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ORIGINAL PAPER

Utilization and Perceived Effectiveness of Mindfulness Meditation in Veterans: Results from a National Survey

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Abstract

Objectives Complementary and integrative health (CIH) approaches are increasingly utilized in health care, and mindfulness meditation is one such evidence-based CIH practice. More information is needed about veterans' utilization of mindfulness to inform integration within the Veterans Health Administration (VHA).

Methods This study involved secondary data analysis of a national survey to evaluate utilization and perceived effectiveness of mindfulness relative to other CIH approaches among military veterans. Military veterans ($n = 1230$) enrolled in VHA reported CIH utilization rates, reasons for use, perceived effectiveness, treatment barriers, and demographics.

Results Approximately 18% of veterans reported using mindfulness meditation in the past year, exceeding the proportion using all other CIH approaches ($p < .001$), with the exception of massage and chiropractic care. Mindfulness was most commonly used for stress reduction and addressing symptoms of depression and anxiety. Among mindfulness users, veterans rated mindfulness with a mean score of 3.18 out of 5 ($SD = 0.82$) in terms of effectiveness, reflecting a response in the "somewhat helpful" to "moderately helpful" range. This was similar to ratings of other CIH approaches (mean = 3.20, $p = .391$). Of those who used mindfulness, nearly all (78%) reported only using it outside the VHA. Veterans identified not knowing if the VHA offered mindfulness as the most common reason for using mindfulness outside VHA.

Conclusions In summary, veterans use mindfulness for a range of reasons and report receiving benefit from its use. Low awareness and potentially low availability of VHA's mindfulness programs need to be addressed to increase access.

Keywords Mindfulness · Meditation · Complementary and integrative health · Complementary and alternative medicine · Veterans

Complementary and integrative health care (CIH) includes a wide variety of techniques historically drawn from traditions outside of Western, allopathic medicine that are designed to complement, integrate with, or provide an alternative to Western biomedical approaches (National Center for Complementary and Integrative Health [NCCIH] 2017). CIH may be used for the intention of preventing illness, promoting well-being, and/or treating disease (Barnes et al. 2008). CIH practices are typically administered by trained clinicians (e.g., chiropractic care, massage therapy), taught

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to individuals by qualified teachers (e.g., yoga, meditation), or self-administered (e.g., herbal supplements). Epidemiological studies conducted over the past several decades suggest that CIH utilization is relatively common (e.g., 33.8% in 1993, 42.1% in 1997; Eisenberg et al. 1993; Eisenberg et al. 1998) and may be increasing over time (Barnes et al. 2008). Analyses of national survey data have provided information regarding rates and predictors of CIH utilization (e.g., Barnes et al. 2008), which is helpful for clinicians and health care systems considering recommending or implementing CIH. Robust meta-analytic evidence supporting the clinical value of CIH exists for some (e.g., acupuncture for pain; Vickers et al. 2012), but not all CIH approaches.

One CIH practice that has received considerable scientific attention is the practice of mindfulness meditation (Burke et al. 2017). While mindfulness has also been defined to include an attitudinal stance (e.g., as in Acceptance and Commitment Therapy; Hayes et al. 1999) or dispositional trait (e.g., as in Five Facet Mindfulness Questionnaire; Baer et al. 2006; Goldberg et al. 2019) without emphasis on or reference to formal meditation practice (e.g., sitting meditation), the focus here is on mindfulness meditation as a specific CIH practice. This choice was based on the substantial literature investigating interventions based on mindfulness meditation practice (Wielgosz et al. 2019). Thus, mindfulness is used hereafter to refer specifically to mindfulness meditation. Indeed, to date, hundreds of randomized controlled trials (RCTs) have been conducted testing the efficacy of mindfulness for a range of psychiatric and medical conditions, with meta-analytic evidence supporting its use for a number of common conditions, including depression, anxiety, substance use disorders, smoking cessation, and chronic pain (Goldberg et al. 2018; Gotink et al. 2015). Additionally, several recent studies have begun exploring prevalence and correlates of mindfulness use within the general population (Burke et al. 2017; Cramer et al. 2016), estimating that up to 2.5% of the United States (US) adult population practiced mindfulness in the past 12 months as of 2012. Burke et al. (2017) found utilization of mindfulness practice to be highest among those with college education, women, and non-Hispanic whites, and those reporting higher physical activity, higher utilization of other complementary health approaches, and higher levels of depression.

Military veterans are a subset of the US population that may benefit from access to CIH approaches, including mindfulness. Evidence suggests that many veterans use CIH or are interested in using CIH (e.g., 49.6 to 52%; Baldwin et al. 2002; Taylor et al. 2019), with rates of utilization potentially even higher among veterans with certain medical conditions (e.g., chronic non-cancer pain, 81.5%; Denneson et al. 2011). Numerous RCTs testing CIH in veterans have appeared in the scientific literature (e.g., $k = 50$ RCTs; Elwy et al. 2014). An increasing number of RCTs have specifically tested the efficacy of mindfulness and other meditation-based interventions for veterans, often with a focus on the treatment of posttraumatic stress disorder (PTSD) or other psychiatric conditions (e.g., Arch et al. 2013; Bormann et al. 2013, 2018; Davis et al. 2019; Kearney et al. 2013; King et al. 2016; Nidich et al. 2018; Niles et al. 2012; Polusny et al. 2015). Several of these RCTs along with non-randomized studies provide preliminary evidence that mindfulness-based interventions may be acceptable and efficacious for treating some psychiatric and medical conditions within veteran samples (e.g., Arch et al. 2013; Heffner et al. 2016; Polusny et al. 2015; Serpa et al. 2014). Adaptations of mindfulness for veterans served in the Veterans Health Administration (VHA) (e.g., within primary care clinics; Possemato et al. 2016) have also begun (Vujanovic et al. 2011).

Despite promising empirical support and the potential relevance of mindfulness-based interventions to veteran health, veterans' utilization of mindfulness, both within and outside of the VHA, is unclear. Knowledge regarding veterans' utilization of mindfulness would be valuable for the VHA, given that VHA provides health care to over 9 million veterans across 1243 health care facilities, including 170 Veteran Affairs Medical Centers (Department of Veteran Affairs 2017). In particular, having a clear sense of the demand for mindfulness within the veteran population as well as the perceived effectiveness and potential barriers to utilization could inform health care leaders (e.g., VHA Office of Patient Centered Care and Cultural Transformation) regarding whether, when, and to what extent VHA should be offering or recommending mindfulness-based treatments. In keeping with recent federal mandates encouraging exploration of CIH for veterans (Comprehensive Addiction and Recovery Act of 2016 2016), information on which groups of veterans are using mindfulness, along with barriers and facilitators of use, can guide the development of interventions (e.g., the Whole Health Initiative; National Academies of Sciences, Engineering, and Medicine 2018) and inform clinicians considering providing or recommending these approaches.

The current study employed data from a national survey examining veterans' use of mindfulness and other CIH approaches. The study sought to address the following gaps in the literature: (1) What proportion of this population of veterans is using mindfulness? How does this rate of utilization compare with other CIH approaches? What veteran characteristics predict utilization of mindfulness? (2) What are the most common reasons veterans report using mindfulness (i.e., treatment targets)? (3) How effective do veterans report mindfulness to be for these targets? How do ratings of effectiveness compare with other CIH approaches? (4) What proportion of veterans using mindfulness do so within the VHA? For veterans practicing mindfulness outside of the VHA, what reasons are given for not using mindfulness within the VHA?

Method

Participants

This study involved secondary data analysis of a national survey administered to individuals from the Veteran Insights Panel (VIP; see also Taylor et al. 2019). The VIP is a group of VHA enrollees recruited to allow the opportunity to provide feedback on VHA programs and services. VIP is sponsored by the VHA Office of Reporting, Analytics, Performance, Improvement, and Deployment. To identify VIP members, a sample was pulled from the VHA administrative database and contacted via e-mail. The initial recruitment e-mail included information about panel participation, disclosure materials (e.g., privacy policy), and a link to the recruitment survey. The panel is periodically refreshed, at which time panelists with a history of non-participation are removed and new panelists are recruited. Panel members are not incentivized or compensated monetarily for their participation on the VIP. A total of 3364 members of the VHA VIP were sent e-mails to invite them to participate in the VHA CIH survey, and 1230 completed the CIH survey (36.6% response rate), which was fielded July 17–25, 2017 (see Taylor et al. 2019, for full results of this survey).

Measures

The Veteran CIH Survey was designed in consultation with the VHA Office of Patient Centered Care and Cultural Transformation (OPCC&CT). It asked respondents about 22 CIH approaches (see Table 2) that were identified by OPCC&CT. To assess utilization, respondents were asked: "How often did you use any of these CIH approaches in the past year, either inside or outside the VA?" Mindfulness meditation was represented as "Meditation—Mindfulness or Mindfulness-Based Stress Reduction." For each CIH practice, respondents had the option to view an extended description to assist in interpreting items. For example, mindfulness meditation was defined as "using focused attention and non-judgmental awareness, and sometimes breathing/movement/other activities, to focus on the present moment"; mantram meditation defined as "silently repeating specific words"; other non-mindfulness and non-mantram meditation defined as "mind-body practice incorporating comfortable posture, focus of attention, and non-judgement to support calmness, physical relaxation, and overall wellbeing"; and progressive relaxation defined as "you tense and relax your muscles."

For each type of CIH, respondents indicated the frequency of use by selecting among the following six options: "Did not use in the past year," "A few times a year," "About once a month," "A few times a month," "A few times a week," and "Almost every day." For CIH approaches for which a given participant indicated use, follow-up questions assessed 14 potential non-mutually exclusive reasons for use (i.e., treatment target, e.g., "for my pain" and "for my sleep"; see Table 3). Self-rated effectiveness of using a given CIH approach for a given reason was also assessed on a five-point Likert-type scale including the following: "Not at all helpful," "Slightly helpful," "Somewhat helpful," "Moderately helpful," and "Very helpful." When veterans indicated they used a CIH approach in the past year, follow-up questions assessed where it occurred (i.e., "at the VA," "somewhere else," or "both at the VA and somewhere else"). Those responding "somewhere else" were asked about potential reasons for not using a given CIH approach in the VHA from a discrete list of options (e.g., "VA does not offer"; see Table 4).

Data Analyses

Initial analyses were conducted on the full sample of responses ($n = 1230$, see Taylor et al. 2019, for comprehensive results). Utilization (i.e., use vs. no use) of mindfulness was computed and compared with utilization of other CIH approaches using McNemar's (1947) test which allows testing the difference between non-independent (i.e., paired) binary data. The frequency of utilization was computed for mindfulness and other CIH approaches and compared using Wilcoxon signed rank tests (due to the ordinal nature of the data) across the full sample. Demographic (race/ethnicity, age, gender, and income) and health status variables were examined as predictors of mindfulness utilization (coded as "use" and "no use") using logistic regression models. Reasons veterans reported using mindfulness (i.e., treatment targets) along with self-rated effectiveness of using mindfulness for these reasons were also examined. Among veterans who used mindfulness along with one or more other CIH, Wilcoxon signed rank tests compared the effectiveness of mindfulness versus other CIH approaches for a given treatment target (e.g., for sleep). When more than one non-mindfulness CIH was used, the mean effectiveness rating across all other CIH practices was compared with mindfulness. Lastly, rates of utilization of mindfulness within and outside of the VHA system were assessed, along with veterans' reasons for not using mindfulness within the VHA. All analyses were conducted using R statistical software (R Core Team 2018).

As analyses comparing mindfulness with other CIH practices involved numerous statistical tests, a Bonferroni correction was applied by dividing the traditional p value of .05 by the number of comparisons (Bland and Altman 1995). Models assessing rate and frequency of utilization compared mindfulness with 21 other CIH practices. For these models, a p value $< .002$ (i.e., .05/21) was interpreted as indicating statistical significance. Models comparing effectiveness rating for mindfulness versus other CIH practices examined 14 potential treatment targets. For these models, a p value $< .004$ (i.e., .05/14) was interpreted as indicating statistical significance.

Results

Sample demographics are displayed in Table 1 (see also Taylor et al. 2019), separated by the portion reporting using mindfulness in the past year ($n = 217$) and those not reporting using mindfulness in the past year ($n = 1013$). Reflective of the veteran population, the VHA VIP sample that completed the CIH survey was predominantly male and white. Of the full sample ($n = 1230$), 645 (52.4%) reported using one or more CIH practice in the past year and 217 (17.6%) reported using mindfulness in the past year. Higher utilization of mindfulness was reported among veterans who were female, those of Hispanic ethnicity, those ages 35 to 49, or those who were divorced, separated, or widowed ($ps < .050$). Lower utilization was reported among veterans aged 65 or older or married ($ps < .050$).

Rates of utilization of mindfulness and other CIH practices across the full sample are displayed in Table 2. McNemar's test compared rates of mindfulness utilization with utilization of other CIH practices. Mindfulness utilization was exceeded only by utilization of massage (22.9%, $p < .001$) and did not

Table 1 Sample demographic characteristics

Demographic	Mindfulness users ($n = 217$)	Non-users ($n = 1013$)		
	n (%)	*n* (%)	*OR* [95% *CI*]	*p*
Gender				
Male	162 (74.65%)	886 (87.46%)	0.42 [0.30, 0.61]	< .001
Female	55 (25.34%)	127 (12.54%)	2.37 [1.65, 3.37]	< .001
Age				
18–34	10 (4.61%)	25 (2.47%)	1.91 [0.86, 3.92]	.090
35–49	52 (23.96%)	99 (9.77%)	2.91 [1.99, 4.22]	< .001
50–64	77 (35.48%)	341 (33.66%)	1.08 [0.79, 1.47]	.607
65+	78 (35.94%)	548 (54.10%)	0.48 [0.35, 0.64]	< .001
Ethnicity				
Latino/Hispanic	21 (9.68%)	47 (4.64%)	2.20 [1.26, 3.72]	.004
Race				
White	189 (87.10%)	924 (91.21%)	0.65 [0.42, 1.04]	.062
Black	13 (6.00%)	72 (7.11%)	0.83 [0.43, 1.48]	.557
Asian	5 (2.30%)	20 (1.97%)	1.17 [0.39, 2.93]	.755
Hawaiian/Pacific Islander	4 (1.84%)	7 (0.69%)	2.70 [0.70, 9.02]	.116
American Indian/Alaskan Native	16 (7.37%)	45 (4.44%)	1.71 [0.92, 3.03]	.074
Income				
< $10,000	7 (3.22%)	36 (3.56%)	0.90 [0.36, 1.94]	.811
$10,000–$19,999	27 (12.44%)	94 (9.28%)	1.39 [0.87, 2.16]	.157
$20,000–$39,999	53 (24.42%)	240 (23.69%)	1.04 [0.73, 1.46]	.818
$40,000–$59,999	35 (16.12%)	193 (19.05%)	0.82 [0.54, 1.20]	.315
$60,000–$79,999	25 (11.52%)	143 (14.12%)	0.79 [0.49, 1.23]	.313
$80,000–$99,999	17 (7.83%)	87 (8.59%)	0.90 [0.51, 1.52]	.717
≥ $100,000	26 (11.98%)	112 (11.06%)	1.10 [0.68, 1.70]	.695
Do not know/not answered	27 (12.44%)	108 (10.66%)	1.17 [0.26, 3.72]	.810
Marital status				
Married	122 (56.22%)	653 (64.46%)	0.71 [0.53, 0.95]	.023
Separated/divorced/widowed	78 (35.94%)	283 (27.94%)	1.45 [1.06, 1.97]	.019
Single/never married	17 (7.83%)	77 (7.60%)	1.03 [0.58, 1.74]	.907
Health status				
Poor/fair	76 (35.02%)	298 (29.42%)	1.29 [0.95, 1.76]	.104
Good	74 (34.10%)	388 (38.30%)	0.83 [0.61, 1.13]	.247
Excellent	67 (30.88%)	327 (32.28%)	0.94 [0.68, 1.28]	.687

OR = odds ratio predicting utilization of mindfulness in the past year from demographic characteristics, with non-users of mindfulness as the reference group. Total number of race category identifications is larger than total *n* due to individuals' ability to choose multiple racial categories

Table 2 Comparison of utilization rates and frequency for mindfulness and other CIH within the full sample ($n = 1230$)

CIH practice	Utilization rates		Frequency of use			
	n (%)	*p*	Mean	*SD*	*p*	*d*
Massage	281 (22.85)	< .001	1.45	0.98	.012	0.09
Chiropractic care	241 (19.59)	.180	1.39	0.91	< .001	0.15
Mindfulness meditation	217 (17.64)	NA	1.56	1.37	NA	
Yoga	159 (12.93)	< .001	1.31	0.95	< .001	0.22
Other meditation	158 (12.85)	< .001	1.42	1.23	< .001	0.11
Relaxation	130 (10.57)	< .001	1.31	1.01	< .001	0.21
Movement therapy	112 (9.11)	< .001	1.29	1.02	< .001	0.23
Acupuncture	107 (8.70)	< .001	1.18	0.67	< .001	0.37
Animal-assisted therapy	95 (7.72)	< .001	1.35	1.26	< .001	0.16
Acupressure	93 (7.56)	< .001	1.17	0.69	< .001	0.38
Reflexology	75 (6.10)	< .001	1.11	0.53	< .001	0.47
Mantram meditation	71 (5.77)	< .001	1.18	0.81	< .001	0.35
Tai Chi	66 (5.37)	< .001	1.12	0.59	< .001	0.45
Touch	61 (4.96)	< .001	1.09	0.49	< .001	0.51
Imagery	60 (4.88)	< .001	1.12	0.64	< .001	0.44
Art therapy	53 (4.31)	< .001	1.13	0.68	< .001	0.42
Biofeedback	43 (3.50)	< .001	1.08	0.52	< .001	0.51
Pilates	40 (3.25)	< .001	1.09	0.55	< .001	0.49
Native American healing	35 (2.85)	< .001	1.08	0.56	< .001	0.50
Qi Gong	23 (1.87)	< .001	1.04	0.35	< .001	0.60
Hypnosis	22 (1.79)	< .001	1.03	0.31	< .001	0.63
Battlefield acupuncture	13 (1.06)	< .001	1.02	0.23	< .001	0.68

Other meditation = not mindfulness or mantram meditation; Relaxation = progressive muscle relaxation; Touch = healing touch/therapeutic touch/Reiki; *n* = sample size reporting using given CIH practice in the past year; *SD* = standard deviation; Frequency of use rated 1 to 6, with 1 = "did not use in the past year" and 6 = used "almost every day"; *p* = *p* value from McNemar's test (comparing percentages using mindfulness versus other CIH) or Wilcoxon signed rank test (comparing frequency of use of mindfulness versus other CIH); *d* = Cohen's *d* (i.e., standardized mean difference, with difference computed as frequency of mindfulness use minus frequency of other CIH use), positive *d* values indicate greater frequency of mindfulness use in the past year

differ statistically from use of chiropractic care (19.6%, $p = .180$). Mindfulness utilization rates were significantly higher than the remaining 19 CIH practices ($ps < .001$).

Across the six frequency categories, the use of mindfulness in the past year in the full sample were as follows: no use ($n = 1013$; 82.4% of full sample), a few times a year ($n = 48$; 3.9%), about once a month ($n = 25$; 2.0%), a few times a month ($n = 44$; 3.6%), a few times a week ($n = 39$; 3.2%), and almost every day ($n = 61$; 5.0%). When examined only among those who used mindfulness ($n = 217$) in the past year, the largest proportion used mindfulness almost daily (28.1%), with 22.1% using a few times a year, 11.5% using about once a month, 20.3% using a few times a month, and 18.0% using a few times a week.

Frequency of use was compared among CIH practices. The mean frequency of use was highest for mindfulness (mean [*M*] = 1.56, *SD* = 1.37), indicating an average response between "Did not use in the past year" and used "A few times a year." Frequency of use of mindfulness was greater than all other CIH practices in Wilcoxon signed rank tests ($ps < .001$, standardized mean differences [i.e., Cohen's *d*] ranged from 0.11 to 0.68), with the exception of massage for which the difference ($d = 0.09$, $p = .012$) did not meet the Bonferroni-adjusted *p* value of < .002.

Reasons for use were examined among those reporting mindfulness use in the past year. The majority of mindfulness users (i.e., those endorsing use "a few times a year" or more) reported using it for stress reduction ($n = 158$, 72.8%) and symptoms of depression and anxiety ($n = 111$, 51.2%; see Table 3). Other common targets included improving health and well-being and addressing symptoms of PTSD. The majority of mindfulness users also provided ratings of the effectiveness of mindfulness for at least one treatment target ($n = 175$, 80.7%). The average effectiveness rating for mindfulness across all targets was 3.18 ($SD = 0.82$), reflecting a response in the "somewhat helpful" to "moderately helpful" range. Effectiveness ratings were highest for mindfulness improving "a sense of control over my health" ($M = 3.55$, $SD = 0.74$), although ratings were similar for most targets (see Table 3).

Table 3 Treatment targets and self-reported effectiveness ratings for mindfulness and other CIH among mindfulness users ($n = 217$)

		Sample rating mindfulness			Sample rating mindfulness and one or more other CIH approaches						
		Mindfulness				Mindfulness		Other CIH			
Target	*n* (%) Using	*n*	Mean	*SD*	*n*	Mean	*SD*	Mean	*SD*	*p*	*d*
Stress reduction	158 (72.81)	101	3.36	0.81	80	3.35	0.83	3.38	0.61	.807	− 0.04
Dep/anx	111 (51.15)	86	3.01	0.87	61	3.11	0.90	3.24	0.66	.140	− 0.17
Health	104 (47.93)	57	3.44	0.66	44	3.45	0.63	3.36	0.53	.276	0.16
PTSD	87 (40.09)	69	3.07	0.88	47	3.11	0.96	3.04	0.82	.594	0.08
Sleep	76 (35.02)	62	3.02	1.00	42	3.00	1.01	3.00	0.85	.640	0.00
Relationships	51 (23.50)	32	3.13	0.87	19	3.26	0.73	3.14	0.73	.473	0.16
Pain	47 (21.66)	39	2.82	0.97	32	2.91	0.96	3.00	0.82	.312	− 0.10
Control	44 (20.28)	29	3.55	0.74	22	3.5	0.80	3.48	0.63	.959	0.03
Blood pressure	33 (15.21)	27	2.96	0.71	20	3.00	0.65	3.01	0.70	.850	− 0.01
Headache	30 (13.82)	28	2.82	0.98	20	2.85	1.04	2.99	0.71	.434	− 0.16
Meds	30 (13.82)	21	3.19	0.98	15	3.07	1.03	2.79	1.02	.014	0.27
Balance	15 (6.91)	14	3.00	0.96	11	2.82	0.98	3.01	0.78	.306	− 0.22
Other	10 (4.61)	3	1.33	0.58	1	1.00	NA	1.00	NA		
Sub use	4 (1.84)	3	3.00	1.00	1	4.00	NA	4.00	NA		

Dep/Anx = for depression or anxiety; Health = to improve overall health and well-being; PTSD = posttraumatic stress disorder; Relationships = to improve relationships with others; Control = to have a sense of control over health; Meds = to reduce need to take medications; Balance = balance issues/fall prevention; Sub Use = to reduce substance use; *n* (%) Using = sample of mindfulness users who reported using mindfulness for a given treatment target; Sample rating mindfulness = subsample of mindfulness users who provided effectiveness ratings of mindfulness for a given target; Sample rating mindfulness and one or more other CIH approaches = subsample of mindfulness users who provided effectiveness ratings for mindfulness and one or more other CIH approaches for a given target; *SD* = standard deviation; *p* = *p* value from Wilcoxon signed rank test; *d* = Cohen's *d* (i.e., standardized mean difference, with difference computed as ratings of effectiveness for mindfulness minus ratings of effectiveness for other CIH practices), positive *d* values indicate higher effectiveness ratings for mindfulness; NA = not applicable (comparison not computed due to insufficient data). Effectiveness ratings were made on a 1 ("not at all helpful") to 5 ("very helpful") Likert-type scale

The majority of mindfulness users provided effectiveness ratings for both mindfulness and another CIH practice ($n = 161$, 74.2%). Among those who used mindfulness and at least one other CIH approach, ratings of the effectiveness of mindfulness ($M = 3.23$, $SD = 0.81$) and other CIH approaches ($M = 3.20$, $SD = 0.66$) did not differ in a Wilcoxon signed rank test ($V = 4981$, $p = .391$, $d = 0.04$). Effectiveness ratings were compared for mindfulness users who reported using mindfulness and another CIH practice for the same target (e.g., for sleep). For comparisons within a given target, ratings of the effectiveness of mindfulness and other CIH approaches did not differ ($ps > .050$; see Table 3 and Fig. 1). Mindfulness was rated as more effective for reducing the need to take medication ($M = 3.07$ out of 5 and $SD = 1.03$ vs. $M = 2.79$ out of 5, $SD = 1.02$ for other CIH approaches, Wilcoxon signed rank test $p = .014$, $d = 0.27$), but this difference failed to meet the Bonferroni-adjusted p value of $< .004$.

Of the veterans reporting using mindfulness, only 15.2% ($n = 33$) received it at the VHA and 6.9% ($n = 15$) received it at the VHA and someplace else. A large proportion ($n = 169$, 77.9%) of veterans using mindfulness reported using it only outside the VHA. Among the subsample of mindfulness users who used mindfulness outside of the VHA ($n = 184$), the majority (58.7%) cited not knowing if the VHA offered mindfulness as their primary reason for not using mindfulness within the VHA (Table 4). Other common reasons included the VHA not offering mindfulness and the VHA being too far away.

Discussion

The current study employed a national sample of veterans to assess the utilization of mindfulness. Results indicated that a significant proportion of veterans used mindfulness in the past year (17.6%), which is at or above their use of all other CIH approaches with the exception of massage which was more commonly used. Veterans utilization of mindfulness also appears higher than rates in recent national surveys of the general population (e.g., Burke et al. 2017; Cramer et al. 2016), indicating that veterans may be a population with particularly high interest in mindfulness. Of the various CIH practices assessed (including other forms of meditation, such as mantram-based meditation), veterans also reported using mindfulness most frequently, although the comparison between frequency of mindfulness and massage ($d = 0.09$, $p = .012$) did not survive Bonferroni correction. The largest

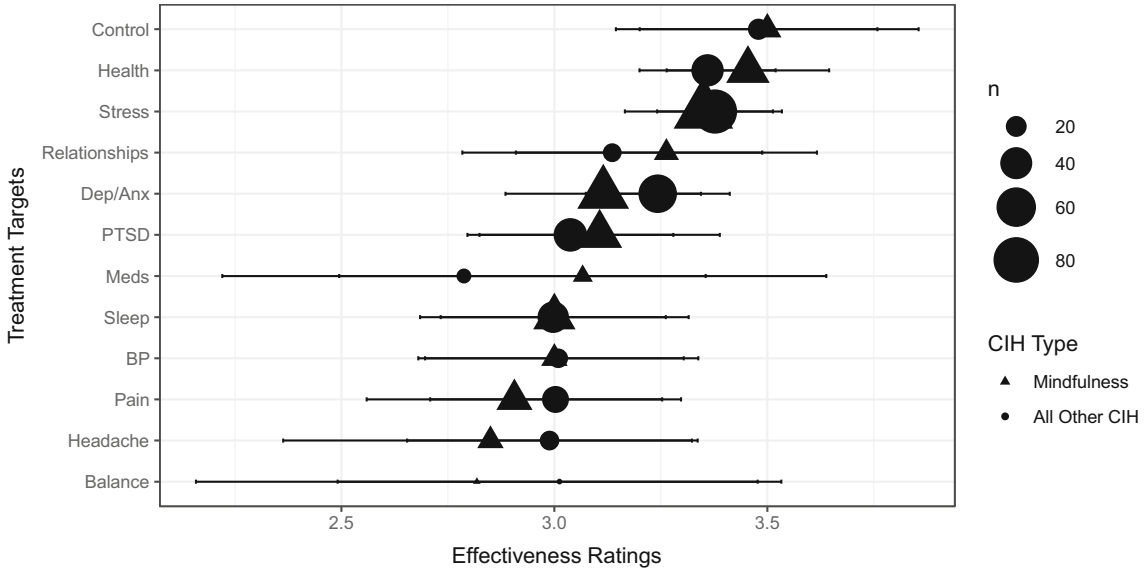

Fig. 1 Effectiveness ratings for mindfulness and other CIH approaches on treatment targets. Note that figure includes only individuals who provided effectiveness ratings for both mindfulness and at least one other CIH practice on a given target (see Table 3 for specific *n*s included in each comparison). Comparisons with $n = 1$ were omitted. Error bars reflect 95% confidence intervals (i.e., 1.96 standard errors). Control = to have a sense of control over health; Health = to improve overall health and wellbeing; Relationships = to improve relationships with others; Dep/Anx = for depression or anxiety; PTSD = posttraumatic stress disorder; Meds = to reduce need to take medications; BP = blood pressure; Balance = balance issues/fall prevention

proportion of those using mindfulness (28.1%) reported doing so "almost every day."

Among the subsample of mindfulness users, veterans on average found it somewhat to moderately helpful for the conditions for which they used it, which were most commonly mental health symptoms (e.g., depression, anxiety, PTSD). The use of mindfulness to address mental health conditions is consistent with research indicating mindfulness may be effective for a range of psychiatric conditions (Goldberg et al. 2018) and may support the integration of mindfulness into settings providing mental health care to veterans (e.g., VHA). Veterans also reported using mindfulness for several more novel treatment targets, including improving relationships and increasing a sense of control over one's health. While veterans tended to rate mindfulness of similar effectiveness to other CIH practices, mindfulness was rated as more effective for reducing the need to take medications ($d = 0.27$, $p = .014$), although the significance test for this difference did not survive Bonferroni p value correction. Nonetheless, this finding is potentially intriguing and future studies could explore medication use and perceived need for medication as an outcome when testing mindfulness-based interventions (e.g., for chronic pain; Garland et al. 2014).

Table 4 Reasons given for not using mindfulness within the VHA

Reasons	Number	Percent
Do not know if VHA has	108	58.70
VHA does not offer	31	16.85
VHA is too far away	24	13.04
Other reason	24	13.04
Inconvenient time	3	1.63
Not comfortable in mixed gender group	2	1.09
I do not have transportation to the VHA	1	0.54
Cost too much	0	0.00

Computed for $n = 184$ mindfulness users who reported using mindfulness outside of the VHA

Some of the results showing demographic characteristics that predicted utilization of mindfulness were consistent with previous national survey studies (i.e., younger and female respondents were more likely, Burke et al. 2017; married were less likely, Cramer et al. 2016). Interestingly, there was not a higher rate of mindfulness utilization among white respondents, but rather higher utilization among Hispanic/Latino veterans, a finding that should be interpreted cautiously, given the small sample of Hispanic/Latino respondents ($n = 68$). Results also did not replicate previous findings indicating higher use of mindfulness among individuals from higher socioeconomic status backgrounds or with lower overall health status (Burke et al. 2017; Cramer et al. 2016). It is possible that veterans' use of mindfulness may be more evenly distributed across demographic characteristics than in the general population.

A key goal of the current study was to assess veterans' use of mindfulness within and outside of the VHA system. Results indicated that the vast majority of veterans using mindfulness are doing so outside of the VHA, consistent with prior large-scale surveys (Reinhard et al. 2014). Veterans in the current sample indicated a variety of reasons for this, with the largest proportion indicating that they did not know if the VHA

offered mindfulness. This finding is consistent with previous research emphasizing the importance of communication between the VHA system and veterans regarding CIH, especially the availability of CIH within the VHA (Fletcher et al. 2014; Held et al. 2016). This also suggests increasing awareness of mindfulness as a possible route forward for improving veterans' access. Of course, it is also possible that veterans' lack of awareness of mindfulness offered within the VHA reflects a lack of available mindfulness programming, rather than simply a lack of awareness of existing programming. To disentangle these possibilities, future work could examine veterans' awareness of mindfulness in VHA settings that currently offer mindfulness.

Limitations and Future Research

There are several limitations that should be considered when interpreting the results of this study. The first is potential selection bias in the sample of veterans drawn from the VIP who responded to this survey. Although the VIP was recruited to reflect opinions about VHA health care in general, it is possible that respondents were particularly willing to complete the survey due to their own use of or interest in CIH. Thus, the current sample could be considered a large convenience sample and results may not be representative of the veteran population. This could have artificially inflated estimates of utilization as well as ratings of effectiveness. The VIP could differ from the population of veterans using VHA in other ways and may reflect a population of veterans who are more engaged in VHA care than the overall VHA patient population, also limiting the generalizability of the sample.

A second limitation was the relatively limited demographic data available on participants that may have reduced the ability to predict utilization (e.g., education level, level of depression; Burke et al. 2017). Third, information on the type, location, and quality of mindfulness instruction being provided was lacking from the survey. Thus, it is impossible to draw conclusions regarding the generalizability of these findings to specific forms of mindfulness (e.g., mindfulness-based stress reduction). It was also not possible to determine from the current data whether participants completed a specific dose of mindfulness training (e.g., 8 weeks of mindfulness-based stress reduction (Kabat-Zinn 2013)). A fourth limitation was a reliance on self-reported effectiveness, which is known to be at risk for a host of response set biases (Heppner et al. 2008; Nisbett and Wilson 1977). The fact that effectiveness was rated by a minority of the sample who used the various CIH practices (who may be particularly amenable to these approaches), these ratings may overestimate effectiveness if implemented in the general veteran population.

A fifth limitation was respondents' potential difficulty distinguishing between various forms of meditation (e.g., mindfulness vs. mantram vs. other). While respondents had access to more extended definitions of the various CIH practices (as described in "Method"), respondents may or may not have viewed these descriptions or understood the intended distinctions. It is possible non-mindfulness forms of meditation (e.g., mantram-based meditation) were erroneously identified as mindfulness, leading to an over-reporting of this CIH practice. A sixth limitation was a lack of information regarding whether mindfulness was offered within the VHA settings serving veterans in the current sample. Lacking information about availability, it remains ambiguous whether veterans' lack of awareness of mindfulness programming reflects insufficient communication or advertisement of available resources or an actual lack of programming.

The current study implies several possible directions for future work at the nexus of veterans' health and mindfulness. Future intervention studies could explore the application of mindfulness-based interventions to address concerns for which veterans are currently using mindfulness (e.g., improving relationships, increasing a sense of control over one's health). It could also be useful to promote mindfulness to address clinical concerns for which mindfulness has been demonstrated to be effective, but for which veterans may not already be using mindfulness (e.g., substance use). Herman et al. (2019) recently examined the cost-effectiveness of mindfulness for pain within the VHA system (as has been done elsewhere, e.g., Kuyken et al. 2015), but further cost-effectiveness studies would be valuable. Studies exploring the impact of participation in mindfulness-based interventions on health care utilization rates within the VHA would also be informative, based on existing evidence that participation in mind-body interventions can reduce utilization (Stahl et al. 2015). It could be worthwhile examining awareness of mindfulness practice opportunities within VHA systems that do have opportunities available to more clearly ascertain whether veterans' lack of awareness is due to a lack of programming. A meta-analysis examining the effectiveness of mindfulness-based interventions for veterans would also be useful to more accurately quantify the effect of these treatments in the veteran population.

In conclusion, the current study suggests that in a large, national sample, many veterans who receive care through VHA are using mindfulness, primarily outside the VHA. Results support efforts that have begun in the VHA system to explore the implementation and dissemination of mindfulness programs and other CIH approaches.

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Compliance with Ethical Standards

Disclaimer 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.

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval This research was conducted in compliance with human subject research ethical standards and approval from relevant governing bodies. The status of this work as quality improvement and not research was confirmed following review by the Research and Development Committee at the VA Greater Los Angeles Healthcare System.

Informed Consent Due to the nature of this project as quality improvement, informed consent was not required.

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