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SUFFOLK UNIVERSITY

PERCEIVED NEED FOR CARE AND THE TREATMENT GAP
IN MILITARY POPULATIONS

A DISSERTATION SUBMITTED TO
THE FACULTY OF THE COLLEGE OF ARTS AND SCIENCES
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
DEPARTMENT OF PSYCHOLOGY

BY
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BOSTON, MASSACHUSETTS

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ABSTRACT

Veterans face many mental health challenges after deployment, including serious mental illness and problematic alcohol use (Hoge et al., 2014). Research shows that there is a discrepancy between the number of personnel with a probable need for treatment and the number seeking and receiving treatment (Hoge et al., 2004). While many impediments to care have been researched (e.g., Britt et al., 2008; Graziano & Elbogen, 2017; Kim et al., 2011; Olmsted et al., 2011; Pietrzak et al., 2009; Wright et al., 2009), perceived need for treatment is an important issue that warrants further empirical exploration. Military personnel may be particularly prone to misjudged perceptions of need for treatment (Vogt, Fox, & Di Leone, 2014). Studies have shown that misjudged need for treatment can impact treatment seeking (e.g., Andrade et al., 2014; Graziano & Elbogen, 2017; Larson et al., 2012; Spooner et al., 2014; Stecker, Fortney, Hamilton, & Ajzen, 2007; Vogt et al., 2014; Warner et al., 2008). This study explored perceived need for treatment for the domains of alcohol, post-traumatic stress disorder, and marital problems in military personnel. Supporting prior literature, more service members indicated problems in these domains than recognized a need for treatment. Additionally, there were several significant moderators of the relationship between probable and perceived need for care, including age, race, military branch, and exposure to combat. In an extension of prior research, Veterans did express mild interest in treatment, and, more critically, perceived need for care moderated the relationship between probable need and interest in treatment for all of the domains. This study fills gaps in the literature by further exploring the impact of perceived need for care on interest in treatment.

Introduction

Partly due to the intensity of their occupation, military service members are at increased risk for mental health problems (Hoge et al., 2014). Researchers have explored this problem for decades, throughout the eras of combat. The most recent conflicts in Afghanistan and Iraq have involved prolonged ground combat and severe danger to those deployed, leading to even more focus on returning service members' mental health needs (Hoge et al., 2004; Hoge et al., 2014; Makin-Byrd et al., 2011; Zinzow et al., 2013). Many of these individuals face difficult reintegration into society, struggles with mental illness, and serious impairment in many domains of their lives (Hoge et al., 2004; Makin-Byrd et al., 2011).

Given these consequences of military service, are returning service members receiving help? Studies show a large gap between the number of soldiers reporting impairment and the number of soldiers seeking and receiving help (e.g., Hoge et al., 2004). Various studies have identified factors such as logistical issues (e.g., Kim et al., 2010), attitudes toward mental illness and treatment (e.g., Stecker, Fortney, Hamilton, & Ajzen, 2007), and stigma around seeking mental healthcare (e.g., Kim et al., 2011). Internal barriers to care such as attitudes and beliefs appear to be more critical than external barriers such as logistical issues (Graziano & Elbogen, 2017). One internal barrier, the gap between actual and perceived need for care, may be critical; while many service members experience symptoms and even functional impairment, many do not recognize a problem that requires treatment (Hoge et al., 2004). The current study explored whether returning service members perceive a need for care based on the symptoms they are experiencing.

Failing to recognize a need for care is particularly problematic for issues related to problematic alcohol use. Excessive alcohol use to cope with boredom, stress, and to bond with

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unit members is accepted and even encouraged in military culture (Gibbs et al., 2011; Larson et al., 2012). Combined with the cultural preference for ignoring or dismissing problems, many individuals who suffer serious impairment from alcohol use go without treatment (Larson et al., 2012). Focused alcohol use treatment can greatly help many individuals suffering from these difficulties, though many soldiers who need this treatment never seek it (Burnett-Ziegler et al., 2011). The current study explored recognition of alcohol problems and interest in treatment. Thus, this study explored whether service members are accurately judging their need for alcohol treatment and will assess their interest in treatment for problematic alcohol use.

Military Service, Mental Health, and Alcohol Use

Recent difficult and prolonged military conflicts have led to increasing rates of mental illness in returning service members; researchers conservatively estimate that depression, anxiety, and post-traumatic stress disorder (PTSD) affect between 19% - 44% of those returning from deployments (DeViva et al., 2016). Rates of hazardous alcohol use are also high in service members. Estimates from the Department of Defense Health Behavior Survey show that about 21% of service members reported heavy alcohol use in the past 30 days (Bray et al., 2010). In their review, Larson et al. (2012) described several studies showing increased odds of alcohol problems post-deployment, especially in relation to number of deployments and intensity of combat exposure. Higher risky alcohol use in military populations, particularly after deployment, may be related to several factors including the general acceptance of alcohol use in military culture, the belief that drinking is a bonding mechanism, and the view of alcohol use as a coping mechanism (e.g., self-medicating for stress, symptoms of PTSD; Larson et al., 2012). Due to acceptance and even encouragement of high levels of drinking as a coping mechanism, mental

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illness and problematic alcohol use often go hand in hand in these populations (Gibbs et al., 2011; Larson et al., 2012).

Despite many well-designed studies examining alcohol use in military populations, more research is needed. Alcohol use is a multifaceted problem; getting treatment for alcohol problems is even more complicated. Statistics detailing the psychological impact of warfare and combat on service members are readily available, and many who need care are not receiving it. Estimates vary; some studies report that the majority of returning service members who screen positive for a mental health problem or problematic alcohol use do not go on to receive care (Hoge et al., 2004). Other studies report that many who need care do receive it, but that those most in need are the least likely to initiate treatment (Hoge et al., 2014; Visco, 2009).

Stages of Change

The Stages of Change model may be applied to understand treatment initiation and engagement among combat exposed veterans. Prochaska and DiClemente (1982, 1986) developed this model based on the idea that motivation for change must be present before an individual enacts a new behavior (Miller & Tonigan, 1996). Building upon this, researchers claim that motivation and readiness for change must therefore predict actual changes in the behavior and success in treatment (Heather, Rollnick, & Bell, 1993).

The Stages of Change model identifies and describes five stages through which an individual progresses when enacting a change in their behavior: precontemplation, contemplation, determination (later changed to preparation), action, and maintenance (Prochaska & DiClemente, 1982, 1986). Relapse was added later and can include additional cycling through the initial stages (Miller & Tonigan, 1996). This model has been applied to many behaviors, and research has been particularly fruitful around addictive behaviors such as alcohol use (Miller &

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Tonigan, 1996). The stages of change model purports that an individual must progress through a state of unawareness of a problem (precontemplation), to initial awareness that a problem exists and subsequent engagement in a pro-con analysis to consider making any change (contemplation), to making plans to change (preparation), to actually enacting a change (action) and continuing progress (maintenance) (Miller & Tonigan, 1996). In other words, one must recognize that a problem exists and acknowledge a need for treatment.

Readiness for change is thought to fluctuate over time, influenced by many factors such as self-efficacy and social support (Miller & Rollnick, 2002; Miller & Tonigan, 1996; Prochaska & DiClemente, 1982, 1986). Researchers have noted that motivation to change alcohol use is a fluid process, wherein an individual continually evaluates the pros and cons of changing their drinking behavior (Miller & Tonigan, 1996). In a study of variations over time in readiness for change within and between individuals seeking alcohol treatment, Rice et al. (2014) found both linear and quadratic trajectories, meaning that individuals displayed quite diverse paths on the readiness for change variables and did not always progress in a direct way while taking steps toward sobriety. The authors noted that there did are relationships between prior drinking behavior, readiness for change variables, and treatment attendance; more work was deemed necessary to elucidate these relationships (Rice et al., 2014). There is little empirical evidence to support the claim that readiness to change predicts treatment outcome (Isenhardt, 1997). While unable to support readiness for change predicting success in treatment, the sparse literature does generally support that readiness for change impacts decisions to initiate and remain in treatment (Isenhardt, 1997; Prochaska, DiClemente, & Norcross, 1992).

Variations in prior alcohol use, readiness for change, and other variables (e.g., individual traits, treatment modality) impact success in treatment (Carpenter, Miele, & Hasin, 2002). One

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major criticism of the stages of change model is that it does not predict what influences progression through the stages (Carpenter et al., 2002). Given that readiness for change varies widely (e.g., Rice et al., 2014), and that researchers have had difficulty supporting the relationship between readiness for change and actual change (e.g., Isenhardt, 1997), a greater focus on one particular piece of this model is warranted: problem recognition, or perceived need for care. This is a critical factor that may contribute to motivation, as well as treatment initiation and engagement (Carpenter et al., 2002). Indeed, Carpenter et al. (2002) found that while motivation to change did not appear to impact alcohol use or treatment use, alcohol problem severity did. Thus, this theory may support the importance of perceived need in an individual's decision to initiate treatment.

Theories Related to Treatment Initiation

Several other theories related to treatment initiation have gained popularity in recent literature. The Health Behavior Model (HBM) was originally developed in the 1950s in response to low use of health programs to prevent disease (Sugg Skinner, Tiro, & Champion, 2015). This model is used to predict engagement in health behaviors in individuals. HBM posits five constructs that influence an individual's performance of health-related behavior: perceived susceptibility, or beliefs about their risk for a particular disease or health problem; the severity of this health problem; perceptions of the benefits and barriers to enacting the health behavior; cues to action, which can be internal (e.g., suffering from a symptom) or external (e.g., a recommendation from a doctor); and self-efficacy, or their ability to engage in the health behavior (Sugg Skinner et al., 2015). Thus if an individual perceives benefits to engaging in a health behavior, believes that they have the ability to do so, and believes that the health problem is severe and that they are susceptible to it, the individual's likelihood of engaging in the health

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behavior are higher (Sugg Skinner et al., 2015). This likelihood would be balanced by the individual's perception of barriers to engaging in the health behavior (Sugg Skinner et al., 2015). Indeed, this theory purports that individuals engage in a cost-benefit analysis internally when considering a health behavior (Sugg Skinner et al., 2015). This theory has been applied to many health behaviors, such as colon cancer screening and human papillomavirus (HPV) vaccination in recent years (Sugg Skinner et al., 2015). One older study showed that perceived severity and cues to action were strongly related to the decision to enter treatment for those with alcohol problems (Bardsley & Beckman, 1988). Another study indicated that those same constructs, measured in an initial visit to alcoholism treatment, were related to remaining in treatment (Rees, 1985). Thus, the literature on civilians supports the idea that HBM constructs predict alcohol treatment initiation and engagement.

The HBM has been used by at least one study exploring treatment utilization in military veterans. Graziano and Elbogen (2017) found that beliefs about mental health problems and the need for treatment for PTSD specifically were important in their sample; individuals appeared to weigh the strength of their belief "It's up to me to work out my own problems" against the severity of their symptoms when making treatment-seeking decisions (Graziano & Elbogen, 2017). A recent meta-analysis of studies using HBM to predict behavior identified an individual's perception of benefits and barriers to behavior change as the most consistent predictors (Carpenter, 2010). Given that this study looked at *perceptions*, it supports the notion that internal barriers (i.e., attitudes and beliefs) are critical to treatment decisions. However, other direct effects of the model were not supported; the direct effects of susceptibility and severity were fairly weak compared to other parts of the model (Carpenter, 2010). Thus this model may not be a complete theory to predict behavior change. Regardless, this model also appears to

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support perceived need for care (here labeled internal cues to action) as related to treatment seeking.

Another popular and well-supported theory is the Theory of Planned Behavior (TPB; Ajzen, 1991). TPB posits that intention to perform a behavior can be predicted by attitudes toward the behavior, perception of norms related to the behavior, and perception of control over performing the behavior (Ajzen, 1991). This theory relies on the assumption that intention is a strong predictor of actual behavior, and that one must have both intention and ability to perform the behavior (Montano & Kasprzyk, 2015). Thus if an individual has positive attitudes toward a behavior and the outcomes of that behavior, perceives that important others approve of the behavior, and perceives a stronger ability to perform the behavior, then there is a higher likelihood that this individual will engage in the behavior (Ajzen, 1991). The theory highlights the importance of attitudes and beliefs toward *a health behavior* (e.g., seeking treatment), not just *a health problem* (e.g., cancer) in predicting the behavior (Montano & Kasprzyk, 2015). This theory has been applied to health-related behaviors such as smoking, exercise, sexually-transmitted disease prevention, utilization of health services, and other behaviors more generally (Montano & Kasprzyk, 2015). The utility of TPB in predicting alcohol use was supported in a recent meta-analysis, which showed strong relationships between intentions to drink and drinking behavior, as well as intentions to drink and attitudes, norms, and self-efficacy (Cooke, Dahdah, Norman, & French, 2016). Researchers have also found support for this theory among military service members. Stecker, Fortney, Hamilton, and Ajzen (2007) noted that service members take into account their own attitudes toward mental illness and treatment, social norms, and their ability to obtain treatment when making decisions about accessing care.

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Other studies, not using HBM or TPB by name, have found similar results. Fox, Meyer, and Vogt (2015) found that beliefs about mental illness and treatment were associated with treatment use in military service members. In Johnson et al. (2016), Veterans were asked to rate their agreement with 73 items related to mental health care seeking (e.g., “A problem would have to be really bad for me to seek healthcare” with “1” referring to “strongly disagree” and “5” referring to “strongly agree”); mental health beliefs significantly predicted subsequent mental health care utilization for veterans such that a 1-point increase in negative beliefs toward mental health care was associated with a 63% decrease in the likelihood of utilizing mental health services over the next year. Additionally, self-identifying a mental health concern was important in the sample, such that those who did not identify a concern had an 85% decreased likelihood of accessing mental health care over the next year (Johnson et al., 2016).

The theories mentioned above begin to shed light upon the many potential impediments to receiving care, despite some signal of need. Each of the theories above identifies internal barriers such as perceptions, attitudes, and beliefs as most critical for successful engagement in treatment. In the stages of change model, motivation and ultimately the recognition of a problem that warrants treatment are most critical. Thus in this model, perceived need for care is critical. In HBM, the individual’s beliefs in the domains of the problem, their ability to change, and the necessity of change drive behavior. These factors may be related concepts to probable and perceived need. Finally, in TPB, the individual’s attitudes, their assessment of the attitudes of others, and the individual’s ability to perform the behavior drive their intentions to do so; again, representing concepts related to perceived need. Each of these models provides important pieces to predict behavior; in this case, to predict initiation of treatment for alcohol problems, and what may impede seeking treatment.

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Barriers to Care: Initial Research

There is a wealth of research, often unguided by theory, on potential barriers to care. One of the most cited studies, and the first in this domain of the literature, is Hoge et al. (2004). Hoge et al. (2004) administered anonymous surveys to service members ($n = 3,671$) before and after returning from deployments to Iraq. Surveys included diagnostic checklists for major depressive disorder, generalized anxiety disorder, and PTSD; assessment of functional impairment; whether the individual identified an issue with “stress, emotional problems, problems related to the use of alcohol, or family problems” and if so, to what degree (i.e., mild, moderate, severe); current interest in treatment; and past use of treatment. Participants were also asked about perceived barriers to receiving treatment such as stigma. When looking at only those who met strict criteria for a disorder ($n = 495$), 38% - 45% endorsed interest in receiving treatment and 23% - 40% reported having received any treatment in the past year, which the authors interpreted as serious gaps in those who need treatment versus those actually receiving it (Hoge et al., 2004). The researchers also found that those who met criteria for a mental illness were about two times as likely to report stigma and other barriers to care when compared to those not meeting criteria (Hoge et al., 2004). This finding has been taken to mean that those who need help the most are also the most concerned about the perceived consequences of receiving help (e.g., the potential impact on their career and relationships). Thus, Hoge et al. (2004) became one of the first studies to move beyond highlighting the impact of combat on mental health to show that service members are not receiving much needed help. This study brought forth the question, what is getting in the way of service members seeking care?

Hoge et al. (2004) assessed perceived barriers to care through agreement with 13 statements, such as “Mental health care costs too much money” and “I would be seen as weak”,

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which represent different facets of the construct. A similar format has been used in many subsequent studies examining barriers to care (e.g., Britt et al., 2008; Graziano & Elbogen, 2017; Kim et al., 2011; Olmsted et al., 2011; Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009; Wright et al., 2009). Since Hoge et al. (2004) first defined the construct of barriers to seeking treatment in military service members, many researchers have expanded upon this work.

Barriers to Care: Continuing Research

Since Hoge et al. (2004), there have been many studies exploring barriers to care including qualitative, cross-sectional, and longitudinal studies. Qualitative studies such as Drapalski et al. (2008), Zinzow et al. (2013), and Cornish et al. (2014) show that many service members appear to endorse barriers to care. Specifically, these studies provided support for stigma as a barrier to seeking treatment, as well as the importance of attitudes toward treatment; both of which highlight the importance of internal barriers that may affect seeking treatment (Cornish et al., 2014; Drapalski et al., 2008, Zinzow et al., 2013). At least one study has argued that beliefs about barriers to care are more important than the barriers themselves in terms of the impact on treatment seeking (Stecker et al., 2007). These authors proposed that service members mentally weigh *perceptions* of facilitators versus barriers to engaging in treatment, as people often weigh their views of benefits and costs before making a decision (Stecker et al., 2007). Thus, having a problem and having access to treatment are not enough; beliefs about the problem and the treatment are critical in the decision to seek help.

Cross-sectional literature has explored barriers to care at various stages of treatment, including treatment seeking and initiation (Blais & Renshaw, 2013; Britt et al., 2015; Graziano & Elbogen, 2017; Held & Owens, 2012; Kehle et al., 2010; Vogt, Fox, & Di Leone, 2014) and treatment engagement and receiving an adequate dose of treatment (Britt et al., 2015; Elbogen et

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al., 2013; Hoge et al., 2014). This research indicates that barriers to care may affect decisions about treatment differently at various stages of the process (DeViva et al., 2016), and these decisions impact behavior. Wright, Britt, and Moore (2014) discovered that endorsing barriers to care at baseline was associated with worse symptoms later, highlighting the concerning issue of those who need treatment not receiving it.

In terms of internal barriers, the most often studied is stigma, given that many service members endorse concerns in this domain (Blais & Renshaw, 2013; Britt et al., 2008; Britt et al., 2015; DeViva et al., 2016; Gibbs et al., 2011; Greene-Shortridge, Britt, & Castro, 2007; Held & Owens, 2012; Kim et al., 2010; McFarling et al., 2011; Olmsted et al., 2011; Ouimette et al., 2011; Stecker et al., 2007; Vogt et al., 2014; Wade et al., 2015; Wright et al., 2009). Individuals fear being seen as weak, crazy, or unfit for duty if they choose to seek treatment (e.g., Britt et al., 2008; Kim et al., 2010; Kim et al., 2011; Wright et al., 2009). Other researched internal barriers include self-reliance, or the preference to handle problems on one's own (Adler et al., 2015; Britt et al., 2011; Elbogen et al., 2013; Stecker et al., 2007; Visco, 2009); career worry, or concerns about the impact of identifying a problem and seeking treatment on one's career (Brown & Bruce, 2016); concerns about confidentiality (Hoge et al., 2014); and negative attitudes toward mental health and treatment (e.g., DeViva et al., 2016; Elbogen et al., 2013; Fox, Meyer, & Vogt, 2015; Kehle et al., 2010; Kim et al., 2011; Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2015; Sareen et al., 2007; Stecker et al., 2007; Stecker, Shiner, Watts, Jones, & Conner, 2013; Valenstein et al., 2014; Vogt, 2011). Each of these internal barriers has been found to be important in at least one cross-sectional study. Many researchers have found support for stigma as an impactful barrier to seeking care (Blais & Renshaw, 2013; Britt et al., 2008; Britt et al., 2015; DeViva et al., 2016; Gibbs et al., 2011; Greene-Shortridge, Britt, & Castro, 2007; Held &

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Owens, 2012; Kim et al., 2010; Kim et al., 2011; McFarling et al., 2011; Olmsted et al., 2011; Ouimette et al., 2011; Stecker et al., 2007; Vogt et al., 2014; Wade et al., 2015; Wright et al., 2009). In terms of negative attitudes toward mental health and treatment, the most commonly found to be predictive of lower treatment seeking are ‘mental health treatment does not work’ (Kehle et al., 2010), ‘I do not trust mental health professionals’ (Blais, Tsai, Southwick, & Pietrzak, 2015), ‘I didn’t want to believe I had a problem’ (Stecker et al., 2007), ‘medication has serious side effects’ or ‘medication will not work’ (Elbogen et al., 2013), ‘I will be seen as weak’ (Elbogen et al., 2013), and ‘people who seek treatment are crazy’ (Vogt, 2011).

Cross-sectional research seems to show that internal barriers are a critical obstruction to treatment; however, longitudinal research shows a less clear picture. To date, four prospective studies have examined barriers to care (Adler et al., 2015; Blais, Hoerster, Malte, Hunt, & Jakupcak, 2014; Harpaz-Rotem, Rosenheck, Pietrzak, & Southwick, 2014; Hoerster et al., 2012). Hoerster et al. (2012) found that while stigma and other barriers to care were quite commonly endorsed (37% of the sample expressed agreement), ultimately the receipt of adequate treatment (at least nine sessions) was not associated with barriers to care (Hoerster et al., 2012). Interestingly, being female and having more severe PTSD symptoms were associated with an increased likelihood of receiving adequate treatment. Thus while males seem to be at a greater risk of not receiving adequate care, it is important to note that only 25% of the overall sample did receive adequate care. This is a widespread problem that does not seem to be impacted by traditional barriers to care (Hoerster et al., 2012).

Building on Hoerster et al. (2012), two of the studies listed above found that specific aspects of PTSD were predictive of treatment seeking, while barriers to care were not. Blais, Hoerster, Malte, Hunt, and Jakupcak (2014) noted that dysphoria severity was positively

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correlated with intentions to seek care and actual treatment utilization, avoidance severity predicted lower treatment utilization, and re-experiencing severity predicted greater treatment utilization (Blais, Hoerster, Malte, Hunt, & Jakupcak, 2014). Harpaz-Rotem, Rosenheck, Pietrzak, and Southwick (2014) found similar results, which indicated that re-experiencing symptoms were associated with initiation of treatment, and numbing symptoms were associated with retention (Harpaz-Rotem, Rosenheck, Pietrzak, & Southwick, 2014).

Adler et al. (2015) found that for those who reported experiencing a mental health problem or screened positive for one ($n = 160$), a preference for self-management was associated with a decreased likelihood of having participated in treatment at time two, and positive attitudes toward treatment were associated with an increased likelihood of having participated in treatment (Adler et al., 2015).

Thus the longitudinal literature shows that internal barriers such as stigma, self-reliance, and attitudes toward treatment may have an impact on treatment seeking. These barriers are supported by theories and subsequent research. One aspect that may be of critical importance is a particular domain of attitudes: perceived need for care.

A Critical Internal Barrier: Perceived Need

Many service members and veterans who show a probable need for care are not accessing treatment. Warner et al. (2008) reported that 65% of soldiers in their sample endorsed willingness to address a mental health concern *if they thought they had an issue*. Of note, 35% would apparently not be willing to address an issue, even if one appeared to be present. This also displays the importance of perceptions. Given the estimates of how many service members return from deployment with mental health concerns, this finding may represent low perceived need as a barrier to accessing treatment. Low perceived need indicates an individual making a

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judgment that they do not see a problem that warrants treatment. This construct may overlap with other issues identified in the literature: no identified problem (e.g., Kehle et al., 2010) and/or no identified need for treatment (e.g., Graziano & Elbogen, 2017). Mistaken judgments regarding need for care may be at the crux of the treatment gap in military populations.

In the literature on military personnel, low or absent perceived need for care is measured by a combination of objective and subjective measures, such as screening *positive* on a symptom checklist and responding *negatively* to a prompt such as “Are you currently experiencing a personal, emotional, alcohol, or family stress problem?” (e.g., Kehle et al., 2010), or screening positive for a problem and also endorsing a statement such as “It’s up to me to work out my own problems (e.g., Graziano & Elbogen, 2017). Studies tend to show a large discrepancy between those meeting criteria for a mental health problem and those recognizing an issue on more subjective measures.

Studies Examining Perceived Need

Recognizing a problem is an important part of the treatment seeking process. Actual or probable need can play a large role in recognition of a problem. Maguen et al. (2007) found that need variables such as total number of psychiatric diagnoses, average number of physical health conditions, and PTSD severity were “the most consistent and strongest mediators” of the relationship between predisposing variables (demographics and combat exposure) and treatment use. Thus while combat exposure is consistently shown to be related to treatment use in the literature, this research shows that the relationship between combat exposure and treatment use is better explained by need variables (Maguen et al., 2007). This is of note because it is the perception of a dysfunctional reaction to stressors that plays a key role in treatment seeking, not predisposition or perceptions of the stressors themselves. Kehle et al. (2010) combined PTSD

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and depression checklists with two single items assessing perceived need for and interest in treatment, respectively (“Are you currently experiencing a personal, emotional, alcohol, or family stress problem?” and “Are you currently interested in receiving professional help for a personal, emotional, alcohol, or family stress problem?”) into an “illness-based need” factor. In logistic regressions, this need factor was predictive of self-reported treatment seeking for both psychotherapy and medication (Kehle et al., 2010). Interestingly, other strong predictors included receiving therapy while on deployment and injury during deployment, both of which were positively related to seeking treatment once stateside (Kehle et al., 2010). These aspects could potentially contribute to a perceived need upon return.

Unfortunately, military personnel may have a tendency to ignore probable need (Vogt et al., 2014). Research has determined that there is a certain threshold of symptomatology, and especially functional impairment, that may be important in service members’ assessments of their need for treatment. In a study conducted by Vogt, Fox, and Di Leone (2014), more than half of the sample of military personnel ($N = 640$) agreed that “a problem would have to be very bad before they would seek treatment.” Several other studies found similar issues with a high threshold of symptoms needed for a service member to recognize a problem and show any treatment seeking behavior (Britt et al., 2015; Elbogen et al., 2013; McKibben et al., 2013; Sareen et al., 2010). Thus, part of the misjudgment of need for care may come from low recognition of problems without high levels of symptoms and impairment in these populations.

Of note, experiencing symptoms is important, but will not necessarily get individuals into treatment. The crux is whether they recognize the symptoms and then seek treatment for them. Therefore, accurate judgment of need *and* a belief that treatment is necessary and useful are critical in order to pursue appropriate treatment. Di Leone et al. (2013) supported this notion:

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their results indicated that struggles with PTSD and depression predicted women's use of care, and only PTSD predicted use of care for men; however, for both men and women, more positive attitudes toward treatment predicted use of services over probable need. This may impact perceived need, such that positive attitudes and beliefs about treatment may impact an individual's recognition that treatment is warranted. Thus, the findings of Di Leone et al. (2013) support the idea that actual need for care, as measured by symptomatology, is not enough to get service members into treatment; attitudes and judgments related to treatment are more important. This is further supported in a study conducted by Spont et al. (2014). When controlling for probable need (symptom severity on a PTSD checklist and mental health functioning) and access to treatment, the results indicated that perceived need and encouragement from social networks were the strongest predictors of treatment seeking (Spont et al., 2014). Thus variables related to recognizing a need for treatment remain significant predictors of treatment seeking when probable need is accounted for statistically.

Military personnel may be particularly prone to low perceived need. One of the most researched aspects of military culture that may increase the likelihood of low perceived need is a preference for self-management. This construct comes up often in literature on military personnel, and impacts both components of perceived need – recognition of a problem and recognition of necessity of treatment. In their longitudinal study, Adler et al. (2015) found that a preference for self-management was the only variable associated with a decreased likelihood of seeking treatment among those they measured, which included traditional barriers to care and other attitudes toward treatment. While sometimes viewed as a part of the barriers to care construct, self-management is perhaps better explained under the umbrella of misjudged need for care. Stecker, Fortney, Hamilton, and Ajzen (2007) also found self-management to be important.

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In their study of National Guard members who screened positive for mental illness, the most commonly reported issue blocking service members from seeking treatment was beliefs such as “[I] ought to handle it on my own” or “[I] didn’t want to believe I had a problem” (Stecker et al., 2007). Additionally, while a large proportion of participants reported that their decision to seek treatment would be supported by loved ones and the military, some reported that these groups would prefer they “suck it up” (Stecker et al., 2007). This indicates that service members often believe they need to handle problems on their own, and believe that others prefer for them to handle problems on their own as well. These beliefs may be having an impact on judgments regarding need for care.

Impact of relationships. Partners and families may have an impact on recognizing that treatment is warranted. Multiple studies show the importance of social support and encouragement to seek treatment on service members’ judgments of their own need for care. Several studies have shown that having greater social support is linked to greater perceived need for care (Edlund, Unutzer, & Curran, 2006; Graziano & Elbogen, 2017). Similarly, encouragement to seek care from family members and friends is associated with greater treatment seeking behavior (Burnett-Ziegler et al., 2011; Spont et al., 2014). Spont et al. (2014) noted that encouragement had a stronger effect when it came from both family and friends, and Burnett-Ziegler et al. (2011) noted that encouragement from spouses had a strong impact. Thus including family and close social networks in the treatment decision process can be very important. However, there is also burgeoning literature showing that witnessing a visible impact on partners and family members may increase an individual’s perception that a mental health problem exists (Batten et al., 2009; Meis et al., 2010; Meis et al., 2013; Snyder et al., 2016). These studies showed that service members who acknowledged that their mental health

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problems were having an impact on their families were more likely to seek treatment (Meis et al., 2010; Snyder et al., 2016) or reported greater interest in treatment (Batten et al., 2009; Meis et al., 2013). This research shows that relationships are important to the well-being of returning service members, and can serve as another signal of impairment and thus contribute to judgments related to seeking treatment.

Perceived Need for Care and Alcohol Use in Service Members and Veterans

Experiencing combat is related to serious increases in problematic alcohol use. Jacobson et al. (2008) found that new onset rates of heavy weekly drinking, binge drinking, and alcohol-related problems generally increased after combat exposure, particularly among younger service members and Reserve or National Guard personnel. Additionally, those with previous or existing mental health problems were at greater risk for worse alcohol outcomes (Jacobson et al., 2008). Service members' judgments of perceived need may be particularly distorted in the domain of alcohol use due to aspects of military culture. As mentioned above, alcohol may be used as a coping mechanism after combat exposure, in the form of self-medication (Larson et al., 2012). Additionally, excessive drinking is often viewed by service members, and even leadership, as an acceptable way to cope with stress and boredom (Larson et al., 2012). Finally, excessive alcohol use is viewed as an integral part of bonding (Gibbs et al., 2011). Service members often report that there are no responses to excessive drinking from command unless there is an "incident" such as a DUI, and enrollment in treatment for alcohol is often seen as punishment for getting caught (Gibbs et al., 2011). However, the alcohol is not viewed as the problem; the individual is perceived as not being able to handle the drinking, as having poor judgment, or as a danger to the unit (Gibbs et al., 2011). Getting caught is associated with personal failure and leads to ostracism, career damage, and sanctions; perhaps because of the association between infractions

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and treatment, these negative outcomes have also become associated with obtaining treatment (Gibbs et al., 2011). Thus the culture of binge drinking in the military may exacerbate issues with perceived need for care.

Summary of the Literature on Perceived Need

Looking closely at studies spanning the history of research on probable and perceived need for care, it becomes clear that further exploration is needed. Studies show that probable need, measured more objectively with diagnoses and symptom checklists, is related to treatment use (Andrade et al., 2014). However, to actually seek treatment, service members and veterans need to both identify a problem and recognize the necessity of treatment. Researchers have explored perceived need in different ways including incorporating aspects into a barriers-to-care construct, as well as combining it with other measures of need. Research has generally supported the importance of perceived need for care (e.g., Graziano & Elbogen, 2017; Larson et al., 2012; Spont et al., 2014; Stecker et al., 2007; Vogt et al., 2014; Warner et al., 2008). However, more research is needed to clarify the impact of judgments related to perceived need for care on treatment seeking.

There are several key aspects of the perceived need problem that may be affecting the treatment gap, including service member preference for self-management (Graziano & Elbogen, 2017; Stecker et al., 2007), high threshold for recognizing a problem (Britt et al., 2015; Elbogen et al., 2013; McKibben et al., 2013; Sareen et al., 2010; Vogt et al., 2014; Warner et al., 2008), and low recognition of the necessity of treatment (Spont et al., 2014; Stecker et al., 2007; Vogt et al., 2014). These issues may be particularly difficult in relation to alcohol problems (Gibbs et al., 2011; Larson et al., 2012). Fortunately, there are also factors that can help this problem,

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including partners and family members (Batten et al., 2009; Burnett-Ziegler et al., 2011; Meis et al., 2013; Snyder et al., 2016; Spont et al., 2014).

The current study sought to further clarify the impact of perceived need for care on treatment seeking. Additionally, the studies described above mainly focus on need for treatment in the realms of depression, anxiety, and PTSD; this study seeks to replicate and extend this work, and clarify the discrepancy between probable need for care and service members' perceived need for care in the domain of alcohol use. This study also seeks to further examine the importance of family, particularly romantic partners, by examining the problem of perceived need with service members in committed relationships.

Unanswered Questions

Despite a wealth of research displaying the necessity of empirically supported treatments, there are few studies examining the treatment gap for specific problems. Several studies have explored barriers to care for PTSD treatment (e.g., Lu et al., 2011; Rosen et al., 2011; Sayer et al., 2007; Stecker et al., 2013). Because alcohol use is a difficult and pervasive problem in the military (Gibbs et al., 2011; Larson et al., 2012; Rotunda, O'Farrell, Murphy, & Babey, 2008), it is critical to determine what is keeping service members from accessing treatment targeting problematic alcohol use.

In addition to the dearth of research exploring the treatment gap for specific problems, it is critical to determine what may be getting in the way of accessing empirically supported treatments. More recently, treatments for problematic alcohol use have begun to include important others in therapy, such as partners/spouses and other family members to good effect (Epstein & McCrady, 2002; McCrady, Epstein, & Kahler, 2004; Meis et al., 2013). In fact, a very recent review stated that couples therapy for the treatment of alcohol problems is strongly

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supported by “all major reviews and meta-analyses” they evaluated (Carr, 2018). Military veterans and their families appear to be particularly affected by the vicious cycle of alcohol use, co-occurring problems, and relationship struggles (Makin-Byrd et al., 2011; Rotunda et al., 2008). Additionally, military service members tend to have worse problems related to these issues, and poorer response to treatment (Rotunda et al., 2008). There are several studies showing that couples treatments for alcohol problems are very effective for military service members and veterans, as shown through reduced alcohol use and alcohol-related problems, decreased distress, and increased relationship adjustment after treatment (Rotunda et al., 2008; Schumm et al., 2015).

Research has shown that service members show strong interest in couples- and family-oriented treatments (Meis et al., 2013). Romantic partners are often a primary source of support, which rings true for service members as well (Sherman et al., 2005). Additionally, the couple can be an important piece of the service member’s outcomes going forward: research shows that distressed couple relationships can have a serious negative impact on existing psychological conditions, and that more supportive relationships can have a great positive impact (Meis et al., 2013; Sherman et al., 2005; Snyder et al., 2016). Meis et al. (2013) assessed interest in partner-involved therapy through three items, and found that the majority of service members (78-90%, $n = 144-166$) reported at least “a little bit” of interest in partner-involved therapy. Additionally, a majority of service members (70%, $n = 129$) endorsed willingness to utilize couples therapy (Meis et al., 2013). Thus lack of interest in couples therapy or lack of willingness to use these services do not appear to be driving the low numbers of military personnel accessing couples and family services.

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The Current Study

The model shown in Figure 1 builds upon stages of change, HMB, and TPB to posit the relationships between recognizing a problem and interest in treatment. In this model, the relationship between probable need for care and interest in treatment is mediated by the internal barrier perceived need for care. The relationship between probable need for care and perceived need for care is moderated by gender, severity of symptoms (often measured by total number of symptoms), relationship distress, and military service (e.g., length of service).

This study investigates the treatment gap for alcohol problems. While alcohol is the main area of interest in this study, PTSD and marital problems are additional domains where veterans may show a discrepancy between probable and perceived need for care. As stated above, there are large numbers of Veterans suffering from mental health problems such as PTSD (at least 19% - 44%; DeViva et al., 2016). Several studies have focused on illuminating barriers to care for those experiencing PTSD symptoms (e.g., Di Leone et al., 2013; Kehle et al., 2010; Lu et al., 2011; Maguen et al., 2007; Rosen et al., 2011; Sayer et al., 2007; Spont et al., 2014; Stecker et al., 2013). This literature is still unclear as to the impact of internal barriers on interest in treatment for those suffering with PTSD.

Additionally, there are important connections between psychological symptoms and alcohol use that may be impacting perceived need. The preliminary work on the treatment gap (Hoge et al., 2004) showed many of the individuals suffering from psychological symptoms are not accessing treatment; many are likely self-medicating with alcohol instead (Larson et al., 2012). Jacobson et al. (2008) found that those with previous or existing mental health problems were at greater risk for worse alcohol outcomes. Further research is necessary to clarify perceived need for both types of problems, and how mental health and alcohol interact to impact

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perceived need.

Relationship distress is another critical domain affecting veterans. Prior research shows a clear association between relationships and perceived need: In several studies, service members who noticed the negative impact of their symptoms on their families were more likely to seek treatment (Meis et al., 2010; Snyder et al., 2016). Studies have also shown that relationships can strongly impact psychological symptoms, with relationship distress leading to worse outcomes, and more satisfaction and support leading more positive outcomes (Meis et al., 2013; Sherman et al., 2005; Snyder et al., 2016). As stated above, veterans and their families appear to be particularly affected by interplay between mental health problems, alcohol use, and relationship distress (Makin-Byrd et al., 2011; Rotunda et al., 2008). Veterans appear to have worse problems in these domains, and poorer prognoses (Rotunda et al., 2008). And given that the research shows that those who are the most in need are the least likely to seek help (Hoge et al., 2014; Visco, 2009), it is critical to determine how barriers to care are operating for veterans in these specific domains in order to better help veterans access needed treatments.

The current study has several research aims. Primarily, this study will explore the discrepancy between probable and perceived need for care in the realm of alcohol use problems, PTSD problems, and marital problems for military personnel in committed relationships. The study posed this question: Within the group of individuals who report problems, why do some endorse having a problem that warrants treatment and some do not? This study attempted to capture the discrepancy and explored potential moderators such as gender, length of military service, other psychological symptoms, and relationship distress. The hypotheses were follows:

Hypothesis 1. There will be a discrepancy between measures of probable need for care and service members' (SM) perceptions of need for care, such that SM will show greater

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probable need than perceived need.

Hypothesis 2. Gender will moderate the relationship between probable need for care and perceived need for care, such that females will display a stronger association between probable need for care and perceived need for care relative to males.

Hypothesis 3. Length of military service will moderate the relationship between probable need for care and perceived need for care, such that those with longer military service histories will display a stronger association between probable need for care and perceived need for care relative to those with shorter histories.

Hypothesis 4. Number of psychological symptoms will moderate the relationship between probable need for care and perceived need for care, such that those with a greater number of symptoms will display a stronger association between probable need for care and perceived need for care relative to those with fewer symptoms.

Hypothesis 5. Relationship distress will moderate the relationship between probable need for care and perceived need for care, such that those with greater relationship distress will display a stronger association between probable need for care and perceived need for care relative to those with lower distress.

This study also had an exploratory aim, which was to assess veterans' interest in treatment. This served as a proxy for future treatment seeking behavior, given the cross-sectional nature of the study, therefore completing the model of the relationships between probable need, perceived need, and treatment seeking. Under this aim, this study sought to explore whether veterans reported interest in treatment, and specifically interest in using couples therapy for problems related to alcohol use, now or in the future. Additionally, this study sought to

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determine whether perceived need for care (an internal barrier to care) served as a mediator between the relationship of probable need for care and interest in treatment.

Method

Participants

The sample was recruited using Amazon's Mechanical Turk (MTurk), an online web-based platform that allows researchers to access a pool of subjects with a wide range of characteristics; particular groups can be targeted to allow only those who qualify for the study to participate. In this study, participants were required to be military veterans and in a committed relationship, both of which can be set within the MTurk program. Potential participants are required to create an account through Amazon to participate in available studies and have earnings deposited into their account. Researchers are also required to create an account to offer a Human Intelligence Task (HIT), a task that is devised for human input and is difficult for a computer to complete fraudulently. Potential participants can choose which HIT they want to complete, engage in the HIT for the designated amount of time, and receive payment based on the HIT. Utilizing MTurk allows for efficient data collection, targeting individuals who qualify for the study more quickly and at a lower cost than commonly used convenience samples (Buhrmester, Kwang, & Gosling, 2011; Buhrmester, Talaifar, & Gosling, 2018).

Participants of the current study included 181 adult veterans from the Vietnam war era through the current engagements in Iraq and Afghanistan. Inclusion criteria required that participants be over the age of 18, currently married or in a committed relationship, residing in the United States, and comfortable reading and writing in English. Individuals were included in the initial recruitment regardless of alcohol use status or treatment status. Participants were only excluded from the study if they endorsed "single" ($N = 6$) or "divorced" ($N = 2$) as their marital

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status, or participated in the study (e.g., completed the survey) more than once ($N = 24$).

Participants who endorsed “separated” as their marital status remained in the dataset given that they are still currently married or in a committed relationship ($N = 2$). The characteristics of the sample are captured in Table 1. The mean age of participants was 40.96 years (age range of 21 – 76 years). Participants self-identified their race/identity and the sample was 54.1% White, 27.1% Asian, 5% Black or African American, 4.4% Hispanic/Latino, 4.4% mixed race/ethnicity, 3.9% Native Alaskan/American Eskimo, and one participant (0.6%) who wrote in “Indian.” One participant chose not to disclose their race/ethnicity. Also, the sample was 68.3% male and 31.7% female; one participant chose not to disclose their sex assigned at birth. Ninety-five percent of participants were married, 4.4% were in committed relationships, and 1.1% were separated. In terms of military service, the sample included 44.2% Army, 17.7% Air Force, 14.9% Navy, 8.3% Reservist or National Guard, 6.1% Marine Corps, 5% Coast Guard, and 3.9% other. Eighty-seven percent of the sample reported that they served on active duty, and 70.2% endorsed that their service included combat, dangerous, or traumatic assignments. Sixty-two percent of the sample reported enrollment with the VA, 56.4% reported that they receive VA benefits, and 45.3% reported that they have a service-connected condition (health or mental health not specified). Forty-one percent of the sample met criteria for PTSD with the PC-PTSD (endorsed a Criterion A event and scored over 3; Prins et al., 2016); 53% of the sample met criteria for risky alcohol use on the AUDIT (scored over 8; Saunders et al., 1993).

Procedure

The HIT created through MTurk to collect the data for the current study directed potential participants to a website where the survey was housed. The survey was anonymous and included a set of self-report measures, which required a time commitment of approximately 30 minutes.

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The battery was limited to this length in order to adequately compensate participants. Informed consent was obtained via a webpage at the beginning of the online survey (see Appendix A). Participants who provided consent then proceeded through questionnaires at their own pace. At the end of the final questionnaire, participants were thanked for their responses and provided with a resource list with information specific to receiving help for substance use as a service member or veteran (see Appendix B). Participants were compensated \$3.00 for their participation in the study; this is consistent with recent guidelines stipulating \$0.10 per minute as an ethical minimum payment for MTurk workers (Desoto, 2016). Participants were also given the option to click through to a separate page that was not linked to their data where they could provide their email address to be entered into a gift card drawing for \$50. One participant who elected to provide their email address was selected to win the drawing; a gift card was sent electronically.

Measures

Most of the measures have been utilized in prior research and show adequate to good psychometric properties. Table 2 shows descriptive statistics for variables of interest created from the following measures, including the number of items, participant means and standard deviations for each scale, the observed and possible ranges for each scale, internal consistency of the scale (Cronbach's α) if appropriate, and skewness and kurtosis of the data for the scale.

Demographic questionnaire. Participants were asked to provide basic demographic information such as their age, gender, race/ethnicity, and marital/relationship status.

Additionally, participants were asked to provide their military branch; the number, length, and dates of any deployments; and military rank. This measure is included as Appendix C.

Demographic information was collected to describe the sample. In addition, demographics were

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evaluated as potential moderators of relations between *Probable Need for Treatment* and *Perceived Need for Treatment*.

Treatment history. Participants were asked about their prior experiences with the following types of treatment: seeing a psychiatrist or other mental health professional who can prescribe medications; being prescribed medications for a personal, emotional, alcohol, or marital/relationship problem; being admitted to a psychiatric hospital or attending residential treatment; attending one-to-one counseling with a psychologist, counselor, or other mental health professional; attending group counseling; attending couple or family counseling; attending alcohol or substance use treatment; attending a detoxification program for alcohol or substance use; attending a rehab program for alcohol or substance use; and attending a 12-step program (e.g., AA, NA, SMART) for alcohol or substance use. For each of these types of treatment, participants were asked to respond “Yes” or “No” for both “Lifetime” and “Past Year.” Lifetime history of treatment was measured as a “yes” response to at least one type of treatment under the “Lifetime” column, and treatment within the past year was measured as a “yes” response to at least one type of treatment under the “Past Year” column. This measure is included as Appendix D. Information about treatment history was collected to describe the sample.

Perceived need for treatment. Perceived Need for Treatment is the primary dependent variable of the current study. Perceptions of need for treatment were assessed via multiple questions, all of which were based on previously validated measures from peer-reviewed studies. This measure is included as Appendix E. For each question, the stem remained the same and the ends were modified to focus on the domains relevant to the current study given that prior work has not explored alcohol use problems and marital problems. Modeled after Kehle et al. (2010), participants were asked, “Are you currently experiencing an alcohol problem?” with responses

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“yes” or “no.” This was followed by a prompt created and used by Hoge et al. (2004) which stated, “If yes, to what degree?” with responses “mild” (1 in the dataset), “moderate” (2), or “severe” (3). If the participant responded “no” to the first question, then a score of 0 (i.e., “none”) was entered as the participant’s *Perceived Need for Alcohol Treatment (PN Alcohol)*. For participants who answered yes to the first question, responses to the problem severity item (scores = 1 – 3) were used as participants’ *PN Alcohol* scores.

Participants were asked, “Are you currently experiencing a personal, emotional, or stress problem?” with responses “yes” or “no”, followed by “If yes, to what degree?” with responses “mild” (1 in the dataset), “moderate” (2), or “severe” (3). If the participant responded “no” to the first question, then a score of 0 (i.e., “none”) was entered as the participant’s *Perceived Need for Personal, Emotional, or Stress Problem Treatment (PN PES)*. For participants who answered yes to the first question, responses to the problem severity item (scores = 1 – 3) were used as participants’ *PN PES* scores.

Participants were asked “Are you currently experiencing a marital or relationship problem?” with responses “yes” or “no”, followed by “If yes, to what degree?” with responses “mild” (1 in the dataset), “moderate” (2), or “severe” (3). If the participant responded “no” to the first question, then a score of 0 (i.e., “none”) was entered as the participant’s *Perceived Need for Marital Treatment (PN Marital)*. For participants who answered yes to the first question, responses to the problem severity item (scores = 1 – 3) were used as participants’ *PN Marital* scores.

Alcohol use. Participants were asked to complete the Alcohol Use Disorder Identification Test (AUDIT; Saunders et al., 1993; Appendix F), which is a 10-item questionnaire measuring problematic alcohol use. Each item is scored 0-4, and the maximum score is 40. A score of 8 or

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above indicates hazardous alcohol use. Initial research showed that using this cut-off, the sensitivity of the measure was 92% and the specificity was 94%. This measure is shown in prior work to have good reliability, with Cronbach's $\alpha = .93$. In the current study, this measure had a Cronbach's $\alpha = .90$. Total score on the AUDIT was used as the assessment of *Probable Need for Alcohol Treatment (PB Alcohol)* and served as the primary predictor variable in the analyses examining *PN Alcohol*.

Post-Traumatic Stress Disorder (PTSD). Participants were asked to complete the Primary Care PTSD Screen for DSM-5 (PC-PTSD-5; Prins et al., 2016; Appendix G). This is a five-item questionnaire assessing exposure to traumatic events and post-traumatic stress responses, based on DSM-5 criteria for post-traumatic stress disorder. Participants were first asked if they have experienced an event meeting the criteria for a traumatic event, and then they were asked about five symptoms they may have experienced related to that event in the past month. Each of the items is rated "Yes" or "No", and symptoms are counted for a total score (i.e., a participant has between 0 and 5 symptoms related to the traumatic event). Prior work validating this measure has found that a cut-off score of 3 symptoms yielded sensitivity of 95% and specificity of 85% (Prins et al., 2016). Total score on the PC-PTSD-5 was used as the assessment of *Probable Need for PTSD Treatment (PB PTSD)* and served as the primary predictor variable in the analyses examining *PN PES*.

Relationship satisfaction. Participants were asked to complete the Revised Dyadic Adjustment Scale (RDAS; Busby et al., 1995; Appendix H). This is a 14-item measure adapted from the Dyadic Adjustment Scale (DAS; Spanier, 1976) assessing three components of dyadic adjustment or relationship satisfaction: consensus (6 items), satisfaction (4 items), and cohesion (4 items). This measure shows acceptable reliability in prior research, with Cronbach's $\alpha = .90$

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for the total scale, and between .80 and .85 for subscales (Busby et al., 1995). In the current study, Cronbach's $\alpha = .82$ for the total scale and .83, .83, and .79 for the Consensus, Satisfaction, and Cohesion subscales, respectively. One item from the cohesion subscale ("Please respond to the following prompt - Do you and your mate engage in outside interests together?") was problematic in this data set; this item affected the subscale's reliability (Cronbach's $\alpha = .61$ with the item and Cronbach's $\alpha = .79$ without the item). This item was thus removed. Research shows that this measure is able to distinguish between distressed and non-distressed relationships (Busby et al., 1995). The Satisfaction subscale was used as the assessment of *Probable Need for Marital Treatment (PB Marital)* and served as the primary predictor variable in the analyses examining *PN Marital*.

Number of people concerned. Participants were asked, "In the past year, have people in your life encouraged you to get treatment for PTSD or other emotional problems?" with the following options: "No one", "Spouse or significant other", "Other family members", "Other veterans", "Friends", "Medical providers", and "Employers." This measure was created and used by Sareen et al., 2007 as a brief way to capture concern from those in one's support network. The number of people selected was totaled for each participant, with possible scores from 0-6. This variable was assessed as a potential moderator in all of the analyses predicting *PB* from *PN*. This measure is included in Appendix I.

Attitudes about perceived need. Participants were asked to rate their agreement with the following statements, which were aggregated single items created and used by Graziano & Elbogen (2017), Kazis et al. (2006), and Stecker et al. (2007): "It's up to me to work out my own problems", "I prefer to handle personal, emotional, alcohol, or marital/relationship problems on my own.", "Others prefer for me to handle personal, emotional, alcohol, or marital/relationship

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problems on my own.”, “A personal, emotional, alcohol, or marital/relationship problem would have to be very bad before I sought treatment.”, “If I had a personal, emotional, alcohol, or marital/relationship problem, I would not know where to get help.”, and “If I had a personal, emotional, alcohol, or marital/relationship problem, I would be afraid of what others would think of me if I asked for help.” These previously validated items were combined to represent a more dimensional measure of attitudes toward perceived need. Following previous uses, each of these statements was followed by the following options: “Strongly Disagree” (0), “Somewhat Disagree” (1), “Somewhat Agree” (2), and “Strongly Agree” (3). Participants received a score of 0-3 for each item and a total score was obtained for each participant, representing their *Attitudes toward Perceived Need for Care*. This variable was assessed as a potential moderator in analyses predicting *PB* from *PN*. This measure is included in Appendix J.

Interest in treatment. Participants were asked to rate their interest in receiving professional help for each domain (e.g., alcohol, PES, and marital). Following Hoge et al. (2004), for each domain, participants were asked “Are you currently interested in receiving professional help for an ___ problem?” with responses “Not at all interested” (scored 0), “Slightly interested” (scored 1), “Somewhat interested” (scored 2) and “Very interested” (scored 3). Responses to this item in each problem domain (e.g., alcohol, PES, and marital; scores = 0 – 3) were used as participants’ *Interest in Treatment* score for each domain.

Created and used by Batten et al. (2009), participants were then asked “How interested are you in having your spouse or significant other more involved in your treatment?”, “How interested do you believe your significant other is in being more involved in your treatment?,” “How interested do you believe your significant other would be in attending treatment sessions

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with you?” with responses 0 (Not at all interested) to 4 (Very interested). Average interest in involving their partner in treatment was calculated. This measure is included as Appendix K.

Results

Data cleaning and screening are described in the first section of the results. Next, the analyses for each specific hypothesis will be described. These will be followed by the exploratory analyses evaluating *Interest in Treatment*. Descriptive information about the continuous and ordinal variables of interest are displayed in Table 2. Table 3 displays the bivariate relationships between variables of interest.

Data Screening

Statistical analysis began with initial data cleaning and checking, including evaluating the data for outliers, normality, and missing data points. There were no significant outliers requiring removal or additional data cleaning. Missing data was accounted for by removing participants in a listwise fashion in each analysis (e.g., if they were missing data for at least one variable of interest in the analysis). A large amount of data was missing or unusable for *Length of Military Service*. Participants were asked to enter the dates, number of months, and location of duty for each of their deployments (if any); many participants chose not to complete this section, and most of those who did entered information that did not make sense (e.g., a single date, a seemingly random combination of numbers, seemingly random words). Thus this variable was not used in the analyses.

Each of the variables was checked to evaluate distribution and homoscedasticity. Skewness and kurtosis were evaluated for each of the variables. The level of skewness and kurtosis was evaluated by dividing the skewness and kurtosis statistic by the standard error for each variable. Skewness and/or kurtosis were determined to be outside of acceptable limits (i.e.,

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dividing the skewness and kurtosis score by its standard error and having a result greater than ± 1.96 ; Pett, 1997) for the following variables: *PB Alcohol*, *PB PTSD*, *PB Marital*, *PN Alcohol*, *PN PES*, and *PN Marital*. This was supplemented by visual inspection of the variables.

According to the literature, the data in treatment research are often non-normal, and heavily skewed and kurtotic (Bono, Blanca, Arnau, & Gómez-Benito, 2017). Transformations were tested on the variables listed above with non-normal distributions, including log10, natural log, and square root transformations. None of these transformations brought the distributions to acceptable levels of normality (i.e., dividing the skewness and kurtosis score by its standard error and having a result within ± 1.96). Given this, non-parametric tests were utilized in place of the parametric tests in the initial analysis plan. Kruskal-Wallis H tests were used to evaluate the relationships between variables of interest and dichotomous potential moderators such as gender, race, and military branch; these results are described in the appropriate sections below. Spearman Rank Order correlations were used to evaluate the relationships between continuous variables of interest such as *PB Alcohol*, *PB PTSD*, *PB Marital*, *PN Alcohol*, *PN PES*, and *PN Marital* (see Table 3).

Hypothesis 1

The first hypothesis examined differences between measures of probable need for care and perceived need for care for alcohol problems, PTSD, and marital problems. Raw scores were converted to z-scores and Wilcoxon signed-rank tests, a non-parametric test appropriate for comparing repeated measurements on a single sample, were used to evaluate these differences.

Alcohol problems. The Wilcoxon signed rank test indicated that *PB Alcohol* scores were not significantly different than *PN Alcohol* scores ($Z = -.44$, $p = .66$).

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PTSD problems. The Wilcoxon signed rank test indicated that *PB PTSD* scores were not significantly different than *PN PES* scores ($Z = -.32, p = .75$).

Marital problems. The Wilcoxon signed rank test indicated that *PB Marital* scores were not significantly different than *PN Marital* scores ($Z = -.55, p = .58$).

Correlations between variables of interest were also examined to explore the relationship between probable need for care and perceived need for care for alcohol problems, PTSD, and marital problems.

Alcohol problems. Bivariate Pearson correlations indicated a strong positive relationship between *PB Alcohol* and *PN Alcohol* ($r = .68, p < .01$).

PTSD problems. Bivariate Pearson correlations indicated a strong positive relationship between *PB PTSD* and *PN PES* ($r = .41, p < .01$).

Marital problems. Bivariate Pearson correlations indicated a strong negative relationship between *PB Marital* and *PN Marital* ($r = -.52, p < .01$).

Finally, OLRs were conducted predicting the PN variables from the PB variables for each domain (e.g., alcohol, PTSD, and marital problems).

Alcohol problems. *PB Alcohol* was a significant predictor of *PN Alcohol*, ordered log-odds estimate = .19 ($SE = .02$), proportional odds ratio (OR) = 1.21 (95% CI 1.16 to 1.26), Wald $\chi^2(1) = 71.10, p < .001$. This indicates that a 1-unit increase in *PB Alcohol* is associated with a 21% increase in the odds of being in a higher *PN Alcohol* category.

PTSD problems. *PB PTSD* was a significant predictor of *PN PES*, ordered log-odds estimate = .49 ($SE = .08$), proportional odds ratio (OR) = 1.64 (95% CI 1.40 to 1.92), Wald $\chi^2(1) = 36.63, p < .001$. This indicates that a 1-unit increase in *PB PTSD* is associated with a 64% increase in the odds of being in a higher *PN PES* category.

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Marital problems. *PB Marital* was a significant predictor of *PN Marital*, ordered log-odds estimate = $-.27$ ($SE = .05$), proportional odds ratio (OR) = 0.76 (95% CI 0.70 to 0.84), Wald $\chi^2(1) = 33.65$, $p < .001$. This indicates that a 1-unit increase in *PB Marital* is associated with a 24% decrease in the odds of being in a higher *PN Marital* category.

Hypothesis 2

The second hypothesis examined whether gender served as a moderator of the relationship between probable need for care and perceived need for care for alcohol problems, PTSD, and marital problems. It was hypothesized that females would display a stronger association between probable need for care and perceived need for care relative to males. This was tested in two ways. First, and for descriptive purposes, Kruskal-Wallis H tests were conducted to determine whether there were differences between males and females on *PN Alcohol*, *PN PES*, and *PN Marital* scores. Second, ordinal logistic regressions (OLR) were conducted predicting *PN* (outcome) from *PB* (predictor), gender (moderator), and the gender * *PB* interaction term for each problem domain (e.g., alcohol, PTSD, and marital).

Alcohol problems. The Kruskal-Wallis H test showed that *PN Alcohol* scores were not statistically significantly different between females (mean rank *PN Alcohol* score = 90.52) and males (mean rank *PN Alcohol* score = 90.49), $\chi^2(1) = 0.00$, $p = 1.0$.

Next an OLR was conducted predicting *PN Alcohol* from *PB Alcohol*, gender, and the *PB Alcohol* * *Gender* interaction term. The interaction term was not a significant predictor of perceived need in this model (Wald $\chi^2(1) = 0.02$, $p = .90$), meaning that gender does not interact with *PB Alcohol* to predict *PN Alcohol*.

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PTSD problems. The Kruskal-Wallis H test showed that *PN PES* scores were not statistically significantly different between females (mean rank *PN PES* score = 96.52) and males (mean rank *PN PES* score = 87.71), $\chi^2 (1) = 1.23, p = 0.27$.

Next an OLR was conducted predicting *PN PES* from *PB PTSD*, gender, and the *PB PTSD * Gender* interaction term. The *PB PTSD * Gender* interaction term was a significant predictor of *PN PES*, ordered log-odds estimate = -.33 (*SE* = .17), proportional odds ratio (OR) = 0.72 (95% CI 0.52 to 1.00), Wald $\chi^2 (1) = 3.85, p = .05$. Therefore, additional analyses were conducted to further elucidate the impact of gender on relations between *PB PTSD* and *PN PTSD*; specifically, OLRs were conducted separately for males and for females. For males, *PB PTSD* was a significant predictor of *PN PES*, ordered log-odds estimate = .39 (*SE* = .50), proportional odds ratio (OR) = 1.48 (95% CI 1.23 to 1.79), Wald $\chi^2 (1) = 17.22, p < .001$. This indicates that for males, a 1-unit increase in *PB PTSD* is associated with a 48% increase in the odds of being in a higher *PN PES* category. For females, *PB PTSD* was a significant predictor of *PN PES*, ordered log-odds estimate = .76 (*SE* = .17), proportional odds ratio (OR) = 2.13 (95% CI 1.54 to 2.96), Wald $\chi^2 (1) = 20.88, p < .001$. This indicates that for females, a 1-unit increase in *PB PTSD* is associated with a 213% increase in the odds of being in a higher *PN PES* category. These results indicate that there is a stronger relationship between *PB PTSD* and *PN PES* for females as compared to males.

Marital problems. The Kruskal-Wallis H test showed that *PN Marital* scores were not statistically significantly different between females (mean rank *PN Marital* score = 91.99) and males (mean rank *PN Marital* score = 89.81), $\chi^2 (1) = 0.08, p = 0.78$.

Next an OLR was conducted predicting *PN Marital* from *PB Marital*, gender, and the *PB Marital * Gender* interaction term. The interaction term was not a significant predictor of

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perceived need in this model (Wald $\chi^2(1) = 0.43, p = .51$), meaning that gender does not interact with *PB Marital* to predict *PN Marital*.

Other potential moderators. Other potential moderators were tested such as age, race, *Number of People Concerned*, and *Attitudes toward Perceived Need for Care*. For each of these analyses, relationships between the variables were first tested with Spearman Rank Order correlations (for age, *Number Concerned*, and *PN Attitudes*) or a Kruskal-Wallis H Test (for race). Next, OLRs were conducted predicting the *PN* domain (e.g., alcohol, PES, and marital) from the *PB* domain (e.g., alcohol, PTSD, and marital), the potential moderator, and the *PB* * potential moderator interaction term.

Age. Spearman Rank Order correlations showed that age was moderately negatively correlated with *PN Alcohol* (Spearman's $\rho = -.38, p < .001$), *PN PES* (Spearman's $\rho = -.25, p = .001$), and *PN Marital* (Spearman's $\rho = -.27, p < .001$).

Next, separate OLRs were conducted for each domain (e.g., alcohol, PTSD, and marital), predicting the *PN* variables from the *PB* variables, age, and the *PB* * age interaction terms (see Table 4). Given that the interaction terms were not significant in any of the analyses, additional analyses were conducted without the interaction terms. Table 5 displays the results of these analyses. The *PB* variables remained significant. Age was a marginally significant predictor of *PN Alcohol* ($p = .08$) and *PN Marital* ($p = .06$); each 1-year increase in age is associated with a 2% decrease in the odds of being in a higher *PN Alcohol* category, and a 2% decrease in the odds of being in a higher *PN Marital* category.

Race. Given the large number of categories in this variable ($n = 8$), and discrepant number of participants in each category, there was likely low power for these analyses; thus the original race variable was first analyzed with all 8 categories and then a new dichotomous

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variable was created representing White versus Non-white. The Kruskal-Wallis H tests showed that only *PN Alcohol* scores were statistically significantly different between self-identified race categories (see Tables 6, 7, and 8). Participants who selected “Other” and those who chose not to identify their race showed the highest *PN Alcohol* scores, followed by individuals identifying as Native Alaskan/American Eskimo, Asian, Hispanic/Latino, White, and Black. Those who self-identified as “Mixed Race” were the lowest. In the White versus Non-white analysis, those who self-identified as Non-white had statistically significantly higher scores (mean rank *PN Alcohol* score = 102.91) than those who identified as White (mean rank *PN Alcohol* score = 80.37), $\chi^2(1) = 11.78, p = .003$. Table 9 displays the results of the ordinal logistic regressions, described below.

First, an OLR was conducted predicting *PN Alcohol* from *PB Alcohol*, race, and the *PB Alcohol * Race* interaction term using the full race variable. The interaction term was not a significant predictor of *PN Alcohol* in this model ($\chi^2(1) = 0.01$ to $1.09, p = .30$ to $.94$). Next, a similar analysis was conducted using the White versus Non-white race variable. The interaction term was not a significant predictor of *PN Alcohol* in this model ($\chi^2(1) = .02, p = .89$).

An OLR was conducted predicting *PN PES* from *PB PTSD*, race, and the *PB PTSD * Race* interaction term using the full race variable. The interaction term was not a significant predictor of *PN PES* in this model ($\chi^2(1) = 0.00$ to $1.41, p = .23$ to $.95$). Next, a similar analysis was conducted using the White versus Non-white race variable. The interaction term was not a significant predictor of *PN PES* in this model ($\chi^2(1) = .26, p = .61$).

An OLR was conducted predicting *PN Marital* from *PB Marital*, race, and the *PB Marital * Race* interaction term using the full race variable. The interaction term was not a significant predictor of *PN Marital* in this model ($\chi^2(1) = 0.00$ to $1.60, p = .21$ to 1.00). Next, a

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similar analysis was conducted using the White versus Non-white race variable. The *PB Marital* * *Race* interaction term was a significant predictor of *PN Marital*, ordered log-odds estimate = -.18 ($SE = .09$), proportional odds ratio (OR) = 0.83 (95% CI 0.70 to 1.00), Wald $\chi^2(1) = 3.74$, $p = .05$. Therefore race interacts with *PB Marital* to predict *PN Marital*.

Follow up analyses were completed to further elucidate this interaction. The bivariate correlation between *PB Marital* and *PN Marital* was -.51 ($p < .001$) for participants who identified as White, and -.35 ($p = .001$) for participants who identified as Non-White. Follow up slope analyses indicated that Race moderated the relationship between *PB Marital* and *PN Marital*. For those who self-identified as White, each 1-unit increase in *PB Marital* was associated with 31% decrease in the odds of being in a higher *PN Marital* category. The Non-white category served as the reference group in these analyses.

Number concerned. Spearman Rank Order correlations showed that *Number Concerned* was moderately positively correlated with *PN Alcohol* (Spearman's $\rho = .45$, $p < .001$), *PN PES* (Spearman's $\rho = .48$, $p < .001$), and *PN Marital* (Spearman's $\rho = .40$, $p < .001$).

Next, separate OLRs were conducted for each domain (e.g., alcohol, PTSD, and marital), predicting the *PN* variables from the *PB* variables, *Number Concerned*, and the *PB * Number Concerned* interaction terms. None of the interaction terms were significant predictors. These results may represent power issues.

PN Attitudes. Spearman Rank Order correlations showed that *PN Attitudes* was negatively correlated with *PN Alcohol* (Spearman's $\rho = -.21$, $p = .005$) and *PN Marital* (Spearman's $\rho = -.25$, $p = .001$). *PN Attitudes* was marginally significantly correlated with *PN PES* (Spearman's $\rho = -.14$, $p = .06$). Table 10 further elucidates the relationships between *PN Attitudes* items and the *PN* variables.

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Next, separate OLRs were conducted for each domain (e.g., alcohol, PTSD, and marital), predicting the *PN* variables from the *PB* variables, *PN Attitudes*, and the *PB * PN Attitudes* interaction terms. In all of the models, the *PN*PN Attitudes* interaction term was not significant (for *Alcohol*: $\chi^2(1) = 0.33$ and 0.40 , $ps = .57$ and $.53$, respectively; for *PTSD*: $\chi^2(1) = 0.01$ and 0.00 , $ps = .94$ and $.96$, respectively; for *Marital*: $\chi^2(1) = 0.49$ and 0.09 , $ps = .53$ and $.76$, respectively).

Finally, OLRs were conducted for each domain (e.g., alcohol, PTSD, and marital), predicting the *PN* variables from the *PB* variables, each *PN Attitudes* item, and the *PB * PN Attitudes* item interaction terms. The results of these analyses are shown in Table 11. Only one of the 18 interaction terms (5%) was significant: the *PB * PN Attitudes* item 4 interaction significantly predicted PN Alcohol, ordered log-odds estimate = -0.05 ($SE = .02$), proportional odds ratio (OR) = 0.95 (95% CI 0.91 to 0.99), Wald $\chi^2(1) = 6.62$, $p = .01$. This item states: “A personal, emotional, alcohol, or marital/relationship problem would have to be very bad before I sought treatment.” None of the remaining 17 interaction terms were significant (for *Alcohol*: $\chi^2(1) = 0.11$ to 1.40 , $ps = .24$ to $.75$; for *PTSD*: $\chi^2(1) = 0.11$ to 3.45 , $ps = .06$ to $.75$; for *Marital*: $\chi^2(1) = 0.21$ to 3.06 , $ps = .08$ to $.65$).

Hypothesis 3

The third hypothesis could not be tested as written given that the data for *Length of Military Service* was unusable. However, given that there was other data collected about military service history, analyses were completed to test whether military branch or exposure to combat served as moderators of the relationship between the *PB domains* (alcohol, PTSD, and marital) and the *PN domains* (alcohol, PES, and marital). First, and for descriptive purposes, Kruskal-Wallis H tests were conducted to determine whether there were differences between military

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branches on *PN Alcohol*, *PN PES*, and *PN Marital* scores. Second, ordinal logistic regressions (OLR) were conducted predicting *PN* (outcome) from *PB* (predictor), military branch (moderator), and the *Military Branch* * *PB* interaction term for each problem domain (e.g., alcohol, PTSD, and marital). Similar analyses were conducted for exposure to combat.

Military branch.

Alcohol problems. The Kruskal-Wallis H test showed that *PN Alcohol* scores were not statistically significantly different between military branches: Army (mean rank *PN Alcohol* score = 90.91), Navy (mean rank *PN Alcohol* score = 97.59), Air Force (mean rank *PN Alcohol* score = 73.72), Marine Corps (mean rank *PN Alcohol* score = 111.55), Coast Guard (mean rank *PN Alcohol* score = 111.17), Reservist or National Guard (mean rank *PN Alcohol* score = 95.57), and Other (mean rank *PN Alcohol* score = 77.64), $\chi^2(6) = 9.03, p = .17$.

Next an OLR was conducted predicting *PN Alcohol* from *PB Alcohol*, military branch, and the *PB Alcohol* * *Military Branch* interaction term. The *PB Alcohol* * *Military Branch* interaction term was a significant predictor of *PN Alcohol* for Army (ordered log-odds estimate = .17 (*SE* = .08), proportional odds ratio (OR) = 1.18 (95% CI 1.01 to 1.38), Wald $\chi^2(1) = 4.40, p < .05$), Navy (ordered log-odds estimate = .19 (*SE* = .09), proportional odds ratio (OR) = 1.21 (95% CI 1.01 to 1.44), Wald $\chi^2(1) = 4.23, p < .05$), and Air Force (ordered log-odds estimate = .22 (*SE* = .10), proportional odds ratio (OR) = 1.25 (95% CI 1.02 to 1.51), Wald $\chi^2(1) = 4.85, p < .05$). Therefore military branch interacts with *PB Alcohol* to predict *PN Alcohol*.

Follow up slope analyses were completed to further elucidate this interaction. Table 12 shows the results for each military branch. For Air Force service members, each 1-unit increase in *PB Alcohol* was associated with 31% increase in the odds of being in a higher *PN Alcohol* category. For Navy service members, there was a 27% increase in the odds, and a 24% increase

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in the odds for Army service members. Results were non-significant for Marine Corps, Coast Guard, and Reservist or National Guard ($\chi^2 (1) = 0.24$ to 0.91 , $p = .34$ to $.63$). The “Other” category served as the reference group in these analyses.

PTSD problems. The Kruskal-Wallis H test showed statistically significant differences in *PN PES* scores between military branches: Army (mean rank *PN PES* score = 99.75), Navy (mean rank *PN PES* score = 80.37), Air Force (mean rank *PN PES* score = 68.66), Marine Corps (mean rank *PN PES* score = 97.64), Coast Guard (mean rank *PN PES* score = 108.33), Reservist or National Guard (mean rank *PN PES* score = 107.30), and Other (mean rank *PN PES* score = 66.50), $\chi^2 (6) = 14.69$, $p < .05$. Members of the Coast Guard were the highest, followed by Reservists or National Guard members, followed by Army, Marine Corps, Navy, and Air Force members. “Other” service members displayed the lowest ranks.

Next an OLR was conducted predicting *PN PES* from *PB PTSD*, military branch, and the *PB PTSD * Military Branch* interaction term. The *PB PTSD * Military Branch* interaction term was a significant predictor of *PN PES* for all branches ($\chi^2 (1) = 361.57$ to 1155.15 , $ps < .001$). Therefore military branch interacts with *PB PTSD* to predict *PN PES*.

Follow up slope analyses were completed to further elucidate this interaction. Table 13 shows the results for each military branch. For Navy service members, each 1-unit increase in *PB PTSD* was associated with 86% increase in the odds of being in a higher *PN PES* category. For Army service members, there was a 72% increase in the odds. There was a 60% increase for Air Force, 56% for Marine Corps, and 52% for both Coast Guard and Reservists or National Guard. The “Other” category served as the reference group in these analyses.

Marital problems. The Kruskal-Wallis H test showed that *PN Marital* scores were not statistically significantly different between military branches: Army (mean rank *PN Marital*

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score = 98.04), Navy (mean rank *PN Marital* score = 86.30), Air Force (mean rank *PN Marital* score = 74.05), Marine Corps (mean rank *PN Marital* score = 89.18), Coast Guard (mean rank *PN Marital* score = 110.22), Reservist or National Guard (mean rank *PN Marital* score = 88.90), and Other (mean rank *PN Marital* score = 88.79), $\chi^2 (6) = 7.55, p = .27$.

Next an OLR was conducted predicting *PN Marital* from *PB Marital*, military branch, and the *PB Marital * Military Branch* interaction term. The *PB Marital * Military Branch* interaction term did not approach statistical significance in this model ($\chi^2 (1) = \text{between .07 and .38}, p = \text{between .54 and .82}$).

Combat.

Alcohol problems. The Kruskal-Wallis H test showed statistically significant differences in *PN Alcohol* scores between those whose military service included combat and dangerous or traumatic assignments (mean rank *PN Alcohol* score = 99.63) and those whose service did not (mean rank *PN Alcohol* score = 70.69), $\chi^2 (1) = 13.92, p < .001$.

Next an OLR was conducted predicting *PN Alcohol* from *PB Alcohol*, *Combat*, and the *PB Alcohol * Combat* interaction term. The *PB Alcohol * Combat* interaction term was not a significant predictor of perceived need in this model (Wald $\chi^2 (1) = .30, p = .59$).

PTSD problems. The Kruskal-Wallis H test showed statistically significant differences in *PN PES* scores between those whose military service included combat and dangerous or traumatic assignments (mean rank *PN PES* score = 96.32) and those whose service did not (mean rank *PN PES* score = 78.48), $\chi^2 (1) = 4.85, p < .05$.

Next an OLR was conducted predicting *PN PES* from *PB PTSD*, *Combat*, and the *PB PTSD * Combat* interaction term. The *PB PTSD * Combat* interaction term was a significant predictor of *PN PES*, ordered log-odds estimate = .49 ($SE = .20$), proportional odds ratio (OR) =

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1.63 (95% CI 1.10 to 2.44), Wald $\chi^2 (1) 5.79, p < .05$. Therefore *Combat* interacts with *PB PTSD* to predict *PN PES*. Additional analyses were conducted to further elucidate the impact of combat on relations between *PB PTSD* and *PN PES*. Specifically, OLRs were conducted separately for those who did and did not have exposure to combat. For those with combat exposure, *PB PTSD* was a significant predictor of *PN PES*, ordered log-odds estimate = .43 ($SE = .10$), proportional odds ratio (OR) = 1.54 (95% CI, 1.27 to 1.86), Wald $\chi^2 (1) = 19.48, p < .001$. This indicates that for those with combat exposure, a 1-unit increase in *PB PTSD* is associated with a 54% increase in the odds of being in a higher *PN PES* category. For those without combat exposure, *PB PTSD* was a significant predictor of *PN PES*, ordered log-odds estimate = .74 ($SE = .20$), proportional odds ratio (OR) = 2.10 (95% CI, 1.42 to 3.09), Wald $\chi^2 (1) = 13.97, p < .001$. This indicates that for those without combat exposure, a 1-unit increase in *PB PTSD* is associated with a 210% increase in the odds of being in a higher *PN PES* category. These results indicate that there is a stronger relationship between *PB PTSD* and *PN PES* for those without combat exposure as compared to those who did experience combat.

Marital problems. The Kruskal-Wallis H test showed statistically significantly differences in *PN Marital* scores between those whose military service included combat and dangerous or traumatic assignments (mean rank *PN Marital* score = 97.09) and those whose service did not (mean rank *PN Marital* score = 76.67), $\chi^2 (1) = 6.93, p < .05$.

Next an OLR was conducted predicting *PN Marital* from *PB Marital*, *Combat*, and the *PB Marital * Combat* interaction term. The *PB Marital * Combat* interaction term was a significant predictor of *PN Marital*, ordered log-odds estimate = -.34 ($SE = .12$), proportional odds ratio (OR) = 0.72 (95% CI 0.56 to 0.91), Wald $\chi^2 (1) 7.35, p < .05$. Therefore *Combat* interacts with *PB Marital* to predict *PN Marital*. Additional analyses were conducted to further

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elucidate the impact of *Combat* on relations between *PB Marital* and *PN Marital*. Specifically, OLRs were conducted separately for those who did and did not have exposure to combat. *PB Marital* was a significant predictor of *PN Marital* for those with combat exposure (ordered log-odds estimate = $-.19$ ($SE = .05$), proportional odds ratio (OR) = 0.83 (95% CI 0.75 to 0.91), Wald $\chi^2(1) = 13.57$, $p < .001$) and without (ordered log-odds estimate = $-.54$ ($SE = .13$), proportional odds ratio (OR) = 0.58 (95% CI 0.45 to 0.75), Wald $\chi^2(1) = 17.56$, $p < .001$). These results show that there is a stronger relationship between *PB Marital* and *PN Marital* for those who did have exposure to combat as compared to those who did not.

Hypothesis 4

This hypothesis was also not tested as written, due to the overlap between the data for predictor, potential moderator, and outcome variables. The hypothesis sought to explore the moderating influence of psychological symptoms on the relationship between probable and perceived need for care. The psychological symptoms variable would include AUDIT scores and PC-PTSD scores, which became the scales used for the *PB Alcohol* and *PB PTSD* variables. Therefore this hypothesis would have tested the relationships between *PB Alcohol* and *PN Alcohol*, as moderated by *PB Alcohol* and *PB PTSD*. Given this overlap, this analysis was not completed as proposed.

However, analyses were completed to test whether *PB Alcohol* served as a moderator of the relationship between *PB PTSD* and *PN PES*. An OLR was conducted predicting *PN PES* from *PB PTSD*, *PB Alcohol*, and the *PB PTSD * PB Alcohol* interaction term. The *PB PTSD * PB Alcohol* interaction term was a significant predictor of *PN PES*, ordered log-odds estimate = $-.02$ ($SE = .01$), proportional odds ratio (OR) = 0.98 (95% CI 0.96 to 1.00), Wald $\chi^2(1) = 4.53$, $p < .05$. Therefore *PB Alcohol* interacts with *PB PTSD* to predict *PN PES*.

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Additional analyses were conducted to further elucidate the impact of *PB Alcohol* on the relationship between *PB PTSD* and *PN PES*. Specifically, *PB Alcohol* was recoded into three separate variables: *Low PB Alcohol* (i.e., 1 standard deviation below the mean), *Average PB Alcohol*, and *High PB Alcohol* (i.e., 1 standard deviation above the mean) (see Aiken & West, 1991). Separate OLRs were conducted predicting *PN PES* from *PB PTSD* and each *PB Alcohol* variable. The effect of *PB PTSD* on *PN PES* did not statistically differ for low or average *PB Alcohol* (OR = 1.54 and 1.50, 95% CI 1.28 to 1.85 and 1.25 to 1.79, Wald $\chi^2(1) = 21.36$ and 19.70, $ps < .001$). When *PB Alcohol* was high, *PB PTSD* was much more likely to increase the odds of being in a higher *PN PES* category (OR = 2.14 (95% CI 1.44 to 3.19), Wald $\chi^2(1) = 14.16$, $p < .001$).

Similarly, analyses were completed to test whether *PB PTSD* served as a moderator of the relationship between *PB Alcohol* and *PN Alcohol*. An OLR was conducted predicting *PN Alcohol* from *PB Alcohol*, *PB PTSD*, and the *PB Alcohol * PB PTSD* interaction term. The *PB Alcohol * PB PTSD* interaction term was a not significant predictor of *PN Alcohol* ($\chi^2(1) = 0.10$, $p = .76$).

Hypothesis 5

The fifth hypothesis examined whether relationship distress served as a moderator of the relationship between probable need for care and perceived need for care for alcohol problems and PTSD. It was hypothesized that those with greater relationship distress will display a stronger association between probable need for care and perceived need for care relative to those with lower distress. First, and for descriptive purposes, Spearman Rank Order correlations were conducted to analyze the relationships between *PB Marital*, *PN Alcohol*, and *PN PES*. Second, ordinal logistic regressions (OLR) were conducted predicting *PN Alcohol* from *PB Alcohol*, *PB*

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Marital (moderator), and the *PB Marital * PB Alcohol* interaction term. A parallel analysis examined the interaction between *PB Marital* and *PB PTSD* when predicting *PN PES*.

Alcohol problems. Spearman Rank Order correlations indicated a significant moderately negative correlation between *PB Marital* and *PN Alcohol* (Spearman's $\rho = -.52, p < .001$).

An OLR was conducted predicting *PN Alcohol* from *PB Alcohol*, *PB Marital*, and the *PB Alcohol * PB Marital* interaction term. The *PB Alcohol * PB Marital* interaction term was a not significant predictor of *PN Alcohol* in this model ($\chi^2 (1) = 2.24, p = .14$). Thus while *PB Marital* predicts *PN Marital* in the absence of *PB Alcohol*, this relationship is no longer significant in the presence of *PB Alcohol*.

PTSD problems. Spearman Rank Order correlations indicated a significant moderate negative correlation between *PB Marital* and *PN PES* (Spearman's $\rho = -.38, p < .001$).

An OLR was conducted predicting *PN PES* from *PB PTSD*, *PB Marital*, and the *PB PTSD * PB Marital* interaction term. The *PB PTSD * PB Marital* interaction term was a not significant predictor of *PN PES* in this model ($\chi^2 (1) = 2.55, p = .11$).

PB Alcohol and PB PTSD on PN Marital.

Similar analyses were conducted to analyze the potential moderating impact of *PB Alcohol* and *PB PTSD* on the relationship between *PB Marital* and *PN Marital*. First, and for descriptive purposes, Spearman Rank Order correlations were conducted to analyze the relationships between *PB Alcohol*, *PB PTSD*, and *PN Marital*. Second, ordinal logistic regressions (OLR) were conducted predicting *PN Marital* (outcome) from *PB Marital* (predictor), *PB Alcohol* or *PTSD* (moderator), and the *PB Marital * PB Alcohol* or *PTSD* interaction term.

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Alcohol problems. Spearman Rank Order correlations indicated a significant moderate positive correlation between *PB Alcohol* and *PN Marital* (Spearman's $\rho = .42, p < .001$).

An OLR was conducted predicting *PN Marital* from *PB Marital*, *PB Alcohol*, and the *PB Marital * PB Alcohol* interaction term. The *PB Marital * PB Alcohol* interaction term was a significant predictor of *PN Marital*, ordered log-odds estimate = .02 ($SE = .01$), proportional odds ratio (OR) = 1.02 (95% CI 1.00 to 1.03), Wald $\chi^2 (1) = 6.06, p < .05$.

Additional analyses were conducted to further elucidate the impact of high and low *PB Alcohol* on relations between *PB Marital* and *PN Marital*. Specifically, *PB Alcohol* was recoded into a dichotomous dummy variable where “0” represented below the mean on AUDIT scores (e.g., low *PB Alcohol*) and “1” represented above the mean on AUDIT scores (e.g., high *PB Alcohol*). The file was split and an OLR was conducted. For those with low *PB Alcohol*, *PB Marital* was a significant predictor of *PN Marital*, ordered log-odds estimate = -.34 ($SE = .08$), proportional odds ratio (OR) = 0.72 (95% CI 0.62 to 0.83), Wald $\chi^2 (1) = 18.89, p < .001$. This indicates that for those with low *PB Alcohol*, a 1-unit increase in *PB Marital* is associated with a 28% decrease in the odds of being in a higher *PN Marital* category. For those with high *PB Alcohol*, *PB Marital* was a marginally significant predictor of *PN Marital*, ordered log-odds estimate = -.13 ($SE = .07$), proportional odds ratio (OR) = 0.88 (95% CI 0.77 to 1.00), Wald $\chi^2 (1) = 3.69, p = .06$. This indicates that for those with high *PB Alcohol*, a 1-unit increase in *PB Marital* is associated with a 12% decrease in the odds of being in a higher *PN Marital* category. These results indicate that there is a stronger relationship between *PB Marital* and *PN Marital* for those with low *PB Alcohol* compared to those with high *PB Alcohol*.

PTSD problems. Spearman Rank Order correlations indicated a significant moderate positive correlation between *PB PTSD* and *PN Marital* (Spearman's $\rho = .34, p < .001$).

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An OLR was conducted predicting *PN Marital* from *PB Marital*, *PB PTSD*, and the *PB Marital * PB PTSD* interaction term. The *PB Marital * PB PTSD* interaction term was a not significant predictor of *PN Marital* in this model ($\chi^2(1) = .32, p = .57$).

Exploratory Hypothesis

The exploratory hypothesis tested (1) whether veterans reported interest in utilizing couples therapy for problems related to alcohol use now or in the future, and (2) whether perceived need for care served as a mediator in the relationship between probable need for care and interest in treatment.

For the first aim, Table 14 shows descriptive information about all of the *Interest in Treatment* variables. Participants showed a mean interest of 0.72 ($SD = 1.02$) for *Alcohol Treatment*, 1.18 ($SD = 1.16$) for *PES Treatment*, and 0.87 ($SD = 1.10$) for *Marital Treatment*. Thus, on average, veterans' interest in treatment is between "Not at all" and "Somewhat interested." On the questions related to couples treatment, participants had a mean of 1.32 ($SD = 1.31$) for interest in having their spouse more involved in their treatment, 1.40 ($SD = 1.29$) for their perception of their spouse's interest in being involved in their treatment, and 1.37 ($SD = 1.24$) for their perception of their spouse's interest in attending their treatment sessions. Thus, on average, veterans' interest in greater spouse involvement in treatment is between "A little" and "Somewhat."

The second exploratory aim sought to determine whether *PN* served as a mediator in the relationship between *PB* and *Interest in Treatment*. First, relationships between the *PB*, *PN*, and *Interest in Treatment* variables for the problem domains (e.g., alcohol, PTSD, and marital) were examined with Spearman Rank Order correlations (shown in Table 3). There were moderate to strong relationships between all variables of interest in these analyses.

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Next, separate OLRs were conducted for each domain (e.g., alcohol, PTSD, and marital), predicting the *PN* variables from the *PB* variables. Separate OLRs were also conducted for each domain (e.g., alcohol, PTSD, and marital) predicting the *Interest in Treatment* variables from the *PN* variables. These results were used in the RMediation program.

RMediation was used to determine whether *PN* mediates the relationship between *PB* and *Interest in Treatment*. RMediation was used to compute 95% confidence intervals (CIs) for the distribution of the product of the variables, and is based on MacKinnon et al. (2002). This process allows for a test of the indirect path, and eliminates the need to test each path of a model individually (Montoya & Hayes, 2017). This method is recommended over others, especially with smaller sample sizes (Tofighi, 2011). In Figure 2, the product of the coefficients *ab* is the indirect effect of *PB* (predictor) on *Interest in Treatment* (outcome), through *PN* (potential mediator). To test the mediation hypothesis, a 95% CI was computed for the product of *ab*. In each of these analyses, if the CI does not contain 0 then mediation is present.

Alcohol problems. This regression analysis was used to investigate whether *PN Alcohol* mediates the relationship between *PB Alcohol* and *Interest in Alcohol Treatment*. Results indicated that *PB Alcohol* was a significant predictor of *PN Alcohol*, ordered log-odds estimate = 0.19 (*SE* = .02), proportional odds ratio (OR) = 1.21 (95% CI 1.16 to 1.26), Wald $\chi^2(1) = 71.10$, $p < .001$ and that *PN Alcohol* was a significant predictor of *Interest in Alcohol Treatment*, ordered log-odds estimate = 1.76 (*SE* = .21), proportional odds ratio (OR) = 5.81 (95% CI 3.82 to 8.83), Wald $\chi^2(1) = 67.67$, $p < .001$. The indirect effect was tested using RMediation; results indicated that the indirect coefficient was significant, estimate = 0.34 (*SE* = 0.07), proportional odds ratio (OR) = 1.40 (95% CI 1.23 to 1.63). Figure 3 displays the RMediation results. These results indicate that *PN Alcohol* mediates the relationship between *PB Alcohol* and *Interest in*

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Alcohol Treatment. *PN Alcohol* accounts of 52% of the variance in *Interest in Alcohol Treatment*. Percent mediation ($a*b / c$) was calculated to be 98%.

PTSD problems. This regression analysis was used to investigate whether *PN PES* mediates the relationship between *PB PTSD* and *Interest in PES Treatment*. Results indicated that *PB PTSD* was a significant predictor of *PN PES*, ordered log-odds estimate = 0.49 ($SE = .08$), proportional odds ratio (OR) = 1.64 (95% CI 1.40 to 1.92), Wald $\chi^2 (1) = 36.63, p < .001$ and that *PN PES* was a significant predictor of *Interest in PES Treatment*, ordered log-odds estimate = 1.21 ($SE = .17$), proportional odds ratio (OR) = 3.36 (95% CI 2.41 to 4.70), Wald $\chi^2 (1) = 50.50, p < .001$. The indirect effect was tested using RMediation; results indicated that the indirect coefficient was significant, estimate = 0.61 ($SE = 0.16$), proportional odds ratio (OR) = 1.83 (95% CI 1.39 to 2.57). Figure 4 displays the RMediation results. These results indicate that *PN PES* mediates the relationship between *PB PTSD* and *Interest in PES Treatment*. *PN PES* accounts of 30% of the variance in *Interest in PES Treatment*. Percent mediation was calculated to be 97%.

Marital problems. This regression analysis was used to investigate whether *PN Marital* mediates the relationship between *PB Marital* and *Interest in Marital Treatment*. Results indicated that *PB Marital* was a significant predictor of *PN Marital*, ordered log-odds estimate = -0.27 ($SE = .05$), proportional odds ratio (OR) = 0.76 (95% CI 0.70 to 0.84), Wald $\chi^2 (1) = 33.65, p < .001$ and that *PN Marital* was a significant predictor of *Interest in Marital Treatment*, ordered log-odds estimate = 1.31 ($SE = .18$), proportional odds ratio (OR) = 3.71 (95% CI 2.60 to 5.30), Wald $\chi^2 (1) = 52.15, p < .001$. The indirect effect was tested using RMediation; results indicated that the indirect coefficient was significant, estimate = -0.36 ($SE = 0.09$), proportional odds ratio (OR) = 0.70 (95% CI 0.57 to 0.83). Figure 5 displays the RMediation results. These

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results indicate that *PN Marital* mediates the relationship between *PB Marital* and *Interest in Marital Treatment*. *PN Marital* accounts of 36% of the variance in *Interest in Marital Treatment*.

Percent mediation was calculated to be 98%.

Summary of Results

Regarding the relationship between *PB* and *PN*, there were no statistically significant differences between *PB* and *PN*. However, there were moderate to strong correlations between the *PB* and *PN* variables across domains (e.g., alcohol, PTSD, and marital problems). Additionally, in regressions, the *PB* variables were statistically significant predictors of the *PN* variables.

Regarding gender, gender moderated the relationship between *PB PTSD* and *PN PES* such that there was a stronger relationship between those variables for female veterans. Several other potential moderators were tested, but did not display predictive power. Only race interacted with *PB Marital* for veterans who self-identified as white. There was an interaction between military branch and *PB* in the domains of alcohol and PTSD, and an interaction between combat exposure and *PB* in the domains of PTSD and marital problems.

Regarding interactions between the domains, alcohol problems moderated the relationship between *PB PTSD* and *PN PES*, though the opposite direction was not statistically significant. Additionally, alcohol impacted marital problems such that there was a stronger relationship between *PB Marital* and *PN Marital* for those with low *PB Alcohol* compared to those with high *PB Alcohol*.

The exploratory hypotheses showed that veterans in this sample did endorse interest in treatment for the various domains of problems, and also endorsed interest in having their spouses involved in treatment.

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Finally, for all domains, *PN* moderated the relationship between *PB* and *Interest in Treatment*.

Discussion

The first hypothesis explored whether there were differences between probable and perceived need for care across three domains: alcohol problems, PTSD, and marital problems. On the tests utilized in this study, there were no statistically significant differences between probable and perceived need across any of the domains. This is inconsistent with the literature, which shows that veterans tend to have low recognition of problems in the face of symptoms (Britt et al., 2015; Elbogen et al., 2013; McKibben et al., 2013; Sareen et al., 2010; Vogt et al., 2014; Warner et al., 2008), and low recognition of the necessity of treatment (Spoont et al., 2014; Stecker et al., 2007; Vogt et al., 2014). There were significant positive correlations between probable and perceived need for alcohol and PTSD, and regressions showed that probable need predicted perceived need for all three domains. In this sample, it appears that there is stronger recognition of problems in the face of symptoms. This may be due to the conceptually related nature of these constructs as measured in this study. Additionally, these findings could be a result of data collection methods which led to a self-selected sample; these individuals may have been more amenable to participating in this study because they were better informed about mental health problems and the utility of treatment.

The second hypothesis explored whether gender served as a moderator of the relationship between probable and perceived need for care across the three domains (i.e., alcohol, PTSD, and marital distress). Results indicated that gender had an impact on PTSD symptoms and perceived need for care; there was a stronger relationship between probable and perceived need for care in the domain of PTSD for females than for males. Thus, females in this sample were more likely to

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recognize a problem and a need for treatment in the face of struggles with PTSD symptoms than males. This is consistent with the literature showing that being female and having more severe PTSD symptoms are associated with an increased likelihood of accessing treatment (Hoerster et al., 2012). This study appears to support the claim that females are more likely to perceive a need for care, which is a first step in initiating treatment. It is not yet clear why this gender difference was not evident for alcohol or marital problems. This finding represents a critical problem in the field: engaging males with PTSD in treatment. Clinicians engaging in treatment recruitment efforts can develop educational materials about PTSD symptoms and available treatments to specifically inform and attract males in order to help those in need and close the treatment gap.

Several other variables were also tested as potential moderators, including demographic variables such as age and self-identified race, the number of people an individual identified as concerned about them, and the veteran's attitudes toward perceived need for care. Overall, the relationships between probable and perceived need for treatment for alcohol, PTSD, and marital problems were largely unaffected by these variables. There was limited evidence that the dichotomous self-identified race variable moderated the relationship between probable and perceived need for treatment for marital problems. Given prior research showing that demographic variables such as gender, self-identified race, and age may have an impact on utilizing mental health services (e.g., Byers, Arean, & Yaffe, 2012; Hoerster et al., 2012), future research is warranted to explore these questions in larger studies with more power to be able to test these effects. Of note, this sample included relatively lower numbers of participants from marginalized racial and ethnic groups, leading to decreased representation of the Veteran population and decreased power to detect significant differences between groups.

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The third hypothesis explored whether aspects of an individual's military service history served as to moderate the relationship between probable and perceived need for care across the three domains (e.g., alcohol, PTSD, and marital). There were important differences between military branches, such that individuals who served in the Army, Navy, and Air Force branches were perceiving a greater need for treatment for alcohol when faced with symptoms, as compared to other military branches. In the domain of PTSD problems, military branch again served as a moderator; individuals in the various branches of the military appear to experience symptoms of PTSD differently; the relationship between probable and perceived need was strongest for Army, Navy, and Air Force members which was similar to the pattern observed for alcohol problems. Future research should explore the differing influences on the various military branches in order to determine how best to help a broader spectrum of service members. These differences may be reflective of the diversity of experiences had by members of the various branches of the military. Veterans of the various branches may have very different experiences in terms of duties and deployments while in the service. These findings can inform clinicians treating members of the various branches; treatment recruitment materials and treatment components may be best tailored to specific branches of veterans in order to best attract and help them.

Interestingly, when looking at individuals who were exposed to combat and other dangerous or traumatic assignments, there was a stronger relationship between probable and perceived need for care in each of the domains (i.e., alcohol, PTSD, and marital problems) for those *without* combat exposure as compared to those who did experience combat. It appears that there is some recognition of need when there is a problem for those who were exposed to combat, but the effect is more muted. These results may be due to stronger military culture

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fostered by those who are exposed to combat and missions involving greater danger, and particularly the aspects of military culture that may increase the likelihood of low perceived need, such as self-management (e.g., Stecker et al., 2007). It may be that these aspects of military culture are more reinforced in combat zones where danger is constantly present. Clearly, there is still work to be done in the US Military to improve support around mental health. Greater access to information about mental health symptoms could help to decrease stigma and low perceived need among service members and veterans. Additionally, greater access to services both abroad (e.g., during deployments) and stateside could be beneficial, especially given the work of Kehle et al. (2010) showing that accessing treatment while on deployment was positively related to accessing services once home. Shifts in military culture such as these appear to be central to increasing the recognition of problems and initiation of treatment for veterans.

For marital problems, these results indicate that those with higher relationship satisfaction were more likely to be in a higher perceived need category. Results indicated that there was a stronger relationship between probable and perceived need for care for those who did have exposure to combat as compared to those who did not. Thus those with higher levels of relationship satisfaction were more likely to perceive a need for care. This is consistent with the literature showing that having greater social support is linked to greater perceived need for care (Edlund, Unutzer, & Curran, 2006; Graziano & Elbogen, 2017). Additionally, it is consistent with studies indicating that when service members recognized that their mental health problems were having an impact on their families, they were more likely to seek treatment (Meis et al., 2010; Snyder et al., 2016) or reported greater interest in treatment (Batten et al., 2009; Meis et al., 2013). Overall, it appears that aspects of military service can have an important impact on the perception of need for care.

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The fourth and fifth hypotheses explored whether experiencing multiple types of problems played a moderating role in the relationship between probable and perceived need for treatment. The fourth hypothesis looked at whether alcohol problems impacted the relationship between probable and perceived need for treatment for PTSD. These analyses showed that only when alcohol problems were high (e.g., 1 standard deviation above the mean) did they begin to have an impact on recognition of a problem or recognition of a need for treatment in the domain of PTSD, such that participants endorsing high alcohol problems showed a stronger relationship between probable and perceived need. PTSD symptoms did not appear to play a role in perceived need for treatment for alcohol problems.

The fifth hypothesis explored whether marital problems affected the relationship between probable and perceived need in the domains of alcohol problems and PTSD. Marital problems did appear to influence perception of need for treatment, such that those with lower marital problems (e.g., higher relationship satisfaction) were less likely to perceive a need for treatment. The results of these analyses are consistent with the literature showing that service members often experience a high threshold of symptomatology and functional impairment before perceiving a problem and/or a need for treatment (Britt et al., 2015; Elbogen et al., 2013; McKibben et al., 2013; Sareen et al., 2010; Vogt, Fox, & Di Leone, 2014). Additionally, research has shown that romantic relationships have a strong impact on mental health; healthy relationships are associated with an upward spiral, and relationship distress is associated with a downward spiral, especially for veterans (Meis et al., 2013; Sherman et al., 2005; Snyder et al., 2016). Thus, the individuals who are experiencing both mental health problems and relationship problems may be experiencing greater distress and functional impairment overall.

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The exploratory aims of this study explored interest in treatment. The first exploratory aim explored whether veterans reported interest in using couples therapy for problems related to alcohol use now or in the future. Veterans in this study showed mild interest in treatment across domains, with a slightly higher mean interest in treatment for personal, emotional, or stress problems. Veterans also reported interest in having their spouses involved in treatment, and perceived their spouses as being interested in participating in the veterans' treatment.

The second exploratory aim was to determine whether perceived need for care served as a mediator between the relationship of probable need for care and interest in treatment. Recent literature clearly shows that misjudged need for treatment can impact treatment seeking (e.g., Andrade et al., 2014; Graziano & Elbogen, 2017; Larson et al., 2012; Spooner et al., 2014; Stecker, Fortney, Hamilton, & Ajzen, 2007; Vogt et al., 2014; Warner et al., 2008). This second exploratory aim initiates critical follow up to this question, which is whether recognition of a problem in the face of symptoms inspires one to seek treatment. This ties together the two components of the perceived need construct: recognition of a problem, and recognition that treatment is warranted. Both of these components are supported by theories related to treatment initiation (e.g., stages of change, HBM, and TPB) and may be critical factors that contribute to motivation, treatment initiation, and treatment engagement (Ajzen, 1991; Carpenter et al., 2002; Graziano & Elbogen, 2017; Montano & Kasprzyk, 2015). The results of this analyses, with cross-sectional data, showed that perceived need statistically mediates the relationship between probable need and interest in treatment across the three problem domains (i.e., alcohol, PTSD, and marital problems). This supports claims in the literature that experiencing symptoms is not a direct link to seeking treatment, hence the treatment gap (Hoge et al., 2004). Greater efforts are

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needed to both screen veterans for problems and educate them about what their symptoms mean, and how they can be helped by treatment.

Limitations

There were several limitations to this study. First, this study was designed to be cross-sectional, which limits predictive ability as compared to a longitudinal design and constrains conclusions about mediation. Additionally, because participants were not followed over time, eventual engagement in treatment (or lack thereof) was not measured. Thus, endorsement of interest in treatment was used as a proxy of possible future engagement in treatment. However, previous research demonstrates that perceived need for treatment is a distinct construct from actual behavioral initiation of and retention in treatment. Second, data was collected with the use of self-report questionnaires, which can lead to bias and missing data. Additionally, given that the data is self-reported, it is difficult to separate perceived need for treatment from actual need for treatment across the analyses. Also, it is notable that there is relatively limited information on the psychometrics of a number of the measures developed specifically for and used in this study, given that this is a growing field of research without well validated measures. This study supports prior research showing that perceived need is an important internal barrier to care, and future research should utilize additional methods to better differentiate probable versus perceived need (e.g., diagnostic interviews administered by trained mental health professionals to assess probable need). Third, while the sample size provided adequate power for the majority of the analyses, in certain analyses there was a discrepant number of cases in various categories, and many categories leading to multiple sets of analyses, which likely led to decreased power to detect significant results. Fourth, for efficiency and in order to adequately compensate participants, the battery was limited to 30 minutes. This led to briefer measures of some

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constructs. Future studies should include more comprehensive assessments of these constructs and the relationships between them. Fifth, the sample was comprised of military veterans in committed relationships in order to explore social support and the transactional relationships between romantic relationships, mental health, substance use, and treatment seeking. Thus these results may not generalize to veterans who are not in committed relationships, or to civilians. Additional research on this topic is warranted to clarify the impact of perceived need for treatment on interest in treatment and treatment-seeking behavior.

Implications

Ultimately, it is imperative to determine what is driving the treatment gap in order to better serve the needs of returning service members. Alcohol use problems are serious issues for veterans, especially if they are left untreated. As highlighted by Burnett-Ziegler et al. (2011), “untreated alcohol problems are a cause for concern as they can lead to an exacerbation of mental health symptoms, problems in daily functioning, and interpersonal difficulties.” These authors also pointed out that even though some service members with alcohol use problems do eventually receive treatment, very few are referred to or actually receive alcohol-specific treatment (Burnett-Ziegler et al., 2011). Thus while there is a serious treatment gap for those with mental health problems, the gap for those with alcohol use problems is even worse.

Several problems exist in the realm of getting service members into alcohol use treatment and keeping them engaged. Referral rates are as low as 1% (Elbogen et al., 2013). Additionally, it has historically been difficult to retain returning service members in alcohol treatment, again perhaps related to unfavorable opinions of treatment (Elbogen et al., 2013; Gibbs et al., 2011). Finally, not all of those who enter alcohol use treatment remain in treatment long enough to receive an adequate dose (Hoerster et al., 2012). Addressing these problems has been a major

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concern of researchers, clinicians, and the military. Indeed, there is a certain amount that must be done by the military to improve issues related to the screening and referral process, as well as to address problematic aspects of military culture, including the acceptability of binge drinking and leadership responses to this problem. Clinicians and researchers can continue working to improve treatments and disseminate information about them; of primary importance is providing treatments that focus on alcohol problems and incorporate other aspects that are important to service members such as reintegration, post-traumatic stress disorder, and relationship functioning – all of which are impacted by problematic alcohol use (McCrary, Epstein, & Kahler, 2004). Thus, empirically-supported treatments geared toward engaging service members in issues they see as important may be critical.

The availability of these treatments will not ensure that veterans access them. Many potential barriers to care exist, ranging from external logistical issues (e.g., inability to get time off for treatment; Kim et al., 2010) to internal barriers such as self- and public stigma (Kim et al., 2011) and attitudes toward mental illness and mental health professionals (Stecker et al., 2007). Internal barriers are most consistently supported in the literature, particularly by longitudinal studies (Adler et al., 2015; Blais, Hoerster, Malte, Hunt, & Jakupcak, 2014; Harpaz-Rotem, Rosenheck, Pietrzak, & Southwick, 2014; Hoerster et al., 2012). Of the internal barriers to care, perceived need for care is consistently supported as a critical barrier to accessing treatment (e.g., Graziano & Elbogen, 2017; Larson et al., 2012; Spont et al., 2014; Stecker et al., 2007; Vogt et al., 2014; Warner et al., 2008).

Theories have pointed to this issue for decades. In each of the most lasting and impactful theories related to health behavior change, recognizing a problem (e.g., perceived need) was a critical component supported by research (Bardsley & Beckman, 1988; Cooke, Dahdah, Norman,

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& French, 2016; Fox, Meyer, & Vogt, 2015; Graziano & Elbogen, 2017; Johnson et al., 2016; Montano & Kasprzyk, 2015; Rees, 1985; Stecker, Fortney, Hamilton, & Ajzen, 2007). These theories specify the importance of perceived need in increasing motivation to change (e.g., access treatment for a mental health problem).

Conclusion

This study assessed the problem of perceived need for care, as it is related to problematic alcohol use and other domains relevant to veterans. By exploring this specific critical internal barrier to seeking and receiving treatment, this research may help to fill a gap in the literature, and answer the question of what is preventing service members and veterans from accessing evidence-based treatments for the serious issues affecting them.

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APPENDIX A

Informed Consent

The following information describes the research study in which you are being asked to participate. You must be 18 years or older in order to participate. Please read the below information carefully and take whatever time is necessary to make your decision. If you have any questions about the study that you would like answered before you decide, please contact the Principal Investigator Lance Swenson at LSwenson@suffolk.edu. You should feel fully informed before making your decision. If you decide that you would like to participate in this research study, you will be asked to electronically sign this document and you may save a copy for your records.

Purpose: You have been asked to take part in a research project that studies alcohol use and romantic relationships. This study will take about an hour to complete. As part of this project, you will complete questionnaires asking about a variety of topics such as your alcohol use and your relationship with your partner. This research is being conducted by Leela Holman, M.S., a doctoral candidate, and Lance Swenson, Ph.D., a faculty member at Suffolk University. This Informed Consent document describes what you need to know about this research project before you agree to participate.

The aim of this research is to explore how Military Service Members and Veterans in committed relationships view their alcohol use. Research often requires that participants not know the hypotheses of the study prior to their participation so that they can answer the questionnaires without bias. Although we will describe the nature of the tasks you will be asked to perform, the hypotheses will not be explained to you until after you complete the questionnaires.

Procedures: If you agree to participate, we will use this 60-minute session for you to fill out several questionnaires asking about your alcohol use and your relationship with your partner.

Risk or Discomforts: As in any psychological study, there may be some mild emotional discomfort that arises during your participation in this study. Discomfort may increase if you are uncomfortable thinking about your alcohol use or romantic relationship. In order to minimize this risk, we will conduct a short debrief after the study and provide you with important resources.

Benefits: We do not expect that you will directly benefit from participating in this research. We hope that your participation in this study helps us to better understand how Military Personnel in committed relationships view their alcohol use.

If you choose, you may provide your email address on a separate page in order to be entered into a drawing for a \$50 Amazon gift card at the completion of the study.

Privacy and Confidentiality: You may notice that none of the questionnaires you receive have a place to enter your name. When you fill out the questionnaires, the information you provide will be identified only with a participant number that will be assigned to you that is in no way

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linked to your name. This will aid in ensuring your answers are not identifiable. Your email and your IP address will be collected or recorded. Additionally, neither your name nor any information that could identify you will ever be used in any summaries, write-ups, or discussions of this study or its results. All of the information we obtain will be used only for research and will be kept completely confidential. All information collected will be retained for at least five years in a locked file in a locked room, accessed only by members of the research team. The data in its aggregate form may be used in conference or journal publications.

Voluntary Nature of Participation: Participation in this study is completely voluntary at all times. You may choose not to answer any questions that you do not wish to answer. Also, you may refuse to participate or end your participation at any time without penalties. Should you choose to withdraw from the study, your data will not be utilized in the study; it will be destroyed.

Concerns or Inquiries: If you have any questions, concerns about how your information will be used, or other qualms about the study, please contact the researcher at LSwenson@suffolk.edu. If you have any concerns or complaints about your treatment as a research participant, please contact the Suffolk University IRB at 1-888-634-4387. It is important to remember that your contact information – from this form and from your email – will never be paired with your study data.

Alternatives: The alternative is to not participate in this study.

Consent: I have read the above description and agree to take part in this study. I understand that my participation is voluntary at all times; I may refuse to participate or end my participation at any time without penalties.

(Signature)

(Date)

(Please print your name here)

(Signature of person obtaining consent)

(Date)

(Please print your name here)

Principle Investigator: Lance Swenson, Ph.D.

Co-Investigator: Leela Holman, M.S.

APPENDIX B

Resources for Service Members and Veterans

Information Online

For general information:

United States Department of Veterans Affairs (USDVA)
(800) 827-1000 (Toll free)
www.va.gov

For information about substance use:

American Addiction Centers
<https://americanaddictioncenters.org/rehab-guide/veterans-resources/>

For information about co-occurring PTSD and substance use:

National Center for PTSD
https://www.ptsd.va.gov/public/problems/ptsd_substance_abuse_veterans.asp

For information about other issues facing service members, veterans, and their families:

Substance Abuse and Mental Health Services Administration (SAMHSA)
<https://www.samhsa.gov/veterans-military-families/critical-issues>

Phone Lines

Veteran Crisis Line

Veterans and their loved ones can call **1-800-273-8255** and **Press 1**, chat online, or send a text message to **838255** to receive confidential support 24 hours a day, 7 days a week, 365 days a year. Support for deaf and hard of hearing individuals is available.

American Addiction Centers First Responder Lifeline

Confidential, Toll-free, 24 hours a day, 7 days a week
(888) 902- VETS

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APPENDIX C

Demographics Questionnaire

Age: _____

Gender: ☐ Male ☐ Female ☐ Other

Race/Ethnicity:

- ☐ White
- ☐ Black
- ☐ Asian
- ☐ Hispanic/Latino
- ☐ Native Alaskan/American Eskimo
- ☐ Native Hawaiian/Other Pacific Islander
- ☐ Other: _____

Current marital/relationship status:

- ☐ Single
- ☐ Committed Relationship
- ☐ Married
- ☐ Separated
- ☐ Divorced

Military branch:

- ☐ Army
- ☐ Navy
- ☐ Air Force
- ☐ Marines
- ☐ Coast Guard
- ☐ Reservist or National Guard
- ☐ Other: _____

Did you serve on active duty?

- ☐ Yes
- ☐ No

Did your service include combat, dangerous, or traumatic assignments?

- ☐ Yes
- ☐ No

Deployments:

1. Dates: ____/____/____ (MM/YYYY) to ____/____/____ (MM/YYYY)
Months deployed:
Location of duty:

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2. Dates: ____/____/____ (MM/YYYY) to ____/____/____ (MM/YYYY)
Months deployed:
Location of duty:
3. Dates: ____/____/____ (MM/YYYY) to ____/____/____ (MM/YYYY)
Months deployed:
Location of duty:
4. Dates: ____/____/____ (MM/YYYY) to ____/____/____ (MM/YYYY)
Months deployed:
Location of duty:

Military Rank: _____

Are you enrolled in the VA?

- ☐ Yes
☐ No

Do you receive any VA benefits?

- ☐ Yes
☐ No

Do you have a service-connected condition?

- ☐ Yes
☐ No

APPENDIX D

Treatment History

	Lifetime	Past Year
Have you seen a psychiatrist or other mental health professional who can prescribe medications?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Have you been prescribed medications for a personal, emotional, alcohol, or marital/relationship problem?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Have you been admitted to a psychiatric hospital or attended residential treatment?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Have you attended one-to-one counseling with a psychologist, counselor, or any other mental health professional?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Have you attended group counseling?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Have you attended couple or family counseling?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Have you attended alcohol or substance use treatment?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Have you attended a detoxification program for alcohol or substance use?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Have you attended a rehab program for alcohol or substance use?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Have you attended a 12-step program (e.g., AA, NA, SMART) for alcohol or substance use?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

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APPENDIX E

Perceived Need Questionnaire

Are you currently experiencing a personal, emotional, or stress problem?

Yes No

If yes, to what degree?

Mild Moderate Severe

Are you currently experiencing an alcohol problem?

Yes No

If yes, to what degree?

Mild Moderate Severe

Are you currently experiencing a marital or relationship problem?

Yes No

If yes, to what degree?

Mild Moderate Severe

Are you currently interested in receiving professional help for a personal, emotional, or stress problem?

Very Interested Somewhat Interested Slightly Interested Not At All Interested

Are you currently interested in receiving professional help for an alcohol problem?

Very Interested Somewhat Interested Slightly Interested Not At All Interested

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Are you currently interested in receiving professional help for a marital or relationship problem?

Very Interested Somewhat Interested Slightly Interested Not At All Interested

In the past year, have you had any problems with your mental health?

Yes No

If yes, to what degree?

Mild Moderate Severe

APPENDIX F

Alcohol Use Disorder Identification Test (AUDIT)

1. How often do you have a drink containing alcohol?
 - a. Never
 - b. Monthly or less
 - c. 2-4 times a month
 - d. 2-3 times a week
 - e. 4 or more times a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?
 - a. 1 or 2
 - b. 3 or 4
 - c. 5 or 6
 - d. 7 to 9
 - e. 10 or more
3. How often do you have six or more drinks on one occasion?
 - a. Never
 - b. Less than monthly
 - c. Monthly
 - d. Weekly
 - e. Daily or almost daily
4. How often during the last year have you found that you were not able to stop drinking once you had started?
 - a. Never
 - b. Less than monthly
 - c. Monthly
 - d. Weekly
 - e. Daily or almost daily
5. How often during the last year have you failed to do what was normally expected from you because of drinking?
 - a. Never
 - b. Less than monthly
 - c. Monthly
 - d. Weekly
 - e. Daily or almost daily

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6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

- a. Never
- b. Less than monthly
- c. Monthly
- d. Weekly
- e. Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?

- a. Never
- b. Less than monthly
- c. Monthly
- d. Weekly
- e. Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

- a. Never
- b. Less than monthly
- c. Monthly
- d. Weekly
- e. Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

- a. No
- b. Yes, but not in the last year
- c. Yes, during the last year

10. Has a relative or friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?

- a. No
- b. Yes, but not in the last year
- c. Yes, during the last year

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APPENDIX G

Primary Care PTSD Screen for DSM-5 (PC-PTSD-5)

Sometimes things happen to people that are unusually or especially frightening, horrible, or traumatic. For example:

- a serious accident or fire
- a physical or sexual assault or abuse
- an earthquake or flood
- a war
- seeing someone be killed or seriously injured
- having a loved one die through homicide or suicide

Have you ever experienced this kind of event?	YES	NO
---	-----	----

If no, please stop here.

If yes, please answer the questions below.

In the past month, have you:

Have had nightmares about the event(s) or thought about the event(s) when you did not want to?	YES	NO
Tried hard not to think about the event(s) or went out of your way to avoid situations that reminded you of the event(s)?	YES	NO
Been constantly on guard, watchful, or easily startled?	YES	NO
Felt numb or detached from others, activities, or your surroundings?	YES	NO
Felt guilty or unable to stop blaming yourself or others for the event(s) or any problems the event(s) may have caused?	YES	NO

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APPENDIX H

Revised Dyadic Adjustment Scale (RDAS)

Most persons have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and your partner for each item on the following list.

	Always Agree	Almost Always Agree	Occasionally Disagree	Frequently Disagree	Almost Always Disagree	Always Disagree
Religious matters	5	4	3	2	1	0
Demonstrations of affection	5	4	3	2	1	0
Making major decisions	5	4	3	2	1	0
Sex relations	5	4	3	2	1	0
Conventionality (correct or proper behavior)	5	4	3	2	1	0
Career decisions	5	4	3	2	1	0

	All the time	Most of the time	More often than not	Occasionally	Rarely	Never
How often do you discuss or have you considered divorce, separation, or terminating your relationship?	0	1	2	3	4	5
How often do you and your partner quarrel?	0	1	2	3	4	5
Do you ever regret that you married (or lived together?)	0	1	2	3	4	5
How often do you and your mate "get on each other's nerves"?	0	1	2	3	4	5

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	All the time	Most of the time	More often than not	Occasionally	Rarely	Never
Do you and your mate engage in outside interests together?	5	4	3	2	1	0

How often would you say the following events occur between you and your mate?

	Never	Less than once a month	Once or twice a month	Once or twice a week	Once a day	More often
Have a stimulating exchange of ideas	0	1	2	3	4	5
Work together on a project	0	1	2	3	4	5
Calmly discuss something	0	1	2	3	4	5

APPENDIX I

Number of People Concerned

In the past year, have people in your life encouraged you to get treatment for PTSD or other emotional problems?

- ☐ No one
- ☐ Spouse or significant other
- ☐ Other family members
- ☐ Other veterans
- ☐ Friends
- ☐ Medical providers
- ☐ Employers

APPENDIX J

Attitudes about Perceived Need

Please rate your agreement with the following statements:

It's up to me to work out my own problems.

Strongly Disagree Somewhat Disagree Somewhat Agree Strongly Agree

I prefer to handle personal, emotional, alcohol, or marital/relationship problems on my own.

Strongly Disagree Somewhat Disagree Somewhat Agree Strongly Agree

Others prefer for me to handle personal, emotional, alcohol, or marital/relationship problems on my own.

Strongly Disagree Somewhat Disagree Somewhat Agree Strongly Agree

A personal, emotional, alcohol, or marital/relationship problem would have to be very bad before I sought treatment.

Strongly Disagree Somewhat Disagree Somewhat Agree Strongly Agree

If I had a personal, emotional, alcohol, or marital/relationship problem, I would not know where to get help.

Strongly Disagree Somewhat Disagree Somewhat Agree Strongly Agree

If I had a personal, emotional, alcohol, or marital/relationship problem, I would be afraid to ask for help.

Strongly Disagree Somewhat Disagree Somewhat Agree Strongly Agree

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If I had a personal, emotional, alcohol, or marital/relationship problem, I would be afraid of what others would think of me if I asked for help.

Strongly Disagree Somewhat Disagree Somewhat Agree Strongly Agree

At this time, I feel I need help to deal with emotional problems, PTSD, and/or stress in my life.

Strongly Disagree Somewhat Disagree Somewhat Agree Strongly Agree

APPENDIX K

Interest in Treatment

Below are some options for mental health treatment. Please rate your interest in these options.

	How interested are you in this treatment?	How likely would you be to use this service if it was available to you?
Seeing a psychiatrist or other mental health professional for individual sessions.	<input type="checkbox"/> Not at all <input type="checkbox"/> Slightly <input type="checkbox"/> Somewhat <input type="checkbox"/> Very	<input type="checkbox"/> Would not use <input type="checkbox"/> Would likely not use <input type="checkbox"/> Would likely use <input type="checkbox"/> Would definitely use
Being prescribed medications.	<input type="checkbox"/> Not at all <input type="checkbox"/> Slightly <input type="checkbox"/> Somewhat <input type="checkbox"/> Very	<input type="checkbox"/> Would not use <input type="checkbox"/> Would likely not use <input type="checkbox"/> Would likely use <input type="checkbox"/> Would definitely use
Being admitted to a psychiatric hospital or attending residential treatment.	<input type="checkbox"/> Not at all <input type="checkbox"/> Slightly <input type="checkbox"/> Somewhat <input type="checkbox"/> Very	<input type="checkbox"/> Would not use <input type="checkbox"/> Would likely not use <input type="checkbox"/> Would likely use <input type="checkbox"/> Would definitely use
Attending one-to-one counseling with a psychologist, counselor, or another mental health professional.	<input type="checkbox"/> Not at all <input type="checkbox"/> Slightly <input type="checkbox"/> Somewhat <input type="checkbox"/> Very	<input type="checkbox"/> Would not use <input type="checkbox"/> Would likely not use <input type="checkbox"/> Would likely use <input type="checkbox"/> Would definitely use
Attending group counseling.	<input type="checkbox"/> Not at all <input type="checkbox"/> Slightly <input type="checkbox"/> Somewhat <input type="checkbox"/> Very	<input type="checkbox"/> Would not use <input type="checkbox"/> Would likely not use <input type="checkbox"/> Would likely use <input type="checkbox"/> Would definitely use
Attending couple or family counseling.	<input type="checkbox"/> Not at all <input type="checkbox"/> Slightly <input type="checkbox"/> Somewhat <input type="checkbox"/> Very	<input type="checkbox"/> Would not use <input type="checkbox"/> Would likely not use <input type="checkbox"/> Would likely use <input type="checkbox"/> Would definitely use

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Attending alcohol or substance use treatment.	<input type="checkbox"/> Not at all <input type="checkbox"/> Slightly <input type="checkbox"/> Somewhat <input type="checkbox"/> Very	<input type="checkbox"/> Would not use <input type="checkbox"/> Would likely not use <input type="checkbox"/> Would likely use <input type="checkbox"/> Would definitely use
Attending a detoxification program for alcohol or substance use.	<input type="checkbox"/> Not at all <input type="checkbox"/> Slightly <input type="checkbox"/> Somewhat <input type="checkbox"/> Very	<input type="checkbox"/> Would not use <input type="checkbox"/> Would likely not use <input type="checkbox"/> Would likely use <input type="checkbox"/> Would definitely use
Attending a rehab program for alcohol or substance use.	<input type="checkbox"/> Not at all <input type="checkbox"/> Slightly <input type="checkbox"/> Somewhat <input type="checkbox"/> Very	<input type="checkbox"/> Would not use <input type="checkbox"/> Would likely not use <input type="checkbox"/> Would likely use <input type="checkbox"/> Would definitely use
Attending a 12-step program (e.g., AA, NA, SMART) for alcohol or substance use.	<input type="checkbox"/> Not at all <input type="checkbox"/> Slightly <input type="checkbox"/> Somewhat <input type="checkbox"/> Very	<input type="checkbox"/> Would not use <input type="checkbox"/> Would likely not use <input type="checkbox"/> Would likely use <input type="checkbox"/> Would definitely use

How interested are you in having your spouse or significant other more involved in your treatment?

- 0 Not at all interested
- 1 A little interested
- 2 Somewhat interested
- 3 Quite interested
- 4 Very interested

How interested do you believe your significant other is in being more involved in your treatment?

- 0 Not at all interested
- 1 A little interested
- 2 Somewhat interested
- 3 Quite interested
- 4 Very interested

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How interested do you believe your significant other would be in attending treatment sessions with you?

- 0 Not at all interested
- 1 A little interested
- 2 Somewhat interested
- 3 Quite interested
- 4 Very interested

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Table 1

Sample Demographic Characteristics (n = 181)

Variable	<i>M (SD) / N (%)</i>
Biological Sex	
Female	57 (31.5%)
Male	123 (68.0%)
Chose not to answer	1 (0.5%)
Age	40.96 (13.53)
Race/ethnicity	
White	98 (54.1%)
Black or African American	9 (5%)
Asian	49 (27.1%)
Hispanic/Latino	8 (4.4%)
Native Alaskan/American Eskimo	7 (3.9%)
Other	1 (0.6%)
Multiracial	8 (4.4%)
Chose not to identify	1 (0.5%)
Marital Status	
Committed relationship	8 (4.4%)
Married	171 (94.5%)
Separated	2 (1.1%)
Military Branch	
Army	80 (44.2%)
Navy	27 (14.9%)
Air Force	32 (17.7%)
Marine Corps	11 (6.1%)
Coast Guard	9 (5%)
Reservist or National Guard	15 (8.3%)
Other	7 (3.9%)
Served on Active Duty	
Yes	158 (87.3%)
No	23 (12.7%)
Dangerous/Traumatic Assignments	
Yes	127 (70.2%)
No	54 (29.8%)
Enrolled in VA Care	
Yes	112 (61.9%)
No	69 (38.1%)
Receive VA Benefits	
Yes	101 (55.8%)
No	78 (43.1%)
Chose not to answer	2 (1.1%)
Service-Connected Condition	
Yes	82 (45.3%)
No	99 (54.7%)
Meeting Criteria for PTSD	
Yes	74 (40.9%)
No	107 (59.1%)
Meeting Criteria for Alcohol Problems	
Yes	96 (53%)
No	85 (47%)

Table 2

Descriptive Statistics for Variables of Interest

Variable	# of Items	Mean (SD)/ N (%)	Observed Range	Possible Range	Alpha	Skew (SE)	Kurtosis (SE)
PB Alcohol (AUDIT)	10	10.25 (8.63)	0-40	0-40	0.90	0.69 (0.18)	-0.24 (0.36)
PB PTSD (PC-PTSD)	5	1.91 (1.88)	0-5	0-5	--	0.37 (0.18)	-1.37 (0.36)
PB Marital (RDAS Sat.)	3	9.15 (3.41)	0-5	0-5	0.83	-0.55 (0.18)	-0.48 (0.36)
PN Alcohol	1	0.76 (0.92)	0-3	0-3	--	0.81 (0.18)	-0.62 (0.36)
PN PES	1	1.14 (0.96)	0-3	0-3	--	0.16 (0.18)	-1.18 (0.36)
PN Marital	1	0.75 (0.93)	0-3	0-3	--	0.95 (0.18)	-0.22 (0.36)
# People Concerned	1	0.79 (1.09)	0-4	0-6	--	1.43 (0.18)	1.30 (0.36)
PN Attitudes	7	10.0 (3.97)	0-21	0-21	0.71	0.21 (0.18)	0.19 (0.37)

Notes. PB = Probable need for treatment. Presence of probable need for alcohol treatment, post-traumatic stress disorder treatment (PTSD), and marital treatment was derived from total scores on the AUDIT, PC-PTSD, and RDAS Satisfaction subscale, respectively. Alpha not computed for PC-PTSD; prior work has shown that a cut-off score of 3 yielded sensitivity of 95% and specificity of 85% (Prins et al., 2016). PN = Perceived need for treatment. Presence of perceived need for alcohol treatment, personal/emotional/stress (PES) problem treatment, and marital treatment were derived from the follow up to an item asking “Are you currently experiencing a ___ problem?” (e.g., “personal, emotional, or stress”); the follow up item was “If yes, to what degree?” with ratings of ratings of “mild”, “moderate”, or “severe”. # of People Concerned was derived from the selection of any of the following options: “No one”, “Spouse or significant other”, “Other family members”, “Other veterans”, “Friends”, “Medical providers”, and “Employers.” PN Attitudes was derived from the total score of 7 items rated on a Likert scale from “Strongly Disagree” to “Strongly Agree”.

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Table 3

Relationships Between Variables of Interest

	PB Alcohol	PB PTSD	PB Marital	PN Alcohol	PN PES	PN Marital	Interest in Alc Tx	Interest in PES Tx	Interest in Marital Tx
PB Alcohol		.48	-.50	.67	.40	.42	.67	.44	.47
PB PTSD			-.35	.40	.46	.33	.39	.43	.38
PB Marital				-.52	-.38	-.45	-.53	-.42	-.59
PN Alcohol					.53	.50	.72	.52	.50
PN PES						.46	.40	.54	.45
PN Marital							.38	.34	.60
Interest in Alc Tx								.68	.72
Interest in PES Tx									.63
Interest in Mar Tx									

Note. Bolded correlations have a significance level of $p < .001$. PB = Probable need for treatment. Presence of probable need for alcohol treatment, post-traumatic stress disorder treatment (PTSD), and marital treatment was derived from total scores on the AUDIT, PC-PTSD, and RDAS Satisfaction subscale, respectively. Alpha not computed for PC-PTSD; prior work has shown that a cut-off score of 3 yielded sensitivity of 95% and specificity of 85% (Prins et al., 2016). PN = Perceived need for treatment. Presence of perceived need for alcohol treatment, personal/emotional/stress (PES) problem treatment, and marital treatment were derived from the follow up to an item asking “Are you currently experiencing a __ problem?” (e.g., “personal, emotional, or stress”); the follow up item was “If yes, to what degree?” with ratings of ratings of “mild”, “moderate”, or “severe”. # of People Concerned was derived from the selection of any of the following options: “No one”, “Spouse or significant other”, “Other family members”, “Other veterans”, “Friends”, “Medical providers”, and “Employers.” PN Attitudes was derived from the total score of 7 items rated on a Likert scale from “Strongly Disagree” to “Strongly Agree”.

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Table 4

*Results of OLRs Predicting PN from PB, Age, and PB*Age Interaction Terms*

	Estimate	SE	Wald	df	p	95% CI	
						Lower Bound	Upper Bound
Alcohol							
Age	-.02	.02	.47	1	.49	-.06	.03
PB Alcohol	.22	.07	9.05	1	< .001	0.8	.36
Age * PB Alcohol	.00	.00	.32	1	.57	.00	.00
PTSD							
Age	-.01	.02	.88	1	.35	-.04	.02
PB PTSD	.47	.25	3.59	1	.06	-.02	.96
Age * PB PTSD	.00	.01	.01	1	.95	-.01	.01
Marital							
Age	-.07	.04	4.18	1	.04	-.14	-.00
PB Marital	-.43	.14	9.26	1	.002	-.70	-.15
Age * PB Marital	.01	.00	2.19	1	.14	-.00	.01

Note. Significant effects shown in bold.

PERCEIVED NEED FOR CARE

Table 5

Results of OLRs Predicting PN from PB and Age, Without Interaction Terms

	Estimate	Std. Error	Wald	Df	<i>P</i>	95% CI	
						Lower Bound	Upper Bound
Alcohol							
Age	-.02	.01	3.10	1	.08	-.05	.00
PB Alcohol	.18	.02	58.46	1	<.001	.13	.22
PTSD							
Age	-.01	.01	1.60	1	.21	-.04	.01
PB PTSD	.45	.09	28.23	1	<.001	.29	.62
Marital							
Age	-.02	.01	3.44	1	.06	-.05	.00
PB Marital	-.24	.05	25.59	1	<.001	-.33	-.15

Note. Significant and marginally significant effects shown in bold.

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Table 6

Kruskal-Wallis H Tests for Race and PN Alcohol

Scale	Group	N	Mean Rank	χ^2	<i>p</i>
Race (All)	White	98	80.37	19.24	.007
	Black	9	79.83		
	Asian	49	110.20		
	Hispanic/ Latino	8	97.88		
	Native Alaskan/ American Eskimo	7	111.43		
	Mixed Race	8	75.25		
	Other	1	155.50		
	Did not answer	1	155.50		
Race (Dichotomous)	White	98	80.37	11.78	.003
	Non-White	82	102.91		

Note. Significant effects shown in bold.

PERCEIVED NEED FOR CARE

Table 7

Kruskal-Wallis H Tests for Race and PN PES

Scale	Group	N	Mean Rank	χ^2	<i>p</i>
Race (All)	White	98	88.70	9.94	.19
	Black	9	60.44		
	Asian	49	103.51		
	Hispanic/ Latino	8	84.38		
	Native Alaskan/ American Eskimo	7	91.93		
	Mixed Race	8	70.88		
	Other	1	138.50		
	Did not answer	1	138.50		
Race (Dichotomous)	White	98	88.70	1.27	.53
	Non-White	82	93.17		

PERCEIVED NEED FOR CARE

Table 8

Kruskal-Wallis H Tests for Race and PN Marital

Scale	Group	N	Mean Rank	χ^2	<i>p</i>
Race (All)	White	98	86.29	10.55	.16
	Black	9	60.50		
	Asian	49	103.60		
	Hispanic/ Latino	8	90.94		
	Native Alaskan/ American Eskimo	7	99.50		
	Mixed Race	8	86.81		
	Other	1	119.00		
	Did not answer	1	156.50		
Race (Dichotomous)	White	98	86.29	3.68	.16
	Non-White	82	95.84		

PERCEIVED NEED FOR CARE

Table 9

*Results of OLRs Predicting PN from PB, Race, and PB*Race Interaction Terms*

	Estimate	Std. Error	Wald	Df	<i>p</i>	95% CI	
						Lower Bound	Upper Bound
Alcohol							
Race	-.62	.60	1.07	1	.30	-1.78	.55
PB Alcohol	.18	.03	36.75	1	<.001	.13	.24
Race * PB Alc	.01	.04	.02	1	.89	-.07	.08
PTSD							
Race	.01	.42	.00	1	.99	-.81	.82
PB PTSD	.47	.12	16.12	1	<.001	.24	.71
Race * PB PTSD	.08	.15	.26	1	.61	-.22	.38
Marital							
Race	1.57	.87	3.30	1	.07	-.12	3.27
PB Marital	-.20	.06	11.06	1	.001	-.31	-.08
Race * PB Mar	-.18	.09	3.74	1	.05	-.36	.00

Note. Significant effects shown in bold.

PERCEIVED NEED FOR CARE

Table 10

Relationships Between PN Attitudes and PN Variables

	PN Alcohol	PN PES	PN Marital
It's up to me to work out my own problems	.27	.18	.03
I prefer to handle personal, emotional, alcohol, or marital/relationship problems on my own	.13	.07	-.01
Others prefer for me to handle personal, emotional, alcohol, or marital/relationship problems on my own	-.23	.07	-.10
A personal, emotional, alcohol, or marital/relationship problem would have to be very bad before I sought treatment	.02	.02	.01
If I had a personal, emotional, alcohol, or marital/relationship problem, I would not know where to get help	-.35	-.23	-.24
If I had a personal, emotional, alcohol, or marital/relationship problem, I would be afraid to ask for help	-.37	-.24	-.27
If I had a personal, emotional, alcohol, or marital/relationship problem, I would be afraid of what others would think of me if I asked for help	-.33	-.29	-.32

Note. Bolded correlations have a significance level of $p < .05$. PN = Perceived need for treatment. Presence of perceived need for alcohol treatment, personal/emotional/stress (PES) problem treatment, and marital treatment were derived from the follow up to an item asking "Are you currently experiencing a ___ problem?" (e.g., "personal, emotional, or stress"); the follow up item was "If yes, to what degree?" with ratings of ratings of "mild", "moderate", or "severe".

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Table 11

Results of OLRs Predicting PN from PB, PN Attitudes Items, and PB PN Attitudes Items Interaction Terms*

	Estimate	SE	Wald	df	p	95% CI	
						Lower Bound	Upper Bound
Alcohol							
PN2 * PB Alcohol	-.03	.02	1.40	1	.24	-.07	.02
PN3 * PB Alcohol	-.01	.02	.11	1	.75	-.05	.04
PN4 * PB Alcohol	-.05	.02	6.62	1	.01	-.09	-.01
PN5 * PB Alcohol	.01	.02	.53	1	.47	-.02	.05
PN6 * PB Alcohol	.02	.02	.64	1	.42	-.03	.06
PN7 * PB Alcohol	.02	.02	.83	1	.36	-.02	.06
PTSD							
PN2 * PB PTSD	-.19	.10	3.45	1	.06	-.40	.01
PN3 * PB PTSD	-.09	.08	1.25	1	.26	-.26	.07
PN4 * PB PTSD	.06	.08	.54	1	.46	-.10	.22
PN5 * PB PTSD	.03	.08	.11	1	.75	-.13	.18
PN6 * PB PTSD	.09	.09	1.12	1	.29	-.08	.26
PN7 * PB PTSD	.06	.08	.67	1	.42	-.09	.21
Marital							
PN2 * PB Marital	.08	.05	2.79	1	.10	-.01	.18
PN3 * PB Marital	-.08	.05	3.06	1	.08	-.17	.01
PN4 * PB Marital	.03	.05	.37	1	.54	-.06	.12
PN5 * PB Marital	-.02	.04	.21	1	.65	-.10	.07
PN6 * PB Marital	-.07	.05	1.77	1	.18	-.17	.03
PN7 * PB Marital	-.04	.05	.81	1	.37	-.13	.05

Note. Significant effects shown in bold. PN# = each PN Attitudes Item: I prefer to handle personal, emotional, alcohol, or marital/relationship problems on my own (PN2), alcohol, or marital/relationship problems on my own (PN3), A personal, emotional, alcohol, or marital/relationship problem would have to be very bad before I sought treatment (PN4), If I had a personal, emotional, alcohol, or marital/relationship problem, I would not know where to get help (PN5), If I had a personal, emotional, alcohol, or marital/relationship problem, I would be afraid to ask for help (PN6), If I had a personal, emotional, alcohol, or marital/relationship problem, I would be afraid of what others would think of me if I asked for help (PN7).

Table 12

Follow-up Slope Analyses for Military Branch and PN Alcohol

	Est.	Std. Error	Wald	Df	<i>p</i>	95% CI Lower Bound	95% CI Upper Bound	Odds	Interpretation: For each 1 unit increase in AUDIT scores, the odds of being in a higher perceived need category are increased by...
Branch									
Army	0.17	.08	4.40	1	.04	.01	.32	1.24	24%
Navy	0.19	.09	4.23	1	.04	.01	.37	1.27	27%
Air Force	0.22	.10	4.85	1	.03	.02	.42	1.31	31%
Marine Corps	0.11	.12	.91	1	.34	-.12	.34	1.18	18%
Coast Guard	0.11	.13	.73	1	.39	-.15	.37	1.18	18%
Reservist	0.05	.10	.24	1	.63	-.14	.24	1.11	11%
Other	0.05	.07	.54	0	.47	-.09	.20	.	Reference group

Note. Significant effects shown in bold.

Table 13

Follow-up Slope Analyses for Military Branch and PN PES

	Est.	Std. Error	Wald	Df	<i>p</i>	95% CI Lower Bound	95% CI Upper Bound	Odds	Interpretation: For each 1 unit increase in PTSD scores, the odds of being in a higher perceived need category are increased by...
Branch									
Army	9.04	.27	1155.15	1	< .001	8.51	9.56	1.72	72%
Navy	9.11	.32	812.90	1	< .001	8.48	9.74	1.86	86%
Air Force	8.96	.31	827.55	1	< .001	8.35	9.57	1.60	60%
Marine Corps	8.94	.40	512.68	1	< .001	8.16	9.71	1.56	56%
Coast Guard	8.91	.47	361.57	1	< .001	7.99	9.83	1.52	52%
Reservist	8.91	.00	.	1	.	8.91	8.91	1.52	52%
Other	-8.49	.24	1220.70	0	< .001	-8.97	-8.01	.	Reference group

Note. Significant effects shown in bold.

Table 14

Descriptive Statistics for Interest in Treatment Variables

Variable	# of Items	Mean (SD)	Observed Range	Possible Range	Skew Stat (SE)	Kurtosis Stat (SE)
Interest in Alcohol Tx	1	0.72 (1.02)	0-3	0-3	1.08 (0.18)	-.26 (0.36)
Interest in PES Tx	1	1.18 (1.16)	0-3	0-3	0.34 (0.18)	-1.39 (0.36)
Interest in Marital Tx	1	0.87 (1.10)	0-3	0-3	0.79 (0.18)	-0.92 (0.36)
Having spouse more involved in treatment	1	1.32 (1.31)	0-4	0-4	0.62 (0.18)	-.80 (0.36)
Spouse's interest in being involved in treatment	1	1.40 (1.29)	0-4	0-4	0.43 (0.18)	-1.05 (0.36)
Spouse's interest in attending treatment sessions	1	1.37 (1.24)	0-4	0-4	0.50 (0.18)	-0.79 (0.36)

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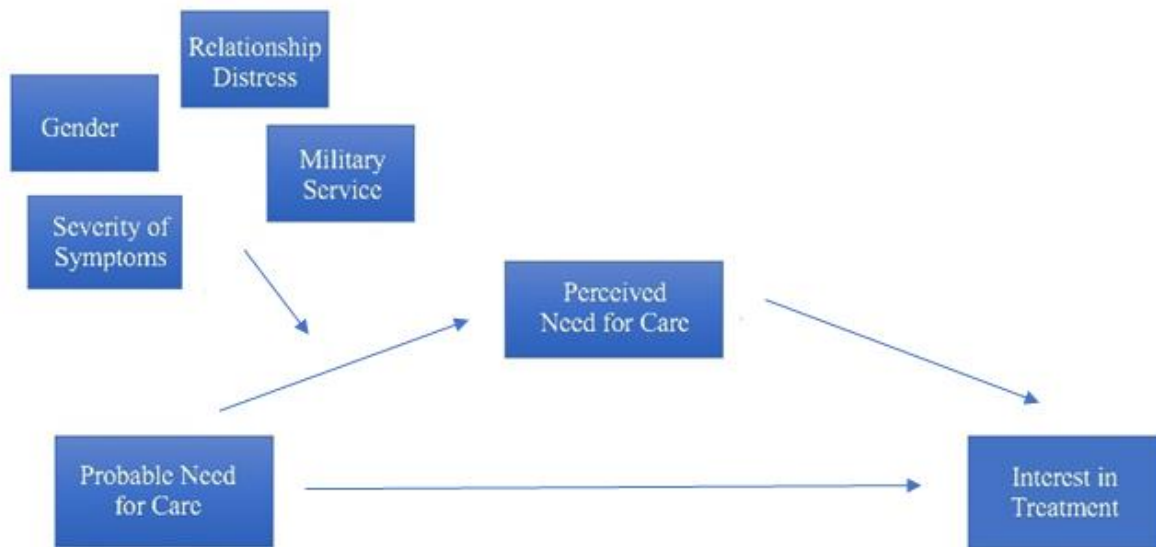


Figure 1. Model of the study.

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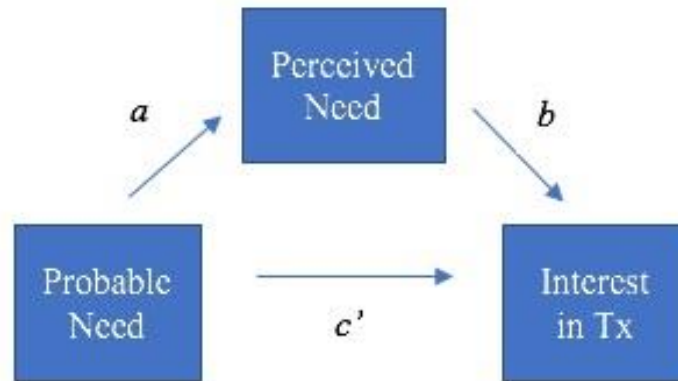


Figure 2. Proposed mediational model of the relations between probable need for treatment and interest in treatment.