

USAARL Report No. 2014-20

Soldier Beliefs about the Readiness of Military Personnel with Mild Traumatic Brain Injury

By Thomas W. Britt¹
Bethany Ranes^{1,2}
Amanda M. Kelley¹
Catherine Grandizio¹
Steven J. Gaydos¹

¹U.S. Army Aeromedical Research Laboratory
²Oak Ridge Institute for Science and Education



**United States Army Aeromedical Research Laboratory
Warfighter Health Division**

May 2014

Approved for public release, distribution unlimited.

Notice

Qualified requesters

Qualified requesters may obtain copies from the Defense Technical Information Center (DTIC), Cameron Station, Alexandria, Virginia 22314. Orders will be expedited if placed through the librarian or other person designated to request documents from DTIC.

Change of address

Organizations receiving reports from the U.S. Army Aeromedical Research Laboratory on automatic mailing lists should confirm correct address when corresponding about laboratory reports.

Disposition

Destroy this document when it is no longer needed. Do not return it to the originator.

Disclaimer

The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other official documentation. Citation of trade names in this report does not constitute an official Department of the Army endorsement or approval of the use of such commercial items.

Human Use

Human subjects participated in this study after giving their free and informed voluntary consent. Investigators adhered to Army Regulation 70-25 and USAMRMC Regulation 70-25 on use of volunteers in research.

| | | | | | |
|---|--------------------|-----------------------|-----------------------------------|---|--|
| REPORT DOCUMENTATION PAGE | | | | <i>Form Approved OMB No. 0704-0188</i> | |
| <small>The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</small> | | | | | |
| PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS. | | | | | |
| 1. REPORT DATE (DD-MM-YYYY) | | 2. REPORT TYPE | | 3. DATES COVERED (From - To) | |
| 4. TITLE AND SUBTITLE | | | | 5a. CONTRACT NUMBER | |
| | | | | 5b. GRANT NUMBER | |
| | | | | 5c. PROGRAM ELEMENT NUMBER | |
| 6. AUTHOR(S) | | | | 5d. PROJECT NUMBER | |
| | | | | 5e. TASK NUMBER | |
| | | | | 5f. WORK UNIT NUMBER | |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) | | | | 8. PERFORMING ORGANIZATION REPORT NUMBER | |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | | | | 10. SPONSOR/MONITOR'S ACRONYM(S) | |
| | | | | 11. SPONSOR/MONITOR'S REPORT NUMBER(S) | |
| 12. DISTRIBUTION/AVAILABILITY STATEMENT | | | | | |
| 13. SUPPLEMENTARY NOTES | | | | | |
| 14. ABSTRACT | | | | | |
| 15. SUBJECT TERMS | | | | | |
| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES | 19a. NAME OF RESPONSIBLE PERSON |
| a. REPORT | b. ABSTRACT | c. THIS PAGE | | | 19b. TELEPHONE NUMBER (Include area code) |

This page is intentionally left blank.

Acknowledgements

The authors would like to express their sincere gratitude to the following people for their contributions to this project:

- Mr. Dan Ranchino for his invaluable assistance with the development and implementation of the online surveys used for this study
- Mr. Bradley Erickson, Ms. Melody King, SPC Hilary Phillips, SPC Brian Laskowski, and SPC Stanslaus Simiyu for facilitating and carrying out the data collection with the participants at lightning speed
- Ms. Elizabeth Stokes for always conquering the administrative hurdles of study completion and report writing

This research manuscript was developed in part by a participant of the Postgraduate Research Participation Program at the U.S. Army Aeromedical Research Laboratory administered by the Oak Ridge Institute for Science and Education through an interagency agreement between the U.S. Department of Energy and USAARL.

This page is intentionally left blank.

Table of contents

| | <u>Page</u> |
|---------------------------------|-------------|
| Introduction..... | 1 |
| Background..... | 1 |
| Methods..... | 4 |
| Participants and procedure..... | 4 |
| Measures..... | 4 |
| Scenarios..... | 4 |
| Evaluation items..... | 5 |
| Data analyses..... | 5 |
| Results..... | 6 |
| Perceived readiness..... | 6 |
| Special accommodations..... | 6 |
| Discussion..... | 8 |
| Future research..... | 9 |
| Limitations..... | 10 |
| Conclusions..... | 10 |
| References..... | 11 |

List of figures

| | |
|--|---|
| 1. Positive evaluation as a function of scenario..... | 6 |
| 2. Special accommodations as a function of scenario..... | 7 |
| 3. Special accommodations as a function of rank..... | 8 |

This page is intentionally left blank.

Introduction

The present study examined the perceptions military personnel have of Soldiers with mild traumatic brain injury (mTBI). U.S. Army Soldiers ($N = 391$) read and responded to one of five scenarios described in a survey. The scenarios involved a hypothetical soldier (SPC Smith) who had returned from combat duty in Afghanistan. In four versions of the scenario, SPC Smith sustained an mTBI, and in one version, he sustained no injury. In the four mTBI scenarios, additional symptoms were described for each scenario, including struggles with balance and dizziness, memory and attention, headaches and blurred vision, or being irritable and withdrawn. Participants then evaluated SPC Smith on different dimensions. The results indicated that SPC Smith was judged lower in perceived readiness and required more special accommodations for reintegration when experiencing an mTBI in comparison to the control condition, and that the different symptoms that occurred in conjunction with the mTBI did not affect his evaluation. Soldiers of higher rank perceived that SPC Smith would need to receive greater accommodations to reintegrate into the unit. These results are the first to shed light on Soldiers' attitudes associated with mTBI in a military setting, and highlight the importance of future research on perceptions of this frequent problem in military personnel.

Background

Researchers have highlighted the psychological and physical injuries resulting from the recent combat operations in Iraq and Afghanistan. In addition to the well-documented prevalence of post-traumatic stress disorder (PTSD) symptoms following these military deployments, research has shown that up to 23 percent of service members who have deployed to Iraq have experienced a traumatic brain injury (TBI) during deployment (Hoge et al., 2008; MacGregor et al., 2010; Terrio et al., 2009). Those who suffer an mTBI may experience neuropsychological difficulties following the injury lasting typically a few days to a few weeks (Hanna-Pladdy et al., 2001). Some reports suggest that these difficulties may persist for 1 to 3 months. Most individuals with an mTBI will recover within 3 to 6 months (Management of Concussion/mTBI Working Group, 2009). However, others develop persistent symptoms, including headaches, fatigue, dizziness, concentration problems, and anxiety, known as post-concussive syndrome (Management of Concussion/mTBI Working Group, 2009). The U.S. Army has developed a number of rehabilitation and treatment centers, including the National Intrepid Center of Excellence – Intrepid Spirit III at Fort Campbell, Kentucky. The program includes vestibular, cognitive, and physical rehabilitation, along with exposure to operationally relevant tasks commonly encountered in combat environments. It has been reported that approximately 77 percent of Soldiers who complete the treatment program return to active duty (Quigley, 2009).

Importantly, the symptoms associated with mTBI may be unlikely to resolve on their own without proper treatment. However, prior researchers have noted a general tendency for individuals with mental health problems and mTBI to avoid treatment for their problems (Hoge et al., 2004; Kim et al., 2010; Thomas et al., 2010). Although prior research has focused on individuals who fail to seek treatment for mental health problems (Britt, 2000; Hoge et al., 2004), researchers have also begun to examine the barriers to treatment among military personnel with mTBI (Hoge et al., 2008). Tanielian and Jaycox (2008) noted that many of the

factors that influence seeking treatment for mental health problems may also be prevalent for military personnel seeking treatment for mTBI, given the similarity in symptoms not being visible to others and the perception that these types of problems should be disregarded (i.e., “shaken off”) by the Soldier in order to focus on the unit’s mission.

Although prior research has investigated attitudes toward Soldiers with mental health problems within the military (Greene-Shortridge, Britt, and Castro, 2007), little or no research has been devoted to examining peer and leadership attitudes associated with mTBI in a military setting. Previous research has established that stigma exists for individuals who have experienced a number of mental and physical health problems. Stigma is generally measured as social negativity and discrimination leading to altered group behavior directed toward the individual. Mental health stigma in the military has been assessed in terms of both the public stigma associated with such problems, as well as the self-stigma associated with having a problem. Public stigma refers to members of society socially distancing themselves from individuals they perceive as having an illness or disability. Often the individual will internalize the public stigma, which leads to the lowering of his/her self-esteem (Greene-Shortridge et al., 2007). Brigadier General Loree Sutton, former Director of DoD Centers of Excellence for Psychological Health and Traumatic Brain Injury, has recently argued that stigma is a “toxic deadly hazard that prevents all too many of our warriors and their loved ones from accessing the resources and tools that are there” (McKenna, 2010).

A person may be stigmatized for physical, psychological, and cognitive disabilities, all of which may appear in an individual experiencing long-term effects of mTBI. As noted above, a great deal of the stigmatization research has focused on mental health issues such as PTSD (Mittal et al., 2013). Individuals with psychological issues are often seen as more responsible for their problems than individuals with physical issues (Weiner, Perry, and Magnusson, 1988). Stigmatization related to physical disabilities includes avoidance behaviors and feelings of pity and discomfort. Often, a more visible disabling condition results in a stronger anti-social response from society (Park, Faulkner, and Schaller, 2003). The stigma associated with cognitive and intellectual disabilities is less understood, but it appears to be more hostile, including verbal abuse and bullying as evidenced in a civilian population (Ali et al., 2008).

A small body of research has examined the stigma associated with TBI in civilian settings, but this research has not differentiated mTBI from moderate or severe TBI. McClellan, Bishop, and McKinlay (2010) used a scenario methodology to examine attitudes toward an individual who had been in a car accident and sustained either a brain or a limb injury. The authors found more negative ratings of an individual with a brain injury on a number of attributes (e.g., sociable, mature, intelligent, likeable). McClure (2011) hypothesized that the stigma shown toward individuals with brain injuries may result from attributional processes where individuals fail to consider the brain injury as a cause for negative behaviors.

Our purpose in discussing the potential stigmas associated with mTBI is to highlight that military personnel may fail to seek treatment for the disorder, and therefore return to their unit still experiencing the cognitive, psychological, and physiological deficits that have the capacity to negatively affect their readiness and ability to perform their mission. When this happens, fellow unit members may justifiably perceive those personnel exhibiting mTBI symptoms more

negatively than service members not exhibiting any symptoms. We would not label this differential evaluation as stigma, given that symptoms reflecting struggles with balance, dizziness, memory and attention difficulties, headaches, and irritability could be expected to affect the readiness of the service member and his/her ability to contribute to the mission of the unit. Better understanding of how military personnel view fellow Soldiers with mTBI associated with different types of symptoms will provide an assessment of how symptoms are perceived to influence the readiness and effectiveness of service members. Documenting a unit's perceived negative effects of mTBI on a Soldier's perceived readiness and effectiveness could serve to motivate Soldiers with mTBI to seek treatment in order to reduce the symptoms associated with the disorder and enhance their perceived readiness and ability to contribute to the mission of the unit. Additionally, a better understanding of negative perceptions or biases toward injured Soldiers who are not presenting symptoms that negatively affect their mission readiness is instrumental in providing proper training and education to Army leaders in order to eliminate any stigma and to maximize unit effectiveness.

In the present survey study, we use a vignette approach to examine Soldier attitudes associated with mTBI. Vignettes are useful for studying topics that are difficult to discuss due to sensitivity or the social desire to be politically correct (Barter and Renold, 1999). Vignettes have also been frequently used within the study of perceptions of mental and physical illness to isolate those factors associated with the most negative social response or highest degree of discrimination exhibited by a subject's peers (Link et al., 2004; Weiner et al., 1988). One recent study used vignettes to examine the stigma associated with receiving different mental health treatments among Soldiers in a deployed environment (Reger et al., 2013). Participants in this study were instructed to imagine they were having problems that were interfering with their work and relationships, and that they would receive prolonged exposure therapy, virtual reality exposure therapy, or medication to treat the problem. These authors found that Soldiers reported less stigma associated with receiving prolonged exposure and virtual reality exposure therapy than with medication therapy.

The vignettes used in the present research depict a fictional Soldier who has returned from a deployment having been exposed to an improvised explosive device (IED). The Soldier has either developed an mTBI with one of four presenting symptom categories (vestibular, cognitive, physiological, behavioral), or has not developed an mTBI. Our major hypothesis was that the Soldier would be evaluated more negatively in the vignettes in which he developed an mTBI following exposure to the IED than the vignette in which he did not develop an mTBI. The different symptom categories in the four mTBI scenarios were included for exploratory purposes to examine whether certain symptom clusters were especially likely to result in negative evaluations of a Soldier with mTBI. The vestibular (e.g., balance and dizziness problems) and physiological (e.g., headaches and blurred vision) symptom categories were more medical in nature, whereas the cognitive (e.g., memory and attention problems) and behavioral (e.g., withdrawal, anger) symptom categories were more psychological in nature.

Methods

Participants and procedure

Participants ($N = 391$) were U.S. Army Soldiers who were recruited from a military base ($n = 342$) or completed the study online ($n = 49$). Regarding the rank of the participants, 24 percent were junior-enlisted (Private to Specialist), 30 percent were non-commissioned officers (NCOs, Sergeant to Master Sergeant), 20 percent were officers (1st Lieutenant to Colonel), and 27 percent were Warrant Officers. A wide variety of Military Occupational Specialties (MOS) were represented in the sample, including Soldiers from combat arms (e.g., infantry, air defense), combat support (e.g., aviation, military police), and combat service support (e.g., medical, quartermaster). In terms of prior deployments, 68 percent of the sample reported previous deployment, 11 percent reported sustaining a combat-related injury, and 81 percent reported knowing someone personally who had sustained a combat-related injury. To reinforce the anonymous conditions of responding to the survey, gender and ethnicity of the participants were not assessed.

Participants who responded to the survey online received an invitation to complete the survey in an e-mail sent to their Army Knowledge Online account. Participants were given a password to access the survey. They then received an informed consent detailing their rights as participants, and checked that they wished to continue with the study. Participants were then directed to one of the scenarios and corresponding questions described in the measures section of this report. A set of instructions confirmed the hypothetical nature of the scenarios and provided guidance to Soldiers on how to complete the survey. Participants who responded to the study in person signed an informed consent document, were given the information sheet, and then completed one of the scenarios and corresponding questions described in the next section.

Measures

Scenarios

The scenarios used in the present study were developed using a focus group comprised of both Junior-Enlisted Soldiers and Officers. Five versions of the scenario were created. All versions of the scenario began with the following information:

SPC Joe Smith has recently returned from a tour of duty in Afghanistan and is transferring into your unit, has the same MOS as you and will be working with you. Other Junior Enlisted Soldiers who know him, say he is squared away and has only been reprimanded for minor mistakes. During SPC Smith's deployment, he was a passenger in a HMMWV that was struck by an IED.

The five different versions of the scenario are described below:

Scenario 1 was a “no injury” condition that contained the following sentence: *SPC Smith did not sustain any injuries from this event (neither physical nor psychological).*

Scenario 2 was an “mTBI with vestibular difficulties” condition that contained the following sentence: *SPC Smith did sustain a head injury (mild traumatic brain injury) from this event and continues to struggle with balance and dizziness.*

Scenario 3 was an “mTBI with cognitive deficits” condition that contained the following sentence: *SPC Smith did sustain a head injury (mild traumatic brain injury) from this event and continues to struggle with his memory and ability to pay attention.*

Scenario 4 was an “mTBI with physiological problems” condition that contained the following sentence: *SPC Smith did sustain a head injury (mild traumatic brain injury) from this event and continues to suffer from frequent headaches and occasional blurred vision.*

Scenario 5 was an “mTBI with behavioral issues” condition that contained the following sentence: *SPC Smith did sustain a head injury (mild traumatic brain injury) from this event and has become irritable and withdrawn from his peers.*

Evaluation items

Following each scenario, participants completed the following three items on a 5-point response scale ranging from “very unlikely” to “very likely”:

1. “How likely is SPC Joe Smith to successfully reintegrate into your Unit?”
2. “How likely is it that SPC Joe Smith will require special consideration or treatment to ensure successful reintegration from his peers?”
3. “How likely is it that this Soldier will be an asset to the mission?”

An examination of the correlations among these items revealed that the first and third items were correlated with each other at $r = .50, p < .01$, but the second item was not significantly correlated with either the first item ($r = -.08, ns$) or the third item ($r = -.03, ns$). Therefore, we combined the first and third items into an index of *perceived readiness*, and analyzed the second item separately to assess *special accommodations*.

Data analyses

In examining how participants evaluated the central character of the scenario, we considered both the scenario type and rank of the participants responding to the scenario. Therefore, each dependent variable was submitted to a 5 (scenario type) X 4 (rank classification) between-subjects factorial. Tukey tests were used to determine differences between pairs of means in the presence of a significant main effect of either variable.

Results

Perceived readiness

No demographic variables (prior history of a deployment, experiencing a prior injury, and MOS) were predictors of reactions to the scenario in the analyses. The results for perceived readiness revealed a main effect of scenario type, $F(4, 350) = 5.80, p < .01, \eta^2 = .06$. There was no main effect of rank, $F(3, 350) = 1.75, p = .16$, nor a significant interaction between scenario type and rank, $F(12, 350) = .62, p = .83$. The effect of scenario type on perceived readiness is depicted in figure 1, and indicates that SPC Smith was evaluated higher in readiness when he did not experience an mTBI than when he experienced mTBI and any of the four symptom clusters. Follow-up Tukey tests revealed the only significant differences between the means involved the no mTBI condition and the four mTBI conditions (p 's $< .05$), with none of the four mTBI conditions being significantly different from each other. However, it is worth noting that average ratings of SPC Smith were still above the scale midpoint for the four mTBI conditions.

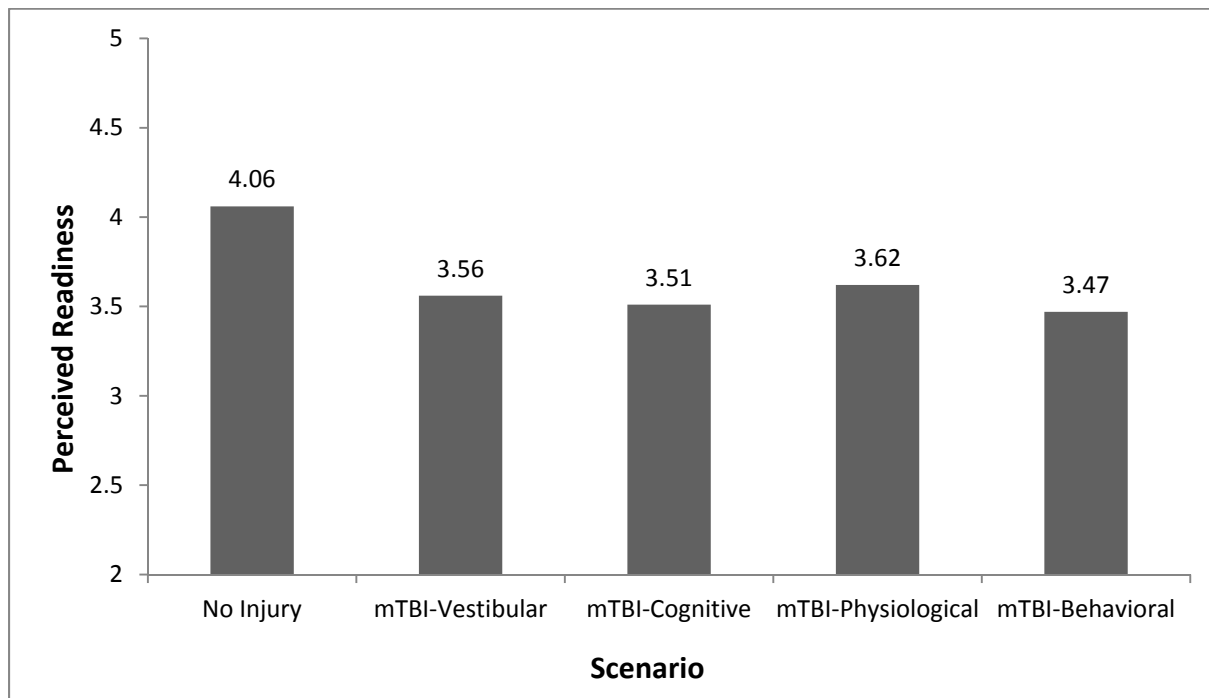


Figure 1. Positive evaluation as a function of scenario.

Special accommodations

The results for special accommodations revealed main effects of scenario type, $F(4, 350) = 9.17, p < .01, \eta^2 = .10$, and rank, $F(3, 350) = 4.45, p < .01, \eta^2 = .04$. The interaction between scenario type and rank fell short of significance, $F(12, 350) = 1.68, p = .07$. The effect of scenario type on special accommodations is depicted in figure 2 and indicates that SPC Smith was evaluated as requiring fewer accommodations when he did not experience an mTBI than when he experienced mTBI and any of the four symptom clusters. Follow-up Tukey tests again

revealed the only significant differences between the means involved the no mTBI condition and the four mTBI conditions (p 's < .05), with none of the four mTBI conditions being significantly different from each other. Mean values suggested that the participants generally believed a Soldier who had experienced an mTBI would likely necessitate special accommodations upon reintegration, regardless of the types of symptoms he or she was presenting.

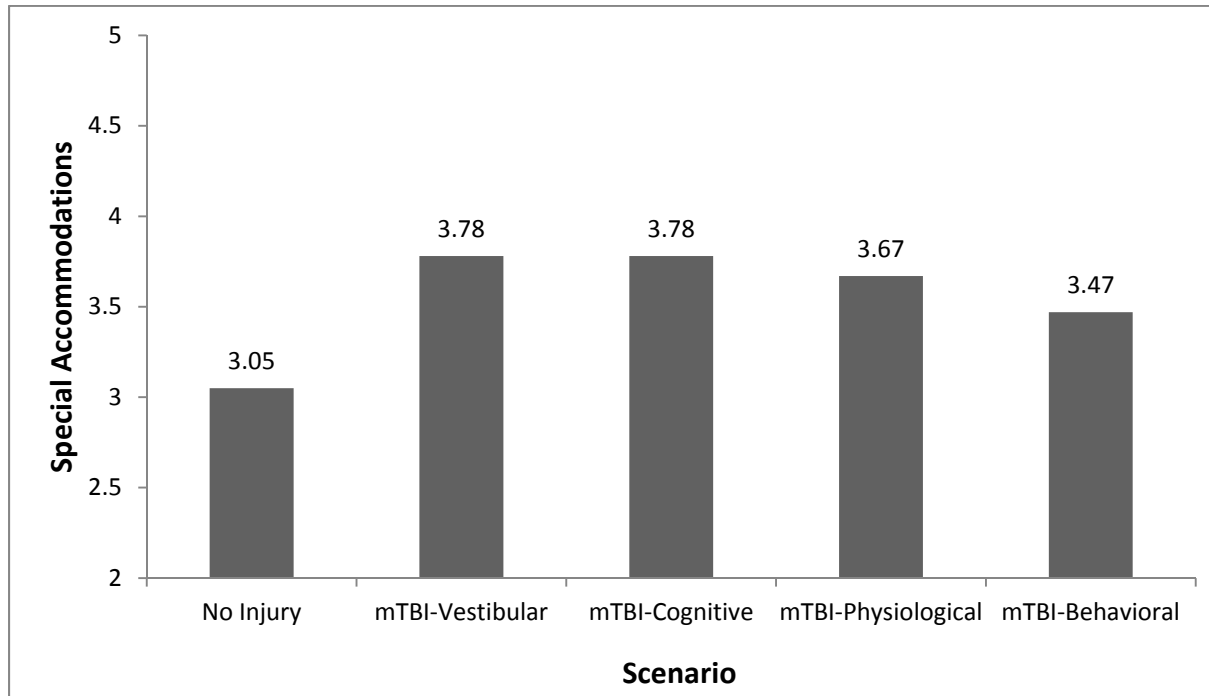


Figure 2. Special accommodations as a function of scenario.

The main effect of rank is depicted in figure 3. The figure indicates a trend for higher ranking officers to evaluate SPC Smith as requiring a higher degree of special consideration when coming into the unit. However, follow-up Tukey tests revealed that although Officers judged SPC Smith as requiring higher accommodation than either Junior-Enlisted or NCOs (p 's < .05), Warrant Officers were not significantly different from the other rank categories. The fact that this main effect was not qualified by an interaction with scenario type may indicate a general tendency for Officers to view Soldiers who experience a traumatic event during a deployment as requiring special consideration upon their return.

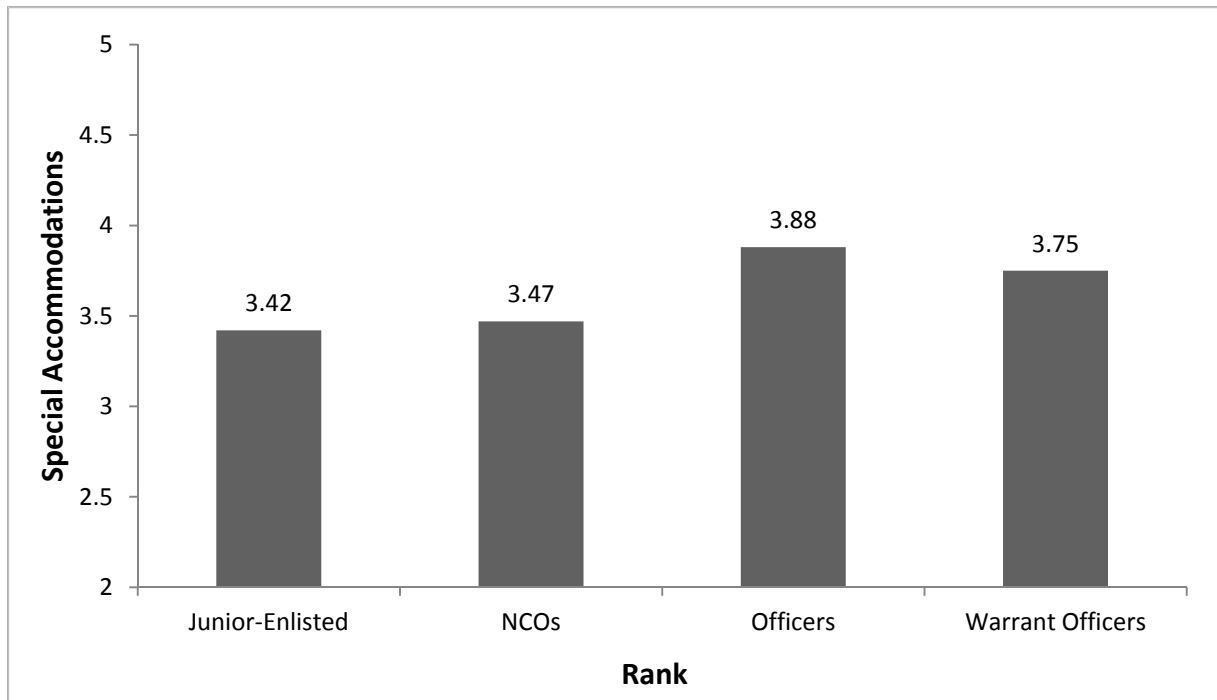


Figure 3. Special accommodations as a function of rank.

Discussion

The results of the present study shed light on military peer and leadership perceptions of Soldiers who incur mTBI during a combat operation. The results showed that the Soldier in the scenario was evaluated as lower on readiness and as requiring greater special accommodations when he incurred mTBI following exposure to an IED. This less favorable evaluation did not depend on the specific symptoms that accompanied the mTBI. A Soldier with mTBI was judged as being less likely to be an asset to the unit and less likely to successfully reintegrate with the unit than a Soldier who did not incur mTBI. The Soldier with mTBI was also seen as requiring special accommodations following the deployment. The results also showed a trend for Soldiers higher in rank to perceive that greater accommodations would need to be made for a Soldier exposed to an IED on a deployment, irrespective of the whether the Soldier incurred an mTBI as a result of the incident.

These results extend prior research on Soldier attitudes toward mental health problems in the military (Britt, 2000; Greene-Shortridge, et al., 2007; Hoge, et al. 2004) by examining attitudes specific to mTBI. The present findings illustrate that military personnel evaluate Soldiers with mTBI as being lower in readiness than Soldiers exposed to the same events during a deployment, but who fail to present any symptoms. Importantly, the present study did not address whether these negative perceptions extended beyond the performance-related evaluations of successful reintegration, being an asset to the mission, and requiring special accommodations. The

differential evaluation of the readiness of a Soldier based upon whether he or she actually experiences potentially debilitating symptoms associated with mTBI may be justified.

It is interesting to consider the present results in view of prior research on attitudes toward individuals with TBI in the civilian population. McLellan, Bishop, and McKinlay (2010) found that individuals who sustained a brain injury following a car accident were evaluated more negatively than individuals who sustained a limb injury on a number of different attributes: sociable, friendly, mature, intelligent, flexible, polite, and employable. Those who sustained a head injury were not judged more negatively on the following attributes: likeable, trustworthy, or honest. The scenarios used in their study were very brief. For example, the scenario used to assess attitudes toward individuals with TBI was “Tony is 25 years old. When he was 10 years old he was injured in a car accident and experienced a head (brain) injury.” The authors argued participants had a negative bias towards TBI in comparison to a limb injury, given the more negative evaluation on a variety of attributes. The largest differences were on the attributes “mature” and “intelligent.” Clearly, individuals are basing their judgments on what they think are the consequences of a head injury, as they were given minimal information about the extent of the injury.

In the present study, military personnel were given more information regarding the context in which the main character in the scenario developed an mTBI, as well as the specific nature of the symptoms accompanying the mTBI. In addition, items were selected to address how well the Soldier would be able to reintegrate with the unit and contribute to the unit’s mission. Although the present results supported the hypothesis that a Soldier who incurs an mTBI during a traumatic event will be evaluated more negatively than a Soldier who did not, we are hesitant to conclude that the differential evaluation reflects an inherent bias towards Soldiers with mTBI. Clearly, military personnel believe that a Soldier experiencing mTBI with any of the four different symptom categories is going to be less of an asset to the mission and require more consideration in comparison to a Soldier who does not have mTBI or the accompanying symptoms. However, this differential perception likely has a basis in reality, as the symptoms that accompany mTBI do have the potential to affect the operational readiness of Soldiers.

Therefore, the results of the present study highlight the importance of Soldiers getting treatment for mTBI so that the symptoms accompanying the disorder can be reduced. One way of getting more Soldiers to seek treatment for mTBI would be to emphasize that without treatment, symptoms may persist that will result in a more negative evaluation by one’s fellow unit members. Further, Soldiers with mTBI who receive treatment will likely experience a reduction in symptoms, resulting in a reduced likelihood that their peers will negatively evaluate their operational readiness.

Future research

Future research on Soldier attitudes associated with mTBI, as well as mental health problems such as PTSD and depression, needs to evaluate the effects of Soldiers receiving treatment for different problems on fellow Soldiers’ evaluation of the injured Soldier’s operational readiness and ability to contribute to the mission of the unit. Military personnel who are informed of effective treatments for mental health conditions and mTBI may evaluate other military

personnel who are seeking treatment for these problems less negatively. If so, communicating this information to service members will likely result in more military personnel seeking treatment to reduce the symptoms of combat-related difficulties interfering with their performance and quality of life.

Limitations

It is important to consider the implications of the present results in conjunction with the limitations of the study. The primary limitation is that military personnel were responding to a hypothetical scenario in the context of a written vignette, which may differ from how personnel would respond to an actual Soldier reintegrating to their unit following a military operation. Although the use of vignettes provides the ability to manipulate factors that may influence perceptions of Soldiers with different types of problems, vignettes do lack the realism of actual interaction with these Soldiers. Future research should examine how military personnel respond to actual Soldiers who are showing symptoms of mTBI and examine this response as a function of whether Soldiers are receiving treatment for these symptoms. The second limitation of the present study was a relatively small number of items assessing the participant's evaluation of the Soldier in the scenario. We focused our assessment on perceptions of the Soldier in terms of his operational readiness and being an asset to the unit's mission, rather than on a more general evaluation of the Soldier in the scenario. Greater evidence of any possible stigma associated with mTBI could be obtained by assessing the overall evaluation of Soldiers with the illness, as well as an evaluation of the Soldier on attributes unrelated to mission success. Finally, a third limitation includes the subjective nature of some of the terms used in the scenario (e.g., "suffers," "struggles"). Additional scenario studies should avoid terms that require participants to place themselves in the position of the main character of the scenario.

Conclusions

In summary, the results of the present study indicate Soldiers with symptoms of mTBI were evaluated more negatively in terms of operational readiness and contribution to the mission of the unit, as compared to Soldiers exposed to the same deployment experience but who did not develop symptoms as a result of mTBI. The findings of the present study can be used to illustrate the importance of Soldiers receiving treatment for mTBI so as to reduce the incidence of symptoms that affect their perceived readiness and efficacy.

References

- Ali, A., Strydom, A., Hassiotis, A., Williams, R., and King, M. 2008. A measure of perceived stigma in people with intellectual disability. The British Journal of Psychiatry. 193: 410-415.
- Barter, C., and Renold, E. 1999. The use of vignettes in qualitative research. Social Research Update. 25. <http://sru.soc.surrey.ac.uk>.
- Britt, T. W. 2000. The stigma of psychological problems in a work environment: Evidence from the screening of service members returning from Bosnia. Journal of Applied Social Psychology. 30(8): 1599-1618.
- Greene-Shortridge, T. M., Britt, T. W., and Castro, T. A. 2007. The stigma of psychological problems in the military. Military Medicine. 172: 157-161.
- Hanna-Pladdy, B., Berry, Z. M., Bennett, T., Phillips, H. L., and Gouvier, W. D. 2001. Stress as a diagnostic challenge for postconcussive symptoms: Sequelae of mild traumatic brain injury or physiological stress response. The Clinical Neuropsychologist. 15: 289-304.
- Hoge, C. W., Castro, C. A., Messer, S. C., McGurk, D., Cotting, D. I., and Koffman, R. L. 2004. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. New England Journal of Medicine. 351: 13-22.
- Hoge, C. W., McGurk, D., Thomas, J. L., Cox, A. L., Engel, C. C., and Castro, C. A. 2008. Mild traumatic brain injury in U.S. soldiers returning from Iraq. New England Journal of Medicine. 358: 453-463.
- Kim, P. Y., Thomas, J. L., Wilk, J. E., Castro, C. A., and Hoge, C. W. 2010. Stigma, barriers to care, and use of mental health services among active duty and National Guard soldiers after combat. Psychiatric Services. 61: 572-588.
- Link, B. G., Yang, L. H., Phelan, J. C., and Collins, P. Y. 2004. Measuring mental illness stigma. Schizophrenia Bulletin. 30: 511-541.
- MacGregor, A. J., Shaffer, R. A., Dougherty, A. L., Galarneau, M. R., Raman, R., et al. 2010. Prevalence and psychological correlates of traumatic brain injury in Operation Iraqi Freedom. Journal of Head Trauma Rehabilitation. 25: 1-8.
- Management of Concussion/mTBI Working Group. 2009. VA/DoD Clinical Practice Guideline for Management of Concussion/Mild Traumatic Brain Injury (Summary). http://www.healthquality.va.gov/management_of_concussion_mtbi.asp.
- McClure, J. 2011. The role of causal attributions in public misconceptions about brain injury. Rehabilitation Psychology. 56: 85-93.

- McKenna, T. 2010. Brain Doc: Helping foster warriors psychological resilience, recovery and reintegration. Military Medical CBRN Technology. <http://www.military-medical-technology.com/mmt-archives/221-mmt-2010-volume-14-issue-1-february/2394-qaa-brigadier-general-loree-k-sutton.html>.
- McLellan, T., Bishop, A., and McKinlay, A. 2010. Community attitudes toward individuals with traumatic brain injury. Journal of the International Neuropsychological Society. 16: 705-710.
- Mittal, D., Drummond, K. L., Blevins, D., Curran, G. C., Corrigan, P., and Sullivan, G. 2013. Stigma associated with PTSD: Perceptions of treatment seeking combat veterans. Psychiatric Rehabilitation Journal. 2: 86-92.
- Park, J. H., Faulkner, J., and Schaller, M. 2003. Evolved disease-avoidance processes and contemporary anti-social behavior: Prejudicial attitudes and avoidance of people with physical disabilities. Journal of Nonverbal Behavior. 27: 65-87.
- Quigley, S. L. 2009. Fort Campbell center represents benchmark in treatment. <http://www.defense.gov/news/newsarticle.aspx?id=53185>.
- Reger, G. M., Durham, T. L., Tarantino, K. A., Luxton, D. D., Holloway, K. M., and Lee, J. A. 2013. Deployed soldiers' reactions to exposure and medical treatments for PTSD. Psychological Trauma: Theory, Research, Practice, and Policy. 5: 309-316.
- Tanielian, T., and Jaycox, L. H. 2008. Invisible wounds of war: Psychological and cognitive injuries, their consequences, and services to assist recovery. Santa Monica, CA: RAND Corporation.
- Terrio, H., Brenner, L. A., Ivins, B. J., Cho, J. M., Helmick, K. et al. 2009. Traumatic brain injury screening: Preliminary findings in a U.S. Army Brigade combat team. Journal of Head Trauma Rehabilitation. 24: 14-23.
- Thomas, J. L., Wilk, J. E., Riviere, L. A., McGurk, D., Castro, C. A., and Hoge, C. W. 2010. Prevalence of mental health problems and functional impairment among active component and National Guard soldiers 3 and 12 months following combat in Iraq. Archives of General Psychiatry. 67: 614-623.
- Weiner, B., Perry, R. P., and Magnusson, J. 1988. An attributional analysis of reactions to stigmas. Journal of Personality and Social Psychology. 55(5): 738-748.



Department of the Army
U.S. Army Aeromedical Research Laboratory
Fort Rucker, Alabama, 36362-0577
www.usaarl.army.mil



U.S. Army Medical Research and Materiel Command