Insomnia Brings Soldiers into Mental Health Treatment, Predicts Treatment Engagement, and Outperforms Other Suicide-Related
Symptoms as a Predictor of Major Depressive Episodes

Melanie A. Hom, M.S.^a, Ingrid C. Lim, Psy.D.^b, Ian H. Stanley, M.S.^a, Bruno Chiurliza, B.S.^a, Matthew C. Podlogar, M.S.^a, Matthew
S. Michaels, M.S.^a,
Jennifer M. Buchman-Schmitt, M.S.^a, Caroline Silva, M.S.^a, Jessica D. Ribeiro, Ph.D.^c,
Thomas E. Joiner, Jr., Ph.D.^a

^a Department of Psychology, Florida State University, 1107 West Call Street, Tallahassee FL 32306, United States

^b Office of the Army Surgeon General, 7700 Arlington Boulevard, Falls Church, VA 22041, United States

^c Department of Psychological Sciences, Vanderbilt University, 111 21st Avenue South, Nashville, TN 37240, United States

Correspondence concerning this article should be addressed to Melanie A. Hom, Department of Psychology, Florida State University, 1107 West Call Street, Tallahassee, FL 32306-4301. Email: hom@psy.fsu.edu; Phone: 415-412-6620.

Abstract

Given the high rates of suicide among military personnel and the need to characterize suicide risk factors associated with mental health service use, this study aimed to identify suicide-relevant factors that predict: (1) treatment engagement and treatment adherence, and (2) suicide attempts, suicidal ideation, and major depressive episodes in a military sample. Army recruiters (N=2,596) completed a battery of self-report measures upon study enrollment. Eighteen months later, information regarding suicide attempts, suicidal ideation, major depressive episodes, and mental health visits were obtained from participants' military medical records. Suicide attempts and suicidal ideation were very rare in this sample; negative binomial regression analyses with robust estimation were used to assess correlates and predictors of mental health treatment visits and major depressive episodes. More severe insomnia and agitation were significantly associated with mental health visits at baseline and over the 18-month study period. In contrast, suicide-specific hopelessness was significantly associated with fewer mental health visits. Insomnia severity was the only significant predictor of major depressive episodes. Findings suggest that assessment of sleep problems might be useful in identifying at-risk military service members who may engage in mental health treatment. Additional research is warranted to examine the predictive validity of these suicide-related symptom measures in a more representative, higher suicide risk military sample.

Keywords: *suicide; depression; sleep; agitation; treatment engagement*

Introduction

Suicide has become a growing problem in the U.S. military, with research indicating that service members die by suicide at higher rates than civilians (Kuehn 2009). These elevated rates may be due, in part, to risk factors unique to military personnel, such as military-specific stress (e.g., exposure to killing, physical wounds), greater access to lethal means (e.g., firearms), and demographic composition (e.g., predominantly young males; Nock et al., 2013; Schoenbaum et al., 2014). Consequently, the development of military suicide prevention strategies has become a public health priority, motivating a marked increase in research in this area (U.S. Department of Health and Human Services [HHS], 2012). In particular, connecting at-risk service members to care has been identified as critical to suicide prevention efforts (Kuehn 2009; Brenner and Barnes 2012).

Although interventions to reduce suicide risk have yielded promising results among military populations (Britton et al. 2012; Knox et al. 2012; Rudd et al. 2015; Trockel et al. 2015), many service members remain reluctant to engage with services, often due to stigma, negative beliefs about treatment, and concerns about career impact (Vogt 2011; Blais et al. 2014; Britt et al. 2015). Thus, efforts must be made to understand patterns and predictors of mental health service use among military personnel, especially those at elevated suicide risk.

As an initial step towards enhancing treatment engagement among at-risk service members, it may be helpful to identify suicide risk factors associated with greater help-seeking behaviors. To maximize utility, symptoms used to screen for suicide risk should signal short-term, acute risk rather than long-term risk. Longer-term risk factors may be informative by revealing mechanisms by which risk is conferred, identifying at-risk sociodemographic or psychiatric groups (see Nock et al. 2008 for review), and

informing public health prevention approaches (e.g., reducing access to means for suicide; Mann et al. 2005). However, in clinical settings, acute warning signs are arguably more useful in informing risk level categorization and treatment provision. Detection of acute warning signs may also be useful in gatekeeper training approaches to suicide prevention (e.g., equipping unit leaders to identify at-risk unit members).

In considering the vast body of suicide risk factors, there are at least five short-term risk symptoms assessable via brief, self-report survey: (1) agitation; (2) insomnia; (3) suicide-specific hopelessness; (4) talk about suicide/reported suicidal ideation; and (5) interpersonal theory of suicide constructs (i.e., perceived burdensomeness, thwarted belongingness, and capability for suicide). Each of these factors is supported by a body of literature justifying its selection as a focus of suicide risk screening (Chu et al. 2015). Agitation has been shown to be a precursor to suicidal behaviors (Fawcett et al. 1990), correlated with near-lethal attempts (Hall and Platt 1999), and related to higher suicidality among individuals with a higher capability for suicide (Ribeiro et al. 2015). Insomnia is also a robust predictor of future suicide risk, including among military samples (Fawcett et al. 1990; Bernert et al. 2005, 2014; Ribeiro et al. 2012), even when controlling for depression and hopelessness (Ribeiro et al. 2012). Relatedly, hopelessness appears to play an integral role both in the emergence and maintenance of suicidal thoughts (Beck 1986; Rudd et al. 2001). Suicidal ideation itself and disclosure of ideation have also been well-established as warning signs for suicide (Rudd et al., 2006). Finally, the interpersonal theory of suicide (Joiner, 2005; Van Orden et al., 2010) proposes that three constructs interact to confer risk for suicide: capability for suicide (i.e., heightened pain tolerance, fearlessness about death), thwarted belongingness (i.e., unmet need to belong), and perceived burdensomeness (i.e., feeling like a burden on others). Capability for suicide may especially be impacted by military service (Selby et

al. 2010), and there is evidence for the association between suicidal history and these constructs among service members (Bryan et al. 2010).

The Present Study

Research identifying suicide risk factors associated with treatment engagement is critical to examine within a military sample since mental health services are more readily available and accessible in this population relative to civilians, for whom structural barriers are potent (Bruffaerts et al. 2011). Utilizing a large, diverse sample of U.S. Army Recruiters, this study aimed to identify suicide-related factors: (1) associated with treatment engagement and adherence; and (2) predicting future suicide risk in a military sample (i.e., attempts, ideation, major depressive episodes). Due to a dearth of research examining the relationship between these variables and treatment engagement indices, a priori hypotheses were not posited.

This study examined predictors of any type of mental health care visits as well as visits excluding standard mental health screenings (i.e., Pre-Post-Deployment Health Assessments to detect deployment-related health concerns) to identify factors predicting voluntary visits. With regard to utilizing depression as an outcome measure, although most individuals with depression will not die by suicide (Bostwick and Pankratz 2000), depression treatment is a key avenue for suicide prevention since it is one of the most common psychiatric disorders among suicide decedents (Cavanagh et al. 2003) and is highly treatable (Mann et al. 2005). As a result, although major depressive episodes (MDEs) are not the suicide risk factor with the greatest specificity, taking into account the potentially low rates of suicide ideation and attempts in this sample—both of which are rare in the general population—MDEs were included at the

study's outset as an additional outcome measure, with consideration that depression is related to but not the sole contributor to suicide risk.

Material and Method

Participants

A total of 3,391 Army recruiters and recruiter candidates enrolled in the study and completed baseline self-report measures. Only those with available medical record data (N=2,596) were included in analyses. There were no statistically significant demographic differences between those with missing medical record data and those included in the study. Included participants were primarily male (92.2%) and ranged from 20 to 57 years of age (M= 29.8, SD=4.8; see Table 1). Regarding race/ethnicity, 66.4% identified as White/Caucasian, 14.8% as Black/African American, 13.4% as Hispanic/Latino, 2.8% as Asian, 1.4% as Native Hawaiian/Other Pacific Islander, and 1.2% as American Indian/Alaskan Native.

Measures

Due to study setting constraints, factor analyses of previous datasets were used to select a subset of items from each self-report measure to comprise a brief assessment battery.

Acquired Capability for Suicide Scale (ACSS; Van Orden et al. 2008; Ribeiro et al. 2014). An abbreviated 4-item version of the ACSS assessed perceived fearlessness about death and physical pain tolerance. Respondents rated four items (e.g., "I am not afraid to die") on a 5-point Likert scale. Total scores on the abbreviated ACSS range from 0 to 16, with higher scores indicating greater perceived pain tolerance and fearlessness about death. Previous research supports the ACSS as an internally consistent

measure with good convergent, discriminant, and construct validity (Ribeiro et al., 2014). This study's abbreviated ACSS demonstrated adequate internal consistency ($\alpha=.76$).

Brief Agitation Measure (BAM; Ribeiro et al. 2011). The BAM is a 3-item self-report questionnaire that asks participants to rate items (e.g., “I want to crawl out of my skin”) on a 7-point Likert scale. BAM total scores range from 3 to 21, with higher scores indicating increased agitation. Previous research has shown that the BAM has good internal consistency and convergent validity (Ribeiro et al. 2011), and it also demonstrated good internal consistency within this study ($\alpha=.85$).

Depressive Symptom Inventory—Suicidality Subscale (DSI-SS; Metalsky and Joiner 1997). The DSI-SS is a self-report measure consisting of 4 items assessing suicidal thoughts, perceived control over these thoughts, suicide attempt plans, and suicidal urges. Participants rate each item on a 4-point Likert scale. Total scores range from 0 to 12, and higher scores are associated with increasing severity of suicidal symptoms. Research supports the DSI-SS' construct validity and internal consistency (Joiner et al. 2002). Within this study, the DSI-SS demonstrated modest internal consistency ($\alpha=.70$).

Interpersonal Needs Questionnaire (INQ¹; Van Orden et al. 2012). An adapted version of the INQ was used to measure thwarted belongingness (INQ-TB; 4 items) and perceived burdensomeness (INQ-PB; 4 items), with responses occurring on a 7-point response scale. Previous research has found good internal consistency for the belongingness ($\alpha=.85$) and burdensomeness items

¹The adapted version of the INQ used within this study utilized items from the INQ-25 and INQ-15. It also included an item designed specifically to address perceived burdensomeness within a military population (“These days I think I am an asset to the people in my life”), which strongly loaded onto the perceived burdensomeness construct.

($\alpha=.89$) in the 15-item version of the INQ (Van Orden et al., 2012), which was also demonstrated in this sample ($\alpha=.90$ and $.87$, respectively).

Insomnia Severity Index (ISI; Bastien et al. 2001). A 5-item version of the 7-item ISI assessed insomnia symptom severity. Individuals rated various sleep complaints (e.g., difficulty falling asleep) on a 0 to 4 scale. Total scores on the abbreviated ISI range from 0 to 20, with higher total scores indicating greater insomnia severity. Previous research supports the validity and internal consistency of the ISI (Bastien et al. 2001; Morin et al. 2011). This study's abbreviated ISI demonstrated good internal consistency ($\alpha=.87$).

Suicide Cognitions Scale (SCS; Rudd et al. 2008). An abbreviated 10-item version of the 25-item SCS assessed suicide-specific hopelessness along three subscales: unlovability, unbearability, and unsolvability (Ellis and Rufino 2015). Individuals rate the extent to which they agree or disagree with each item using a 1 to 5 scale, with higher scores indicating greater suicide-specific hopelessness. Previous research supports the validity and reliability of the SCS as a measure of suicide-related cognitions among military personnel (Bryan et al. 2014). The independent subscales did not demonstrate adequate internal consistency ($\alpha s < .60$); thus, only the SCS total score was utilized in analyses ($\alpha=.87$).

Procedures

Participants were recruited from Army Recruiter courses at the U.S. Recruiting and Retention School at Fort Jackson, South Carolina. Individuals electing to participate in the study completed self-report measures as a subset of a larger battery of non-research assessments in an orientation survey. Then, demographics data and information regarding number of mental health visits, MDEs, and

episodes of suicide ideation and attempts both (1) prior to study enrollment and (2) during the 18-months study period were obtained from participants' military medical records. MDEs were defined using DSM-IV-TR diagnostic criteria and were assessed by military psychiatrists, along with episodes of suicide ideation and attempts. No compensation was provided for study participation. All participants provided informed consent after the nature of the procedures had been fully explained. The Institutional Review Boards (IRB) of Fort Jackson and the university leading the investigation approved all procedures. The investigation was carried out in accordance with the latest version of the Declaration of Helsinki.

Data Analytic Plan

Due to the low rate of suicide ideation and attempts ($< .001\%$) during the study, of our three suicide risk outcome measures, only MDE recurrences were evaluated. Due to the inclusion of over-dispersed count variables, negative binomial regression analyses with a robust estimation was used to assess the extent to which self-report measures were associated with the number of any type of mental health visits, mental health visits excluding standard screenings, and MDEs occurring (1) prior to study enrollment and (2) over 18-months, controlling for baseline mental health visits and MDEs. Consistent with similar prospective studies (e.g., Ribeiro et al. 2012), we controlled for these baseline variables to determine the unique contributions of suicide-related symptoms after accounting for the variance in our outcomes explained by their baseline values. An incidence rate ratio (IRR)² was yielded for each predictor in each analysis. Between-predictor intercorrelations were in an acceptable range ($VIF < 5$). Missing data analyses revealed

²IRRs are interpreted as follows: for every one-unit increase in a suicide-related symptom the number of observations that occurred (e.g., number of MDEs or number of treatment visits) increases by a factor of the IRR. For example, if analyses examining the ISI's ability to predict MDEs yields an IRR of 2, this can be interpreted as follows: for every one-unit increase in the ISI, participants' number of MDEs increase by a factor of 2.

that those with missing medical record data at follow-up were more likely to have had a prior MDE ($t[1727]=4.0, p<.001$) and reported greater baseline agitation ($t[1415]=2.1, p=.033$) and capability for suicide ($t[1279]=2.7, p=.006$). Sensitivity analyses revealed that we were powered to detect a minimum IRR of 1.013 (Power $[1-\beta]>80\%$, Type 1 error $[\alpha]<0.05$). Analyses were conducted using SPSS 20.0.0.

Results

Descriptive Statistics

Table 2 presents descriptive statistics and intercorrelations for all self-report measures and outcome variables. The DSI-SS and SCS score distributions, in particular, had significant positive skews, which were expected given that suicidal ideation and cognitions are relatively rare. Since all measures assessed suicide-related symptoms, it is unsurprising that many were significantly associated with each other. Of note, the mean score for the DSI-SS was particularly low ($M=.03, SD=.28$). This may represent an accurate picture of this sample since military recruiters are considered relatively high-functioning and required to receive treatment for psychiatric problems before beginning recruiting duties; thus, they may have lower suicidal ideation than other personnel. These low scores may also be related to a reluctance to disclose suicidal thoughts (Anestis and Green 2015), but this was not directly probed.

Mental Health Visits of Any Type

Baseline. Negative binomial regression analyses revealed that scores on BAM agitation (IRR=1.033; 95% CI: 1.007-.060; $p=.013$), ISI insomnia (IRR=1.028; 95% CI: 1.011-1.045; $p=.001$), and SCS hopelessness (IRR=.967; 95% CI: .940-.995; $p=.020$) were significantly associated with the number of visits at study enrollment, controlling for number of past MDEs (see Table 3).

Follow-Up. Scores on BAM agitation (IRR=1.091; 95% CI: 1.004-1.185; $p=.040$), ISI insomnia (IRR=1.080; 95% CI: 1.030-1.132; $p=.001$), and SCS hopelessness (IRR=.913; 95% CI: .839-.993; $p=.033$) were the only significant predictors of the number of any type of mental health visits at follow-up, controlling for mental health visits at baseline and MDEs at baseline and follow-up (see Table 3).

Mental Health Visits Excluding Standard Assessment Visits

Baseline. Controlling for past MDEs, BAM agitation (IRR=1.052; 95% CI: 1.010-1.095; $p=.014$), INQ-PB perceived burdensomeness (IRR=.930; 95% CI: .874-.990; $p=.023$), and ISI insomnia (IRR=1.028; 95% CI: 1.004-1.053; $p=.021$) were significantly associated with the number of treatment visits at study entry, excluding standard physical/mental health assessments (see Table 4).

Follow-Up. Scores on BAM agitation (IRR=1.090; 95% CI: 1.005-1.183; $p=.038$), ISI insomnia (IRR=1.085; 95% CI: 1.032-1.140; $p=.001$), and SCS hopelessness (IRR=.915; 95% CI: .839-.998; $p=.045$) significantly predicted the number of visits that were not standard assessments at follow-up, controlling for non-standard mental health visits at baseline and MDEs at baseline and follow-up (see Table 4).

Major Depressive Episodes

Baseline. Only scores on ISI insomnia (IRR=1.043; 95% CI: 1.010-1.078; $p=.010$) and INQ-TB thwarted belongingness (IRR=1.034; 95% CI: 1.010-1.059; $p=.005$) were significantly associated with number of MDEs at study enrollment, controlling for

baseline mental health visits (Table 5). In other words, for every one-unit increase in participants' baseline ISI scores, the number of prior MDEs increased by a factor of 1.034.

Follow-Up. ISI insomnia was the only significant predictor of MDEs during the study period (IRR=1.104; 95% CI: 1.024-1.190; $p=.010$), controlling for baseline MDEs and mental health visits. That is, for every one-unit increase in participants' baseline ISI scores, the number of MDEs experienced during the study increased by a factor of 1.104. Of note, prior MDEs also significantly predicted number of MDEs over the study period (IRR=1.429; 95% CI: 1.023-1.997; $p=.037$). Otherwise stated, for every prior MDE, the number of MDEs experienced by a participant during the study increased by a factor of 1.429.

Discussion

This study identified suicide-related symptoms that bring soldiers to mental health treatment and predict treatment engagement and MDEs. Greater agitation, more severe insomnia, and lower suicide-specific hopelessness predicted the number of mental health visits at baseline and over the course of the study, above and beyond other symptoms. These three symptoms were also the only significant predictors of number of voluntary mental health visits attended across 18 months, even controlling for past visits. Finally, only insomnia was significantly associated with prior and future MDEs. These findings have implications for research and practice.

First, findings suggest that insomnia and agitation are important motivating factors both for connection and ongoing contact with mental health services, independent of MDE occurrences. One interpretation of this finding is that sleep problems and agitation are particularly distressing and consequently prompt individuals to seek services and continue attending treatment visits. However, since suicidal ideation and suicide-specific hopelessness are likely to be similarly distressing, this finding may instead signal that

service members are more willing to endorse agitation and insomnia symptoms on self-report surveys, and, relatedly, are more comfortable seeking out services for these problems. As discussed previously, stigma is a barrier to care among military service members (Vogt 2011; Blais et al. 2014; Britt et al. 2015), so it is understandable that military personnel may be less likely to seek support for suicide-related hopelessness or perceptions of being burdensome than for sleep problems.

Thus, sleep disturbances may represent a useful, non-stigmatizing entry point into mental health care, emphasizing the importance of its assessment by primary care providers, with whom at-risk individuals may be more likely to interface (Luoma et al. 2002). Additionally, since sleep disturbances are relatively observable, improving recognition of symptoms by laypersons may be useful, particularly in light of evidence suggesting that family and friend encouragement facilitates mental health help-seeking (Warner et al. 2008; Hipes 2012). At-risk service members can then be referred to insomnia treatment, and perhaps, ultimately, treatment for other psychiatric symptoms. Fortunately, behavioral treatments for insomnia—which can be cost-effectively disseminated in group format—have been shown to be efficacious in treating insomnia (Edinger and Means 2005) as well as facilitating improvements in depression and posttraumatic stress disorder (PTSD) symptoms (Manber et al. 2008, 2011; Ulmer et al. 2011). Therefore, the assessment and treatment of sleep problems may indirectly improve other mental health problems germane to military personnel.

Interestingly, individuals with greater suicide-related hopelessness—and thus, likely greater suicide risk—were *less* likely to seek care than those with lower hopelessness. This aligns with past literature suggesting that those with more severe suicidal symptoms are also less likely to engage in treatment (Carlton and Deane 2000; Deane et al. 2001). Though reasons for these findings

cannot be determined from our data, prior research suggests that poor coping skills and hopelessness regarding treatment effectiveness may in part explain this relationship (see Hom et al. 2015 for review). Regardless of underlying mechanisms, this finding is concerning and emphasizes the importance of following large-scale risk screening with connection of at-risk individuals to care. Motivational interviewing (Miller and Rollnick 2013) may be particularly helpful in enhancing motivation and self-efficacy to engage in treatment.

Considering agitation as a treatment engagement predictor, there is a dearth of literature on non-pharmacological methods that therapeutically impact an agitated state. Agitation may prompt individuals to seek care, but it is also a state that may resolve with the passage of time, perhaps making it more difficult to address in a treatment setting. Due to this, while agitation may be an indicator of willingness to engage in treatment, at the present time, sleep problems may be a more helpful focus of ongoing treatment efforts (though acute agitation is clinically worrisome and pharmacological management of it, as well as ongoing assessment of its severity and co-occurrence with other suicide risk factors, should be considered).

Relatedly, these findings highlight insomnia as a potentially useful proxy for gauging future MDE risk. This aligns with longitudinal studies that have identified insomnia as a risk factor for MDEs (Ford and Kamerow 1989; Buysse et al. 2008). Indeed, a meta-analysis of 21 studies found that insomnia conferred an approximately two-fold risk for subsequent depression (Baglioni et al. 2011). Our study extends these findings by establishing the predictive relationship between insomnia and depression in an Army recruiter sample, even after accounting for the effects for other suicide-related constructs—which has, to our knowledge, not previously been examined. While insomnia severity may have predicted MDEs because insomnia itself is a depressive symptom, our

findings and past research suggest otherwise—past studies have demonstrated a temporal relationship between insomnia and depression (see Baglioni et al. 2011 for review). Additionally, MDEs were controlled for in present analyses. Thus, our findings suggest that insomnia severity conferred risk for future MDEs in this military sample independent of other depression symptoms (e.g., agitation, suicidal ideation).

Given this, as previously noted, it may be useful to screen for clinically significant insomnia symptoms to identify service members who may benefit from treatment for sleep problems and/or depression symptoms, if present or emerging (Franzen and Buysse 2008). As demonstrated within this study, insomnia complaints can be easily assessed using a brief self-report measure and behavioral insomnia treatments are brief and extremely effective (Edinger and Means 2005). Thus, assessment and treatment of insomnia are feasibly incorporable into current military mental health treatment and other health settings.

Limitations and Future Directions

There are a number of study limitations. Because our sample was of relatively low suicide risk, these findings' direct relevance to suicide prevention is limited, and further research is warranted to test study aims in a higher suicide risk military sample. Furthermore, in terms of our findings' clinical utility, given the relatively small effect sizes for significant effects, we caution against over-interpretation of these results and emphasize the need for replication of these findings. However, these results represent positive preliminary work and signal that important associations may exist between these constructs. To address this study's methodological constraints, it will be useful to utilize a more clinically heterogeneous and high-risk sample, self-report and clinician-assessed

symptom data at multiple follow-up time points, measures of depression symptom severity, and explicit assessment of participants' rationale for treatment engagement. By employing these techniques, results will likely better reflect the true magnitude of effects. Replication of findings may also inform the establishment of clinical cutoffs that will allow for the targeted study of treatment engagement among those with elevated psychiatric symptoms. Such cutoffs would also aid in identifying the extent to which a service member with clinically significant insomnia is more likely to develop depression as compared to one without marked insomnia. Additionally, it would be useful to identify clinically meaningful effect sizes for various predictors of MDEs and service use. The notable portion of missing data may have also impacted findings.

It is also important to consider the possibility that insomnia and agitation predicted mental health visits simply because they are depression symptoms, and more severe depression symptoms may prompt service members to seek care. Both are also symptoms of other psychiatric disorders, so some participants may have sought care for non-depression complaints. Still, other constructs assessed (e.g., suicidal ideation, hopelessness) are also depression symptoms but did not significantly predict mental health visits. Additionally, even when controlling for MDEs, insomnia and agitation remained significant predictors of mental health visits. This suggests that both are meaningful signifiers of willingness to engage in care. Finally, it is possible that insomnia and agitation were only associated with past mental health visits because these symptoms were unsuccessfully treated by prior care. Despite this, that these symptoms predicted future treatment visits even when controlling for past visits suggests that these are important treatment engagement motivators.

Other study limitations include its relatively long follow-up period since short-term outcomes may be more clinically useful. As such, it is recommended that outcomes are assessed within a shorter time frame (e.g., days, weeks). However, this longer follow-up period also served as a strength by enhancing our ability to assess treatment engagement behaviors and MDE onset, which may precede suicidal behaviors. The use of self-report measures at baseline but medical record data at follow-up may have also limited our ability to assess symptom fluctuations. Yet, this design likely reduced the inflation of correlations due to common method variance. Sole reliance on military medical record data was another limitation of this study since individuals may have sought care elsewhere. To circumvent barriers to disclosure, future studies would also benefit from inclusion of multiple modes of observation and implicit ideation measures (Nock & Banaji, 2007; Nock et al., 2010). Relatedly, assessment of factors impacting treatment engagement (e.g., attitudes towards care) could be incorporated in future studies.

Conclusion

In sum, results revealed that self-reported agitation and sleep problems were both associated with greater past engagement in mental health services and predicted greater treatment engagement over the course of 18 months, independent of other suicide-related symptoms. Insomnia severity also outperformed these other symptoms as a predictor of MDEs. Consequently, assessment of insomnia and agitation may be promising in identifying military service members both in need of and willing to engage in treatment. We look forward to additional research that addresses the gaps of this study, including further investigation into symptoms that may best predict suicidal behaviors among a higher suicide risk, more representative military sample.

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Acknowledgment

This work was supported in part by a United States Army Military Operational Medicine Research Program (MOMRP) grant (W81XWH-09-1-0737); a grant from the Military Suicide Research Consortium (MSRC), an effort supported by the Office of the Assistant Secretary of Defense for Health Affairs under Award No. (W81XWH-10-2-0181); and a training grant (T32MH18921) from the National Institute of Mental Health. Opinions, interpretations, conclusions and recommendations are those of the author and are not necessarily endorsed by the Department of Defense, Department of Veterans Affairs, MSRC, or National Institute of Mental Health. We also gratefully acknowledge the critical feedback provided by the anonymous reviewers.

Table 1

Participant Demographics and Characteristics (N=2,596)

Characteristic	Valid %
Gender	
Male	92.2%
Female	7.8%
Age (M=29.8, SD=4.8)	
18-24	12.6%
25-34	72.2%
35-44	14.5%
45-54	0.7%
55-64	< 0.1%
Race/Ethnicity	
American Indian or Alaska Native	1.2%
Asian	2.8%
Black or African American	14.8%
Hispanic or Latino	13.4%
Native Hawaiian or Other Pacific Islander	1.4%
White or Caucasian	66.4%
Rank	

Sergeant	39.3%
Staff Sergeant	46.7%
Sergeant First Class	7.1%
First Sergeant/Master Sergeant	1.4%
Command Sergeant Major/Sergeant Major	< 0.1%
Second Lieutenant	<0.1%
Captain	5.4%

Table 2

Means, Standard Deviations, Normality Statistics, and Intercorrelations of Self-Report Measures, Major Depressive Episodes, and Mental Health Visits

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. ACSS	1.00												
2. BAM	.04*	1.00											
3. DSI-SS	.03	.23**	1.00										
4. INQ-PB	-.01	.42**	.33**	1.00									
5. INQ-TB	-.03	.35**	.22**	.37**	1.00								
6. ISI	.11**	.41**	.11**	.22**	.28**	1.00							
7. SCS	-.01	.42**	.53**	.56**	.34**	.21**	1.00						
8. MDE (T1)	-.01*	.11**	.06**	.07**	.10**	.11**	.05**	1.00					
9. MDE (T2)	-.01*	.06**	.04**	.06**	.06**	.08**	.06**	.12**	1.00				
10. MHV (T1)	.01	.11**	.05**	.04*	.07**	.13**	.03	.45**	.11**	1.00			
11. MHV (T2)	.03	.10**	.04*	.06**	.06**	.11**	.04*	.07**	.39**	.11**	1.00		
12. NS-MHV (T1)	-.01	.09**	.04*	.02	.02	.08**	.02	.33**	.07**	.73**	.09**	1.00	
13. NS-MHV (T2)	.03	.10**	.04*	.06**	.05	.11**	.04*	.05**	.36**	.11**	.98**	.09**	1.00
M	9.61	4.37	.03	4.45	7.22	4.45	10.36	.18	.03	5.14	2.17	2.83	2.10
SD	3.24	2.56	.28	1.77	4.50	3.70	1.72	.60	.25	8.46	10.21	7.11	10.06
Range	0-16	3-21	0-7	4-28	4-28	0-20	10-35	0-13	0-4	0-101	0-179	0-101	0-179
Skew	-.28	2.58	13.61	6.67	2.04	.89	7.50	7.33	9.49	4.38	9.05	5.80	9.23
Kurtosis	.11	7.97	239.05	60.89	4.93	.33	69.69	105.38	99.44	26.84	104.81	47.47	109.57
α	.76	.85	.70	.87	.90	.87	.87	--	--	--	--	--	--

* $p < .05$; ** $p < .01$

Note: ACSS=Acquired Capability for Suicide Scale, BAM=Brief Agitation Measure, DSI-SS=Depressive Symptom Inventory–Suicidality Subscale, INQ-PB=Interpersonal Needs Questionnaire–Perceived Burdensomeness, INQ-TB=Interpersonal Needs Questionnaire–Thwarted Belongingness, ISI=Insomnia Severity Index, SCS=Suicide Cognitions Scale, MDE=Major Depressive Episode, NS=Non-Standard, MHV=Mental Health Visits

Table 3

Negative Binomial Regression Results for Any Type of Past Mental Health Visits at Baseline and During 18-Month Study Period

Variable	<u>Baseline</u>			<u>18 Month Follow-Up</u>		
	IRR	95% CI	<i>p</i>	IRR	95% CI	<i>p</i>
ACSS	1.010	.994, 1.026	.207	1.045	.992, 1.102	.099
BAM	1.033*	1.007, 1.060	.013	1.091*	1.004, 1.185	.040
DSI-SS	1.106	.926, 1.321	.265	1.020	.683, 1.522	.923
INQ-PB	.991	.967, 1.016	.493	.996	.928, 1.069	.906
INQ-TB	.999	.986, 1.011	.824	1.004	.968, 1.043	.816
ISI	1.028**	1.011, 1.045	.001	1.080**	1.030, 1.132	.001
SCS	.967*	.940, .995	.020	.913*	.839, .993	.033
MDE (T1)	2.466**	2.210, 2.752	< .001	1.029	.758, 1.398	.853
MDE (T2)	--	--	--	4.643**	3.390, 6.360	< .001
MHV (T1)	--	--	--	1.033**	1.014, 1.053	.001

* $p < .05$; ** $p < .01$

Note: ACSS=Acquired Capability for Suicide Scale, BAM=Brief Agitation Measure, DSI-SS=Depressive Symptom Inventory–Suicidality Subscale, INQ-PB=Interpersonal Needs Questionnaire–Perceived Burdensomeness, INQ-TB=Interpersonal Needs Questionnaire–Thwarted Belongingness, ISI=Insomnia Severity Index, SCS=Suicide Cognitions Scale, MDE=Major Depressive Episode, MHV=Mental Health Visits

Table 4

Negative Binomial Regression for Any Past Mental Health Visits, Excluding Standard Assessments, at Baseline and During 18-Month Study Period

Variable	<u>Baseline</u>			<u>18 Month Follow-Up</u>		
	IRR	95% CI	<i>p</i>	IRR	95% CI	<i>p</i>
ACSS	.992	.969, 1.016	.504	1.050	.994, 1.108	.081
BAM	1.052*	1.010, 1.095	.014	1.090*	1.005, 1.183	.038
DSI-SS	.974	.794, 1.196	.803	1.055	.684, 1.629	.809
INQ-PB	.930*	.874, .990	.023	.997	.929, 1.069	.928
INQ-TB	.991	.971, 1.012	.414	1.005	.966, 1.046	.805
ISI	1.028*	1.004, 1.053	.021	1.085**	1.032, 1.140	.001
SCS	1.016	.966, 1.069	.535	.915*	.839, .998	.045
MDE (T1)	2.871**	2.456, 3.357	< .001	1.068	.810, 1.408	.641
MDE (T2)	--	--	--	4.499**	3.272, 6.186	< .001
NS MHV (T1)	--	--	--	1.030**	1.010, 1.051	.004

* $p < .05$; ** $p < .01$

Note: ACSS=Acquired Capability for Suicide Scale, BAM=Brief Agitation Measure, DSI-SS=Depressive Symptom Inventory–Suicidality Subscale, INQ-PB=Interpersonal Needs Questionnaire–Perceived Burdensomeness, INQ-TB=Interpersonal Needs Questionnaire–Thwarted Belongingness, ISI=Insomnia Severity Index, SCS=Suicide Cognitions Scale, MDE=Major Depressive Episode, NS=Non-Standard, MHV=Mental Health Visits

Table 5

Negative Binomial Regression for Major Depressive Episodes at Baseline and During 18-Month Study Period

Variable	<u>Baseline</u>			<u>18 Month Follow-Up</u>		
	IRR	95% CI	<i>p</i>	IRR	95% CI	<i>p</i>
ACSS	.986	.954, 1.019	.392	.966	.891, 1.048	.408
BAM	1.022	.975, 1.071	.363	.996	.910, 1.090	.930
DSI-SS	1.035	.803, 1.334	.790	.944	.543, 1.640	.838
INQ-PB	1.005	.957, 1.055	.840	1.007	.921, 1.101	.879
INQ-TB	1.034**	1.010, 1.059	.005	1.041	.974, 1.114	.235
ISI	1.043*	1.010, 1.078	.010	1.104*	1.024, 1.190	.010
SCS	.997	.942, 1.056	.923	1.058	.971, 1.152	.201
MDE (T1)	--	--	--	1.429*	1.023, 1.997	.037
MHV (T1)	1.075**	1.061, 1.088	< .001	1.030**	1.008, 1.052	.008

* $p < .05$; ** $p < .01$

Note: ACSS=Acquired Capability for Suicide Scale, BAM=Brief Agitation Measure, DSI-SS=Depressive Symptom Inventory–Suicidality Subscale, INQ-PB=Interpersonal Needs Questionnaire–Perceived Burdensomeness, INQ-TB=Interpersonal Needs Questionnaire–Thwarted Belongingness, ISI=Insomnia Severity Index, SCS=Suicide Cognitions Scale, MDE=Major Depressive Episode, MHV=Mental Health Visits