Occupational Challenges in Military Service Members With Chronic Mild Traumatic Brain Injury

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OBJECTIVE. The purpose of this study was to identify the needs of military service members with chronic symptoms after mild traumatic brain injury (mTBI) that fall within the scope of occupational therapy practice.

METHOD. In this qualitative descriptive study, service members with a history of mTBI ($N = 12$) participated in semistructured interviews about their injury history, symptoms, daily routines, challenges, and plans.

RESULTS. Two main themes were identified: occupational changes and plans for the future. Occupational changes contains six subthemes: (1) rest and sleep, (2) activities of daily living and instrumental activities of daily living, (3) work, (4) social participation, (5) play and leisure, and (6) education. Plans for the future contains three subthemes: (1) supports, (2) barriers, and (3) fears.

CONCLUSION. Occupational therapists who work with this population should consider all areas of occupation, especially sleep, during assessment and treatment planning. Some clients may require additional support for preparing for civilian life.

Mild traumatic brain injuries (mTBIs), or concussions, account for more than 80% of the more than 360,000 brain injuries reported among active-duty military service members from 2000 through 2016 ([Defense and Veterans Brain Injury Center, 2018](#)). The U.S. Department of Defense (DoD) characterizes mTBI as an injury that results in loss of consciousness for less than 30 min or alteration of consciousness, less than 24 hr of posttraumatic amnesia, or Glasgow Coma Scale ([Sternbach, 2000](#)) score of 13–15 in the first 24 hr after injury ([Department of Veterans Affairs \[VA\] & DoD, 2009](#)). Although most acute symptoms resolve within 3 mo, persistent cognitive, emotional, and physical impairments occur in approximately 15%–20% of cases ([Carroll et al., 2014](#); [Williams et al., 2010](#)). Deficits in executive function, such as planning, decision making, and emotional regulation, that correlate to limitations in daily participation have been reported ([Erez et al., 2009](#)) as have limitations in community participation and work ([Sveen et al., 2010](#)).

Some key differences exist between military service members and civilian populations who experience mTBI events, the most significant of which is the timing of diagnosis and treatment. Although not all civilians seek immediate care for mTBI, many receive treatment during the acute injury phase in a hospital, emergency department, or outpatient physician office ([Sosin et al., 1996](#)). A screening tool has been in place since 2008 to identify acute mTBI in the combat environment ([French et al., 2008](#); [Iverson, 2010](#)), and guidelines to facilitate return to duty after injury as symptoms resolve were released in 2014 ([McCulloch et al., 2015](#)). However, many military service members were injured before the installation of these protocols ([Iverson et al., 2009](#)) and may not have sought immediate care.

Another difference that affects timing of diagnosis and treatment is that among military personnel, mTBI is frequently coupled with psychological trauma. In the moments after the injury event, personnel often must focus on avoiding further danger, responding to commands, or directing others rather than seeking assistance for their own symptoms.

The conditions of this high-stress environment may contribute to the later appearance of symptoms and delayed seeking of diagnosis and treatment (Davenport, 2016; Rigg & Mooney, 2011). The standard screening procedures in military and veteran health care settings may result in increased attribution of chronic symptoms to prior brain injury events compared with the civilian population.

Connections between symptoms and disruption in daily life have not been established, particularly among the active-duty population. Much of the recent occupational therapy research with veterans of the Afghanistan and Iraq wars has emphasized those who were already separated from active service (e.g., Eakman et al., 2016; Plach & Sells, 2013) or service members with mental health diagnoses (Rogers et al., 2014). Few studies in the field have concentrated specifically on veterans with mTBI and other combat-related injuries, and the studies concentrating on these veterans have focused on driving (e.g., Classen, Cormack, et al., 2014; Classen, Monahan, et al., 2014). There remains a need to investigate how chronic symptoms of mTBI affect daily living—particularly among active-duty service members—and potential areas for occupational therapy intervention. Moreover, first-person perspectives of injured active-duty service members have not been represented in the literature, with a few exceptions (e.g., Brunger et al., 2014).

The purpose of this study was to identify the needs of military service members who have chronic symptoms attributed to a historical mTBI event that fall within the scope of occupational therapy intervention. We explored whether and how the presence of symptoms interfered with service members' desired participation in personal and professional roles as well as perceived opportunities and limitations after separation from active service.

Method

Design

We conducted a qualitative descriptive study to identify the occupational challenges of active-duty service members through semistructured interviews. The qualitative descriptive design was influenced by phenomenology (Merriam & Tisdell, 2016; Sandelowski, 2000), because we sought to learn about the experience of living with chronic mTBI symptoms while serving in the military. However, our analysis is descriptive in nature and not interpretive. The findings represent a portion of a larger needs assessment that included interviews with health care providers, spouses of service members, and uninjured service members in supervisory roles. The study was contextualized with an occupational science perspective that engagement in occupation is intimately connected to health and that symptoms alone do not determine satisfaction with participation in occupation (Clark, 1997; Wilcock, 1993).

Participants

Twelve male service members participated in the study (Table 1). All participants were enlisted personnel on active-duty status, and 10 had plans to separate from military service at the time the interviews were conducted. Eleven participants were Marines, and 1 was a Navy hospital corpsman. All service members reported several chronic symptoms, including memory loss, headaches, and disrupted sleep.

Participants were recruited from a multidisciplinary concussion care clinic. To be eligible, service members had to have a history of mTBI and have been referred for occupational therapy services (typically for cognitive symptoms). Service members receiving concurrent treatment of substance abuse or diagnosed with a personality disorder according to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; American Psychiatric Association, 2013) were ineligible. No member of the research team was involved in the clinical care of participants. We aimed for maximum variation sampling and successfully recruited participants with a wide range of ages, years of military service, and brain injury history when the target enrollment was reached. This sampling strategy was appropriate to understand the full range of occupational challenges that service members experienced (Patton, 2002).

Table 1. Participant Demographics (N = 12)

Service Members	Average (range) or n
Age, yr	35.2 (22–49)
Years of service	13.7 (3–28)
Total combat deployments	2.4 (1–5)
Total recalled lifetime head injuries	3.8 (1–10)
Time from last head injury, mo	63 (12–132)
Blast injury (1 or more)	11
Repetitive subacute blast exposure	7
Comorbidities	
Mental health	10
Chronic orthopedic injuries/pain	10
Marital status	
Married	9
Unmarried	2
Separated	1
Children living at home	1.16 (0–2)
Education	
High school	9
Some college	2
Bachelor's degree	1
Ethnicity	
African-American	2
Caucasian	6
Hispanic or Latino	3
Asian-American	1
Military operational specialty	
Infantry	3
Logistics	3
Mechanic	3
Engineer	1
Reconnaissance	1
Corpsman	1
Duty status ^a	
Full duty	2
Limited duty	4
Wounded Warrior Battalion	6

^aFull duty: still in prior work role; limited duty: assigned to prior unit but with reduced responsibilities; Wounded Warrior Battalion: nondeploying unit with focus on injury recovery.

Procedure

The study took place at Naval Hospital Camp Pendleton in Oceanside, CA, and was approved by the institutional review boards of the Naval Medical Center San Diego and the University of Southern California. All participants completed an informed consent process before being interviewed.

The first author (Alison M. Cogan) conducted a semistructured interview with each participant in a private office located in the naval hospital during regular business hours between February 2015 and January 2016. Brain injury history was confirmed using the Ohio State University TBI Identification structured interview (Bogner & Corrigan, 2009), which was embedded into the semistructured interview guide. Service members were asked about their home life, their daily routines, changes that they had noticed since their injuries, the health care they had received, their plans for the future, and what they wanted other people to understand about their injuries. Interviews lasted an average of 67 min (range = 41–87 min), were audio recorded, and were transcribed verbatim. The interviewer also recorded field notes after each interview and personal reflections, which were used to provide context during the data analysis process and to identify potential researcher biases, such as statements from participants that were surprising or unexpected.

As each interview was completed and transcribed, the first author read through the transcript, recorded memos of reflections and possible themes, and then began an iterative coding process of the transcripts using NVivo software (QSR International, Melbourne, Victoria, Australia). *Occupational Therapy Practice Framework: Domain and Process* (3rd ed.; OTPF-3; American Occupational Therapy Association [AOTA], 2014) domains were used to organize data about occupations. Additional codes emerged through inductive analysis. Codes were updated and revised as each interview was completed and analyzed. Interviews with three additional service members using the same guide were conducted for confirmation after thematic saturation was reached. All coauthors reviewed the identified themes and associated raw data for confirmation.

Results

We identified two main themes: occupational changes and plans for the future. Occupational changes contains six subthemes, which are organized according to the OTPF-3: (1) rest and sleep, (2) activities of daily living (ADLs) and instrumental activities of daily living (IADLs), (3) work, (4) social participation, (5) play and leisure, and (6) education. Plans for the future contains three subthemes: (1) supports, (2) barriers, and (3) fears. As a result of the semistructured nature of the interviews, additional themes emerged from the data; however, they are beyond the scope of this article.

Occupational Changes

Participants reported challenges across all domains of the OTPF-3 (AOTA, 2014).

Rest and Sleep.

The most pervasive occupational change reported was sleep disruption. All participants described an extended period (more than 1 yr) of disrupted sleep that had been only marginally or temporarily improved with pharmacological treatment. Most reported difficulty with both falling and staying asleep, and none reported sleeping more than 7 hr during the night on average. Julio (all names are pseudonyms) reported, “Sometimes I just don’t fall asleep, sometimes I do fall asleep and get back up.”

One participant, Gavin, reported that he had slept excessively before attending an intensive outpatient treatment program for posttraumatic stress disorder. However, since then, he said, “Now I can’t sleep because . . . everything’s coming out.” Several participants reported that their sleep was frequently interrupted by nightmares. Maurice’s night terrors were so extreme that he was no longer able to share a bed with his wife:

She sleeps in a different room than I. And when I’m asleep, whenever I’m asleep, she’s awake to watch me in case I’m, you know, kicking the bed too much or something like that; she can grab my foot. Now she knows, hey, you got to grab my foot, and don’t grab anywhere up here [motions to upper body]. . . . So, if it’s too bad for me, she knows about that, and when I wake up, she goes to sleep.

ADLs and IADLs.

Participants reported difficulty with maintenance of basic household tasks and relying on spouses, children, and assistive devices (e.g., smartphone, tablet) to help them manage basic ADLs and IADLs. Eleven participants reported using a calendar, notebook, or other device for reminders of tasks they needed to do or places they needed to be. When Jason described changes to managing tasks at home, he explained,

I can’t do the finances anymore at home. My wife has to handle all that. . . . Scheduling, stuff like that, everything has to be broken down almost, almost on a daily basis to where . . . it’s actually at a child’s level [of] scheduling. . . . And still sometimes, that doesn’t even go right, you know.

Work.

Work was significantly affected by chronic symptoms of mTBI. Several participants were assigned to limited duty (LimDu) with a reduced workload or had been reassigned to an administrative job within their unit. Others had been transferred to the Wounded Warrior Battalion, a nondeploying unit in which their mission was to recover from their injuries.

Julio, reassigned to an administrative job, said that the job “sucks.” When asked why he described it that way, he said, “The thrill of going to the field, spending time with the boys, it’s not the same, you know what I mean?” Lorenzo acknowledged that his LimDu assignment was less stressful than his military job because there was less for him to remember but that given the choice, “I’d go back to my old job.”

Being unable to continue in their previous work roles was a significant source of distress for 6 of the participants. However, Ryan, who was assigned to the Wounded Warrior Battalion, reported that “being able to spend more time with my wife and kids is a huge plus.” Ryan, who had experienced suicidal ideation after his injuries, described what happened when he realized that he might not be able to continue in his military job:

It got to the point where it was just too much for me to handle, and I started getting more suicidal thoughts . . . and I ended up having to come out of the field of a 6- or 7-day operation with the battalion to come back and see my psychologist.

His transfer to the Wounded Warrior Battalion was initiated shortly thereafter.

The 2 participants who remained on full duty status reported significant support from their respective commands, which enabled them to balance their workload with attending medical appointments. In both cases, they reported that their workloads had been reduced even though their duty status had not changed. Rhett explained that, although he was still in his military job, “I don’t feel like I’m at the top of my game like I used to be.”

Social Participation.

All participants described purposefully limiting their social engagement in the community. As Armand explained it,

People kind of, they start giving you a bit of a wide berth. Which is fine by you because you don’t want to socialize with them; you don’t want to go anywhere. Unless it’s the people that you were there [in combat] with, you don’t want to be around anybody.

Nearly all preferred to avoid crowds and events that would be noisy, such as fireworks. One exception, Drew, described his preferred weekend activities as attending concerts. In contrast, Rhett explained,

I don’t like really busy places, because I always find myself positioning myself in the best place in case something happens. You know, my son makes it a joke. He’s always like, you know, “OK Dad, where are we going to go stand? Let’s go over there.” But it’s a game to him . . . but for me, it’s like, it’s like I never left. . . . Can’t turn it off.

Play and Leisure.

All participants described a loss of interest in or cessation of previously enjoyable leisure activities. As Maurice explained,

Before, we used to do a lot of stuff. We used to go fishing. We used to play tennis. Especially when we [were] over in Hawaii, we used to go hiking to the waterfall and all that type of stuff, but after all that [injuries] happened, you know, it just stopped.

Jake was no longer able to play video games, which had previously been his preferred leisure activity, because they caused migraine headaches, and he had to avoid roller coasters because of vestibular problems. Lorenzo said that “certain movies I can’t watch anymore or certain songs I can’t hear anymore because [they] just [give] me a flashback or a memory.”

Rhett said that he no longer found as much pleasure in some of the outdoor activities that were important family pastimes he had enjoyed from childhood. He had been an avid hunter and liked to take his son on hunting trips. However, after his injuries, the experience had changed for him:

When you’re out hunting, you know, sometimes I have to remember where I’m at. . . . I was hunting with my son . . . but it bothered me watching the deer die. I guess from, you know, everything that’s happened overseas . . . it’s just interesting that, you know, some of the things that you enjoyed doing before are not as pleasurable anymore.

Education.

Only 2 of the 12 participants reported current enrollment in college courses. Both reported struggles with concentration and retention of material they had read as well as increased difficulty compared with school experiences before their head injuries. For example, Jake explained,

The problem is getting through it. Like as far as the actual reading part of it. So I’ll read a sentence, then I’ll realize that my mind is like, I’m not paying attention [so I] have to go back and reread it and reread it until I’m paying attention.

Similarly, Rhett stated that his schoolwork was “really requiring me to do a lot more reading and studying, whereas before I didn’t have to work that hard when I was younger.”

Plans for the Future

Although a few participants intended to continue their military service, most had an impending separation date. Their plans varied widely in terms of certainty and detail. Two service members, Maurice and Jeremy, wanted to recover sufficiently to return to their military jobs. Three others had concrete plans to complete school or seek a particular kind of employment, but most reported nebulous plans. Armand reported diverse possible career trajectories such as physician's assistant, attorney, and hospitality management. For those who had uncertain postdischarge plans, what to do after leaving the military seemed to depend on a combination of their disability status upon discharge and related compensation (none had received a decision at the time of the interview) and jobs they perceived as being lucrative and attainable with their skill set and education.

Supports.

Many of the supports identified were family members, particularly spouses. Others noted transition support services and programs in which they had participated in preparation for separation from military service. Some also reported the VA infrastructure as a support, although this sentiment was not universal, and 1 participant explicitly stated concern about the quality of VA care.

Barriers.

Several participants reported that they could not think of any barriers that would prevent them from attaining their goals. One participant, Julio, was explicit about the loss of his identity as a significant barrier. A few mentioned the difference between military and civilian cultures as being a challenge for them. For example, Julio described how "you hear all these people talking and they complain so much." From his point of view, it was not acceptable for a service member to complain about his or her work and he would have to learn to not criticize people outside of the military for such behavior.

Fears.

Fears were characterized as potential problems in the future that had not yet occurred but were of concern. They were not included with barriers because they were not perceived as a current problem, but instead something that could happen in the future. Maurice was afraid that he would not be able to find a job:

You know, they [other Marines] think, "I can get out, and I'm going to go work this job" and . . . next thing you know, a year down the road, they're still trying to find a job. So, you know . . . that could be me in the future, and I don't want that to happen at all.

Given his current physical challenges, Rhett was concerned about how much worse he could get:

Especially knowing the issues I have now, well what am I going to be, what kind of shape am I going to be in 10 years? . . . From all the service-connected problems, you know? So yeah, there's a lot of apprehension there that I have.

Discussion

The findings in this study suggest that service members with chronic symptoms related to mTBI have needs across the full domain of occupational therapy practice. Similar to findings in civilian samples, service members reported participation deficits in work and other aspects of daily life (Erez et al., 2009; Sveen et al., 2010). Our findings of limited social and leisure participation are consistent with a study of student veterans that found lower levels of psychosocial protective factors compared with nonveteran students (Eakman et al., 2016). Such limitations in daily occupations present a serious risk to a person's overall health (Clark, 1997; Wilcock, 1993).

Occupational therapy services are included as part of rehabilitation in the military health system (Dillingham & Belandres, 1998). Nonetheless, evidence to support the efficacy of occupational therapy interventions in the population of active-duty service members with chronic symptoms after mTBI is still needed. Other health care providers likely

address some of the problems described in the Results section; however, occupational therapy is unique in its emphasis on ADLs, and this lens could complement other services such as medicine, physical therapy, psychology, and speech–language therapy. We suggest that occupational therapy have a broader, more consistent role in evaluating and treating service members from the acute to chronic stages of mTBI. In particular, sleep disruption emerged as a significant area of need, which is consistent with the results of a prior study of student veterans (Plach & Sells, 2013).

Occupational therapy support may also be warranted to facilitate the process of transition from military to civilian life. Participants reported learning about resources during information sessions that they had attended, yet they had unclear pictures of postmilitary life. Occupational therapy practitioners could provide career transition support and help with establishing new, health-promoting daily routines as service members make the shift to the civilian world and rebuild their identities. Service members who delayed medical care because they feared it would end their military careers, as did most of the participants in our study, may require specialized support.

Note that, in addition to a history of mTBI and reported symptoms, most participants had mental health comorbidities. It is impossible to fully disentangle the etiologies of the symptoms of mTBI from mental health diagnoses. In addition, participants reported sleep disorders, chronic pain, hearing impairment, and visual impairment among other problems. Many of these issues create feedback loops that increase symptoms. These complex cases demand a holistic approach to care. It is not simply a resolution of symptoms that is required to allow for a return to meaningful activities but learning to live well under these conditions. We also do not know the impact of chronic symptoms that could be related to mTBI in people who have not sought medical treatment.

Trustworthiness of the Study

We recruited participants and conducted interviews over a 12-mo period, which helped to establish the credibility of the study. Credibility was further supported by the triangulation of all themes by the full research team, two of whom are Navy occupational therapists (Christine E. Haines and Karla M. Lepore). This step also strengthened confirmability, as did recording the first author's personal reflections after each interview. Transferability is supported by the detailed description of the study population and research setting. The study was dependable in that we followed an iterative analysis process and provided ample data to verify each theme.

Limitations

All of the interviews were conducted by the same researcher (Alison M. Cogan), who is a civilian. The study sample was limited to people with chronic symptoms after mTBI, which was not representative of all service members with head injury events. Because we did not review medical records, we could not confirm that structural MRI scans were negative in all cases. In addition, participating service members had already been identified as having needs that were within the occupational therapy scope of practice and had received occupational therapy services, which may have biased the sample.

Another possible limitation to the study was the issue of secondary gains. Level of disability at the conclusion of military service determines the financial disability benefits that a service member receives. It is conceivable that the possibility of monetary gain influenced interview responses, although participants were assured of the confidentiality of their answers and none disclosed that he was exaggerating his symptoms or disability. However, we acknowledged this potential risk.

Future Research

Members of our research team have undertaken a follow-up study to describe occupational therapy treatment of the active-duty patient population with chronic symptoms attributed to mTBI for the purposes of identifying the theoretical underpinnings of current approaches and to establish a foundation for future intervention development. Additional

research with active-duty service members who expect to return to their military job roles and are not imminently planning to separate from active service may be useful because their treatment needs may be different from those who are preparing for the transition to civilian life.

Implications for Occupational Therapy Practice

Our findings indicate the following implications for occupational therapy practice:

- Occupational therapy evaluation should be thorough and assess the full domain of functions, role identity, life goals, and satisfaction with occupational performance.
- Occupational therapists should assess current sleep patterns, sleep hygiene, and concurrent treatments that service members are receiving to tailor treatment and complement other therapies.
- For clients who have an impending date for separation from active military service, occupational therapy practitioners should facilitate preparation for civilian life and especially identify potential challenges and obstacles.

Conclusion

The unique injury and symptom patterns among military service members with mTBI were found to have deviated from those of civilians with mTBI (Bailie et al., 2016); therefore, research to design appropriate interventions for this population and test their efficacy is much needed. Meanwhile, we suggest that occupational therapists who work with these service members and veterans consider the full domain of their professional scope of practice during assessment and treatment. Because this generation of veterans with chronic symptoms after mTBI will continue to be seen in VA and civilian health care settings after they separate from the military, investigation into long-term strategies and solutions is justified. ■

References

- American Occupational Therapy Association. (2014). Occupational therapy practice framework: Domain and process (3rd ed.). *American Journal of Occupational Therapy*, 68(Suppl. 1), S1–S48. <https://doi.org/10.5014/ajot.2014.682006>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Bailie, J. M., Kennedy, J. E., French, L. M., Marshall, K., Prokhorenko, O., Asmussen, S., . . . Lange, R. T. (2016). Profile analysis of the neurobehavioral and psychiatric symptoms following combat-related mild traumatic brain injury: Identification of subtypes. *Journal of Head Trauma Rehabilitation*, 31, 2–12. <https://doi.org/10.1097/HTR.0000000000000142>
- Bogner, J., & Corrigan, J. D. (2009). Reliability and predictive validity of the Ohio State University TBI identification method with prisoners. *Journal of Head Trauma Rehabilitation*, 24, 279–291. <https://doi.org/10.1097/HTR.0b013e3181a66356>
- Brunker, H., Ogden, J., Malia, K., Eldred, C., Terblanche, R., & Mistlin, A. (2014). Adjusting to persistent post-concussive symptoms following mild traumatic brain injury and subsequent psycho-educational intervention: A qualitative analysis in military personnel. *Brain Injury*, 28, 71–80. <https://doi.org/10.3109/02699052.2013.857788>
- Carroll, L. J., Cassidy, J. D., Cancelliere, C., Côté, P., Hincapié, C. A., Kristman, V. L., . . . Hartvigsen, J. (2014). Systematic review of the prognosis after mild traumatic brain injury in adults: Cognitive, psychiatric, and mortality outcomes: Results of the International Collaboration on Mild Traumatic Brain Injury Prognosis. *Archives of Physical Medicine and Rehabilitation*, 95(Suppl.), S152–S173. <https://doi.org/10.1016/j.apmr.2013.08.300>
- Clark, F. A. (1997). Reflections on the human as an occupational being: Biological need, tempo and temporality. *Journal of Occupational Science*, 4, 86–92. <https://doi.org/10.1080/14427591.1997.9686424>
- Classen, S., Cormack, N. L., Winter, S. M., Monahan, M., Yarney, A., Lutz, A. L., & Platek, K. (2014). Efficacy of an occupational therapy driving intervention for returning combat veterans. *OTJR: Occupation, Participation and Health*, 34, 177–182. <https://doi.org/10.3928/15394492-20141006-01>
- Classen, S., Monahan, M., Canonizado, M., & Winter, S. (2014). Utility of an occupational therapy driving intervention for a combat veteran. *American Journal of Occupational Therapy*, 68, 405–411. <https://doi.org/10.5014/ajot.2014.010041>
- Davenport, N. D. (2016). The chaos of combat: An overview of challenges in military mild traumatic brain injury research. *Frontiers in Psychiatry*, 7, 85. <https://doi.org/10.3389/fpsy.2016.00085>
- Defense and Veterans Brain Injury Center. (2018). *DoD numbers for traumatic brain injury worldwide—Totals*. Retrieved from https://dvbic.dcoe.mil/files/tbi-numbers/worldwide-totals-2000-2018Q1-total_jun-21-2018_v1.0_2018-07-26_0.pdf
- Department of Veterans Affairs & Department of Defense. (2009). *VA/DoD clinical practice guideline for management of concussion/mild traumatic brain injury (mTBI)*. Retrieved from http://www.healthquality.va.gov/guidelines/Rehab/mtbi/concussion_mtbi_full_1_0.pdf

- Dillingham, T. R., & Belandres, P. V. (1998). Physiatry, physical medicine, and rehabilitation: Historical development and military roles. In R. Zajtcuk (Ed.), *Rehabilitation of the injured combatant, Vol. 1*. Retrieved from https://ke.army.mil/bordeninstitute/published_volumes/rehab1/RH1ch1.pdf
- Eakman, A. M., Schelly, C., & Henry, K. L. (2016). Protective and vulnerability factors contributing to resilience in post-9/11 veterans with service-related injuries in postsecondary education. *American Journal of Occupational Therapy, 70*, 7001260010. <https://doi.org/10.5014/ajot.2016.016519>
- Erez, A. B., Rothschild, E., Katz, N., Tuchner, M., & Hartman-Maeir, A. (2009). Executive functioning, awareness, and participation in daily life after mild traumatic brain injury: A preliminary study. *American Journal of Occupational Therapy, 63*, 634–640. <https://doi.org/10.5014/ajot.63.5.634>
- French, L., McCrea, M., & Baggett, M. (2008). The Military Acute Concussion Evaluation (MACE). *Journal of Special Operations Medicine, 8*, 68–77.
- Iverson, G. L. (2010). Clinical and methodological challenges with assessing mild traumatic brain injury in the military. *Journal of Head Trauma Rehabilitation, 25*, 313–319. <https://doi.org/10.1097/HTR.0b013e3181d6f9bd>
- Iverson, G. L., Langlois, J. A., McCrea, M. A., & Kelly, J. P. (2009). Challenges associated with post-deployment screening for mild traumatic brain injury in military personnel. *Clinical Neuropsychologist, 23*, 1299–1314. <https://doi.org/10.1080/13854040903153902>
- McCulloch, K. L., Goldman, S., Lowe, L., Radomski, M. V., Reynolds, J., Shapiro, R., & West, T. A. (2015). Development of clinical recommendations for progressive return to activity after military mild traumatic brain injury: Guidance for rehabilitation providers. *Journal of Head Trauma Rehabilitation, 30*, 56–67. <https://doi.org/10.1097/HTR.0000000000000104>
- Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). San Francisco: Jossey-Bass.
- Patton, M. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.
- Plach, H. L., & Sells, C. H. (2013). Occupational performance needs of young veterans. *American Journal of Occupational Therapy, 67*, 73–81. <https://doi.org/10.5014/ajot.2013.003871>
- Rigg, J. L., & Mooney, S. R. (2011). Concussions and the military: Issues specific to service members. *Physical Medicine and Rehabilitation, 3*(Suppl. 2), S380–S386. <https://doi.org/10.1016/j.pmrj.2011.08.005>
- Rogers, C. M., Mallinson, T., & Peppers, D. (2014). High-intensity sports for posttraumatic stress disorder and depression: Feasibility study of ocean therapy with veterans of Operation Enduring Freedom and Operation Iraqi Freedom. *American Journal of Occupational Therapy, 68*, 395–404. <https://doi.org/10.5014/ajot.2014.011221>
- Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing and Health, 23*, 334–340. [https://doi.org/10.1002/1098-240X\(200008\)23:4<334::AID-NUR9>3.0.CO;2-G](https://doi.org/10.1002/1098-240X(200008)23:4<334::AID-NUR9>3.0.CO;2-G)
- Sosin, D. M., Sniezek, J. E., & Thurman, D. J. (1996). Incidence of mild and moderate brain injury in the United States, 1991. *Brain Injury, 10*, 47–54. <https://doi.org/10.1080/026990596124719>
- Sternbach, G. L. (2000). The Glasgow Coma Scale. *Journal of Emergency Medicine, 19*, 67–71. [https://doi.org/10.1016/S0736-4679\(00\)00182-7](https://doi.org/10.1016/S0736-4679(00)00182-7)
- Sveen, U., Bautz-Holter, E., Sandvik, L., Alvsåker, K., & Røe, C. (2010). Relationship between competency in activities, injury severity, and post-concussion symptoms after traumatic brain injury. *Scandinavian Journal of Occupational Therapy, 17*, 225–232. <https://doi.org/10.3109/11038120903171295>
- Wilcock, A. (1993). A theory of the human need for occupation. *Journal of Occupational Science, 1*, 17–24. <https://doi.org/10.1080/14427591.1993.9686375>
- Williams, W. H., Potter, S., & Ryland, H. (2010). Mild traumatic brain injury and postconcussion syndrome: A neuropsychological perspective. *Journal of Neurology, Neurosurgery, and Psychiatry, 81*, 1116–1122. <https://doi.org/10.1136/jnnp.2008.171298>

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Acknowledgments

We thank the leadership at Naval Hospital Camp Pendleton and Naval Medical Center San Diego who supported this study. We are grateful to the service members who participated. This work was completed in partial fulfillment of Alison M. Cogan's requirements for a PhD in occupational science at the University of Southern California (USC). Dr. Cogan extends her thanks to Drs. Florence Clark, Mary Lawlor, Mike Carlson, and Beth Pyatak at USC, who served on her dissertation committee and provided feedback on a draft of this article. Disclaimer: The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, Department of Veterans Affairs, or the U.S. government.

Citation: Cogan, A. M., Haines, C. E., Devore, M. D., Lepore, K. M., & Ryan, M. (2019). Occupational challenges in military service members with chronic mild traumatic brain injury. *American Journal of Occupational Therapy, 73*, 7303205040. <https://doi.org/10.5014/ajot.2019.027599>