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PTSD Symptomatology and Readiness to Quit Smoking among Women with Serious Mental Illness

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Abstract

Introduction—Posttraumatic stress disorder (PTSD) is a risk factor for tobacco addiction. The majority of research on PTSD and smoking has been conducted with men, particularly combat veterans, and little is known about the association among women. In a clinical sample of women civilian smokers with serious mental illness (SMI), we examined the prevalence of PTSD symptomatology and associations with physical and mental health functioning, co-occurring substance use, nicotine dependence, and readiness to quit smoking.

Methods—376 adult women smokers aged 18–73 were recruited from 7 acute inpatient psychiatry units and screened by diagnostic interview for current PTSD symptomatology (PTSD⁺). In multiple regressions, we examined the associations of screening PTSD⁺ with physical and mental health functioning; past-month drug use; past-year substance use disorders; nicotine dependence and readiness to quit smoking.

Results—Nearly half the sample (43%) screened PTSD⁺, which was significantly associated with use of stimulants (OR = 1.26) and opiates (OR = 1.98), drug use disorders (OR = 2.01), and poorer mental health ($B = -2.78$) but not physical health functioning. PTSD⁺ status was unrelated

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Contributors

Dr. Young-Wolff performed the data analyses and wrote the first draft of the manuscript. Dr. Prochaska designed and led the research study from which the data were drawn, provided input into analyses, and assisted with reviewing and ongoing revision of the manuscript. Dr. Sharon Hall participated in design of the research trial and provided ongoing mentoring and input on recruitment and retention and feedback on the manuscript. Dr. Fromont contributed to design of the research trial and was instrumental in screening research participants and facilitating recruitment at one of the treating hospitals. Dr. Stephen Hall advised on the research study and facilitated recruitment at one of the treating hospitals. All of the authors approved the final version of this manuscript.

Conflict of interest

The authors have no conflicts of interest to report.

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to nicotine dependence, but predicted greater desire to quit smoking ($B = 2.13$) and intention to stop smoking in the next month ($OR = 2.21$). In multivariate models that adjusted for substance use disorders, physical and mental health functioning, and nicotine dependence, screening PTSD⁺ remained predictive of greater desire and intention to quit smoking.

Conclusion—PTSD symptomatology was common in our sample of women smokers with SMI and associated with worse substance use and mental health, but also greater readiness to quit smoking, suggesting the need for and potential interest in integrative PTSD-addiction treatment among women.

Keywords

PTSD; women; mental illness; smoking; substance use; stage of change

1. Introduction

Trauma exposure and posttraumatic stress disorder (PTSD) are risk factors for tobacco addiction. In the U.S., 45% of individuals with PTSD smoke (Lasser et al., 2000), and there is a two-to five-fold increased risk of PTSD or nicotine dependence given the occurrence of the other (Fu et al., 2007). Individuals with PTSD smoke more heavily, experience more severe withdrawal symptoms, and have lower quit rates than those without PTSD (Lasser et al., 2000; Morissette et al., 2007; Zvolensky et al., 2008). Multiple mechanisms likely contribute to PTSD-smoking comorbidity, including overlapping neurobiological systems involved in stress response, PTSD, and drug reward (Brady & Sinha, 2005; Sinha, 2012) and shared genetic liability (Koenen et al., 2003; 2005; 2006). Further, individuals with PTSD may attempt to self-medicate PTSD symptoms (e.g., hyperarousal, re-experiencing) (Fu et al., 2007) or reduce negative affect (Feldner et al., 2007) by smoking. Smoking among individuals with PTSD contributes to their poorer physical health and greater healthcare costs (Beckham et al., 1997; Deykin et al., 2001).

While some of the extant literature on smoking and PTSD draws from large epidemiologic studies with community-based samples (Lasser et al., 2000), the majority of basic research and clinical treatment trials have been conducted with civilian veterans, mostly men. Two randomized controlled trials, both within the Veterans Affairs (VA) Medical System and the more recent trial a large 10 VA site, multisite trial, demonstrated efficacy for treating tobacco within mental health settings for persons with PTSD without harm to their PTSD recovery (McFall et al., 2005; 2006; 2010). When smoking cessation treatment was delivered as part of PTSD care, clients engaged more with treatment (i.e., attended more sessions, used cessation medications) and had two- to five-fold greater smoking abstinence as compared to clients referred to the VA outpatient quit smoking clinics. Important and novel findings for the field, it is unknown how the approach may generalize to other health care systems and to the treatment of women with PTSD.

With a greater prevalence of PTSD than men, women experience more severe PTSD symptoms and greater co-occurring drug addiction (Olff et al., 2007; Pietrzak et al., 2011; Tolin & Foa, 2006; Compton et al., 2007; Grant et al., 1997; Kessler et al., 2005). Further, women are often younger at the time of trauma exposure, experience different types of

traumatic events, are more likely to appraise events as threatening, and have greater acute emotional and dissociative trauma reactions than men, which may contribute to their higher PTSD prevalence (Olf et al., 2007).

The current study is a first investigation of PTSD symptomatology, nicotine dependence, and intentions to quit smoking among women. A diverse sample of women smokers with serious mental illness (SMI), defined as a mental health disorder resulting in serious functional impairment, which substantially interferes with or limits one or more major life activities, was recruited from acute inpatient psychiatry settings. Individuals with SMI are particularly at risk for tobacco use, trauma exposure, and PTSD (Bromet et al., 1998; CDC, 2013; Grubaugh et al., 2011). Approximately 17–53% of individuals with SMI have current PTSD, compared to 1–4% in the general population, and consistent with epidemiological patterns of sex differences, women with SMI have greater exposure to traumatic events, a higher conditional probability of developing PTSD following trauma, and elevated PTSD prevalence compared to men with SMI (Creamer et al., 2001; Grubaugh et al., 2011; Kessler et al., 2005).

It is of theoretical and clinical interest to understand how PTSD symptomatology relates to nicotine dependence and readiness to quit smoking, and given gaps in the literature, particularly among civilian women and largely hidden smokers, such as those with SMI. Clinicians may hesitate to address smoking among women with PTSD symptoms if they view these individuals as self-medicating and unmotivated to quit. The current study aimed to: 1) examine the prevalence of PTSD symptomatology among women smokers with SMI; and 2) assess how PTSD symptomatology relates to physical and mental health functioning, co-occurring alcohol and drug use, nicotine dependence, and measures of readiness to quit smoking. Specially, we hypothesized that PTSD symptomatology would be common and associated with poorer physical and mental health, greater co-occurring alcohol and drug use, greater nicotine dependence, and lower readiness to quit smoking.

2. Materials and Methods

2.1 Participants and Procedures

This study examined baseline data from 376 women smokers with SMI who participated in a randomized controlled tobacco treatment trial (Prochaska et al., in press). Participants were recruited from 2009–2013 and the intervention was initiated during an acute hospitalization on one of seven inpatient psychiatry units with complete smoking bans at a nonprofit community hospital and two academic medical centers in the San Francisco Bay Area. The intervention combined a computer-delivered smoking cessation program tailored to readiness to quit, individual motivational enhancement and cognitive behavioral counseling, and nicotine replacement therapy (Prochaska et al., 2009).

Individuals were eligible to participate if they were self-reported adult (i.e., 18 years old) smokers of ≥ 5 cigarettes/day, were not pregnant, had no contraindications to nicotine replacement, were not planning to move outside of the greater Bay Area during the 18-month study, and had the capacity to consent in English. Patients did not have to want to

quit smoking to participate. The institutional review boards of the participating hospitals and universities approved the study procedures.

2.2 Measures

Measures were administered during one-on-one interviews and included established scales with evidence of reliability and validity in clinical populations (Prochaska, Rossi, et al., 2004; Prochaska, Leek, Hall, & Hall, 2007). The Mini-International Neuropsychiatric Interview Screener (MINI; Sheehan et al., 1998) assessed PTSD and substance use disorders. For assessment of PTSD, we chose to use only the MINI's 3-item screener; in our prior study of smoking in a hospitalized sample with mental illness, we found that the full PTSD interview, with its follow-up detailed questions, was too emotionally charged to warrant administration (Prochaska et al., 2006). The 3-item PTSD screener assessed: (1) trauma exposure to self or other experienced or witnessed; (2) trauma response with intense fear, helplessness or horror; and (3) re-experiencing of the event in the past month in a distressing way (e.g., dreams, intense recollections, flashbacks or physical reactions). Individuals who answered yes to all three questions, which are necessary criteria but not sufficient for a confirmed diagnosis, were coded as screened PTSD⁺. The screener did not assess the nature of the trauma, degree of impairment, nor rule out causation from medical problems, medications, or drugs or alcohol. The Medical Outcomes Short Form (SF-12) assessed physical and mental health functioning (Ware et al., 1996). The 24-item Behavior and Symptom Identification Scale (BASIS-24) assessed depression, interpersonal relationships, self-harm, psychosis, emotional lability, and substance abuse (Eisen et al., 2006). The Addiction Severity Index (ASI) assessed past month heavy alcohol, stimulant, sedative, opiate and marijuana use (McLellan et al., 1992). The Fagerström Test for Nicotine Dependence assessed nicotine dependence (FTND; Heatherton et al., 1991). The Stages of Change Scale (Prochaska et al., 1983) assessed readiness to quit smoking with defined stages of precontemplation, not intending to quit smoking in the next 6 months; contemplation, intending to quit within 6 months; and preparation, planning to quit within 30 days with at least one 24-hour past-year quit attempt. The Thoughts about Abstinence (TAA) scale (Hall et al., 1990) measured desire to quit smoking, anticipated success with quitting, and perceived difficulty staying tobacco-free after quitting, all on 10-point scales.

2.3 Statistical Analyses

We first calculated the prevalence of PTSD⁺. Next, separate multiple regression analyses examined the association between screening PTSD⁺ and mental and physical health, alcohol and drug use measures, nicotine dependence and intention to quit. Finally, multiple regression analyses tested whether screening PTSD⁺ was associated with intention to quit smoking and thoughts about abstinence after further adjusting for mental and physical health, alcohol and drug use disorders, and nicotine dependence. All analyses were conducted using SAS version 9.3 (SAS, 2011) and age, race/ethnicity, marital status, education, and employment were included in all models.

3. Results

The sample ($N=376$) had a mean age of 40 years ($SD = 14$), averaged 14 years of education ($SD = 2.9$), 22% were employed, and 50% had an annual household income $< \$10,000$. The racial/ethnic composition was 43% non-Hispanic Caucasian, 28% African American, 5% Hispanic, 5% Asian/Pacific Islander, and 18% multiracial/other. Primary psychiatric disorders were psychotic disorder (24%), bipolar disorder (33%), major depression (30%), and other (13%). Demographics did not vary by PTSD⁺ screening status (all $p > .05$).

Nearly half the sample (43%) screened PTSD⁺. Table 1 presents descriptive statistics for sample characteristics and results from the multiple regression analyses examining differences by PTSD⁺ screening status. Women who screened PTSD⁺ had greater mental health problems on the BASIS-24; poorer mental health, but not poorer physical health, functioning on the SF-12; and a greater likelihood of use of sedatives or opiates, or a past-year drug use disorder. Associations with heavy alcohol use, stimulant use, marijuana use, alcohol use disorders, and severity of nicotine dependence were not significant. Notably, women who screened PTSD⁺ reported greater desire to quit smoking, and were more likely to be in the preparation stage of change, than in the precontemplation stage of change. PTSD⁺ screening status was not associated with expected success or difficulty with quitting. In multivariate models that adjusted for physical and mental health functioning, the BASIS-24 summary score, drug and alcohol use disorders, and nicotine dependence, screening PTSD⁺ remained significantly associated with greater desire to quit ($B = 1.99$, $p = .047$) and a greater likelihood of being in preparation than in the precontemplation stage of change ($OR = 2.65$, 95 CI = 1.27, 5.55, $p = .01$).

4. Discussion

The current study is a first investigation of PTSD symptomatology, nicotine dependence, and intentions to quit smoking among women with SMI. Nearly half the sample screened PTSD⁺, which was associated with poorer mental health functioning, greater illicit drug use, and a greater prevalence of drug use disorders. All current smokers, screening PTSD⁺ was unrelated to severity of nicotine dependence, and notably, women who screened PTSD⁺ reported *greater* desire to quit smoking, and were *more* likely to intend to quit smoking in the next 30 days, compared to women who screened negative for PTSD.

Findings suggest the relevance of and potential interest in intervention practices that concurrently address trauma recovery and tobacco cessation. Although psychological treatments for co-occurring PTSD-addiction traditionally have targeted substance use first, interventions that simultaneously address addiction and PTSD have received support (McCauley et al., 2012; van Dam et al., 2012), and tobacco treatment has been successfully integrated into mental health care among persons with PTSD in the VA health care system (McFall et al., 2005; 2006; 2010). Further, interventions that provide psychoeducation about the PTSD-addiction cycle (Ford et al., 2007), address trauma-related symptoms early on (Greenfield et al., 2010), and target behaviors that contribute to substance use, may aid recovery among women. For example, in a study by Bornoalova and colleagues (2009), the PTSD-substance use relation was partially mediated by difficulties controlling impulsive

behavior among women, and the authors hypothesized that distress tolerance skills may aid recovery for women with co-occurring PTSD-substance use.

The high prevalence of PTSD symptomatology in the current study speaks to the need for PTSD screening among women smokers with SMI. Co-occurring SMI and PTSD is clinically relevant, as it is associated with greater psychosocial problems and use of psychiatric services, higher disability and health care costs, and poorer quality of life (Grubaugh et al., 2011). Psychiatric inpatient visits present a unique screening opportunity for PTSD among women; yet, PTSD symptomatology is rarely assessed in psychiatric settings, and a large percentage of patients with SMI may have unrecognized and untreated PTSD (Grubaugh et al., 2011). Research supports the feasibility of training clinicians in treating PTSD symptoms among patients with SMI (Lu et al., 2012), and brief PTSD screeners exist (O'Hare et al., 2012). Importantly, screening and identification would allow for earlier intervention, more appropriate referrals, and likely improved treatment outcomes for women with SMI.

4.1 Limitations

Participants were adult women smokers hospitalized for SMI, and results may not generalize to everyone with SMI. The data were cross-sectional and measures were assessed retrospectively via self-report. Research indicates that individuals with SMI can accurately recount their trauma exposure and trauma-related symptoms, and are more likely to under-report than over-report trauma exposure (Grubaugh et al., 2011). We used the MINI PTSD screener and not the full diagnostic assessment, to avoid overly emotionally charged inquiry; and hence, likely falsely identified some participants as PTSD⁺.

4.2 Conclusions

In our diverse sample of women smokers with SMI, PTSD symptomatology was common and associated with worse substance use and mental health problems, but also greater readiness to quit smoking. Results highlight the need for, and potential interest in, integrative PTSD-tobacco addiction treatment for women. Additional research is needed to evaluate whether tobacco treatment can be successfully integrated into mental health care among women with PTSD symptomatology.

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Highlights

- We examined PTSD symptoms & co-occurring problems in women with serious mental illness
- PTSD symptoms were common and related to poorer mental health and substance use
- PTSD symptoms also associated with greater readiness to quit smoking
- Results suggest the need for integrative PTSD-addiction treatment among women

Table 1Risk for substance use outcomes and mental and physical health by PTSD⁺ status

	All (N = 376)	No PTSD (n = 214)	PTSD (n = 162)	OR (95% CI) or B [*]
<i>Mental and Physical Health</i>				
BASIS-24 Scales [M (SD)]				
Depression	2.7 (1.0)	2.6 (1.0)	2.8 (1.0)	2.48 [*]
Interpersonal	1.7 (1.0)	1.6 (1.0)	1.8 (1.0)	1.93 [*]
Self-Harm	1.6 (1.4)	1.4 (1.3)	1.9 (1.5)	2.93 ^{**}
Emotional Liability	2.2 (1.2)	2.1 (1.2)	2.5 (1.2)	2.98 ^{**}
Psychosis	1.2 (1.2)	1.1 (1.2)	1.3 (1.3)	2.16 [*]
Substance Abuse	1.1 (1.1)	0.9 (1.12)	1.2 (1.2)	2.69 [*]
Summary Score	2.1 (0.8)	2.0 (0.8)	2.3 (0.8)	3.74 ^{**}
SF-12 Mental Health [M (SD)]	29.9 (13.9)	31.6 (14.3)	27.6 (13.0)	-2.78 [*]
SF-12 Physical Health [M (SD)]	44.5 (13.3)	45.0 (13.5)	44.0 (13.1)	-1.06
<i>Alcohol and Drug Use Measures</i>				
Heavy alcohol use	36%	33%	41%	1.40 (0.88, 2.21)
Stimulant use	22%	21%	23%	1.26 (0.74, 2.15)
Sedative use	37%	33%	42%	1.57 [*] (1.01, 2.45)
Opiate use	26%	20%	33%	1.98 [*] (1.21, 3.23)
Marijuana use	40%	35%	46%	1.51 (0.96, 2.38)
Drug use disorder	43%	36%	51%	2.01 ^{**} (1.28, 3.16)
Alcohol use disorder	36%	33%	41%	1.29 (0.83, 2.01)
<i>Tobacco Characteristics</i>				
Nicotine Dependence [M (SD)]	4.7 (2.2)	4.6 (2.3)	4.7 (2.2)	0.37
Desire to Quit [M (SD)]	6.2 (3.0)	5.9 (3.0)	6.5 (2.9)	2.13 [*]
Perceived Success [M (SD)]	6.3 (2.9)	6.4 (2.9)	6.3 (2.9)	-0.42
Expected Difficulty [M (SD)]	7.0 (2.7)	7.1 (2.7)	7.0 (2.8)	-0.33
<i>Stage of Change</i>				
Precontemplation	26%	29%	22%	Reference
Contemplation	51%	52%	50%	1.45 (0.85, 2.48)
Preparation	23%	19%	28%	2.21 [*] (1.15, 4.22)

Notes.^{*} $p < .05$;^{**} $p < .01$.

PTSD⁺ status based on the Mini-International Neuropsychiatric Interview Screener 3-item PTSD screener. Odds Ratios (OR) and *B* represent risk of substance use outcomes, tobacco characteristics, and psychiatric characteristics associated with PTSD⁺ status. Multiple regression analyses adjusted for sociodemographic variables. SF-12 scores range 0–100, national norm = 50, SD=10, lower scores indicate worse functioning; BASIS-24 Scales range 0–4, higher scores indicate greater symptom/problem severity. Nicotine dependence based on FTND total scores range 0–10, with 1–4 indicating low nicotine dependence and 5 indicating moderate nicotine dependence.