



## Short Communication

# Psychiatric disorders, suicidal ideation, and sexually transmitted infections among post-deployment veterans who utilize digital social media for sexual partner seeking



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## HIGHLIGHTS

- Use of digital social media to find sexual partners (DSMSP+) is common among veterans.
- DSMSP+ is associated with PTSD, insomnia, depression and suicidality.
- DSMSP+ is associated with hypersexuality and sexually transmitted infections.

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## ABSTRACT

**Introduction:** Digital social media platforms represent outlets through which individuals may find partners for sexual encounters. Using a sample of US post-deployment military veterans, the current study evaluated the prevalence of digital sex seeking as well as clinical correlates of psychopathology, suicidal ideation, and sexually transmitted infections (STIs).

**Methods:** Using data from a baseline telephone interview and follow-up internet-based survey, we examined the prevalence of sexual partnering via digital social media platforms in a national sample of 283 US combat veterans. **Results:** Among veterans, 35.5% of men and 8.5% of women reported having used digital social media to meet someone for sex. Individuals who reported having used digital social media to find sexual partners (DSMSP+) as compared to those who did not (DSMSP-) were more likely to be young, male, and in the Marine Corps. After adjusting for sociodemographic variables, DSMSP+ status was associated with post-traumatic stress disorder (OR = 2.26,  $p = 0.01$ ), insomnia (OR = 1.99,  $p = 0.02$ ), depression (OR = 1.95,  $p = 0.03$ ), hypersexuality (OR = 6.16,  $p < 0.001$ ), suicidal ideation (OR = 3.24,  $p = 0.04$ ), and treatment for an STI (OR = 1.98,  $p = 0.04$ ).

**Conclusion:** Among US post-deployment military veterans, DSMSP+ behaviors were prevalent, particularly among men. The association between DSMSP+ behaviors and PTSD, insomnia, depression, hypersexuality, suicidal ideation, and STIs suggest that veterans who engage in DSMSP+ behaviors should be particularly thoroughly screened and evaluated for these psychiatric concerns and counseled on the benefits of safe sexual practices.

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## 1. Introduction

Nearly two-third of American adults (65%) engaged with digital social media platforms in 2015, a ten-fold increase compared to 2005 (Perrin, 2015). These platforms include mainstream social media (e.g.,

Facebook, Twitter), online dating and “partner-seeking” sites (e.g., Match, Craigslist, Manhunt), and geosocial networking applications that present profiles of potential romantic or sexual partners by geographic distance from the user (e.g., Grindr, Tinder, Scruff) (Holloway et al., 2014). These digital platforms are readily accessible via computer or mobile device (e.g., cellphone, tablet), and some of these platforms contain sexually explicit content (e.g., Craigslist, Manhunt, Grindr) and represent tools through which individuals may find available partners for sexual encounters. Use of digital social media to find sexual partners

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(DSMSP) is prevalent among men who have sex with men (MSM; 40%) (Liau, Millett & Marks, 2006); however, this behavior has not been extensively studied in heterosexual or mixed-sexuality populations or in military veterans.

The relationship between digital social media and mental health has been studied in the context of mainstream social media platforms. Compulsive or addictive use of Facebook has been linked to depression, anxiety, problematic drinking, poor emotional regulation, and insomnia (Blachnio, Przepiorka, & Pantic, 2015; Hanprathet, Manwong, Khumsri, Yingyeun, & Phanasathit, 2015; Hormes, Kearns, & Timko, 2014). Although sexual-partner-seeking and geosocial platforms have been used to recruit sexual minority participants for mental-health studies (Gibbs & Rice, 2016), there has been a paucity of research into the relationship between DSMSP and psychiatric concerns. In addition, the relationship between DSMSP and sexual health only has been examined among gay and bisexual men, with DSMSP associated with sexually transmitted infections (STIs) and risky sexual behaviors including inconsistent condom use and condomless anal sex (Beymer et al., 2014; McFarlane, Bull, & Rietmeijer, 2000; Winetrobe, Rice, Bauermeister, Petering, & Holloway, 2014).

Although DSMSP may represent an expression of healthy sexuality, we hypothesize that some DSMSP may be linked to psychopathology (e.g., depression, anxiety) including compulsive sexual behavior (a.k.a., “hypersexuality”) that may be driving its use. Among US veterans, compulsive sexual behavior (CSB) has been associated with severity of post-traumatic stress disorder (PTSD), young age, and childhood sexual trauma (Smith et al., 2014). Additionally, both heterosexual college students and gay and bisexual men who meet criteria for hypersexuality as measured by the Sexual Compulsivity Scale (Kalichman & Rompa, 1995) have been reported to have more sexual encounters and unprotected sexual intercourse (Dodge, Reece, Cole, & Sandfort, 2004; Grov, Parsons, & Bimbi, 2010). The associations between DSMSP and CSB has been unexplored among US military veterans.

In the current study, we evaluated the prevalence of DSMSP among US post-deployment military veterans of Operation Iraqi Freedom, Enduring Freedom, and New Dawn. We hypothesized that veterans who engage in DSMSP would share similarities with veterans with CSB (i.e., male, younger-aged, more psychopathology, and greater childhood trauma histories) as well as increased frequencies of STIs and higher scores on the Hypersexual Behavior Inventory (HBI), a measure of CSB (Reid, Garos, & Carpenter, 2011).

## 2. Methods

### 2.1. Procedure

The current study was conducted with data from the Survey of the Experiences of Returning Veterans (SERV) study project, and received approval from the Institutional Review Board of the Department of Veterans Affairs. The general procedures employed to recruit participants and conduct the SERV project have been described elsewhere (Smith et al., 2014). Eligible veterans completed a baseline clinical structured interview via telephone that lasted 60–90 min and were paid \$50 for participation. Six-hundred-and-fifty-six veterans had completed the initial baseline clinical interview between September 2011 and July 2014 (Time 1).

Between July 2014–February 2015 (Time 2), we also conducted an Internet-based study to ask additional follow-up questions about veterans' sexual health behaviors and psychological wellbeing. We surveyed only veterans who had completed the SERV baseline interview. Veterans were encouraged to complete the online survey in the privacy of their home, and the survey took about 20 min to complete. Veterans were paid \$15 for their participation with the online survey.

### 2.2. Participants

Six-hundred-and-fifty-six veterans completed the initial baseline SERV interview (Time 1). Out of those who completed the initial clinical interview, 50 participants were excluded from participating in the follow-up study because 11 individuals did not consent to be emailed and 39 individuals did not have working email addresses when we conducted the follow-up study. Therefore, we successfully emailed 606 veterans requesting their participation in a follow-up study about sexual health and well-being. Of the 606 participants who were emailed, 295 completed the internet-based survey. This resulted in a response rate of 48.7%. However, out of the 295 veterans who completed the survey, 12 participants did not provide complete data and were subsequently removed from further analysis. A sample of 283 veterans had complete data.

Of the 283 participants, most were male (69.6%,  $n = 197$ ), and the mean age was 35.1 ( $SD = 9.2$ ) years. The sample comprised 67.8% non-Hispanic white/Caucasian, 9.9% non-Hispanic black/African American, and 20.1% Other. Approximately half the sample was employed full-time (45.6%). Marital status was 54.1% married. Education status included 8.8% high-school graduate, 46.6% associate degree/some college, and 43.1% college graduate. The majority of the sample had multiple deployments (40.3% = 1 deployment, 31.8% = 2 deployments, 26.1% = 3+ deployments). Four branches of the military were represented, though the sample was mostly comprised of Army veterans (65% = Army, 12.4% = Air Force, 10.6% = Marine Corps, and 10.6% = Navy).

### 2.3. Measures

Sociodemographics and psychiatric concerns were assessed during the baseline telephone interview (Time 1). All responses from questionnaires were self-report and recorded during the structured clinical interview. Psychiatric concerns were determined using specific questionnaires. For example, we used the Primary Care Evaluation of Mental Disorders (PRIME-MD) (Spitzer, Kroenke, & Williams, 1999) to assess for depression; PRIME MD has been shown to be psychometrically sound when screening for clinical depression (Arnau, Meagher, Norris, & Bramson, 2001). We used the anxiety module of the Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV; Grant & Dawson, 2000; Grant et al., 2003) for anxiety disorders (e.g., generalized anxiety, panic disorder, and agoraphobia); the AUDADIS-IV (AUDADIS-IV; Grant & Dawson, 2000; Grant et al., 2003) for substance use disorders. Research has also shown the AUDADIS-IV to be psychometrically sound and reliable for clinical research (Grant et al., 2003; Ruan et al., 2008). We used the Insomnia Severity Index (Bastien, Vallières, & Morin, 2001) for insomnia (Cronbach's  $\alpha = 0.75$ ), and the PTSD symptom checklist (PCL-civilian; Cronbach's  $\alpha = 0.96$ ) (Wilkins, Lang, & Norman, 2011) for post-traumatic stress disorder. Both childhood physical and sexual trauma were measured using single items at baseline taken from the Deployment Risk and Resilience Inventory (DRRI; King, King, Vogt, Knight, & Samper, 2006); although we used single items from the DRRI, the questionnaire has been validated among OEF/OIF veterans and is psychometrically sound (Vogt, Proctor, King, King, & Vasterling, 2008). Child sexual trauma was defined as an affirmative response to the following item: “[Prior to age 18] I experienced unwanted sexual activity as a result of force, threat of harm, or manipulation.” Physical trauma was assessed with the following item: “[Prior to age 18] I was physically punished by a parent or primary caregiver.”

At Time 2, sexual behavior was assessed using several measures. The Sexual Behaviors Questionnaire (Rosenberg & Kraus, 2014) was used to collect descriptive statistics about veterans' sexual history characteristic (e.g., number of sexual partners, history of STIs, frequency of sexual behaviors in the past 30 days). The Hypersexual Behavior Inventory (HBI) (Reid et al., 2011) measures characteristics of hypersexuality (e.g., repeated unsuccessful attempts to control sexual thoughts, urges, and

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