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Short communication

Momentary assessment of PTSD symptoms and sexual risk behavior in male OEF/OIF/OND Veterans

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ABSTRACT

Background: Post-traumatic stress disorder (PTSD) in Veterans is associated with increased sexual risk behaviors, but the nature of this association is not well understood. Typical PTSD measurement deriving a summary estimate of symptom severity over a period of time precludes inferences about symptom variability, and whether momentary changes in symptom severity predict risk behavior.
Methods: We assessed the feasibility of measuring daily PTSD symptoms, substance use, and high-risk sexual behavior in Veterans using ecological momentary assessment (EMA). Feasibility indicators were survey completion, PTSD symptom variability, and variability in rates of substance use and sexual risk behavior. Nine male Veterans completed web-based questionnaires by cell phone three times per day for 28 days.
Results: Median within-day survey completion rates maintained near 90%, and PTSD symptoms showed high within-person variability, ranging up to 59 points on the 80-point scale. Six Veterans reported alcohol or substance use, and substance users reported use of more than one drug. Eight Veterans reported 1 to 28 high-risk sexual events. Heightened PTSD-related negative affect and externalizing behaviors preceded high-risk sexual events. Greater PTSD symptom instability was associated with having multiple sexual partners in the 28-day period.
Limitations: These results are preliminary, given this small sample size, and multiple comparisons, and should be verified with larger Veteran samples.
Conclusions: Results support the feasibility and utility of using of EMA to better understand the relationship between PTSD symptoms and sexual risk behavior in Veterans. Specific antecedent-risk behavior patterns provide promise for focused clinical interventions.

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1. Introduction

Of the 1.9 million Veterans returning from Operations Enduring Freedom, Iraqi Freedom, and New Dawn (OEF/OIF/OND), approximately 13% (over 250,000) have screened positive for post-traumatic stress disorder (PTSD) (Dursa et al., 2014), a multi-factored disorder associated with elevated rates of risk-taking behavior in Veterans (Boscarino, 2006; Drescher et al., 2003; Jacobson et al., 2008; Kuhn et al., 2010), including high-risk sexual behavior. In recent studies, OEF/OIF Veterans with PTSD reported high rates of recent unprotected sex, sex under the influence of drugs or alcohol, and sex with casual and multiple partners (Strom et al., 2012), and were 57% more likely than Veterans without PTSD to report recently risking getting a sexually transmitted disease (Adler et al., 2011). This information is particularly relevant in light of studies identifying elevated rates of HIV (Owens et al., 2007; Valdiserri et al., 2008) and other sexually transmitted infections (Goulet, 2013) among Veterans, and underutilization of available HIV testing (Goulet, 2013; Valdiserri et al., 2008).

Despite a pressing need to improve health outcomes for Veterans, the nature of the relationship between PTSD symptoms and high-risk sexual behavior is not well understood, in part because of how PTSD is measured. For example, the PTSD Checklist for the Diagnostic and Statistical Manual – 5th edition (PCL-5) (Weathers et al., 2013) derives a single estimate of past-month

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symptom severity. This aggregation precludes inferences about symptom variability across days, and how severity at a given moment, or instability over time, may predict high-risk sexual events.

Ecological momentary assessment (EMA) techniques involve repeatedly assessing momentary experiences in real time (Shiffman et al., 2008; Stone and Shiffman, 1994). These techniques produce rich longitudinal data that permit insight into event sequences that cannot be explored with summary, cross-sectional data. EMA of PTSD symptoms and high-risk sexual behavior can elucidate Veterans' day-to-day experiences of symptoms and how these relate temporally to sexual risk events.

A small number of recent studies have demonstrated the feasibility of assessing daily PTSD symptoms in OEF/OIF/OND Veterans. In one study, Veterans had high completion rates (86%) with four daily assessments of PTSD symptoms (using PCL-IV), affect, and substance use over a 28-day period using telephone-delivered interactive voice response recording, when cell phones were provided to them (Possemato et al., 2012). Using palm-top computers, Gaher and colleagues (2014) measured PTSD symptoms with an adapted PCL-IV-symptom checklist 8 times per day for 2 weeks, demonstrating good (70%) compliance with randomly-prompted surveys, and a significant positive relationship between PTSD symptoms recorded during the day and evening alcohol use. Both studies reported significant decreases in PTSD symptoms over the course of the study.

Using a daily life-charting instrument, a small study involving combat-exposed Veterans compared self-ratings of worst PTSD symptoms within symptom clusters to monthly symptom ratings, finding these were highly correlated (Westermeyer et al., 2015).

To our knowledge, no study has combined daily PTSD measures with assessment of high-risk sexual behavior in Veterans. This study is the first in a series of planned studies applying EMA techniques to assess PTSD symptoms and high-risk sexual behavior in real time, and model the temporal relationship between these variables in OEF/OIF/OND Veterans. In this study, we evaluated the feasibility of assessing, by web-based survey, daily PTSD symptoms, high-risk sexual behavior, and substance use in a sample of male Veterans. Feasibility was assessed with regard to daily survey completion, variability in PTSD symptoms, rates of self-reported high-risk sexual events and substance use.

2. Methods

All study procedures were approved by the Institutional Review Boards of VA Connecticut Healthcare System and Yale University.

2.1. Participants

Veterans were recruited between April and August, 2014 from two Department of Veterans Affairs (VA) outpatient clinics in Connecticut. Potential participants were Veterans applying for service-connection benefits for PTSD, and Veterans receiving PTSD-related outpatient treatment. Inclusion criteria were male gender, OEF/OIF/OND Veteran status, reliable access to phone and internet for 28 days, demonstration of understanding of the terms of participation as outlined in the consent form, and self-reported high-risk sexual behavior in the past 28 days, defined as unprotected vaginal, anal, or oral sex, or sex under the influence of drugs or alcohol with a partner who was not a legal spouse or cohabitating partner with whom the participant had an exclusive sexual relationship (Meyers et al., 2008).

Ten Veterans consented to participate, and one withdrew before completing any assessments. The nine who participated had a mean age of 34 years ($SD=8.44$, Range 24–51); four (44%) identified as White Non-Hispanic; four (44%) were Black Non-Hispanic, and one (11%) was Hispanic.

2.2. EMA procedures

Following orientation to EMA procedures, Veterans received three calls per day, randomly timed within the three 5-h intervals between 7 am and 10 pm, for 28 days. Each call prompted completion of a web-based survey at that time.

The survey, created with REDCap survey software (Harris et al., 2009), comprised assessments of PTSD symptoms and substance use in the past two hours, and high-risk sexual behavior since the last completed survey. Participants completed surveys using their own smartphones or computers. Entries were automatically date- and time-stamped.

2.2.1. PCL-5 (Weathers et al., 2013)

The standard 20-item assessment was amended to inquire about PTSD symptoms in the last 2 h (rather than past month). The instrument's seven symptom dimensions (using standard-scored items) assess severity of re-experiencing (items 1–5), avoidance (items 6–7), negative affect (items 8–11), anhedonia (items 12–14), externalizing behaviors (items 15–16), anxious arousal (items 17–18), and dysphoric arousal (items 19–20) symptoms (Armour et al., 2014).

2.2.2. High-risk sexual behavior

Items inquired about sexual events since the last completed survey, including the number and types of sexual contact (oral, vaginal, and anal), partner characteristics (gender, regular/not regular partner), substance use at the time of sexual event, and condom use. For this study, regular partner was defined as the person with whom the participant regularly had sex. All other partners were defined as not regular partners.

2.2.3. Substance use

The number of standard alcoholic drinks consumed, and any use of marijuana, cocaine, opiates, and "other" drugs in the past 2 h were recorded.

Participants were paid $2.50 for each survey completed within the day of the call prompt, and an additional $2.50 for each day that all three surveys were completed within 2 h of prompts.

2.3. Qualitative interview

Following the EMA period, participants were interviewed about the acceptability of daily calls, accessibility of the web-based survey, content of survey items, and reasons for skipped items. With participant consent, interviews were audio-recorded and transcribed. Participants who completed interviews were compensated $20.

All payment was made at the end of study participation, with total payment ranging from $117.50 to $280 of the possible $300 ($M=\$222$, $SD=\$59$).

2.4. Data analysis

EMA survey completion was calculated as the percentage of prompted surveys completed within the same calendar day, and within 2 h of the call prompt. Pearson's correlation coefficient estimated the linear relationship between the number of surveys completed over 28 days and overall PTSD symptom severity and symptom instability (measures described below).

High-risk sexual behavior was summarized as the total number of high-risk events, and the number of concurrent sexual partners.

Drug and alcohol use were summarized as the percentage of