using logistic regression.

PARTICIPANTS: Participants were 460 veterans endorsing pain lasting ≥ 3 months who completed the baseline survey of the Women Veterans Cohort Study (response rate 7.7%.

MAIN MEASURES: Outcome was self-reported use of NPMs in the past 12 months.

KEY RESULTS: Veterans were 33.76 years old (SD = 10.72), 56.3% female, and 80.2% White. Regarding NPM use, 22.6% reported using psychological/behavioral, 50.9% used exercise/movement and 51.7% used manual therapies. Veterans with a college degree (vs. no degree; OR = 2.51, 95% CI = 1.46, 4.30, $p = 0.001$) or those with worse mental health symptoms (OR = 2.88, 95% CI = 2.11, 3.93, $p < 0.001$) were more likely to use psychological/behavioral therapies. Veterans who were female (OR = 0.63, 95% CI = 0.43, 0.93, $p = 0.02$) or who used non-opioid pain medications (OR = 1.82, 95% CI = 1.146, 2.84, $p = 0.009$) were more likely to use exercise/movement therapies. Veterans who were non-White (OR = 0.57, 95% CI = 0.5, 0.94, $p = 0.03$), with greater educational attainment (OR = 2.11, 95% CI = 1.42, 3.15, $p < 0.001$), or who used non-opioid pain medication (OR = 1.71, 95% CI = 1.09, 2.68, $p = 0.02$) were more likely to use manual therapies.

CONCLUSIONS: Results identified demographic and clinical characteristics among different NPMs, which may indicate differences in veteran treatment preferences or provider referral patterns. Further study of provider referral patterns and veteran treatment preferences is needed to inform interventions to increase NPM utilization. Research is also need to identify demographic and clinical correlates of clinical outcomes related to NPM use.

J Gen Intern Med 33(Suppl 1):S54–S60
DOI: 10.1007/s11606-018-4322-0

Published online April 9, 2018

INTRODUCTION

Chronic pain is a major public health problem affecting approximately 100 million Americans[1] and U.S. military veterans who are a particularly vulnerable group:[2] up to 50% of male veterans[3] and 78% of female veterans[4] presenting to VHA primary care settings report chronic pain. Pain is one of the most common presenting complaints of Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn (OEF/OIF/OND) veterans treated in the Veterans Health Administration (VHA).[5] Veterans from this era have higher rates of pain than non-veterans of similar ages, than veterans from other eras, and than a representative sample of U.S. adults.[2, 5–8]

Citing efforts to improve pain management and address the opioid crisis, the Department of Veterans Affairs and Department of Defense (VA/DoD) Clinical Practice Guideline,[9] Centers for Disease Control (CDC) Guideline for Prescribing Opioids for Chronic Pain,[10], and National Pain Strategy (NPS)[11] have highlighted the importance of multimodal treatment for chronic pain including non-opioid pain medication and non-pharmacological modalities (NPMs). The recent VHA State-Of-The-Art (SOTA) Conference, "Non-pharmacological approaches to chronic musculoskeletal pain management," identified a range of NPMs as having sufficient evidence of effectiveness to encourage their routine availability in VHA. The SOTA Conference[12] also categorized NPMs into three groups: psychological/behavioral (cognitive-behavioral

therapy, acceptance and commitment therapy, mindfulness-based stress reduction), exercise/movement (physical therapy, structured exercise, tai chi, yoga), and manual (acupuncture, chiropractic/spinal manipulation, massage; which could also be categorized as passive approaches) therapies.[12]

Despite guidance recommending a multimodal approach, along with substantial evidence for the effectiveness of some NPMs,[13–20] over the past decade, opioid medications have often been used as a primary treatment modality for chronic pain.[9] As opioids have been linked to numerous serious harms and demonstrated modest or no benefit, [21] increasing NPM uptake is a major emphasis of guidelines promoting reduced reliance on opioids for chronic pain.[10] Understanding how to promote NPMs is important, yet little research regarding the NPM utilization has been conducted.

Studies have reported differences in NPM utilization for pain management by demographics, using survey data, electronic health records (EHR) data, and claims data.[22–24] Regarding psychological/behavioral therapies, one study using EHR data reported that female veterans receiving opioids for chronic pain were more likely to receive mental health assessments and psychotherapy than male veterans.[22] Vignette studies found that when a patient with chronic pain was described as female or reporting depression, providers were more likely to suggest a referral to mental health.[25, 26] The 2011 Institute of Medicine report, Relieving Pain in America, noted that women with pain are at greater risk of sub-optimal patient-provider communication and stigma regarding pain; stereotypes or the perception that women's pain is more psychological may contribute to this finding.[1]

Concerning exercise/movement therapies, one study of persons with low back pain (acute or chronic) found that participants using opioids were less likely to engage in physical therapy, but found no differences by sex, age, non-opioid pain medication use, or mental health diagnoses.[23] Another study using VHA EHR data reported female (versus male) veterans prescribed long-term opioids were more likely to receive rehabilitation therapies;[22] another study of post-deployment veterans with pain reported higher pain severity, absence of a mental health diagnosis, and number of pain conditions were associated with rehabilitation therapies.[27]

Regarding manual therapies, one longitudinal study of persons with low back pain found that older age, female gender, use of pain medication, and reporting depression were related to increased use of acupuncture.[24] Other work examining chiropractic care for a range of conditions reported that younger age,[28, 29] White race,[30, 31] and higher socioeconomic status[32, 33] were related to increased use of chiropractic care. In another investigation of OEF/OIF/OND veterans, higher income, uncertain access to healthcare, and presence of multiple pain conditions were related to use of manual therapies.[27]

Increasing uptake of NPMs for veterans with chronic pain is important as an increasingly acknowledged component of evidenced-based care for chronic pain. A better understanding of who uses NPMs may inform clinicians' efforts to encourage NPM use. Limitations in existing data regarding correlates of NPM use include published studies more than a decade old, positive shifts in the attitudes towards of NPM treatments in recent years,[34] and changes in availability of NPMs. Additionally, few studies focus on veterans.[22] The current study examines veterans from the OEF/OIF/OND era, a cohort of veterans that may disproportionately suffer from chronic pain,[5] and oversample female veterans, allowing us to examine important sex differences. The aim of this study was to conduct a secondary analysis of baseline survey data from the Women Veterans Cohort Study (WVCS) to examine NPM use, using the three categories identified by VA SOTA, and to explore potential demographic and clinical variables as correlates of NPM use by category.

METHODS

Overview and Participants

Data for the study were derived from the WVCS survey, described in detail elsewhere.[35, 36] Eligible participants were military veterans of the OEF/OIF/OND era who enrolled for care in VHA settings between September 12, 2001 and September 30, 2012 ($n = 625{,}082$). A subsample of veterans participated in three surveys were administered yearly and recruited primarily via mailings sent to 8465 potential participants from eight states; female veterans were oversampled as a means to equalize numbers of male and female participants. A total of 767 veterans provided consent, and 662 completed the baseline WVCS survey between July 2008 and December 2011, for an overall response rate of 7.7%. This secondary analysis used baseline data from the WVCS survey, and only those who endorsed having pain for 3 months or longer were included, yielding a sample of 460 veterans. The study was approved by the Institutional Review Boards at the VA Connecticut Healthcare System and Yale University School of Medicine.

Measures

Demographics. The demographic section of the baseline WVCS survey included age, sex, race/ethnicity, marital status, employment status, and education.

Use of Non-Pharmacological Modalities (NPMs). The survey asked of respondents used the following approaches to manage pain in the past year: physical therapy, chiropractic, acupuncture, psychotherapy, massage, educational classes, or exercise. Veterans responded based on all use of NPMs, inside or outside of VHA. Using categories defined by the VA SOTA, we created three variables: use of psychological/behavioral therapies, including psychotherapy or educational classes; use of exercise/movement therapies, including physical therapy

or exercise; and use of manual therapies, including chiropractic, acupuncture, or massage.

Pain Intensity. The Brief Pain Inventory (BPI) [37] was used to measure worst, least, average, and current pain intensity in the past week on 0 (no pain) to 10 (worst pain imaginable) scales. Participants also indicated location(s) of their pain by responding to a checklist of possible types (i.e., back pain, neck pain, headache or migraine, stomach ache or abdominal, joint pain, chest pain, facial ache or pain, or whole body pain); finally, participants also indicated the length of time they had experienced pain using categories ranging from 3 to 6 months up to more than 4 years.

Opioid Use. Veterans reporting chronic pain were asked about past-week use of the following opioid analgesics, listed verbatim: morphine (MS Contin, Roxanol, Oramorph), oxycodone (OxyContin, Percocet, Roxicet, Tylox, Endocet), hydrocodone (Vicodin, Lortab, Norco), methadone (Dolophine), fentanyl (Duragesic, Actiq), codeine (Tylenol #3,Tylenol #4), propoxyphene (Darvon, Darvocet), or tramadol (Ultram, Ultracet). Veterans were instructed to report on all medication use, regardless of VHA/non-VHA prescriber status. We created a variable "opioid pain medication use" to indicate whether a veteran used at least one opioid pain medication in the past week.

Non-Opioid Pain Medication Use. Veterans endorsing chronic pain were asked about past-week use of the following non-opioid analgesics, listed verbatim: non-steroidal anti-inflammatory drugs (NSAIDs) (e.g., ibuprofen [Motrin], naproxen [Naprosyn, Aleve], indomethacin [Indocin], meloxicam [Mobic], etodolac, or Celebrex), acetaminophen (Tylenol), herbal or nutritional supplements, tricyclics (e.g., amitriptyline [Elavil], nortriptyline [Pamelor], doxepin, imipramine), muscle relaxants (e.g., cyclobenzaprine [Flexeril], methocarbamol [Robaxin], carisoprodol [Soma]), antiepileptics (e.g., gabapentin [Neurontin], Lyrica, Topamax), and SNRIs (e.g., Cymbalta, venlafaxine [Effexor]). We did not ask about topical analgesics. Veterans were instructed to respond based on all medication use, regardless of VHA/non-VHA prescriber status. We created a variable "any non-opioid pain medication use" to indicate whether a veteran used at least one non-opioid pain medication in the past week.

Mental Health Symptoms. The survey included the Patient Health Questionnaire-9 (PHQ-9),[38, 39] a self-report measure of depressive symptoms, and the PTSD Symptom Checklist-Military version (PCL-M),[40, 41] a self-report measure of PTSD symptoms. In this sample, these two measures were highly correlated ($r = 0.79$). Therefore, we elected to use a symptom composite to avoid concerns of multicollinearity. PHQ-9 scores and PCL-M scores were converted into z scores ($M = 0$, SD = 1) and averaged to create a mental health composite score representing overall mental health symptom severity.

Data Analysis

Descriptive statistics for the entire sample were calculated for all variables. Less than 1% of data were missing. We examined bivariate relationships between frequency of use of NPMs and demographic/clinical variables (e.g., age, race/ethnicity, sex, education, pain severity, mental health symptom severity, opioid and non-opioid pain medication use) using independent sample t tests, correlations, and chi square tests as appropriate. We used logistic regression to examine demographic and clinical factors associated with the use of each category of NPMs.

RESULTS

Descriptive Analysis (Table 1)

Veterans with chronic pain in the sample ($N = 460$) were on average 33.76 years old (SD = 10.72), approximately half were female (56.3%), and the majority were White (80.2%). Veterans reported an average pain intensity of 3.45/10 (SD = 1.95). Most veterans reported pain lasting more than a year, with 42.1% reporting pain lasting 1 to 4 years and 40.9% reporting pain lasting 4 years or longer. The most common types of pain were joint pain (80.6%), back pain (80.4%), and headache (64.0%).

About one fifth (20.7%) reported past-week opioid analgesic use whereas a large majority reported past-week non-opioid analgesic use (72.4%) with the most common medication class being NSAIDs (62.0%).

A majority (75.9%) reported using at least one NPM in the past year, with 22.6% using a psychological/behavioral therapy, 50.9% using an exercise/movement therapy, and 51.7% using a manual therapy. Veterans used on average 1.68 NPMs (SD = 1.51). The most frequently endorsed NPM was massage, reported by 42.6% of the sample, followed by physical therapy (37.0%). Acupuncture and educational classes (both 8.3%) were the least frequently endorsed. Psychological/behavioral therapy use and exercise/movement therapy use were positively related ($X^2 = 9.88$; $p = 0.002$), while psychological/behavioral therapy use and manual therapy use were not related ($X^2 = 0.51$; $p = 0.48$). Exercise/movement therapy use and manual therapy use were positive related ($X^2 = 25.26$; $p \leq 0.001$).

Bivariate Analysis (Table 2)

Veterans using psychological/behavioral strategies to manage pain were less likely to be White and more likely to have a college degree. They also reported greater pain severity, worse mental health symptoms, and more pain medication use (opioid and non-opioid). Veterans using exercise/movement

Table 1 Descriptive Data ($N = 460$)

	M	SD	%
Demographic and pain variables			
Age	33.76	10.72	
Race/ethnicity			
% White			80.2
% Black or African American			5.9
% Other			13.9
Sex (% female)			56.3
Marital status (% married)			45.9
Employment status (% employed)			68.3
Education (% college degree)			49.1
Pain intensity	3.45	1.95	
Pain duration			
Less than 1 year			17.0
1 to 4 years			42.1
More than 4 years			40.9
Pain location (% yes)			
Joints			80.6
Back			80.4
Headache			64.0
Neck			55.2
Abdominal			43.5
Whole body			29.6
Chest			19.0
Facial			13.7
Mental health variables			
PHQ-9 score	8.23	6.65	
PCL score	38.55	17.95	
MH composite score	0.00	0.95	
NPM use			
Psychotherapy			20.0
Educational classes			8.3
Psychological treatment			22.6
Physical therapy			37.0
Exercise instruction or classes			28.5
Exercise/movement			50.9
Chiropractic			23.5
Acupuncture			8.3
Massage			42.6
Manual			51.7
Any of the above			75.9
# Of the above (range 0 to 7)	1.68	1.51	
Pain medication variables (reported use in the past week)			
Opioid use			20.7
Herbal supplement use			16.3
Acetaminophen use			42.6
NSAID use			62.0
Tricyclic use			1.7
Muscle relaxant use			8.5
Anti-epileptic use			6.1
SNRI use			3.7
Use of any non-opioid pain medication			72.4

therapies were more likely to be female, reported greater pain severity, and reported greater use of opioid and non-opioid pain medications. Veterans using manual therapies were more likely to have a college degree and were more likely to report using non-opioid pain medication.

Regression Analysis (Table 3)

Psychology/Behavioral Therapies. The odds of reporting the use of psychological/behavioral therapies in the past year was 2.51 (95% CI = 1.46, 4.30, $p = 0.001$) times greater for veterans with at least a college degree, compared to those without a college degree. Additionally, reporting worse mental health symptoms was related to increased use of psychological/behavioral therapies for pain management, such that for every one point increase on the mental health symptom score composite, the odds of reporting the use of psychological/behavioral therapies for pain management increased by 2.88 (95% CI = 2.11, 3.93, $p < 0.001$).

Exercise/Movement Therapies. Males were less likely to report using exercise/movement therapies than females (OR = 0.63; 95% CI = 0.43, 0.93, $p = 0.02$). The odds of reporting use of exercise/movement therapies was 1.82 (95% CI = 1.16, 2.84, $p = 0.009$) times greater for veterans using non-opioid pain medication vs. those not using non-opioid pain medication. Additionally, for every one point increase in pain severity, the odds of reporting use of exercise/movement therapies was 1.13 (95% CI = 1.00, 1.28, $p = 0.04$) times greater.

Manual Therapies. White veterans were less likely to use manual therapies than non-White veterans (OR = 0.57; 95% CI = 0.35, 0.94, $p = 0.03$). The odds of reporting use of manual therapies was 2.11 (95% CI = 1.42, 3.15, $p < 0.001$) times greater among veterans with a college degree (vs. no college degree), while the odds of using manual therapies was 1.71 (95% CI = 1.09, 2.68, $p = 0.02$) times greater among veterans taking non-opioid pain as compared to veterans not taking any non-opioid pain medications.

Table 2 Relationships Between NPM Use and Demographic/Clinical Variables

	Psychological/behavioral			Exercise/movement			Manual		
	Y	N	*p*	Y	N	*p*	Y	N	*p*
Age	33.55	33.82	0.81	34.46	33.13	0.22	33.30	34.25	0.34
% White	72.12	82.58	0.02	82.05	78.32	0.32	76.89	83.78	0.06
% Female	52.88	57.30	0.42	61.54	50.88	0.02	58.82	53.60	0.26
% College degree	57.69	46.63	0.04	52.56	45.58	0.13	56.30	41.44	0.001
Pain severity	4.35	3.19	< 0.001	3.68	3.21	0.01	3.45	3.45	0.99
MH symptoms	0.75	− 0.22	< 0.001	0.05	− 0.05	0.24	− 0.01	0.01	0.80
% Opioids	32.69	17.13	0.001	24.36	16.81	0.046	21.85	19.37	0.51
% Non-opioids	80.77	69.94	0.03	79.91	64.60	< 0.001	76.47	68.02	0.04

Means and t tests reported for dichotomous/continuous variables. Percentages and Pearson chi square coefficients reported for dichotomous/dichotomous associations

Y yes, using NPM; N no, not using NPM; % Opioids % reporting opioid use in past week; % non-opioids % reporting using a non-opioid medication for pain in the past week

Table 3 Logistic Regressions

	Psychological/ behavioral therapy use	Exercise/ movement therapy use	Manual therapy use
Variable	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
Age	1.00 (0.98, 1.03)	1.01 (0.99, 1.03)	0.98 (0.96, 1.00)
Race (ref: non-White)	0.59 (0.32, 1.07)	1.30 (0.80, 2.09)	0.57 (0.35, 0.94)
Sex (ref: female)	1.12 (0.68, 1.88)	0.63 (0.43, 0.93)	0.93 (0.63, 1.37)
Education (ref: <BA/BS)	2.51 (1.46, 4.30)	1.34 (0.91, 2.00)	2.11 (1.42, 3.15)
Pain severity	1.03 (0.88, 1.20)	1.13 (1.00, 1.28)	0.99 (0.88, 1.12)
Mental health symptoms	2.88 (2.11, 3.93)	0.98 (0.77, 1.99)	0.92 (0.72, 1.16)
Opioid use (ref: none)	1.41 (0.77, 2.61)	1.19 (0.72, 1.99)	1.16 (0.70, 1.92)
Non-opioid pain med use (ref: none)	1.34 (0.71, 2.55)	1.82 (1.16, 2.84)	1.71 (1.09, 2.68)

DISCUSSION

In this cross-sectional survey of veterans from the OEF/OIF/OND era enrolled in VHA care, we found that past-year NPM use was reported by a large majority (75.9%) of the sample. One in five veterans reported past-week opioid use, and the majority (72.4%) used a non-opioid medication in the past week. We identified demographic and clinical characteristics related to use of NPMs that deserve comment. These may indicate differences in veteran treatment preferences, provider referral patterns, or availability of NPMs. It is perhaps unsurprising that veterans with worse mental health symptoms were more likely to use psychological/behavioral therapies for pain. Veterans with worse mental health symptoms may be more likely to be connected with mental health providers or to have received psychotherapy in the past. Past experience with therapy may lead providers to be more likely to refer these veterans for pain-focused psychological therapies or may make veterans more likely to accept these referrals.

Consistent with a study using VHA administrative data reporting that female veterans were more likely to receive rehabilitation therapies,[22] we found that female veterans were more likely to use exercise/movement therapies compared to men. Research has suggested that men with chronic pain have higher rates of kinesiophobia (fear of movement) than women with chronic pain.[42] Perhaps lower rates of kinesiophobia contribute to increased willingness to engage in exercise/movement therapies. Additionally, one study of healthy participants found that vigorous physical activity produced analgesia in women but not men,[43] suggesting women may benefit more from exercise therapies than men.

Consistent with previous studies,[24,32,33] we found that higher educational attainment and use of non-opioid pain medications were related to increased use of manual therapies. We also found that non-White veterans were more likely to report using manual therapies than White veterans, which was surprising given prior research demonstrating the opposite.[30,31] Methodological and study population differences may account for these findings; for example, one study conducted with older adults in Mississippi did not control for socioeconomic status in the analyses[30]; additionally, none of the studies reviewed was conducted in a veteran population. In the current sample, all participants were enrolled in VHA healthcare, increasing their potential access to manual therapies for chronic pain, which may reduce known racial disparities in accessing healthcare. However, given that veterans' self-reported treatments received inside and outside of VHA, perhaps higher educational attainment suggests improved access to services, either via higher income levels or improved insurance coverage, which may lead to improved access to manual therapies. Indeed, a study using a related subsample of WVCS survey, respondents found that greater income and uncertain access to healthcare were associated with receipt of the manual therapies described in the current study.[27]

This study was limited by its cross-sectional design and reliance on self-report data, collected between 2008 and 2011. The data are somewhat old; however, more recent studies of the OEF/OIF/OND population have reported similar characteristics.[2] The survey only inquired about a specific set of NPMs, and did not include questions about frequency or dose of medication or NPM treatment. Moreover, although questions were worded to inquire specifically about treatments used for pain, it is possible that some participants endorsed NPM use when that NPM was not pain-focused (e.g., attended psychotherapy that was not pain-focused), and it is not possible to examine details regarding NPMs (e.g., if therapy provided was an evidence-based intervention). Additionally, although only veterans with chronic pain were included in the sample, inquiring about past-week medication use may have captured medications used for acute pain. Furthermore, there was a high nonresponse rate to the survey, and the nonresponse rate was greater for males than females. Analysis of responders versus non-responders from a majority subsample indicated few group differences.[35] Although responders were more likely to be White (82.9 vs. 73.4%) and older (32.7 vs. 29.1 years) than non-responders, the groups did not differ on any other demographic measures. Finally, by focusing on OEF/OIF/OND veterans, who often present with chronic pain,[2] our sample included veterans who are younger, more likely to be women, and more likely to be ethnic/racial minorities than older cohorts of veterans. This may limit generalizability to older cohorts of veterans and civilian samples.

Despite limitations, this study's strengths include a moderate-sized sample and an adequate sample of female veterans. The detailed information about self-reported types of medications and NPMs is a strength, as it provided more detail regarding pain management than studies relying solely on EHR data. By using self-

reported data, we were able to capture VHA services not easily captured in administrative data.

In summary, results from cross-sectional survey data indicated that the majority of veterans with chronic pain reported using at least one NPM in the past year. Some differences were observed in the use of NPMs based on demographic and clinical characteristics, which may indicate differences in veteran treatment preferences or provider referral patterns. Our findings may be useful in developing targeted interventions to improve referral processes and treatment uptake. For example, veterans with a mental health history may be more amenable to referrals to psychological/behavioral treatment, and providers should be sure to recommend exercise/movement therapies for women veterans. Most importantly, however, providers should emphasize the overall benefits of using NPMs and use a shared decision making approach to determine which NPMs might work best for each patient. Future research should utilize both self-report and EHR data to examine pain management strategy use (including pharmacological and non-pharmacological strategies) over time. Looking at these relationships over time may provide insight into how the combination of treatments or sequencing of treatments relates to pain intensity and pain-related functioning.

Acknowledgements: *The authors wish to thank Erin Krebs, M.D. for her important intellectual contributions to this research, specifically her role in the development of the survey, and her contribution as a site principal investigator.*

Corresponding Author: *Sara N. Edmond, Ph.D.; Pain Research, Informatics, Multimorbidities, and Education (PRIME) Center/ 11ACSLGVA Connecticut Healthcare System, 950 Campbell Avenue, West Haven, CT 06516, USA (e-mail: sara.edmond@yale.edu).*

Funding Information *This research was supported by VA Health Services Research and Development awards (#DHI07–065 and #IIR-12-118) and the VA Health Services Research and Development Service Center of Innovation (CIN 13-407).*

Compliance with Ethical Standards:

Contributors: *None*

Prior Presentations: *None*

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

Disclaimers: *The views expressed in this article are those of the authors and do not necessarily represent the position or policy of the Department of Veterans Affairs or the United States government.*

REFERENCES

1. Institute of Medicine. Relieving pain in America: a blueprint for transforming prevention, care, education, and research. Washington, DC; 2011.
2. **Nahin RL.** Severe pain in Veterans: the effect of age and sex, and comparisons with the general population. J Pain 2017;18(3):247–54.
3. **Kerns RD, Otis J, Rosenberg R, Reid MC.** Veterans' reports of pain and associations with ratings of health, health-risk behaviors, affective distress, and use of the healthcare system. J Rehabil Res Dev. 2003;40(5):371–9.
4. **Haskell SG, Heapy A, Reid MC, Papas RK, Kerns RD.** The prevalence and age-related characteristics of pain in a sample of women veterans receiving primary care. J Womens Health (Larchmt) 2006;15(7):862–9.
5. **Gironda RJ, Clark ME, Massengale JP, Walker RL.** Pain among veterans of Operations Enduring Freedom and Iraqi Freedom. Pain Med. 2006;7(4):339–43.
6. **Lew HL, Otis JD, Tun C, Kerns RD, Clark ME, Cifu DX.** Prevalence of chronic pain, posttraumatic stress disorder, and persistent postconcussive symptoms in OIF/OEF veterans: polytrauma clinical triad. J Rehabil Res Dev. 2009;46(6):697–702.
7. **Clark ME.** Post-deployment pain: a need for rapid detection and intervention. Pain Med. 2004;5(4):333–4.
8. **Hardt J, Jacobsen C, Goldberg J, Nickel R, Buchwald D.** Prevalence of chronic pain in a representative sample in the United States. Pain Med. 2008;9(7):803–12.
9. The Management of Opioid Therapy for Chronic Pain Working Group. VA/DoD clinical practice guideline for opioid therapy for chronic pain. Department of Veterans Affairs / Department of Defense; 2017.
10. **Dowell D, Haegerich TM, Chou R.** CDC Guideline for Prescribing Opioids for Chronic Pain — United States, 2016. MMWR Recomm Rep. 2016;65:1–49.
11. The Office of the Assistant Secretary for Health at the U.S. Department of Health and Human Services. National Pain Strategy; 2016.
12. SOTA Placeholder. SOTA Placeholder Reference. J Gen Intern Med. 2018.
13. **Schonstein E, Kenny D, Keating J, Koes B, Herbert RD.** Physical conditioning programs for workers with back and neck pain: a cochrane systematic review. Spine (Phila Pa 1976). 2003;28(19):E391–5.
14. **Fransen M, McConnell S, Hernandez-Molina G, Reichenbach S.** Exercise for osteoarthritis of the hip. Cochrane Database Syst Rev. 2014;(4):CD007912.
15. **Fransen M, McConnell S, Harmer AR, Van der Esch M, Simic M, Bennell KL.** Exercise for osteoarthritis of the knee. Cochrane Database Syst Rev. 2015;1:CD004376.
16. **Hayden JA, van Tulder MW, Malmivaara AV, Koes BW.** Meta-analysis: exercise therapy for nonspecific low back pain. Ann Intern Med. 2005;142(9):765–75.
17. **Hoffman BM, Papas RK, Chatkoff DK, Kerns RD.** Meta-analysis of psychological interventions for chronic low back pain. Health Psychol. 2007;26(1):1–9.
18. **Fishman SM, Young HM, Lucas Arwood E, Chou R, Herr K, Murinson BB,** et al. Core competencies for pain management: results of an interprofessional consensus summit. Pain Med. 2013;14(7):971–81.
19. **Chou R, Huffman LH**, American Pain S, American College of P. Nonpharmacologic therapies for acute and chronic low back pain: a review of the evidence for an American Pain Society/American College of Physicians clinical practice guideline. Ann Intern Med. 2007;147(7):492–504.
20. **Chou R, Qaseem A, Snow V, Casey D, Cross JT Jr., Shekelle P, et al.** Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147(7):478–91.
21. Chou R, Turner JA, Devine EB, Hansen RN, Sullivan SD, Blazina I, et al. The effectiveness and risks of long-term opioid therapy for chronic pain: a systematic review for a National Institutes of Health Pathways to Prevention Workshop. Ann Intern Med. 2015;162(4):276–86.
22. **Oliva EM, Midboe AM, Lewis ET, Henderson PT, Dalton AL, Im JJ,** et al. Sex Differences in Chronic Pain Management Practices for Patients Receiving Opioids from the Veterans Health Administration. Pain Med. 2015;16:112–8.
23. **Fritz JM, Kim J, Thackeray A, Dorius J.** Use of Physical Therapy for Low Back Pain by Medicaid Enrollees. Phys Ther. 2015;95(12):1668–79.
24. **Chenot JF, Becker A, Leonhardt C, Keller S, Donner-Banzhoff N, Baum E,** et al. Determinants for receiving acupuncture for LBP and associated treatments: a prospective cohort study. BMC Health Serv Res. 2006;6:149.
25. **Hirsh AT, Hollingshead NA, Matthias MS, Bair MJ, Kroenke K.** The influence of patient sex, provider sex, and sexist attitudes on pain treatment decisions. J Pain. 2014;15(5):551–9.
26. **Hirsh AT, Hollingshead NA, Bair MJ, Matthias MS, Wu J, Kroenke K.** The influence of patient's sex, race and depression on clinician pain treatment decisions. Eur J Pain. 2013;17(10):1569–79.
27. **Driscoll MA, Higgins D, Shamaskin-Garroway A, Burger A, Buta E, Goulet JL,** et al. Examining Gender as a Correlate of Self-Reported Pain Treatment Use Among Recent Service Veterans with Deployment-Related Musculoskeletal Disorders. Pain Med. 2017;18(9):1767–77.

28. **Gordon NP, Lin TY.** Use of complementary and alternative medicine by the adult membership of a large northern California health maintenance organization, 1999. J Ambul Care Manage. 2004;27(1):12–24.
29. **Thomas KJ, Nicholl JP, Coleman P.** Use and expenditure on complementary medicine in England: a population based survey. Complement Ther Med. 2001;9(1):2–11.
30. **Cuellar N, Aycock T, Cahill B, Ford J.** Complementary and alternative medicine (CAM) use by African American (AA) and Caucasian American (CA) older adults in a rural setting: a descriptive, comparative study. BMC Complement Altern Med. 2003;3:8.
31. **Cherkin DC, Deyo RA, Sherman KJ, Hart LG, Street JH, Hrbek A, et al.** Characteristics of visits to licensed acupuncturists, chiropractors, massage therapists, and naturopathic physicians. J Am Board Fam Pract. 2002;15(6):463–72.
32. **Kelner M, Wellman B.** Who seeks alternative health care? A profile of the users of five modes of treatment. J Altern Complement Med. 1997;3(2):127–40.
33. **Walker BF, Muller R, Grant WD.** Low back pain in Australian adults. health provider utilization and care seeking. J Manip Physiol Ther. 2004;27(5):327–35.
34. **Boon HS, Olatunde F, Zick SM.** Trends in complementary/alternative medicine use by breast cancer survivors: comparing survey data from 1998 and 2005. BMC Womens Health. 2007;7:4.
35. **Cobb Scott J, Pietrzak RH, Southwick SM, Jordan J, Silliker N, Brandt CA,** et al. Military sexual trauma interacts with combat exposure to increase risk for posttraumatic stress symptomatology in female Iraq and Afghanistan veterans. J Clin Psychiatry. 2014;75(6):637–43.
36. **Slane JD, Levine MD, Borrero S, Mattocks KM, Ozier AD, Silliker N,** et al. Eating behaviors: prevalence, psychiatric comorbidity, and associations with body mass index among male and female Iraq and Afghanistan Veterans. Mil Med. 2016;181(11):e1650-e6.
37. **Cleeland CS, Ryan KM.** Pain assessment: global use of the Brief Pain Inventory. Ann Acad Med. 1994;23(2):129–38.
38. **Spitzer RL, Kroenke K, Williams JB.** Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire. JAMA. 1999;282(18):1737–44.
39. **Martin A, Rief W, Klaiberg A, Braehler E.** Validity of the Brief Patient Health Questionnaire Mood Scale (PHQ-9) in the general population. Gen Hosp Psychiatry. 2006;28(1):71–7.
40. **Weathers F, Huska J, Keane T.** The PTSD checklist military version (PCL-M). Boston, MA: National Center for PTSD. 1991;42.
41. **Weathers F, Ford J.** Psychometric review of PTSD Checklist (PCL-C, PCL-S, PCL-M, PCL-PR). Measurement of stress, trauma, and adaptation. 1996:250–1.
42. **Branstrom H, Fahlstrom M.** Kinesiophobia in patients with chronic musculoskeletal pain: differences between men and women. J Rehabil Med. 2008;40(5):375–80.
43. **Sternberg WF, Bokat C, Kass L, Alboyadjian A, Gracely RH.** Sex-dependent components of the analgesia produced by athletic competition. J Pain. 2001;2(1):65–74.