Journal of Regional Medical Campuses

"Vets Restoring Vets": An Innovative Peer Support Program

Cody C. Stewart MD, M.S., Baraka Muvuka PhD, MPH, Will Hutwagner M.S., Hunter McCollum, William K. Dyer, Elizabeth R. Ryan EdD

z.umn.edu/JRMC

"Vets Restoring Vets": An Innovative Peer Support Program

Cody C. Stewart MD, M.S., Baraka Muvuka PhD, MPH, Will Hutwagner M.S., Hunter McCollum, William K. Dyer, Elizabeth R. Ryan EdD

Introduction
Military Veterans disproportionately experience mental health issues due to unique service-related experiences. Peer and social support interventions have shown promise in improving Veterans' mental health alongside clinical mental health interventions yet there are limited studies on Veteran-designed and Veteran–led peer or social support interventions. This study explored the perceptions and experiences of Veterans participating in an innovative Veteran-designed and Veteran-led community-based peer and social support program. It was a preliminary study in a long-term Community Based Participatory Research partnership between Indiana University School of Medicine-Northwest regional campus and Operation Combat Bikesaver (OCB).

Methods
This mixed methods study utilized a limited dataset from pre-and-post-session surveys collected by OCB between September 2019 and August 2021. We examined pre-post differences in participants' self-rated "feelings" (i.e., emotional state) with the following independent variables through Linear Mixed Models in SPSS: OCB location, OCB event attended, day of the week, time of day, duration of attendance, frequency of attendance, and social assistance. We analyzed participants' qualitative OCB experiences using inductive thematic analysis in Dedoose. This study was reviewed and exempted by The Indiana University Human Research Protection Program (Protocol # 12499) on August 16, 2021.

Results
A total of 128 participants completed pre-post surveys for 746 OCB sessions. There was a statistically significant pre-post session increase in participants' feelings (mean=34.6; SD=21.7; $p<0.001$), with increasing effects by duration ($p=0.002$) in an OCB session. There was no linear trend in individual pre-and-post session changes in feelings over time. The following themes describe participants' OCB experiences: sense of purpose and meaning, regaining comradery and brotherhood, "Vets restoring Vets," satisfaction with OCB structure and processes, and experiencing OCB impacts.

Conclusions
Convening Veterans with shared experiences around innovative and supportive social activities may develop their perceived sense of purpose, belonging, and mutual support and produce improvements in perceived mental

Cody C. Stewart MD, M.S.; Captain, Indiana Army Reserve National Guard; General Surgery Resident, University of Wisconsin School of Medicine and Public Health; 4th year Medical Student at the time of writing, Indiana University School of Medicine-Northwest, 3400 Broadway, Gary, Indiana 46408; cstewa53@iu.edu; ORCID ID: https://orcid.org/0000-0001-5908-0998

Baraka Muvuka PhD, MPH; Director of Research, Assistant Professor of Clinical Family Medicine, Indiana University School of Medicine-Northwest, 3400 Broadway, Gary, Indiana 46408; bmuvuka@iu.edu; ORCID ID: https://orcid.org/0000-0003-0761-0365

Will Hutwagner M.S.; 2nd Lieutenant, US Army, Health Professions Scholarship Program; 2nd Year Medical Student (1st Year at the time of writing), Indiana University School of Medicine-Northwest, 3400 Broadway, Gary, Indiana 46408; whutwagn@iu.edu; ORCID ID: https://orcid.org/0000-0002-5800-7032

Hunter McCollum; 2nd Lieutenant, US Air Force, Health Professions Scholarship Program; 3rd Year Medical Student (2nd Year at the time of writing), Indiana University School of Medicine-Northwest, 3400 Broadway, Gary, Indiana 46408; hmccollu@iu.edu; ORCID-ID: https://orcid.org/0000-0001-7618-5927

William K. Dyer; 2nd Lieutenant in the US Air Force, Health Professions Scholarship Program; 4th Year Medical Student (3rd Year at the time of writing), Indiana University School of Medicine-Northwest, 3400 Broadway, Gary, Indiana 46408; wildyer@iu.edu; ORCID-ID: https://orcid.org/0000-0003-4696-1520

Elizabeth R. Ryan EdD; Associate Dean and Center Director, Northwest Campus and Professor of Clinical Family Medicine, Indiana University School of Medicine-Northwest, 3400 Broadway, Gary, Indiana 46408; ryaneli@iu.edu; ORCID ID: https://orcid.org/0000-0001-8680-3741

health. Future research within this community-regional medical campus research partnership will explore jointly determined research questions to follow-up on the main findings and limitations of the current study.

Key Words: Community Based Participatory Research, Depression, Mental health, Peer support, Post Traumatic Stress Disorder, Social support, Veterans, Traumatic Brain Injury

Introduction

Military Veterans disproportionately experience mental health issues due to unique service-related experiences. Post-Traumatic Stress Disorder (PTSD) and depression are highly prevalent among Veterans, at 23% and 15% respectively.[1-3] Veterans represented 14% of suicides in the United States (US) in 2019 despite accounting for 5% of the population.[4] Mental health issues have adverse quality of life and socio-economic implications.[5] For instance, the first year of PTSD treatment costs on average $8,300 per Veteran.[6] There are numerous VA-recommended clinical mental health interventions with demonstrated effectiveness.[7,8] However, Veterans experience multiple treatment barriers, including low care-seeking, stigma, attrition, and non-adherence.[9-11] This indicates a need for integrative, innovative, culturally appropriate, and community-based approaches to complement existing clinical mental health interventions and address barriers to mental health care.[6, 12-14]

Veteran peer and social support interventions are designed to improve mental health through therapeutic reciprocal relationships around shared experiences.[12,13] Community-based peer support programs have grown in variety and quantity, with visits to community-based mental health programs outnumbering clinical visits.[14] Despite this increase, there are limited studies on Veteran-designed and Veteran–led community-based peer or social support interventions.[6,8,14] To address this research gap, Indiana University School of Medicine-Northwest (IUSM-NW) regional campus has partnered with Operation Charlie Bravo (OCB), a Veterans Service Organization (VSO), on a multi-phased Community Based Participatory Research (CBPR) to examine the structure, processes, and impacts of OCB's Veteran-designed and Veteran-led peer and social support model. This partnership was integrated within IUSM-NW's Urban Medicine and Healthcare Disparities Scholarly Concentration in response to the Association of American Medical Colleges' (AAMC)

mission area of community collaboration.[15] This partnership's preliminary study aimed to explore the perceptions and experiences of Veterans participating in an innovative Veteran-designed and Veteran-led peer and social support program.

Methods

Description of Operation Charlie Bravo

Operation Charlie Bravo is a non-profit community-based VSO with the mission of reducing suicide and homelessness among Veterans suffering from PTSD, Traumatic Brain Injury (TBI), or depression.[16] OCB was founded in Northwest Indiana on October 13, 2015, by a US Army engineer Veteran and has expanded to Alabama (March 24, 2019) and California (June 30, 2019), with operations standardized through a chapter application, training, operating manual, and periodic monitoring. OCB has increasingly gained recognition as a Veteran resource within these communities and has been spotlighted on Mike Rowe's *Returning the Favor*, a web series featuring community change agents around the United States.[16-18]

OCB's landmark intervention is "Hot Rod Therapy," a novel Veteran-led approach involving weekly motorcycle workshops (Sunday Shop Days) in which Veterans collaboratively build or restore motorcycles for Veterans at no cost to recipients.[16-18] These motorcycle workshops are designed to provide Veterans from all service branches with a safe space to learn, work, and socialize, while transforming negative emotions into productive and creative energy. In addition, OCB incorporates social events, social assistance, and a weekly peer support group facilitated by a fellow Veteran with experiential knowledge and a Mental Health First Aid Certification.[16]

Study design

This study employed a concurrent mixed methods design to generate comprehensive insights around the following jointly determined research questions: 1) Is there a difference in participants' self-

rated "feelings" (i.e., emotional state) before and after OCB sessions? 2) Is there a difference in participants' self-rated feelings over time in the OCB program? 3) Do pre-post session changes in self-rated feelings differ by OCB event attended, duration of attendance, time of day, day of the week, frequency of attendance, and OCB location? and 4) What are participants' perceptions and attitudes towards OCB? The study analyzed a limited dataset with quantitative and qualitative data from self-administered electronic pre-and-post session surveys designed and routinely collected by OCB on each event between September 9, 2019 and August 22, 2021 for continuous quality improvement. The Indiana University Human Research Protection Program exempted this study (Protocol # 12499) on August 16, 2021.

Measures
The dependent variable (DV) was the pre-post session difference in participants' self-rated "feelings" (i.e., emotional state), measured by OCB using its circular digital self-assessment tool with sliders on a scale of 0 (lowest/negative) through 100 (highest/positive). The following OCB session-related information from the dataset served as independent variables (IVs): OCB location, OCB event attended, day of the week, time of day (morning, afternoon, full day), duration of attendance, frequency of attendance, and social assistance. The qualitative component assessed participants' perceptions, attitudes, and experiences in OCB based on their written post-session feedback.

Data analysis
Data analysis was conducted by four military medical students trained in qualitative analysis (CS, WH, HM, WD) and two qualitative researchers with public health (BM) and medical education (ER) expertise. We performed statistical analysis in IBM SPSS version 28.0 for Windows (IBM Corp) using descriptive analysis and linear mixed models for unbalanced repeated measures at $p \leq 0.05$. The qualitative analysis (n=1386 excerpts) employed inductive thematic analysis, a grounded theory approach comprising open coding, focused coding, and thematic identification.[19] First, two coders (CS, BM) independently open-coded the data and generated initial codes that the team sorted into

focused codes during a consensus-building meeting. A codebook comprising 41 focused codes and their descriptions was created and uploaded to Dedoose version 9.0.17 (SocioCultural Research Consultants LLC). Next, five coders independently focused-coded the data in Dedoose and adjudicated coding discrepancies via consensus-building group discussions with an independent reviewer (ER). The focused codes and corresponding quotes were categorized into themes. We presented preliminary findings to three OCB stakeholders and integrated their feedback in the analysis.

Results

A total of 128 Veterans completed the pre-post session surveys and collectively attended 1446 OCB sessions (mean= 9; SD= 12.2), with self-rated pre-post feelings for 746 sessions (Table 1). Indiana accounted for the majority (75%, n=557) of sessions attended. Sunday Shop Day was the most common (87%, n=646) event attended. Participants spent on average 7.2 hours (SD=4.28) per OCB session.

Table 1. Descriptive Statistics of Eligible Operation Charlie Bravo (OCB) Session Surveys Between September 9, 2019 and August 22, 2021 .

Variable entries	N=746 eligible survey entries N=128 participants	Count (%)	Mean (SD)/Median (IQR)
Location			
Indiana		557(74.7%)	
California		123 (16.5%)	
Alabama		66 (8.8%)	
OCB Event Attended			
Sunday Shop Day		646 (87%)	
Weekly Peer Support Group		64 (8.6%)	
Additional events (volunteering, personal project, special events)		33 (4.4%)	
Day of Attendance			
Sunday		659 (88.3%)	
Monday		2 (0.3%)	
Tuesday		3 (0.4%)	
Wednesday		1 (0.1%)	
Thursday		68 (9.1%)	
Friday		4 (0.5%)	
Saturday		9 (1.2%)	
Time of Day			
Morning		33 (4.4%)	
Afternoon		104 (13.9%)	
Full Day		609 (81.6%)	
Duration of Attendance			Mean: 7.2 (4.28); Median=7(4)
Frequency of Attendance			Mean: 9.1 (12.2); Median: 3(12)
Pre-Session Feelings			Mean: 44.49 (23.25); Median=41(40)
Post-Session Feelings			

There was a statistically significant increase in participants' self-rated feelings before and after OCB

sessions (mean difference=34.6; SD=21.7; p<0.001; 95% CI= 32.12-35.05). An assessment of individual trajectories across multiple OCB sessions revealed no linear trend in pre-post session self-rated feelings over time in the program. Duration (p=0.002) and time of day (p=0.03) had a statistically significant effect on the pre-post difference in self-rated feelings, with each hour increase in duration associated with a 0.44-point increase (p=0.002, 95% CI=0.17-0.72) in post-session self-rated feelings (Table 2). The pre-post session difference in self-rated feelings for full day attendance was significantly higher than for morning only attendance (mean difference=7.11; p=0.008; 95% CI=1.84-12.39). There were no significant differences in pre-post session self-rated feelings by OCB event, frequency, day of the week, and location.

Table 2. Linear Mixed Model Estimate of Fixed Effects[a] for Pre-Post Session Changes in Participants' Feelings by Duration and Time of Day

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Intercept	46.613656	9.254458	547.248	5.037	<.001*	28.435048	64.792265
Duration	.443705	.140703	682.227	3.153	.002*	.167442	.719969
Time of day=AM	-7.113074	2.684996	710.500	-2.649	.008*	-12.384549	-1.841599
Time of day=PM	-.769997	2.348120	716.299	-.328	.743	-5.380016	3.840023
Time of day=FULL DAY	0[b]	0					

a. Dependent Variable: Pre-post change in feelings
b. Reference group: Both
* The mean difference is significant at the .05 level

The following themes describe participants' OCB experiences and perceptions: Sense of Purpose and Meaning, Regaining Comradery and Brotherhood, "Vets Restoring Vets," Satisfaction with OCB Structure and Processes, and Experiencing OCB Impacts. Table 3 outlines the themes, codes, and some illustrative quotes.

Table 3. Qualitative Themes, Codes, and Representative Quotes

Theme	Code	Illustrative Quote
Sense of Purpose and Meaning	Having a sense of purpose	"It [OCB] just gives me something to keep waking up for" (Excerpt 946)
	Feeling accomplished	"It's mind numbing thinking of everything that went into getting to this point. All the assistance from everyone that helped with the build, starting this build basically from scratch has been a long journey" (Excerpt 60)
	Having a healthy outlet/positive distraction	"I'm already looking forward to next weekend, and I think that's going to power me through the week!" (Excerpt 766)
	Contributing to OCB's Mission	"I am so glad to have been able to donate the proceeds from my 300 mile run this year to OCB" (Excerpt 52)
	Setting goals/making plans	"I talked about my plans for school and what I should be focusing on. I got some good ideas on where I can start fixing my bike and got a plan together for this weekend. I feel much better today." (Excerpt 365)
	Assuming leadership role	"Learning more to help this wonderful organization! I enjoy having a position with this organization to help Veterans and have a purpose. Feeling like I learned a lot today and got stuff done! The vibe from other Vets in the shop was good! Enjoyed my day!" (Excerpt 1212)
	Showing/Having self-awareness	"Because of my disability I am very limited on what I can do but socializing with other veterans clears my head I help the best I can around the shop..." (Excerpt 315)
Regaining Comradery and Brotherhood	Comradery/Brotherhood/Friendship	"I have never since the military felt more loved and involved by people that are not my blood than I do with my OCB family." (Excerpt 1056)
	Having shared/similar lived experiences	"I know that every other Sunday when I come in that I get to be around people that are very similar to myself and that helps me to ease the feeling of being alone in the world." (Excerpt 1060)
	Working as a team	"I observed and interacted with the other vets, getting to know the other guys and helping wrench on a bike, all of us banding together to build a bike, felt very familiar! So thankful for the opportunity." (Excerpt 1125)
	Having a sense of belonging/group identification	"OCB is not just about motorcycles rejuvenation...My impression is OCB is about communication among like vets, a brotherhood..." (Excerpt 370)

	Feeling supported	*"I helped out on the office side. Talked to a couple of guys that needed an ear. Dealing with some stuff of my own. But being with brothers makes it a whole lot better to get through." (Excerpt 518)*
	Involving immediate family	*"Today wasn't horrible. I got to show my son what I'm working on here." (Excerpt 313)*
	Having a safe space	*"Love the connection with the brotherhood and how u can feel comfortable to open up about problems" (Excerpt 1097)*
	Having fun	*"Also had a great time with whoopie gag twice in one day. Thanks for giving us a space to be us." (Excerpt 702)*
"Vets Restoring Vets"	Helping others/"vets restoring vets"	*"I got to speak from my own experience to help someone struggling with something I've gone through. It was nice to be on the other side of that and to help another veteran learn and grow" (Excerpt 363)* *"This is what I love about OCB, brothers and sisters taking care of brothers and sisters." (Excerpt 1260).*
	Assuming leadership role (training, mentorship)	*"... being able to help some people learn things that I already know" (Excerpt 1042)*
	Seeking support (external to OCB, internal to OCB)	*"I ended up going into the [name of Hospital] Hospital program for a 30-day intensive outpatient program to get things under control" (Excerpt 919)*
	Feeling supported	*"Listening to other veterans deal with the same things I do is very helpful. Just listening and helping them solve their problems helps me in my own day-to-day. It is a positive change in my life to surround me with like-minded individuals that push me to be the best version of myself. I admire the men and women at OCB and I strive to be more like them every time I'm there." (Excerpt 364)*
	Having shared/similar lived experiences	*"Struggling with life in general. [OCB additional service support group] shows me That I'm not unique in my problems. There are others going through similar issues. Fellow veterans are willing to help." (Excerpt 304)*
Satisfaction with OCB Structure and Processes	Showing/expressing satisfaction	*"I was very satisfied with the outcome and it's something I want to do more of. I really enjoyed it and want to do more…" (Excerpt 698).*
	Observing and reacting to change	*"Also cleaned up and set in place the newest addition to our tooling, a 1966 Bridgeport milling machine. We are going to be able to fabricate almost anything now!" (Excerpt 1271)*
	Having competing priorities	*"Even though I had to work, I would have preferred to spend more time here." (Excerpt 54)*
	Providing recommendations/program feedback	*"Sundays the demand is getting pretty big… our space is just way too small and donations keep flooding in" (Excerpt 1023)*
Experiencing OCB Impacts		
A. Improved knowledge, skills, and attitudes	Developing skills	*"[Name] taught me how to Bondo and I spent the day working on my tank." (Excerpt 781)*
	Overcoming challenges (Technical Problem Solving)	*"Diagnosed a no start issue on a 1983 honda magna v65 and got it turning over, mounted tail light on shop bike" (Excerpt 1345)*
	Overcoming challenges (Showing Resilience)	*"Nothing went on like it was supposed to. 30 minute job took 8 hours" (Excerpt 976)*
	Overcoming Challenges (Showing Ingenuity)	*"Playing with [Name redacted] bike, trying to figure out how to make a fender from scratch." (Excerpt 1295)*
B. Improved perceived mental health	Dealing with/experiencing personal issues	*"This last year has been really really fucking hard! There were times that I honestly didn't know if I would make it through the day. I have come a long way but I'm still wanting more for my life and my kids lives. If you aren't progressing you are recessing I think is how the saying goes." (Excerpt 1130)*
	Describing the General impacts of OCB (Improved Perceived Mental Health)	*"I LOVE OPERATION Charlie Bravo and would be really lost without it or be in my grave. Happy to have the shop as a home I can go to when I am down and my ptsd is trying to get the best of me." (Excerpt 1042)*
	Experiencing improved feelings after session	*"No matter what I always get healing after the week" (Excerpt 45)*
	Having a healthy outlet/positive distraction	*"Thanks for keeping me going lately. Everything I have been working on for OCB has been keeping me focused off of my issues of late. My brothers and sisters there help curb the pain all the time…" (Excerpt 703)*
	Overcoming Challenges (Developing Coping Strategies)	*"Taking a step back has allowed me to recharge and get my priorities in order" (Excerpt 919)*

Sense of purpose and meaning

OCB interactions prompted participants' self-reflections and meaning-making around personal life experiences, enabling many to discover or rediscover their purpose at OCB and in society. Participants reported deriving meaning and purpose from helping fellow Veterans, socializing, and contributing to OCB's mission. OCB-related goal-setting and planning were perceived to provide direction, motivation (*"something to live for"),* and anticipation *("something to look forward to"*), while accomplishing OCB projects refueled participants to face subsequent OCB and personal projects.

"This week was rough actually beyond rough. I actually had to call the suicide hotlines one night because I just needed someone to talk me through some things. Knowing that I could face some of my fears at that time and then being able to come in on Thursday and have a group of guys that has my back no matter what. You guys help me keep my focus throughout the week and it gives me something to look forward to." (Excerpt 1129). Participants' sense of purpose was predominantly oriented towards making a difference on other Veterans through OCB by volunteering, donating, and leading. Their accountability, meaningful service to fellow Veterans, and contribution to a VSO were reported to generate a unique sense of purpose, meaning, pride, and accomplishment.

Regaining comradery and brotherhood

Participants expressed a strong sense of belonging rooted in shared military and Veteran experiences. They described OCB as a brotherhood, comradery, family, and home where they felt safe to be themselves. Regaining the comradery and brotherhood lost after separation from military service was reported to reduce feelings of isolation. *"I have never since the military felt more loved and involved by people that are not my blood than I do with my ocb family." (Excerpt 1056)*. Participants described OCB as a strong social network characterized by *"organic conversations"* (Excerpt 323) around *"life's problems and solutions"* (Excerpt 1378) and mutual support through life's *"highs and the lows"* (Excerpt 323).

"Vets restoring Vets"

OCB was perceived as a mutual support and restoration platform, where participants received,

provided, and sought emotional, social, informational, technical, and material support. Emotional and social support were predominant; those with mental health struggles reported seeking and receiving overwhelming support from OCB. Emotional support manifested as lending a listening ear to fellow Veterans, linking them with appropriate resources, and outreach to Veterans in need.

"I got to speak from my own experience to help someone struggling with something I've gone through. It was nice to be on the other side of that and to help another veteran learn and grow" (Excerpt 363)

Satisfaction with OCB structure and processes
Participants expressed high satisfaction with OCB's supportive structure and processes, indicating that OCB provided meaningful experiences through its leadership, activities, members, and outcomes. They valued OCB's peer mentoring, positive atmosphere, and teamwork.

"So awesome to see the group come together for his first ride out of the shop on his bike. I am blessed to be a part of this place and it is keeping me going" (Excerpt 698).
A few participants provided constructive feedback to improve OCB experiences, the most common being more motorcycle workshop days to accommodate competing priorities (e.g., work, family) on Sundays as well as additional space, funding, and personnel to accommodate OCB's growth.

Experiencing OCB impacts
Participants overwhelmingly believed that OCB is achieving its mission of improving Veteran mental health based on personal and observed improvements within the following subthemes: 1) improved knowledge, skills, and attitudes, and 2) improved perceived mental health.

Improved knowledge, skills, and attitudes. Participants suggested that OCB enabled them to develop hard and soft knowledge and skills through observations, social interactions, hands-on experiences, and peer mentoring. Participants translated technical skills developed in Sunday Shop Days (e.g., welding, custom body work, electrical wiring, troubleshooting) into life skills (e.g., resourcefulness, resilience, problem-solving, healthier coping mechanisms) which they applied to personal circumstances beyond OCB.

"...perspective, that some of our issues weren't as big in comparison" (Excerpt 870)

Improved perceived mental health. Many OCB participants faced mental, physical, and social issues including depression, PTSD, anxiety, family issues, and financial struggles.
"For about 2 weeks all I have been seeing is darkness at the end of the tunnel called the life of a veteran. I have been in a very tough spot with some not good outcome thoughts." (Excerpt 1041).
However, the majority reported notable improvements in their feelings and perceived mental health, ranging from immediate post-session improvements to long-term positive effects such as feeling *"recharged"* or *"rejuvenated"* for the rest of the week or *"improving over time"* in the OCB program. Participants attributed their perceived mental health improvements to OCB's peer and social support program.
"...OCB helps to divert that and it works. I know first hand it works." (Excerpt 1058).
"There are times why I question the reason that all I feel is hatred and anger about everything. My time at ocb helps me come around to the fact that it is the ptsd and I forget how deep it runs and its hold on my life. To be honest without ocb and some of the people there I am not sure I would still be breathing at times thank you for the program" (Excerpt 1069)
More specifically, these perceived mental health improvements were linked with finding a healthy outlet for negative thoughts or emotions and having a sense of hope through OCB.
"It [OCB] *gave me alot to think about and reflect on and gave me motivation to want to be a better me... It gave me a sense that I'm not alone in this and I need that now more than ever!" (Excerpt 1130)*

Discussion
This mixed methods study was first to explore the perceptions and experiences of Veterans in OCB's innovative community-based, Veteran-designed, and Veteran-led peer and social support program. This study found a statistically significant improvement in participants' self-rated feelings and qualitative improvements in perceived mental health among OCB participants, which they attributed to an increased sense of purpose, structure, comradery, Vet-to-Vet social support, and improved knowledge,

skills, and attitudes derived from the OCB program. These findings are supported by empirical and theoretical evidence on peer and social support.

There was a significant pre-post session increase in participants' self-rated feelings, with increasing effects by duration in an OCB session. There is overwhelming evidence on the effectiveness of peer support programs for substance use but less on those targeting other conditions and Veterans.[14] A peer support program for Veterans with mental health diagnoses significantly improved mental health, with similar results in Veteran-led and clinician-led groups.[20] Another Veteran-led peer support program for psychiatric conditions was significantly associated with stronger recovery attitudes by duration and frequency of participation,[21] with duration measured as time in the program and not in each session as defined in our study.

There was no linear trend in individual changes in feelings over time in the OCB program. The discrepancy between participants' perceived improvements in feelings over time in the program and the quantitative findings of nonlinear changes in feelings over time in the program warrants further research on OCB's long-term impacts. Our quantitative findings corroborate previous reports that changes in mental health symptoms are often nonlinear and noncontinuous rather than linear and gradual even in established psychotherapies, owing to the complexity of mental health.[21,22] Veterans are often diagnosed with comorbid mental health conditions such as PTSD, anxiety, and depression,[23,24] linked with cognitive, emotional, and behavioral variability. Daily fluctuations in feelings and emotions have been reported in Veterans with comorbid mental health issues.[25,26] These observations have informed research recommendations to examine processes (*when, how,* and *why)* of change rather than merely measuring *whether* change happens.[21,26] They further indicate the need for continuous engagement to manage recurrences and support adaptive emotion processing.[21] OCB engages Veterans in diverse activities throughout the week, with an open-door policy and 24/7 crisis peer support to reach Veterans during various times of need.[16] The mean pre-post session improvement in self-rated feelings was not significantly different across OCB locations,

potentially indicating implementation fidelity and standardization across OCB chapters.

The qualitative themes were vital in understanding the mechanisms behind the quantitative findings. Participants reported that OCB enhanced their sense of purpose and meaning, consistent with findings from other Veteran peer support interventions.[27] Veterans are service-oriented and purpose-driven due to their training and mission of protecting the nation.[14,27,28] The military provides structure, resources, and procedures to fulfill this mission.[27,28,29] Several studies have documented a loss of purpose throughout military-civilian transitions attributed to cultural and identity transitions into worlds with different values, norms, and expectations.[14,27,30,31] Many Veterans struggle with long-term disabilities, limited structure and direction, new roles and careers, civilian power dynamics, limited institutional support, and social disconnection, adversely affecting their sense of purpose and meaning.[27-29] The loss of purpose and meaning is significantly associated with severe suicidal ideation among US Veterans.[32,33] Conversely, an increased sense of purpose and meaning is associated with lower suicidal ideation and attempts.[32] OCB participants reported that they found new purpose and meaning by making sense of shared experiences and engaging in new service opportunities of restoring other Veterans. Veterans perceive peer support programs as an opportunity to support other Veterans.[14] In addition, OCB incorporates some structural elements from the military to provide direction, including a clearly defined mission, goals and procedures, peer mentoring, and teamwork.

OCB was perceived to create a sense of belonging and social identity through its core operational framework of comradery and brotherhood. Social disconnection and isolation are common among Veterans who may not necessarily revert to civilian identity.[34,35] Based on the Social Identity Theory, individuals derive self-concept and identity from social groups to which they have strong ties.[36,37] Social identity gains prominence over personal identity when an individual's self-concept is predominantly defined by their group membership.[36,37] Consistent with our findings, the military training, experience, and identity are often central to Veterans' self-

concept.[34, 35] This is largely due to their separation from civilian social networks by time, space, and unique experiences according to the Homecoming Theory.[38] This also explains Veterans' disconnect from providers lacking military cultural competency or experience, which influences their mental health service seeking, utilization, and satisfaction.[27,38-40] OCB participants openly discussed personal struggles with fellow Veterans given their shared understanding. Veterans' shared understanding is crucial in social re-integration and mental health recovery since their social identity shapes their perceptions of insiders and outsiders.[27,35,36]

OCB was described as a strong Veteran social support network for mutual restoration. Many Veterans experience a loss of social support given the higher individuality in civilian settings.[14,27] Peer support interventions increase social support, a protective factor against mental health issues.[14] Suicidal ideation is negatively correlated with social support in Veterans suffering from PTSD, Depression and TBI.[41-43] The Social Support Theory distinguishes between instrumental and expressive social support, both observed in our study. Instrumental social support refers to tangible assistance while expressive social support involves the sharing of sentiments, understanding, and frustrations among social connections.[44] In our study, expressive social support was central in participants' perceived mental health improvements, with the narratives overwhelmingly pointing to OCB as an outlet for negative feelings. OCB participants reported improved feelings and sense of purpose when helping fellow Veterans with similar problems. Veterans who have adapted to civilian life are vital support systems for fellow Veterans.[29] This aligns with the "Helper" Therapy Principle (HTP), a peer support principle underlying self-help groups such as Alcoholics Anonymous, in which individuals with a problem assist those with a more severe form of the problem.[45] The HTP suggests that the act of helping produces mutual healing in the helper and recipient, with more benefits to the helper.[45]

Finally, OCB participants reported gaining useful technical and life skills. They expressed a positive outlook in life and developed healthier coping mechanisms, with some reporting reductions in suicidal ideation. Negative cognition about oneself is a strong predictor of suicidal ideation.[46] Our findings are corroborated by evidence that peer support significantly improved Veterans' self-efficacy related to coping with PTSD,[47] reduced Veterans' self-stigma, and improved attitudes towards professional mental health care.[14,27] Our findings can be linked to OCB's integrative framework comprising formal and informal strategies to improve Veterans' physical, social, and mental well-being.[16]

This study has notable strengths including mixed methods, Veterans from various service branches, and repeated measurements. However, the findings should be interpreted with limitations. First, the sample consisted of self-selected participants who may be different from non-OCB members. Future research should include control groups of non-OCB members to provide stronger quantitative evidence on intervention effects. Second, we used self-rated pre-post feelings from OCB's survey, which captured their perceptions of their overall mental health. Future research can use validated mental health surveys or assess the psychometric properties of OCB's survey. Third, the OCB survey and dataset lacked socio-demographic and health characteristics such as age, income, gender, race/ethnicity, education, length of service, length of separation from the military, mental health history, and professional mental health service utilization since the data are routinely collected for quality improvement rather than research. These factors should be accounted for to assess group differences in future research. Finally, this study was intended to provide preliminary findings for subsequent participatory research that will generate stronger evidence on diverse outcomes such as the following: the influence of socio-demographic factors and mental health history on participants' self-rated feelings; OCB's long-term impacts; processes of change among OCB participants; the influence of participants' feelings on decisions to attend OCB; differences between active OCB participants, inactive OCB members, and non-OCB Veterans; and OCB's influence on professional mental health service uptake.

Conclusion

This study contributes to growing evidence on Veteran peer and social support programs by describing participants' experiences and mechanisms for improvements in perceived mental health in an innovative Veteran-designed and Veteran-led peer support program. It suggests that convening Veterans with shared experiences around innovative social and supportive activities may develop their perceived sense of purpose, belonging, social identity, mutual support, structure, and critical life skills. Incorporating these elements into mental health management models can help address critical limitations associated with traditional Veteran mental health programs such as low participation, stigma, attrition, and non-adherence. [9-11] Further research on Veteran-led peer and social support programs is needed to inform efforts to raise awareness on their benefits, enhance and scale-up these programs, and establish their linkages with formal Veteran mental health care.

Acknowledgements

References

1. Fulton JJ, Calhoun PS, Wagner HR, et al. The prevalence of posttraumatic stress disorder in Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) veterans: a meta-analysis. J Anxiety Disord. 2015;31:98-107. doi:10.1016/j.janxdis.2015.02.003

2. Gradus JL. Epidemiology of PTSD. US Department of Veteran Affairs. Available at https://www.ptsd.va.gov/professional/treat/essentials/epidemiology.asp#three. Updated September 10, 2021. Accessed August 8, 2021.

3. Liu Y, Collins C, Wang K, Xie X, Bie R. The prevalence and trend of depression among veterans in the United States. J Affect Disord. 2019;245:724-727. doi:10.1016/j.jad.2018.11.031

4. US Department of Veterans Affairs. 2021 National Veteran Suicide Prevention Annual Report. Available at https://www.mentalhealth.va.gov/docs/data-sheets/2021/2021-National-Veteran-Suicide-Prevention-Annual-Report-FINAL-9-8-21.pdf. Published September 2021. Accessed January 5, 2022.

5. Tanielian T, Batka C, Meredith LS. Bridging gaps in mental health care: lessons learned from the Welcome Back Veterans Initiative. Rand Health Q. 2018;7(4):8. Available at https://www.rand.org/pubs/research_reports/RR2030.html. Accessed January 5, 2022.

6. Reisman M. PTSD Treatment for Veterans: What's working, what's new, and what's next. P T. 2016;41(10):623-634. Available at https://www.ncbi.nlm.nih.gov/pubmed/27757001. Accessed January 5, 2022.

7. Forbes D, Pedlar D, Adler AB, et al. Treatment of military-related post-traumatic stress disorder: challenges, innovations, and the way forward. Int Rev Psychiatry. 2019;31(1):95-110. doi:10.1080/09540261.2019.1595545

8. Jonas DE, Cusack K, Forneris CA, et al. Psychological and Pharmacological Treatments for Adults With Posttraumatic Stress Disorder (PTSD). Rockville (MD): Agency for Healthcare Research and Quality (US); April 2013.

9. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. N Engl J Med. 2004;351(1):13-22. doi:10.1056/NEJMoa040603

10. Laffaye C, Cavella S, Drescher K, Rosen C. Relationships among PTSD symptoms, social support, and support source in veterans with chronic PTSD. J Trauma Stress. 2008;21(4):394-401. doi:10.1002/jts.20348

11. Seal KH, Maguen S, Cohen B, et al. VA mental health services utilization in Iraq and Afghanistan veterans in the first year of receiving new mental health diagnoses. J

Trauma Stress. 2010;23(1):5-16. doi:10.1002/jts.20493

12. Moore TM, Risbrough VB, Baker DG, et al. Effects of military service and deployment on clinical symptomatology: The role of trauma exposure and social support. J Psychiatr Res. 2017;95:121-128. doi:10.1016/j.jpsychires.2017.08.013

13. Price M, Lancaster CL, Gros DF, Legrand AC, van Stolk-Cooke K, Acierno R. An examination of social support and PTSD treatment response during prolonged exposure. Psychiatry. 2018;81(3):258-270. doi:10.1080/00332747.2017.1402569

14. Drebing CE, Reilly E, Henze KT, et al. Using peer support groups to enhance community integration of veterans in transition. Psychol Serv. 2018;15(2):135. doi:10.1037/ser0000178

15. Association of American Medical Colleges. Mission areas. Available at https://www.aamc.org/what-we-do/mission-areas. Accessed January 5, 2022.

16. Operation Combat Bikesaver. Mission above all else. Operation Combat Bikesaver. Available at https://www.combatbikesaver.org/mission-first.html. Published 2015. Accessed July 16, 2021.

17. Returning the Favor. Season 1, Episode 2: Operation Combat Bikesaver. Available at https://www.facebook.com/ReturningTheFavor/videos/1942086476062613/. Published 2017. Accessed January 5, 2022.

18. Returning the Favor. Season 3, Episode 23: One soldier's inspiration to serve. Available at https://www.facebook.com/ReturningTheFavor/videos/2397634806984462/. Published 2019. Accessed January 5, 2022.

19. Charmaz K. Constructing Grounded Theory. 2nd ed. Thousand Oaks, California: SAGE; 2014.

20. Eisen SV, Schultz MR, Mueller LN, et al. Outcome of a randomized study of a mental health peer education and support group in the VA. Psychiatr Serv. 2012;63(12):1243-1246. doi:10.1176/appi.ps.201100348

21. Barber JA, Rosenheck RA, Armstrong M, Resnick SG. Monitoring the dissemination of peer support in the VA Healthcare System.

Community Ment Health J. 2008;44(6):433-441. doi:10.1007/s10597-008-9146-7

22. Hayes AM, Laurenceau JP, Feldman G, Strauss JL, Cardaciotto L. Change is not always linear: The study of nonlinear and discontinuous patterns of change in psychotherapy. Clin Psychol Rev. 2007;27(6):715-723. doi:10.1016/j.cpr.2007.01.008

23. Hayes AM, Andrews LA. A complex systems approach to the study of change in psychotherapy. BMC Med. 2020;18(1):197. doi:10.1186/s12916-020-01662-2

24. Knowles KA, Sripada RK, Defever M, Rauch SAM. Comorbid mood and anxiety disorders and severity of posttraumatic stress disorder symptoms in treatment-seeking veterans. Psychol Trauma. 2019;11(4):451-458. doi:10.1037/tra0000383

25. Armenta RF, Walter KH, Geronimo-Hara TR, Porter B, Stander VA, LeardMann CA. Longitudinal trajectories of comorbid PTSD and depression symptoms among U.S. service members and veterans. BMC Psychiatry. 2019;19(1):396. doi:10.1186/s12888-019-2375-1

26. Biggs QM, Ursano RJ, Wang J, et al. Daily variation in post traumatic stress symptoms in individuals with and without probable post traumatic stress disorder. BMC Psychiatry. 2019;19(1):56. doi:10.1186/s12888-019-2041-7

27. Hundt NE, Robinson A, Arney J, Stanley MA, Cully JA. Veterans' perspectives on benefits and drawbacks of peer support for posttraumatic stress disorder. Mil Med. 2015;180(8):851-856. doi:10.7205/milmed-d-14-00536

28. Hall LK. The importance of understanding military culture. Soc Work Health Care. 2011;50(1):4-18. doi:10.1080/00981389.2010.513914

29. Ahern J, Worthen M, Masters J, Lippman SA, Ozer EJ, Moos R. The challenges of Afghanistan and Iraq veterans' transition from military to civilian life and approaches to reconnection. PLoS One. 2015;10(7):e0128599. doi:10.1371/journal.pone.0128599

30. Shue S, Matthias MS, Watson DP, Miller KK, Munk N. The career transition experiences of

military veterans: a qualitative study. Mil Psychol. 2021;33(6):359-371. doi:10.1080/08995605.2021.1962175

31. Demers A. When Veterans return: the role of community in reintegration. J Loss Trauma. 2011;16:160-179. doi:10.1080/15325024.2010.519281

32. Straus E, Norman SB, Tripp JC, Pitts M, Pietrzak RH. Purpose in life and conscientiousness protect against the development of suicidal ideation in U.S. military veterans with PTSD and MDD: results from the National Health and Resilience in Veterans study. Chronic Stress. 2019;3. doi:10.1177/2470547019872172

33. Braden A, Overholser J, Fisher L, Ridley J. Life meaning is associated with suicidal ideation among depressed veterans. Death Stud. 2015;39(1-5):24-29. doi:10.1080/07481187.2013.871604

34. Brunger H, Serrato J, Ogden J. "No man's land": the transition to civilian life. J Aggress Confl Peace Res. 2013;5(2):86-100. doi:10.1108/17596591311313681

35. Atuel HR, Keeling M, Kintzle SM, Hassan A, Castro CA. Veteran employment in the 21st century. In: Hicks L, Weiss E, Coll J, eds. The Civilian Lives of US Veterans: Issues and Identities. Santa Barbara, CA: Praeger; 2016;1:161-179.

36. Tajfel H. Social categorization, social identity and social comparison. In: Tajfel H, ed. Differentiation Between Social Groups: Studies in the Social Psychology of Intergroup Relations. London: Academic Press;1978;61-76.

37. Tajfel H, Turner JC. An integrative theory of intergroup conflict. In: Austin WG, Worchel S, eds. The Social Psychology of Intergroup Relations. Monterey, California: Brooks/Cole;1979;56(65):33-37.

38. Schuetz A. The homecomer. Am J Sociol. 1945;50(5):369-376. doi:10.1086/219654

39. Atuel H, Castro C. Military cultural competence. Clin Soc Work J. 2018;46. doi:10.1007/s10615-018-0651-z

40. Hoge CW. Interventions for war-related posttraumatic stress disorder: meeting veterans where they are. JAMA. 2011;306(5):549-551. doi:10.1001/jama.2011.1096

41. Pietrzak RH, Pitts BL, Harpaz-Rotem I, Southwick SM, Whealin JM. Factors protecting against the development of suicidal ideation in military veterans. World Psychiatry. 2017;16(3):326-327. doi:10.1002/wps.20467

42. Smith NB, Mota N, Tsai J, et al. Nature and determinants of suicidal ideation among U.S. veterans: results from the national health and resilience in veterans study. J Affect Disord. 2016;197:66-73. doi:10.1016/j.jad.2016.02.069

43. Wilks CR, Morland LA, Dillon KH, et al. Anger, social support, and suicide risk in U.S. military veterans. J Psychiatr Res. 2019;109:139-144. doi:10.1016/j.jpsychires.2018.11.026

44. Lin N, Ye X, Ensel WM. Social support and depressed mood: a structural analysis. J Health Soc Behav. 1999;40(4):344-359. doi:10.2307/2676330

45. Riessman F. The" helper" therapy principle. Social Work. 1965;10(2):27-32. doi:10.1093/sw/10.2.27

46. Horwitz AG, Held P, Klassen BJ, Karnik NS, Pollack MH, Zalta AK. Posttraumatic cognitions and suicidal ideation among veterans receiving PTSD treatment. Cognit Ther Res. 2018;42(5):711-719. doi:10.1007/s10608-018-9925-6

47. MacEachron A, Gustavsson N. Peer support, self-efficacy, and combat-related trauma symptoms among returning OIF/OEF veterans. Adv Soc Work. 2012;13(3):586-602. doi:10.18060/2391