Eating Behaviors 31 (2018) 8–11

Contents lists available at ScienceDirect

Eating Behaviors

journal homepage: www.elsevier.com/locate/eatbeh

PTSD is associated with emotional eating among veterans seeking treatment for overweight/obesity

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ARTICLE INFO

Keywords:
Veterans
PTSD
Obesity
Emotional eating

ABSTRACT

Both obesity and post-traumatic stress disorder (PTSD) are common among veterans. Veterans with PTSD are at higher risk for obesity and have poorer outcomes in obesity treatment. We examined emotional eating among veterans presenting for obesity treatment, and its relationship with PTSD. Veterans completed questionnaire batteries before initiating treatment. Participants were 120 veterans with a mean age of 62 years and mean BMI of 38. A positive PTSD screen was associated with significantly higher scores on the Yale Emotional Overeating Questionnaire (YEOQ) overall, as well as higher scores on each individual item, which includes anxiety, sadness, loneliness, tiredness, anger, happiness, boredom, guilt, and physical pain (all $p < 0.005$). Higher scores on the PTSD screener were associated with more frequent emotional eating for all emotions as well. Findings suggest that emotional eating is common among veterans reporting PTSD symptoms, and that any degree of PTSD symptom severity is associated with more frequent emotional eating. Veterans with PTSD may need specific attention given to alternative coping strategies when facing difficult emotions as part of weight loss treatment.

1. Introduction

Addressing overweight/obesity among veterans is a high priority for the Veterans Health Administration (VHA) given that the combined prevalence of overweight and obesity among veterans is approaching 80% (Breland et al., 2017). Post-traumatic stress disorder (PTSD) is also a significant concern in VHA. The prevalence of PTSD is higher among veterans receiving care through VHA compared to veterans receiving care outside of VHA (Boscarino et al., 2015; Vaughan et al., 2014), with roughly one out of five VHA-users who were in the recent Iraq and Afghanistan conflicts carrying the diagnosis of PTSD (Fulton et al., 2015). PTSD remains common among Vietnam veterans as well (Dohrenwend et al., 2006). The prevalence of obesity among veterans with PTSD is higher than the prevalence of obesity among veterans overall within VHA (47% vs 41%, respectively) (Breland et al., 2017), suggesting that this population is particularly at risk for weight gain and its related complications. Further, veterans with PTSD lose less weight during treatment than those without comorbid mental health conditions (Hoerster et al., 2014). The presence of PTSD has also been shown to be associated with eating disorders (Litwack et al., 2014; Maguen et al., 2012; Mitchell et al., 2014), night eating (Dorflinger et al., 2017), and food addiction (Mitchell & Wolf, 2016) among veterans. PTSD has been linked to other eating behaviors as well, including binge eating and eating as a coping strategy (Mason et al., 2017), and has been associated with weight change over time (Mitchell et al., 2016).

Emotional eating, characterized by eating in response to distress, has also been associated with PTSD among medically healthy veterans (Talbot et al., 2013). Emotional eating is important to study among veterans with overweight/obesity given that emotional eating has previously been shown to be associated with weight gain (Hays & Roberts, 2008; Koenders & van Strien, 2011) and that, in a national sample of veterans with overweight/obesity, those self-reporting a diagnosis of PTSD were also more likely to endorse eating because of emotions or stress compared to those not endorsing a mental health diagnosis (Klingaman et al., 2016). The current study therefore attempts to replicate and extend prior findings about the relationship between emotional eating and PTSD (Talbot et al., 2013) by examining emotional eating and its relationship to PTSD symptoms among veterans enrolling in treatment for obesity. We hypothesize that veterans reporting PTSD symptoms will be more likely to report emotional eating, and that greater PTSD symptom severity will be related to higher scores on a measure of emotional eating.

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https://doi.org/10.1016/j.eatbeh.2018.07.005
Received 29 January 2018; Received in revised form 11 July 2018; Accepted 18 July 2018
Available online 18 July 2018

2. Materials and methods

2.1. Participants

Data was collected from 126 veterans referred to the MOVE! weight management program at VA Connecticut Healthcare System. MOVE! is a structured behavioral weight management intervention available at VAs nationwide that is focused on education, motivation enhancement, problem solving, and goal setting related to dietary change and increasing physical activity. As part of a national VHA initiative, veterans are routinely screened for overweight/obesity within primary care. If a veteran has a BMI of ≥25, the primary care team engages the veteran in a discussion about behavioral treatment options, including MOVE!, and veterans who are interested in learning more are referred to the program. Veterans completed questionnaire batteries during orientation sessions during which they learned about the program and options for participation. There were no inclusion or exclusion criteria for the study, as information was collected as part of routine clinical care. This study was approved by the Institutional Review Board at VA Connecticut Healthcare System. Participants' written consent was waived with implied consent.

2.2. Measures

2.2.1. Demographics

Age and sex were self-reported by participants on the questionnaire. Data regarding race, ethnicity, and BMI was extracted from electronic medical records.

2.2.2. Yale Emotional Overeating Questionnaire (YEOQ)

The YEOQ is a 9-item questionnaire assessing the frequency with which individuals have eaten, over the prior 28 days, an unusually large amount of food given the circumstances in response to feelings of anxiety, sadness, loneliness, tiredness, anger, happiness, boredom, guilt, and physical pain (Hays & Roberts, 2008). Response options are 0 (no days), 1 (1–5 days), 2 (6–12 days), 3 (13–15 days), 4 (16–22 days), 5 (23–27 days), or 6 (every day). The YEOQ has good concurrent validity with measures of eating disorder symptomatology, including binge eating and eating concern as assessed by the Eating Disorders Examination Questionnaire and eating disinhibition as assessed by the Three Factor Eating Questionnaire (Hays & Roberts, 2008). The YEOQ demonstrated good internal consistency in the current study, with Cronbach's alpha = 0.946.

2.2.3. Primary Care PTSD Screen (PC-PTSD)

The PC-PTSD is a 4-item measure that is routinely used within VHA to screen for PTSD. The measure has demonstrated adequate test-retest reliability, and has demonstrated superior sensitivity (0.78) and specificity (0.87) for detecting PTSD compared to the PTSD symptom checklist (Prins et al., 2003). The measure starts with a prompt of: "In your life, have you ever had any experience that was so frightening, horrible, or upsetting that, *in the past month*, you…" Participants then respond "Yes" or "No" to four items assessing intrusive thoughts/nightmares, avoidance, hypervigilance, and emotional numbing. A score of 3 or 4 indicates a positive result and that further assessment is warranted.

2.3. Analyses

Demographic information was analyzed using basic frequencies and descriptive analyses. Independent samples *t*-tests and Pearson correlations were conducted to examine potential relationships between PTSD symptoms and emotional eating, and demographic factors. A one-way analysis of covariance was conducted controlling for BMI, age, sex, race, and ethnicity, as noted below, to examine the relationship between PTSD symptoms and emotional eating, both for the total score as well as for each emotion individually. Linear regressions, with the same covariates, also were conducted to examine whether PTSD symptom severity was associated with YEOQ score, both overall and for each emotion individually. Tests were conducted using Bonferroni adjusted alpha levels of 0.005 (0.05/10).

3. Results

There were 120 participants with sufficient data for analyses. There was little missing data, as research assistants checked for completion of packets and prompted participants to complete items if able. Three participants did not complete the second half of the questionnaire packet, and three participants did not complete the YEOQ specifically. There were no significant differences in demographic or other variables between participants who did and did not complete the YEOQ. The response rate was 95.2%. Of those with sufficient data for analyses, participants had a mean age of 61.64 years (SD = 8.46) and mean BMI of 37.99 (SD = 7.39). Participants were mostly male (90.0%), Caucasian (75.6%), and not Hispanic (93.3%). Roughly one-quarter of participants (23.3%) screened positive on the PC-PTSD (henceforth referred to as PC-PTSD+).

Younger participants had higher scores on the YEOQ ($r = 0.28$, $p = 0.002$). There were no significant relationships between the YEOQ and sex, race, or ethnicity. Being PC-PTSD+ was associated with younger age ($t = 3.21$, $p = 0.002$), and was more common among women ($\chi^2 = 4.29$, $p = 0.038$, 46.15% of women screening positive vs 20.54% of men) and non-Caucasians ($\chi^2 = 11.97$, $p = 0.001$, 46.67% of non-Caucasians screening positive vs 15.96% of Caucasians). While the relationship between ethnicity and PC-PTSD+ was not significant, none of the eight participants identifying as Hispanic were PC-PTSD+. There were no significant relationships between BMI and either YEOQ or PTSD. Given the significant differences by age, sex, race, and ethnicity, and that BMI is commonly controlled for in studies of eating and weight, these variables were controlled for in the analyses below.

The overall score, as well as scores for each item of the YEOQ, can be seen in Table 1. Those who were PC-PTSD+ had significantly higher scores on the YEOQ overall, as well as higher scores on each individual item (all p's < 0.005).

Participants who endorsed a greater number of symptoms of PTSD also reported more frequent emotional eating across all emotions assessed (all p's < 0.001; see Table 2).

Table 1
YEOQ scores for overall sample, and those with positive and negative screens for the PC-PTSD.

YEOQ	Overall *M (SD)*	PTSD+ *M (SD)*	PTSD− *M (SD)*	*F*	*p*
Total	11.30 (13.14)	22.40 (16.28)	7.89 (10.16)	25.05	*< 0.001*
Anxiety	1.23 (1.75)	2.78 (2.17)	0.74 (1.28)	30.32	*< 0.001*
Sadness	1.18 (1.64)	2.41 (1.89)	0.81 (1.39)	19.85	*< 0.001*
Loneliness	1.04 (1.72)	2.62 (2.08)	0.60 (1.31)	25.60	*< 0.001*
Guilt	1.03 (1.71)	2.52 (2.24)	0.62 (1.25)	23.49	*< 0.001*
Anger	1.08 (1.65)	2.15 (2.11)	0.79 (1.38)	12.11	*0.001*
Happiness	1.14 (1.52)	1.96(1.89)	0.84 (1.24)	11.61	*0.001*
Boredom	1.65 (1.88)	2.74 (2.07)	1.29 (1.69)	12.02	*0.001*
Tiredness	1.43 (1.89)	2.59 (2.26)	1.06 (1.63)	10.20	*0.002*
Physical pain	1.50 (2.20)	2.74 (2.43)	1.10 (2.00)	10.11	*0.002*

YEOQ = Yale Emotional Eating Questionnaire. Results show analyses of covariance controlling for BMI, age, sex, race, and ethnicity, to examine the relationship between PTSD and emotional eating. Scale range for individual items/emotions is 0–6; total score reflects the sum of the 9 items/emotions. With Bonferroni correction, findings are considered significant where p ≤ 0.005.