ORIGINAL PAPER

CrossMark

Associations between Mindfulness Facets and PTSD Symptom Severity in Psychiatric Inpatients

Colleen E. Martin[1] · Brooke A. Bartlett[2] · Madhavi K. Reddy[3] · Adam Gonzalez[4] · Anka A. Vujanovic[2]

Abstract

The current study concurrently examined associations of mindfulness facets with PTSD symptom severity and symptom cluster severity in a trauma-exposed, psychiatric inpatient sample. Participants included 152 psychiatric inpatients (42.1% women; $m$age = 33.86, SD = 11.29), who reported a history of trauma exposure consistent with Diagnostic and Statistical Manual of Mental Disorders—Fifth Edition (DSM-5) PTSD Criterion A. A cross-sectional design was used to determine associations between mindfulness facets and PTSD symptom severity and symptom cluster severity. Participants completed questionnaires regarding mindfulness and PTSD symptomatology. The data were analyzed at the bivariate level as well as multivariate level through hierarchical linear regression analyses. Results revealed that the mindfulness facets of acting with awareness ($\beta = -0.34$, $p < 0.001$), non-judging of inner experience ($\beta = -0.34$, $p < 0.001$), and non-reactivity to inner experience ($\beta = 0.34$, $p < 0.001$) demonstrated significant, incremental negative associations with total PTSD symptom severity, as well as PTSD intrusions (p's < 0.05) and negative alterations in cognitions and mood (p's < 0.05) symptom clusters, above and beyond covariates. Covariates included total number of traumatic life events and number of psychiatric diagnoses. This study investigated associations between mindfulness facets and PTSD symptom severity in acute care, psychiatric inpatients. Mindfulness may hold significant clinical utility for trauma-exposed psychiatric inpatients with varying levels of PTSD symptom severity. Research implications and future directions are discussed.

Keywords Mindfulness · Acceptance · PTSD · Trauma · Psychiatric inpatients

Mindfulness involves an intentional regulation of attention to and awareness of the present moment, as well as non-judgmental acceptance of the ongoing flow of sensations, thoughts, and/or emotional states (Baer et al. 2006; Bishop et al. 2004). Commonly conceptualized as being comprised of several facets, mindfulness includes *observing* (i.e., tendency to notice or attend to internal and external experiences), *describing* (i.e., tendency to label internal and external

experiences with words), *acting with awareness* (i.e., full awareness and undivided attention of current experiences), *non-judging of experience* (i.e., viewing internal experiences with a non-evaluative stance), and *non-reactivity to inner experience* (i.e., tendency to allow thoughts, emotions, and bodily sensations to come and go; Baer et al. 2006). Mindfulness is conceptualized as both a *state*, consisting of fluctuations in behaviors, thoughts, or emotions, and a *trait*, a relatively stable personality characteristic that is more long-lasting and less context-dependent (Baer et al. 2006; Brown and Ryan 2003; Lau et al. 2006). Regardless of one's level of trait or state mindfulness, it is considered to be malleable via intervention (e.g., Branstrom et al. 2010; Kimbrough et al. 2010; King et al. 2013; Niles et al. 2012, 2013).

Recently, mindfulness has received increasing attention in the context of traumatic stress research due to its potential theoretical and clinical relevance to the etiology, maintenance, and treatment of posttraumatic stress disorder (PTSD; Kim et al. 2013; Vujanovic et al. 2011, 2016). High levels of mindfulness may serve as a protective factor in the context of

✉ Anka A. Vujanovic
aavujano@central.uh.edu

[1] Cincinnati VA Medical Center, Cincinnati, OH 45220, USA

[2] Department of Psychology, University of Houston, 3695 Cullen Boulevard, 126 Heyne Building, Houston, TX 77204, USA

[3] University of Texas Health Science Center at Houston, Houston, TX 77030, USA

[4] State University of New York at Stony Brook, Stony Brook, NY, USA

Springer

trauma recovery (e.g., Thompson et al. 2011), while lower levels of mindfulness may confer risk following trauma exposure (Vujanovic et al. 2016). Mindfulness may help foster approach-oriented coping when individuals are triggered by external reminders of a traumatic event, and therefore, decrease attempts to avoid one's internal emotional, cognitive, and physical experiences, otherwise known as experiential avoidance. Furthermore, individuals who are more aware of present experience may be better able to effectively engage in various forms of treatment (Vujanovic et al. 2016). Mindfulness-based interventions have shown promise in decreasing PTSD symptoms in a variety of populations (e.g., military veterans, community samples of women, cancer patients, survivors of intimate partner violence) (Banks et al. 2015). Therefore, it is important to build upon our understanding of the relations between the various facets of mindfulness and PTSD symptomatology across clinical populations to better inform mindfulness-based intervention efforts.

Across studies, mindfulness has been negatively associated with PTSD symptom severity; however, patterns of association between mindfulness facets and specific PTSD symptom clusters have been varied. In a sample of trauma-exposed undergraduates, the *non-judging of experience* facet of the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al. 2006) was incrementally and negatively associated with PTSD avoidance symptom severity, after controlling for experiential avoidance (Thompson and Waltz 2010). In another sample of undergraduates (Kalill et al. 2014), incremental negative associations between the *describing* facet of the FFMQ and PTSD hyperarousal symptom severity were documented; the FFMQ *non-reactivity to inner experience* facet also was associated with overall PTSD symptom severity, as well as re-experiencing and hyperarousal symptom severity. Furthermore, Hanley et al. (2017) found *non-judging of experience*, *observing*, and *acting with awareness* facets to be significantly associated with lower levels of PTSD symptom severity in undergraduates.

In trauma-exposed community samples, significant negative associations between the *acting with awareness* and *accepting without judgment* scales of the Kentucky Inventory for Mindfulness Skills (KIMS; Baer et al. 2004) and PTSD symptom severity have been documented (Vujanovic et al. 2009). While the *accepting without judgment* subscale was significantly associated with each PTSD symptom cluster, the *acting with awareness* subscale was only negatively associated with the re-experiencing symptom cluster. Similarly, Bernstein et al. (2011) found mindful *awareness* and *attention*, indexed via the Mindful Awareness and Acceptance Scale (MAAS; Brown and Ryan 2003), to be negatively associated with PTSD symptom severity in a trauma-exposed community sample. In a more recent community sample, higher levels of mindfulness traits per the FFMQ were associated with lower levels of PTSD symptoms (Boughner et al. 2016).

Furthermore, this study also found that *describing, acting with awareness*, and *non-judging of experience* partially mediated associations between lifetime and child trauma exposure and current PTSD symptom severity.

In military samples, mindfulness, as measured by the MAAS (Brown and Ryan 2003), was negatively associated with PTSD symptomatology in a sample of US war veterans (Dahm et al. 2015). However, other studies found no differences in levels of mindfulness between combat veterans with and without PTSD (Call et al. 2015; Wahbeh et al. 2011). In a sample of firefighters, trait mindfulness measured by the MAAS (Brown and Ryan 2003) was associated with lower levels of PTSD symptomatology, depressive symptoms, physical symptoms, and problems with alcohol use. In active-duty police officers, an inverse association between the KIMS *accepting without judgment* subscale and PTSD symptom clusters of avoidance and intrusion were documented (Chopko and Schwartz 2013). This study also established an inverse association between the *describing* and *accepting without judgment* subscales of the KIMS and the hyperarousal symptom cluster of PTSD (Chopko and Schwartz 2013).

Cross-sectional findings have been strengthened by clinical trials suggesting the potential efficacy of mindfulness-based interventions, including mindfulness-based stress reduction (MBSR), mindfulness-based cognitive therapy (MBCT), and mindfulness-based stretching and deep breathing, in reducing symptoms of PTSD. Randomized clinical trials on mindfulness-based interventions for PTSD have been conducted across varied populations, including patients with cancer (e.g., Branstrom et al. 2010), military veterans (e.g., Kearney et al. 2012; Niles et al. 2012), and community adults with PTSD (e.g., Kim et al. 2013). Across studies, mindfulness-based interventions generally have been compared to wait-list control conditions or "treatment-as-usual." No randomized clinical trials have been conducted to date comparing mindfulness-based interventions directly with cognitive-behavioral therapies specifically for PTSD, such as cognitive processing therapy (Resick et al. 2008) or prolonged exposure therapy (Foa et al. 2007). One randomized controlled trial compared present-centered therapy, a non-trauma focused treatment for PTSD (Schnurr et al. 2003), to MBSR and found greater PTSD symptom reduction in the MBSR condition (Polusny et al. 2015). Another randomized controlled trial compared group cognitive-behavioral therapy with Mindfulness-Oriented Recovery Enhancement (MORE) in trauma-exposed, homeless men with co-occurring substance use and psychiatric conditions; and MORE was associated with greater reductions in PTSD symptoms as compared to group cognitive-behavioral therapy (Garland et al. 2016). In addition, changes in mindfulness have been documented in the context of residential PTSD treatment for military veterans, suggesting that mindfulness might also function as a mechanism of change in more established PTSD

intervention programs (Boden et al. 2012; Owens et al. 2012). Although this literature remains in a nascent stage of development, the results remain promising (Banks et al. 2015; Lang 2017; Vujanovic et al. 2016).

Missing from the vast majority of work on mindfulness-PTSD relations to date is a focus on psychiatric inpatients. Several randomized controlled trials have found that mindfulness-based interventions have resulted in symptom and quality of life improvements for individuals with psychosis and schizophrenia (e.g., Aust and Bradshaw 2017). Other studies have found associations between mindfulness and other psychiatric outcomes, such as depression and anxiety, in psychiatric inpatient samples (e.g., Perich et al. 2013). Related research has been conducted with samples of veterans with PTSD in inpatient (Landrum 2016) and residential treatment programs (Boden et al. 2012; Owens et al. 2012). In addition to veteran samples, relations between mindfulness facets and PTSD symptoms have been examined in women in residential treatment programs for substance use (Price et al. 2012). However, no studies have been conducted to evaluate associations between mindfulness facets and PTSD symptomatology in psychiatric inpatients with varying levels of PTSD symptomatology. This is unfortunate since trauma exposure rates as high as 98% have been documented among psychiatric inpatients (e.g., Grubaugh et al. 2011; Mueser et al. 1998; Walsh et al. 2003). Furthermore, rates of PTSD in psychiatric populations vary between 19 and 43% (Grubaugh et al. 2011; Howgego et al. 2005; Mueser et al. 2015), significantly higher than those of the general population. Additionally, mindfulness and facets of mindfulness have been variably measured in the literature across populations. In the relevant literature, the FFMQ and KIMS have been used to measure the specific facets of mindfulness whereas the MAAS has been used to measure mindful attention. Although all instruments measuring mindfulness and its facets can yield clinical utility, a better understanding of the relations between mindfulness facets and PTSD symptoms in psychiatric inpatients is a necessary first step in informing future research and clinical interventions.

The current study aims to address these research issues by concurrently examining the main effects of mindfulness facets, as measured by the FFMQ, in association with PTSD symptom severity in a trauma-exposed, psychiatric inpatient sample. Taken together, *acting with awareness*, *non-judging of inner experience*, and *non-reactivity to inner experience* have demonstrated more robust associations with PTSD symptomatology across populations, as compared to the *observing* and *describing* facets of mindfulness (e.g., Thompson and Waltz 2010; Vujanovic et al. 2009; Chopko and Schwartz 2013). These findings may indicate that the ability to act with present-centered awareness, to remain non-evaluative of internal experiences, and to allow internal experiences to come and go may be more relevant to managing PTSD symptoms via decreasing avoidance than merely being able to pay attention to and label present

experiences (Vujanovic et al. 2016). Notably, no published studies to date have examined relations between the various facets of mindfulness, defined by the FFMQ, and PTSD symptomatology as defined by the DSM-5; and no studies have examined these associations in psychiatric inpatients. Specifically, this study examines how the *observing*, *describing*, *acting with awareness*, *non-judging of inner experience*, and *non-reactivity to inner experience* subscales of the FFMQ are associated with PTSD symptom severity and severity of each PTSD symptom cluster (intrusions, avoidance, negative mood and cognition, and arousal; APA 2013) in psychiatric inpatients. Specifically, based upon extant literature and relevant theoretical models (Follette et al. 2006; Vujanovic et al. 2011, 2016), it was hypothesized that higher levels of *acting with awareness*, *non-judging of inner experience*, and *non-reactivity to inner experience* subscales would be most robustly associated with lower levels of PTSD symptom severity and the severity of each PTSD symptom cluster and vice versa. The *observing* and *describing* facets were not expected to be significantly associated with PTSD outcomes. These effects were expected after controlling for theoretically relevant covariates, including number of traumatic life events endorsed and number of psychiatric diagnoses on record. The covariates were selected based on their associations with PTSD symptomatology in psychiatric inpatient samples (e.g., Martin et al. 2017; Vujanovic et al. 2017a, b) and their inclusion in models examining mindfulness-PTSD relations (e.g., Vujanovic et al. 2009).

Method

Participants

The sample was comprised of 152 psychiatric inpatients (42.1% women; *M*age = 33.86, *SD* = 11.29) at a public, university-affiliated, acute-care psychiatric inpatient hospital in a large metropolitan area in the southern USA. See Table 1 for sample characteristics. Eligible individuals were those 18–65 years of age who reported a history of trauma exposure consistent with *Diagnostic and Statistical Manual of Mental Disorders—Fifth Edition* (*DSM-5*; APA 2013) PTSD criterion A. Potential participants were deemed ineligible if they were unable to provide verbal and written informed consent or if they obtained a score below 20 on the Mini Mental Status Examination (see below).

Procedure

All individuals assigned to one unit in an acute-care psychiatric inpatient hospital were screened for a history of exposure to trauma using the LEC-5 within 24 h of admission. Within 5 days of admission, study staff approached individuals

Table 1 Participant characteristics

	N (%)	M (SD)
Sex[a]		
Male	88 (57.9)	
Female	64 (42.1)	
Race/ethnicity[a]		
White/Caucasian	67 (44.1)	
Black or African American	57 (37.5)	
Asian	3 (2.0)	
Native Hawaiian or Other Pacific Islander	1 (0.7)	
Hispanic	24 (15.8)	
Age[1]		33.86 (11.29)
Marital status[a]		
Single	102 (67.1)	
Married	18 (11.8)	
Divorced	18 (11.8)	
Separated	11 (7.2)	
Widowed	3 (2.0)	
Income[a]		US$350.07 (US$1459.80)
Education[a]		
6th grade	3 (2.0)	
7th grade	3 (2.0)	
8th grade	8 (5.3)	
9th grade	14 (9.2)	
10th grade	7 (4.6)	
11th grade	8 (5.3	
High school/GED	57 (37.5)	
Some college	31 (20.4)	
College diploma	10 (6.6)	
Graduate studies	1 (0.7)	
Graduate degree	4 (2.6	
Mini Mental Status Examination		27.57 (2.61)
Length of hospitalization (days)[a]		9.03 (4.56)
Trauma endorsement[b]		
Transportation accident	95 (62.5)	
Physical assault	92 (60.5)	
Natural disaster	88 (57.9)	
Serious accident (e.g., at work, home)	73 (48.0)	
Childhood physical abuse	73 (48.0)	
Other stressful event or experience	61 (40.1)	
Assault with a weapon	57 (37.5)	
Witnessing sudden, violent death	53 (34.9)	
Sexual assault	52 (34.2)	
Life-threatening illness or injury	50 (32.9)	
Childhood sexual abuse	46 (30.3)	
Fire or explosion	45 (29.6)	
Other unwanted sexual experience	42 (27.6)	
Serious injury or death caused to someone else	32 (21.1)	
Captivity	29 (19.1)	
Combat or exposure to war-zone	21 (13.8)	
Mood disorders[a]	116 (76.3)	
Bipolar disorder NOS	33 (21.7)	
Major depressive disorder with or without psychosis; unspecified	35 (23.0)	
Bipolar disorder I/II with or without psychosis	36 (21.6)	
Substance-induced mood/psychosis mood disorder NOS	8 (5.3)	
Mood disorder NOS	4 (2.6)	
Substance use disorders[a]	125 (82.2)	
Alcohol abuse/dependence	23 (15.1)	
Opioid abuse/dependence	4 (2.6)	
Cocaine abuse/dependence	21 (13.8)	
Polysubstance abuse/dependence	14 (9.2)	
Cannabis abuse/dependence	33 (21.7)	
Hallucinogen abuse	2 (1.3)	
Amphetamine abuse/dependence	10 (6.5)	
PCP abuse/dependence	10 (6.5)	
Anxiolytic abuse/dependence	7 (4.6)	
Inhalant abuse	1 (0.6)	

Table 1 (continued)

	N (%)	M (SD)
Psychotic-spectrum disorders[a]	49 (26.3)	
Schizoaffective disorder	18 (11.8)	
Schizophrenia	13 (8.6)	
Psychosis NOS	4 (2.6)	
Schizophreniform disorder	5 (3.3)	
Anxiety and related disorders[a]	8 (5.3)	
Posttraumatic stress disorder	3 (2.0)	
Anxiety disorder NOS	3 (2.0)	
Adjustment disorder	1 (0.7)	
Panic disorder	1 (0.7)	

[a] Medical records review

[b] Life Events Checklist for DSM-5

endorsing at least one trauma for potential participation. Individuals who were willing to participate provided informed verbal and written consent. Participants were then administered the MMSE and completed a self-report packet, which included the questionnaires used for the current study. Participation was completely voluntary; no financial compensation was provided. The study was approved by the institutional review boards at the University of Texas Health Science Center at Houston and the University of Houston.

Measures

Mini Mental Status Examination (MMSE; Folstein et al. 1975; Tombaugh and McIntyre 1992) The MMSE is an 11-item instrument used as an objective screening tool for general mental status. It provides brief assessment of abilities in the areas of attention, memory orientation (e.g., recall of words, recognition of sentences), and initiation and maintenance of verbal and motor responses. Scores range from 0 to 30, with scores below 20 indicating moderate cognitive impairment.

Medical Records Review Demographic information, including age, sex, race/ethnicity, and psychiatric diagnoses were derived from electronic medical records. Psychiatric diagnoses were determined via non-standardized clinical interviews conducted by unit psychiatrists. Discharge psychiatric diagnoses were used to inform the diagnostic composition of the present sample. Since patients commonly present for admission in acute distress, intake diagnostic information is often incomplete; thus, discharge diagnostic information is more comprehensive and provides a standardized time-point for extraction of diagnostic data. The number of psychiatric diagnoses was entered as a covariate in the hierarchical regression analyses. A summary of the diagnostic composition of the sample is reported in Table 1.

Life Events Checklist for DSM-5 (LEC-5; Weathers et al. 2013) The LEC-5 is a self-report measure used to screen for potentially traumatic events experienced anytime during the lifespan.

Respondents are presented with 17 potentially traumatic events (e.g., natural disaster, combat, sexual assault), including an additional item assessing any "other" traumatic events not listed. In the current study, respondents were asked to indicate whether each listed event "has happened to you at some point in your life." This represents a modification of the original LEC-5, which asks participants whether each event (a) "happened to you," (b) "you witnessed it happen to someone else," (c) "you learned about it happening to a close family member of close friend," (d) "you were exposed to it as part of your job," and/or (e) "you're not sure if it fits." Another modification included the removal of two items from the LEC-5 (exposure to toxic substance and severe human suffering) and the addition of two items (childhood physical abuse and childhood sexual abuse). These modifications were instituted to reduce the potential for false-positive reports (e.g., endorsement of 'exposure to toxic substance' by patients with psychotic-spectrum psychopathology) and to add a childhood time-frame for endorsement of sexual or physical abuse/assault. In the current study, the LEC-5 was used to characterize trauma exposure among the sample and to determine the number of potentially traumatic events each participant experienced, which was entered as a covariate in the hierarchical regression analyses.

PTSD Checklist-Civilian Version-5 (PCL-5; Blevins et al. 2015) The PCL-5 is a 20-item self-report measure of PTSD symptom severity. Each of the 20 items reflects a *DSM-5* symptom of PTSD (APA 2013). Respondents are asked to rate each item on a five-point scale (0 = *Not at all* to 4 = *Extremely*) in terms of how often they have been bothered by the symptom in the past month (e.g., "In the past month, how much have you been bothered by repeated, disturbing, and unwanted memories of the stressful experience?"). Total symptom severity scores range from 0 to 80, where higher scores indicate higher symptom severity. A preliminary PTSD cut-off score of 33 is recommended in the current literature (Bovin et al. 2016). The PCL-5 has demonstrated good internal consistency, test-retest reliability, and convergent and discriminant validity (Armour et al. 2015; Bovin et al. 2016). The internal consistency of the

PCL-5-total score in the current study was very good (Cronbach's $\alpha = 0.91$); internal consistencies for each of the subscales were also good (intrusions: Cronbach's $\alpha = 0.62$; avoidance: Cronbach's $\alpha = 0.73$; negative alterations in cognitions and mood: Cronbach's $\alpha = .89$; arousal: Cronbach's $\alpha = 0.83$). The PCL-5 was used to determine PTSD symptom severity as well as severity of each of the four DSM-5 (APA 2013) PTSD symptom clusters; these five variables were outcomes in the present study.

Five Facet Mindfulness Questionnaire (FFMQ; Baer et al. 2006)

The FFMQ is a 39-item measure of mindfulness. Items are rated on a five-point Likert-type scale ranging from 1 (never or very rarely true) to 5 (very often or always true). The FFMQ measures five facets of mindfulness including observing, describing, acting with awareness, non-judging of experience, and non-reactivity to inner experience (Baer et al. 2006). The observing subscale gauges respondents' attention to internal and external experiences (e.g., "When I'm walking, I deliberately notice the sensations of my body moving"); the describing subscale gauges respondents' ability to label internal experiences (e.g., "I am good at finding words to describe my feelings"); the acting with awareness subscale gauges respondents' attention to activities in the moment (e.g., "When I do things, my mind wanders off and I'm easily distracted"); the non-judging of experience subscale gauges respondents' ability to remain non-evaluative about their internal experiences (e.g., "I criticize myself for having irrational or inappropriate emotions"); the non-reactivity to inner experience subscale gauges respondents' ability to allow internal experiences to come and go (e.g., "I perceive my feelings and emotions without having to react to them") (Baer et al. 2006). The FFMQ has good construct validity and reliability (Baer et al. 2008), and the internal consistency of the FFMQ in the current study was good (Cronbach's $\alpha = 0.83$). Internal consistencies of all subscales were also good (i.e., observing: $\alpha = .83$, describing: $\alpha = 0.53$, acting with awareness: $\alpha = 0.86$, non-judging of experience: $\alpha = 0.77$, non-reactivity to inner experience: $\alpha = 0.77$).

Data Analyses

Analyses were conducted in IBM SPSS Statistics 22. A series of five hierarchical regression analyses were performed. Criterion variables included: (1) PCL-5-total score, (2) PCL-5-intrusion symptoms subscale score, (3) PCL-5-avoidance symptoms subscale score, (4) PCL-5-negative alterations in cognitions and mood symptoms subscale score, and (5) PCL-5-arousal symptoms subscale score. At step one of each of the models, the number of psychiatric diagnoses and LEC-5-total number of traumatic events were entered as covariates. At step two of each of the models, the five FFMQ subscales (i.e., FFMQ-observing, FFMQ-describing, FFMQ-acting with

awareness, and FFMQ-non-judging of experience, FFMQ-non-reactivity to Inner experience) were entered concurrently to examine the unique incremental contributions of these mindfulness variables in relation to each of the PTSD-relevant symptom outcomes.

Results

See Table 2 for a summary of descriptive statistics and correlations among study variables. Assumptions of normality were met. Participants reported an average of 6.06 potentially traumatic events on the LEC-5 ($SD = 3.62$) and endorsed an average PCL-5-total score above the suggested cut-off of 33 (Bovin et al. 2016) for a probable PTSD diagnosis ($M = 59.48$, $SD = 21.79$). Based on the recommended cut-off, 76.3% of the sample met criteria for a probable PTSD diagnosis. Participants were diagnosed with an average of two current psychiatric diagnoses ($SD = 1.14$).

In terms of bivariate correlations, the total number of traumatic event types experienced (LEC-Total) was significantly positively correlated with the PCL-5-total score, as well as with the four PTSD symptom cluster severity scores per the PCL-5. However, number of psychiatric diagnoses was not significantly correlated with any of the study variables. The FFMQ-observing subscale was significantly positively correlated with the LEC-total score as well as the PTSD intrusion subscale. The FFMQ-describing subscale was significantly positively correlated with the PCL-5-intrusion subscale and negatively correlated with PTSD symptom severity subscales of negative alterations in cognitions and mood and arousal. The FFMQ-acting with awareness subscale was significantly negatively correlated with total number of adult traumatic events experienced and significantly negatively correlated with the PCL-total score and three of the four PTSD symptom severity clusters (intrusions, negative alterations in cognitions and mood, arousal). Similarly, the FFMQ-non-judging of experience subscale was significantly negatively correlated with total number of adult traumatic events experienced, as well as three of the four PTSD symptom severity clusters (intrusion, negative alterations in cognitions and mood, arousaL). Lastly, the FFMQ-non-reactivity to inner experience subscale was only significantly negatively correlated with PCL-total score and the PCL- negative alterations in cognitions and mood and PCL-intrusion subscales.

Please see Table 3 for a summary of hierarchical regression analyses. With regard to PTSD symptom severity (PCL-Total score), step one contributed 20.2% of variance to the model ($p < 0.001$), and number of traumatic life events was a significant correlate. Step two contributed 26.8% of unique variance to the model ($p < 0.001$). Acting with awareness, non-judging of inner experience, and non-reactivity of inner experience

Table 2 Correlations and descriptive statistics among study variables

Variable	Mean	SD	Range	1	2	3	4	5	6	7	8	9	10	11	12
1. LEC-total[a]	6.06	3.62	1–16	—											
2. Diagnoses-total[b]	2.01	1.14	1–6	0.05	—										
3. FFMQ: observing[c]	26.37	7.67	8–40	0.22*	0.04	—									
4. FFMQ: desribing[d]	26.57	8.00	8–69	−0.01	0.11	0.38**	—								
5. FFMQ: awareness[e]	25.37	7.62	6–40	−0.21*	0.02	−0.10	0.34**	—							
6. FFMQ: non-judging[f]	24.33	6.76	8–40	−0.22*	−0.01	−0.27**	0.11	0.61**	—						
7. FFMQ: non-reactivity[g]	20.00	5.66	7–35	−0.06	0.00	0.54**	0.44**	0.05	−0.05	—					
8. PCL-5: total[h]	59.48	21.79	20–136	0.44**	0.11	−0.03	−0.15	−0.49**	−0.44**	−0.28**	—				
9. PCL-5: intrusion[i]	15.42	7.73	5–73	0.28**	0.16	0.01	0.15	−0.39**	−0.43**	−0.15	0.81**	—			
10. PCL-5: avoidance[j]	5.98	2.56	2–10	0.36**	−0.01	0.08	−0.08	−0.21**	−0.15	−0.14	0.73**	0.52**	—		
11. PCL-5: negative cognitions and mood[k]	20.37	8.39	7–35	0.45**	0.07	−0.09	−0.30**	−0.47**	−0.41**	−0.31**	0.92**	0.58**	0.66**	—	
12. PCL-5: arousal[l]	17.98	6.53	6–30	0.40**	0.16	−0.02	−0.26**	−0.51**	−0.39**	−0.22*	0.90**	0.57**	0.60**	0.84**	—

*$p < .05$; **$p < .01$

[a] Life Events Checklist-5: total number adult traumatic events experienced

[b] Medical records review: number of psychiatric diagnoses

[c] Five Facet Mindfulness Questionnaire: observing subscale

[d] Five Facet Mindfulness Questionnaire: describing subscale

[e] Five Facet Mindfulness Questionnaire: acting with awareness subscale

[f] Five Facet Mindfulness Questionnaire: non-judging of experience subscale

[g] Five Facet Mindfulness Questionnaire: non-reactivity to inner experience subscale

[h] PTSD Checklist for DSM-5: total score

[i] PTSD Checklist for DSM-5: intrusion

[j] PTSD Checklist for DSM-5: avoidance

[k] PTSD Checklist for DSM-5: negative alteration in cognitions and mood

[l] PTSD Checklist for DSM-5: arousal

Table 3 Hierarchical regression analyses: incremental associations between mindfulness facets and posttraumatic stress symptom severity

	ΔR^2	t	β	sr^2	p
Criterion variable: PCL-5-total[a]					
Step 1	0.202	–	–	–	< 0.001
Number of psychiatric diagnoses[f]	–	1.12	0.09	–	NS
LEC-total[g]	–	5.21	0.44	–	< 0.001
Step 2	0.268	–	–	–	< 0.001
Observing (FFMQ)[h]	–	− 1.18	− 0.11	0.02	NS
Describing (FFMQ)[i]	–	1.64	0.14	0.03	NS
Acting with awareness (FFMQ)[j]	–	− 3.58	− 0.34	0.21	0.001
Non-judging (FFMQ)[k]	–	− 2.33	− 0.21	0.15	< 0.05
Non-reactivity (FFMQ)[l]	–	− 2.97	− 0.26	0.08	0.004
Criterion variable: PCL-5-intrusions[b]					
Step 1	0.100	–	–	–	0.002
Number of psychiatric diagnoses	–	1.63	0.14	–	NS
LEC-total	–	3.11	0.28	–	0.002
Step 2	0.332	–	–	–	< 0.001
Observing (FFMQ)	–	− 1.99	− 0.19	0.003	0 .05
Describing (FFMQ)	–	5.31	0.47	0.02	< 0.001
Acting with awareness (FFMQ)	–	− 3.57	− 0.35	0.13	0.001
Non-judging (FFMQ)	–	− 3.07	− 0.29	0.16	0.003
Non-reactivity (FFMQ)	–	− 2.75	− 0.25	0.02	0.007
Criterion variable: PCL-5-avoidance[c]					
Step 1	0.132	–	–	–	< 0.001
Number of psychiatric diagnoses	–	− 0.26	− 0.02	–	NS
LEC-total	–	4.20	0.36	–	< 0.001
Step 2	0.036	–	–	–	NS
Observing (FFMQ)	–	0.83	0.09	0.00	NS
Describing (FFMQ)	–	0.04	0.004	0.01	NS
Acting with awareness (FFMQ)	–	− 1.08	− 0.13	0.02	NS
Non-judging (FFMQ)	–	0.06	0.01	0.01	NS
Non-reactivity (FFMQ)	–	− 0.156	− 0.17	0.02	NS
Criterion variable: PCL-5-negative alterations in cognitions and mood[d]					
Step 1	0.202	–	–	–	< 0.001
Number of psychiatric diagnoses	–	0.63	0.05	–	NS
LEC-total	–	5.35	0.44	–	< 0.001
Step 2	0.259	–	–	–	< 0.001
Observing (FFMQ)	–	− 1.34	− 0.12	0.05	NS
Describing (FFMQ)	–	− 0.74	− 0.06	0.11	NS
Acting with awareness (FFMQ)	–	− 2.63	− 0.25	0.19	0.01
Non-judging (FFMQ)	–	− 2.33	− 0.21	0.13	< 0.05
Non-reactivity (FFMQ)	–	− 2.21	− 0.20	0.10	< 0.05
Criterion variable: PCL-5-arousal[e]					
Step 1	0.180	–	–	–	< 0.001
Number of psychiatric diagnoses	–	1.74	0.15	–	NS
LEC-total	–	4.66	0.39	–	< 0.001
Step 2	0.238	–	–	–	< 0.001
Observing (FFMQ)	–	− 0.68	− 0.06	0.02	NS
Describing (FFMQ)	–	− 0.57	− 0.05	0.09	NS
Acting with awareness (FFMQ)	–	− 3.60	− 0.35	0.23	< 0.001
Non-judging (FFMQ)	–	− 1.32	− 0.13	0.17	NS
Non-reactivity (FFMQ)	–	− 1.52	− 0.14	0.05	NS

β = standardized beta weight, sr^2 squared semi-partial correlation

[a] PTSD Checklist for DSM-5: total score

[b] PTSD Checklist for DSM-5: intrusion

[c] PTSD Checklist for DSM-5: avoidance

[d] PTSD Checklist for DSM-5: negative alterations in cognitions and mood

[e] PTSD Checklist for DSM-5: arousal

[f] Medical records review: number of psychiatric diagnoses

[g] Life Events Checklist-5: total number adult traumatic events experienced

[h] Five Facet Mindfulness Questionnaire: observing subscale

[i] Five Facet Mindfulness Questionnaire: describing subscale

[j] Five Facet Mindfulness Questionnaire: acting with awareness subscale

[k] Five Facet Mindfulness Questionnaire: non-judging of experience subscale

[l] Five Facet Mindfulness Questionnaire: non-reactivity to inner experience subscale

were all significant incremental correlates of PTSD symptom severity (p's < 0.05), above and beyond covariates at step one.

In terms of PTSD-intrusion symptom severity, step one contributed 10% of variance to the model ($p = 0.002$), and number of traumatic life events was a significant correlate. Step two contributed 33.2% of unique variance to the model ($p < 0.001$), and describing, acting with awareness, non-judging of experience, and non-reactivity to inner experience were significant incremental correlates (p's < 0.05), above and beyond covariates at step one.

With regard to PTSD-avoidance symptom severity, step one accounted for 13.2% of variance to the model ($p < 0.001$), and number of traumatic life evens was a significant correlate ($p < 0.001$). Step two did not significantly contribute unique variance to the model, and none of the five mindfulness facets were significant correlates of PTSD-avoidance symptoms.

In terms of PTSD-negative alterations in cognitions and mood symptom severity, step one contributed 20.2% of variance to the model ($p < 0.001$), and number of traumatic life events was a significant correlate. Step two accounted for 25.9% of unique variance to the model ($p < 0.001$). Acting with awareness, non-judging of experience, and non-reactivity to inner experience were significant incremental correlates (p's < 0.05), above and beyond covariates at step one.

With regard to PTSD-arousal symptom severity, step one explained 18% of variance ($p < 0.001$), and number of traumatic life events was a significant correlate. Step two accounted for 23.8% of unique variance in the model, and acting with awareness was a significant incremental correlate ($p < 0.001$), above and beyond covariates at step one.

Discussion

The present study sought to address the associations between facets of mindfulness, as measured by the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al. 2006), and PTSD symptomatology in an acute-care psychiatric inpatient sample. Consistent with hypotheses, *acting with awareness*, *non-judging of experience*, and *non-reactivity to inner experience* demonstrated significant, incremental negative associations with total PTSD symptom severity, above and beyond variance contributed by number of traumatic life events and number of psychiatric diagnoses at discharge. These findings are consistent with literature on associations between these FFMQ facets and overall PTSD symptom severity in other trauma-exposed samples (e.g., Kalill et al. 2014; Vujanovic et al. 2009; Hanley et al. 2017). Thus, psychiatric inpatients with heightened present-centered awareness as well as non-judgmental acceptance of and non-reactivity to present experience were less likely to report high levels of PTSD

symptoms, and vice versa. These results lend further support to the potential clinical significance of mindfulness facets with regard to PTSD symptoms among acute-care psychiatric populations. Inconsistent with hypotheses, the *observing* and *describing* facets were not significantly associated with PTSD symptom severity. This is inconsistent with past work among veterans, which demonstrated negative associations between the *observing* and *describing* facets of the FFMQ and global PTSD symptom severity (Stephenson et al. 2017). Alternatively, the present findings partially support those found in trauma-exposed community samples and treatment-seeking PTSD samples, wherein the *observing* facet of the FFMQ was not significantly associated with PTSD symptomatology (Boughner et al. 2016; Schoorl et al. 2015). Additionally, the *describing* facet of the FFMQ has not shown significant associations with overall PTSD symptomatology (Possemato et al. 2016; Stephenson et al. 2017); however, it has been examined as a mediator of the relationship between past trauma and current PTSD symptoms (Boughner et al. 2016). Inconsistencies in findings across populations underscore the need for intervention-based studies and longitudinal designs to conclusively determine the most relevant mindfulness skills with regard to PTSD symptomatology.

Describing demonstrated positive associations with the PTSD intrusion cluster, while *acting with awareness*, *non-judging of experience*, and *non-reactivity to inner experience* demonstrated significant negative associations, above and beyond effects of covariates. Specifically, higher levels of labeling internal and external experiences with words were associated with heightened intrusion symptom severity and vice versa. As such, individuals with increased *describing* skills may manifest more focused attention on their internal experiences, including trauma-related intrusions, thus amplifying the extent to which such symptoms are reported. Conversely, higher levels of *acting with awareness*, *non-judging of experience*, and *non-reactivity to inner experience* were associated with lower levels of intrusion symptom severity and vice versa. These findings are consistent with the prior literature (e.g., Kalill et al. 2014; Vujanovic et al. 2009). Inconsistent with hypotheses, the *observing* facet of the FFMQ was not significantly associated with intrusion symptoms. This finding resembles those in trauma-exposed adults, wherein none of the FFMQ subscales, including *observing*, were significantly associated with the intrusion symptom cluster (Gonzalez et al. 2016). The tendency to notice internal and external experiences may not be especially relevant to PTSD symptomatology, in the absence of skills relevant to awareness, non-judgmental acceptance, or non-reactivity to that experience.

Acting with awareness, *non-judging of experience*, and *non-reactivity to inner experience* demonstrated significant incremental associations with negative alterations in cognitions and mood symptom severity, above and beyond

covariates. Heightened levels of these facets of the FFMQ were associated with lower levels of negative alterations in cognition and mood, and vice versa. In veteran samples, increased mindfulness has been associated with decreased levels of emotional numbing (Stephenson et al. 2017), which aligns with the negative cognition and mood symptom cluster of the PCL-5. Inconsistent with hypotheses, the *observing* and *describing* facets of the FFMQ were not significantly associated with the negative cognition and mood symptom cluster; however, the *describing* facet was significantly associated with the negative cognition and mood cluster at the bivariate level ($r = -0.30$, $p < 0.01$). This is partially consistent with recent work, which also failed to document significant associations between *observing* and the DSM-5 PTSD symptom cluster of negative alterations in cognitions and mood, in a sample of trauma-exposed adults (Boughner et al. 2016). Therefore, observing and describing thoughts and emotions may not be as strongly associated with this symptom cluster as actively tolerating and accepting internal experiences.

With regard to arousal symptom severity, *acting with awareness* manifested significant negative associations, above and beyond covariates. Higher levels of *acting with awareness* were significantly associated with lower levels of arousal symptoms, and vice versa. This is consistent with studies examining mindfulness and the hyperarousal symptoms of PTSD (e.g., Boughner et al. 2016; Gonzalez et al. 2016; Stephenson et al. 2017). Inconsistent with hypotheses and extant literature (e.g., Chopko and Schwartz 2013; Kalill et al. 2014), none of the other FFMQ facets were significantly associated with arousal symptomatology. Notably, describing ($r = -0.26$, $p < .01$), *non-judging of experience* ($r = -0.39$, $p < 0.01$), and *non-reactivity to inner experience* ($r = -0.22$, $p < 0.05$) were all significantly associated with PTSD arousal symptom cluster severity at the bivariate level. These significant associations likely became non-significant once entered into the model with variables that accounted for more variance (e.g., *acting with awareness*). Perhaps becoming more aware of one's inner experiences leads to present-focused behavior and decreased arousal symptoms (e.g., easily startled) (Delizonna et al. 2009). Similar to other PTSD outcomes, the *observing* facet was not significantly associated with the arousal symptom cluster at the bivariate or multivariate level. This is consistent with some other literature in trauma-exposed populations wherein *observing* was the only facet of mindfulness not significantly associated with PTSD symptomatology (e.g., Schoorl et al. 2015) but inconsistent with other studies (Stephenson et al. 2017).

Notably, no significant associations were found between any of the FFMQ facets and avoidance symptom cluster severity. This is inconsistent with the extant literature, as other studies have demonstrated significant associations among mindfulness facets and avoidance symptoms. Specifically, the *non-judging of experience* subscale of the FFMQ has been

significantly associated with avoidance in samples of trauma-exposed undergraduate students (Thompson and Waltz 2010) and police officers (Chopko and Schwartz 2013), while the *acting with awareness* subscale of the FFMQ was significantly associated with PTSD avoidance symptoms in trauma-exposed adults with HIV/AIDS (Gonzalez et al. 2016). In a sample of veterans, *non-reactivity to inner experience* of the FFMQ was the only subscale significantly associated with the avoidance cluster of PTSD (Stephenson et al. 2017). These inconsistent findings may point to differences in associations between mindfulness facets and avoidance symptoms across populations.

Consistent with past literature, number of trauma exposure types, as measured by the LEC-5, was significantly and positively associated with PTSD symptom severity and severity of each of the PTSD symptom clusters (e.g., Brown et al. 2016; Lee et al. 2015; Maheux and Price 2015; Weiss et al. 2013; Zuromski et al. 2014). Indeed, individuals in the current study endorsed multiple traumatic life events ($M = 5.98$, $SD = 3.55$), as consistent with extant literature on inpatient samples (Mauritz et al. 2013; Barton et al. 2006; Melartin et al. 2002). Second, inconsistent with prior literature on complex psychopathology and increased severity of psychiatric symptoms (e.g., Arsenault-Lapierre et al. 2004; Krysinska and Lester 2010), number of psychiatric diagnoses was not significantly associated with any of the PTSD outcomes. This finding may be due to limitations inherent in the methodology since psychiatric diagnoses were derived via unstructured clinical interviews between psychiatrists and patients during daily interactions. These interviews often reflected queries relevant to current "presenting problems" and are likely an underestimate of the comprehensive psychiatric composition of the sample. Third, this sample reported a low mean monthly income ($M = \$350.07$, $SD = \$1459.80$) and was racially/ethnically diverse (i.e., 44.1% White/Caucasian, 37.5% Black/African American, 15.8% Hispanic), underscoring the urban, inner-city nature of the overall sample. Research incorporating more detailed socioeconomic and sociocultural information (e.g., perceived discrimination, cultural resilience) is needed to better understand the relevant impact on associations between mindfulness and PTSD symptoms. High levels of day-to-day stress experienced by socioeconomically disadvantaged individuals, due to lack of access to resources, greater exposure to neighborhood stress and violence, and/or societal discrimination, may negatively impact state levels of mindfulness (e.g., Vujanovic et al. 2017a).

Limitations and Future Research Directions

Several limitations of the present study should be noted. First, although a significant strength of the sample was its diversity with regard to psychiatric composition, race/ethnicity, and educational attainment, the sample was significantly

socioeconomically disadvantaged, potentially compromising the external validity. Nonetheless, the low-income, inner-city nature of the sample represents a traditionally understudied population; thus, this study offers meaningful contribution to the literature in that regard. Second, the study relied almost exclusively on self-report measures, potentially contributing to method variance. Future research might include more clinical interview-based measures, specifically with regard to PTSD symptom severity and psychiatric diagnoses more generally, and utilize longitudinal or experimental designs. Notably, the current study used only one measure of mindfulness (i.e., FFMQ), which was selected due to its ability to measure various facets of mindfulness and its well-established use in the mindfulness-PTSD literature (e.g., Vujanovic et al. 2016). Future research should use other self-report measures of mindfulness to replicate and extend current findings. Also, it will be important for future research to examine the feasibility and effectiveness of mindfulness-based interventions delivered in acute-care psychiatric inpatient settings, on PTSD, related symptoms, and functional impairment. Third, the study employed a cross-sectional design, ruling out any potential conclusions about directionality among the study variables. Future studies might incorporate longitudinal designs to examine the predictive utility of state or trait mindfulness at admission with regard to treatment outcome or response during hospitalization. Fourth, medical records were utilized to inform the psychiatric diagnostic composition of the sample, and non-standardized assessments of psychiatric diagnoses were employed therefore limiting a comprehensive diagnostic picture of the sample. For example, it seems that PTSD was underdiagnosed in this setting, as only 2.0% of patients received a PTSD diagnosis by discharge, whereas 76.3% met criteria for PTSD per the PCL-5 diagnostic cut-off of 33 (Bovin et al. 2016).

This study investigated associations between the facets of mindfulness and PTSD symptom severity in acute-care psychiatric inpatients. Several FFMQ facets were associated with the PTSD intrusion, negative mood and cognition, and arousal symptom clusters, whereas there were no significant findings related to the avoidance symptom cluster. This work highlights the importance of examining the potential clinical utility of mindfulness-based interventions for trauma-exposed psychiatric inpatients with varying levels of PTSD symptom severity. Further research is warranted to gain a more complex understanding of these associations, using experimental and longitudinal designs.

Compliance with Ethical Standards

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. This study was approved by the University of Texas Health Science Center at Houston and University of Houston institutional review boards.

Conflict of Interest The authors declare that they have no conflict of interest.

Informed Consent Informed consent was obtained from all individual participants included in the study.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5*. Washington, D.C: American Psychiatric Association.

Armour, C., Tsai, J., Durham, T.A., Charak, R., Beign, T.L., Elhai, J.D … Pietrzak, R.H. (2015). Dimensional structure of DSM-5 posttraumatic stress symptoms: support for a hybrid anhedonia and externalizing behaviors model. *Journal of Psychiatric Research,* 61, 106–113. doi: https://doi.org/10.1016/j.jpsychires.2014.10.012.

Arsenault-Lapierre, G., Kim, C., & Turecki, G. (2004). Psychiatric diagnoses in 3275 suicides: a meta-analysis. *BMC Psychiatry, 4*, 1–11. https://doi.org/10.1186/1471244X437.

Aust, J., & Bradshaw, T. (2017). Mindfulness interventions for psychosis: a systematic review of the literature. *Journal of Psychiatric and Mental Health Nursing, 24*, 69–83.

Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report. *Assessment, 11*, 191–206. https://doi.org/10.1177/1073191104268029.

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*, 27–45.

Baer, R.A., Smith, G.T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S … Williams, M.G. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment,* 15, 329–342. doi: https://doi.org/10.1177/1073191107313003.

Banks, K., Newman, E., & Saleem, J. (2015). An overview of the research on mindfulness-based interventions for treating symptoms of posttraumatic stress disorder: a systematic review. *Journal of Clinical Psychology, 71*, 935–963. https://doi.org/10.1002/jclp.22200.

Barton, B. J., Cumella, E. J., & Sanathara, V. A. (2006). Psychiatric comorbidities of female inpatients with eating disorders. *Psychosomatic Medicine, 68*, 454–462. https://doi.org/10.1097/01.psy.0000221254.77675.f5.

Bernstein, A., Tanay, G., & Vujanovic, A. A. (2011). Concurrent relations between mindful attention and awareness and psychopathology among trauma-exposed adults: Preliminary evidence of transdiagnostic resilience. *Journal of Cognitive Psychotherapy, 25*, 99–113.

Bishop, S. R., Lau, M. A., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J. … Devins, G. (2004). Mindfulness: a proposed operational definition. *Clinical Psychology: Science and Practice, 11*, 230–241.

Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The posttraumatic stress disorder checklist for DSM-5

(PCL-5): development and initial psychometric evaluation. *Journal of Traumatic Stress, 28*, 489–498. https://doi.org/10.1002/jts.22059.

Boden, M. T., Bernstein, A., Walser, R. D., Bui, L., Alvarez, J., & Bonn-Miller, M. O. (2012). Changes in facets of mindfulness and post-traumatic stress disorder treatment outcome. *Psychiatry Research, 200*, 609–613. https://doi.org/10.1016/j.psychres.2012.07.011.

Boughner, E., Thornley, E., Kharlas, D., & Frewen, P. (2016). Mindfulness-related traits partially mediate the association between lifetime and childhood trauma exposure and PTSD and dissociative symptoms in a community sample assessed online. *Mindfulness, 7*, 672–679. https://doi.org/10.1007/s12671-016-0502-3.

Bovin, M.J., Marx, B.P., Weathers, F.W., Gallagher, M.W., Rodriguez, P., Schnurr, P.P … Keane, T.M. (2016). Psychometric properties of the PTSD checklist for diagnostic and statistical manual of mental disorders-fifth edition (PCL-5) in veterans. *Psychological Assessment, 28*, 1379–1391. doi: https://doi.org/10.1037/pas0000254.

Branstrom, R., Kvillemo, P., & Moskowitz, J. T. (2010). A randomized study of the effects of mindfulness training on psychological well-being and symptoms of stress in patients treated for cancer at 6-month follow-up. *International Journal of Behavioral Medicine, 19*, 535–542.

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*, 822–848.

Brown, W. J., Bruce, S. E., Buchholz, K. R., Artime, T. M., Hu, E., & Sheline, Y. I. (2016). Affective dispositions and PTSD symptom clusters in female interpersonal trauma survivors. *Journal of Interpersonal Violence, 31*, 407–424. https://doi.org/10.1177/0886260514555866.

Call, D., Pitcock, J., & Pyne, J. (2015). Longitudinal evaluation of the relationship between mindfulness, general distress, anxiety, and PTSD in a recently deployed national guard sample. *Mindfulness, 6*, 1303–1312. https://doi.org/10.1007/s12671-015-0400-0.

Chopko, B. A., & Schwartz, R. C. (2013). The relation between mindfulness and posttraumatic stress symptoms among police officers. *Journal of Loss and Trauma, 18*, 1–9.

Dahm, K. A., Meyer, E. C., Neff, K. D., Kimbrel, N. A., Gulliver, S. B., & Morissette, S. B. (2015). Mindfulness, self-compassion, posttraumatic stress disorder symptoms, and functional disability in U.S. Iraq and Afghanistan war veterans. *Journal of Traumatic Stress, 28*, 460–464. https://doi.org/10.1002/jts.22045.

Delizonna, L. L., Williams, R. P., & Langer, E. J. (2009). The effect of mindfulness on heart rate control. *Journal of Adult Development, 16*, 61–65.

Foa, E. B., Hembree, E. A., & Rothbaum, B. O. (2007). *Prolonged exposure therapy for PTSD: Emotional processing of traumatic experiences*. New York: Oxford University Press.

Follette, V., Palm, K. M., & Pearson, A. N. (2006). Mindfulness and trauma: implications for treatment. *Journal of Rational-Emotive & Cognitive-Behaviour Therapy, 24*, 45–61.

Folstein, M. F., Folstein, S. E., & McHugh, P. P. (1975). "Mini mental state". A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research, 12*, 189–198. https://doi.org/10.1016/0022-3956(75)90026-6.

Garland, E., Roberts-Lewis, A., Tronnier, C. D., Graves, R., & Kelley, K. (2016). Mindfulness-oriented recovery enhancement versus CBT for cooccurring substance dependence, traumatic stress, and psychiatric disorders: proximal outcomes from a pragmatic randomized trial. *Behaviour Research and Therapy, 77*, 7–16. https://doi.org/10.1016/j.brat.2015.11.012.

Gonzalez, A., Locicero, B., Mahaffey, B., Fleming, C., Harris, J., & Vujanovic, A. (2016). Internalized HIV stigma and mindfulness: associations with PTSD symptom severity in trauma-exposed adults with HIV/AIDS. *Behavior Modification, 40*, 144–163. https://doi.org/10.1177/0145445515615354.

Grubaugh, A.L., Zinow, H.M., Paul, S., Egede, L.E., & Frueh, C. (2011). Trauma exposure and posttraumatic stress disorder in adults with severe mental illness. *Clinical Psychology Review, 31*, 883–399. doi: https://doi.org/10.1016/j.cpr.2011.04.003.

Hanley, A. W., Garland, E. L., & Tedeschi, R. G. (2017). Relating dispositional mindfulness, contemplative practice, and positive reappraisal with posttraumatic cognitive coping, stress, and growth. *Psychological Trauma: Theory, Research, Practice, and Policy, 9*, 526–536. https://doi.org/10.1037/tra0000208.

Howgego, I. M., Owen, C., Meldrum, L., Yellowlees, P., Dark, F., & Parslow, R. (2005). Posttraumatic stress disorder: An exploratory study examining rates of trauma and PTSD and its effect on client outcomes in community mental health. *BMC Psychiatry, 5*, 21. https://doi.org/10.1186/1471-244X-5-21.

Kalill, K. S., Treanor, M., & Roemer, L. (2014). The importance of non-reactivity to posttraumatic stress symptoms: a case for mindfulness. *Mindfulness, 5*, 314–321.

Kearney, D. J., McDermott, K., Malte, C., Martinez, M., & Simpson, T. L. (2012). Effects of participation in a mindfulness program for veterans with posttraumatic stress disorder: a randomized controlled pilot study. *Journal of Clinical Psychology, 69*, 14–27.

Kim, S. H., Schneider, S. M., Bevans, M., Kravitz, L., Mermier, C., Qualls, C., & Burge, M. R. (2013). PTSD symptom reduction with mindfulness-based stretching and deep breathing exercise: randomized controlled clinical trial of efficacy. *The Journal of Clinical Endocrinology and Metabolism, 98*, 2984–2992.

King, A.P., Erickson, T.M., Giardino, N.D., Favorite, T., Rauch, S.A.M., Robinson, E. … Liberzon, I. (2013). A pilot study of group mindfulness-based cognitive therapy (MBCT) for combat veterans with posttraumatic stress disorder (PTSD). *Depression and Anxiety, 30*, 638–645.

Kimbrough, E., Magyari, T., Langenberg, P., Chesney, C., & Berman, B. (2010). Mindfulness intervention for child abuse survivors. *Journal of Clinical Psychology, 66*, 17–33. https://doi.org/10.1002/jclp.20624.

Krysinska, K., & Lester, D. (2010). Post-traumatic stress disorder and suicide risk: a systematic review. *Archives of Suicide Research, 14*, 1–23. https://doi.org/10.1080/13811110903478997.

Landrum, S. S. (2016). Enhancing recovery from trauma: facilitating a mindfulness skills group on a Department of Veterans Affairs inpatient PTSD unit. *Social Work with Groups, 39*, 35–47. https://doi.org/10.1080/01609513.2014.999203.

Lang, A. J. (2017). Mindfulness in PTSD treatment. *Current Opinion in Psychology, 14*, 40–43. https://doi.org/10.1016/j.copsyc.2016.10.005.

Lau, M. A., Bishop, Z. V., Buis, T., Anderson, N. D., & Carlson, L. (2006). The Toronto mindfulness scale: Development and validation. *Journal of Clinical Psychology, 62*, 1445–1467.

Lee, J., Lee, S. W., Choi, K., Chung, U., & Jeong, B. (2015). Differential mediating effects of PTSD symptom clusters on alcohol use and sleep in university students with trauma experiences: a multi-group analysis. *Personality and Individual Differences, 85*, 1–6. https://doi.org/10.1016/j.paid.2015.04.035.

Maheux, A., & Price, M. (2015). Investigation of the relation between PTSD symptoms and self-compassion: comparison across DSM IV and DSM 5 PTSD symptom clusters. *Self and Identity, 14*, 627–637. https://doi.org/10.1080/15298868.2015.1037791.

Martin, C. E., Vujanovic, A. A., & Day, S. X. (2017). Posttraumatic stress disorder symptom severity and emotion regulation in acute-care psychiatric inpatients: associations with suicidality. *Journal of Aggression, Maltreatment, & Trauma, 26*, 1024–1041. https://doi.org/10.1080/10926771.2017.1341443.

Mauritz, M. W., Goossens, P. J. J., Draijer, N., & van Achterberg, T. (2013). Prevalence of interpersonal trauma exposure and trauma-related disorders in severe mental illness. *Psycho-Traumatology, 4*, 185–199. https://doi.org/10.3402/ejpt.v4i0.19985.

Melartin, T. K., Rystala, H. J., Leskela, U. S., Lestela-Mielonen, P. S., Sokero, T. P., & Isomesta, E. T. (2002). *Journal of Clinical Psychiatry, 63*, 126–134.

Mueser, K.T., Gottlieb, J.D., Xie, H., Lu, W., Yanos, P.T., Rosenberg, S.D … McHugo, G.J. (2015). Evaluation of cognitive restructuring for post-traumatic stress disorder in people with severe mental illness. *The British Journal of Psychiatry, 206*, 501–508. doi: https://doi.org/10.1192/bjp.bp.114.147926.

Mueser, K.T., Goodman, L.B., Trumbetta, S.L., Rosenberg, S.D., Osher, F.C., Vidaver, R … Foy, D.W. (1998). Trauma and posttraumatic stress disorder in severe mental illness. *Journal of Consulting and Clinical Psychology, 66*, 493–499. doi: https://doi.org/10.1037/0022006X.66.3.493.

Niles, B. L., Klunk-Gillis, J., Ryngala, D. J., Silberbogen, A. K., Paysnick, A., & Wolf, E. J. (2012). Comparing mindfulness and psycho-education treatments for combat-related PTSD using a tele-health approach. *Psychological Trauma: Theory, Research, Practice, and Policy, 4*, 538–547.

Niles, B. L., Vujanovic, A. A., Silberbogen, A. K., Seligowski, A. V., & Potter, C. M. (2013). Changes in mindfulness following a mindfulness telehealth intervention. *Mindfulness, 4*, 301–310. https://doi.org/10.1007/s12671-012-0130-5.

Owens, G. P., Walter, K. H., Chard, K. M., & Davis, P. A. (2012). Changes in mindfulness skills and treatment response among veterans in residential PTSD treatment. *Psychological Trauma: Theory, Research, Practice, and Policy, 4*, 221–228. https://doi.org/10.1037/a0024251.

Perich, T., Manicavasagar, V., Mitchell, P. B., & Ball, J. R. (2013). The association between meditation practice and treatment outcome in mindfulness-based cognitive therapy for bipolar disorder. *Behaviour Research and Therapy, 51*, 338–343. https://doi.org/10.1016/j.brat.2013.03.006.

Polusny, M.A., Erbes, C.R., Thuras, P., Moran, A., Lamberty, G.J., Collins, R.C … Lim, K.O. (2015). Mindfulness-based stress reduction for posttraumatic stress disorder among veterans: a randomized clinical trial. *JAMA, 314*, 456–465. doi: https://doi.org/10.1001/jama.2015.8361.

Possemato, K., Bergen-Cico, D., Treatment, S., Allen, C., Wade, M., & Pigeon, W. (2016). A randomized clinical trial of primary care brief mindfulness training for veterans with PTSD. *Journal of Clinical Psychology, 72*, 179–193. https://doi.org/10.1002/jclp.22241.

Price, C. J., Wells, E. A., Donovan, D. M., & Brooks, M. (2012). Implementation and acceptability of mindful awareness in body-oriented therapy in women's substance use disorder treatment. *The Journal of Alternative and Complementary Medicine, 18*, 4540462. https://doi.org/10.1089/acm.2011.0126.

Resick, P. A., Monson, C. M., & Chard, K. M. (2008). *Cognitive processing therapy: Veteran/ military version*. Washington, DC: United States Department of Veterans Affairs.

Schnurr, P., Friedman, M., Foy, D., Shea, T., Hsieh, F., Lavori, P … Bernardy, N. (2003). A randomized trial of trauma-focused group therapy for posttraumatic stress disorder. *Archives of General Psychiatry, 60*, 481–489.

Schoorl, M., Van Mil-Klinkenberg, L., & Van Der Does, W. (2015). Mindfulness skills, anxiety sensitivity, and cognitive reactivity in patients with posttraumatic stress disorder. *Mindfulness, 6*, 1004–1011. https://doi.org/10.1007/s12671-014-0346-7.

Stephenson, K. R., Simpson, T. L., Martinez, M. E., & Kearney, D. J. (2017). Changes in mindfulness and posttraumatic stress disorder symptoms among veterans enrolled in mindfulness-based stress reduction. *Journal of Clinical Psychology, 73*, 201–217. https://doi.org/10.1002/jclp.22323.

Thompson, B. L., & Waltz, J. (2010). Mindfulness and experiential avoidance as predictors of posttraumatic stress disorder avoidance symptom severity. *Journal of Anxiety Disorders, 24*, 409–415.

Thompson, R. W., Arnkoff, D. B., & Glass, C. R. (2011). Conceptualizing mindfulness and acceptance as components of psychological resilience to trauma. *Trauma Violence Abuse, 12*, 220–235. https://doi.org/10.1177/1524838011416375.

Tombaugh, T. N., & McIntyre, N. J. (1992). The mini-mental state examination: a comprehensive review. *Journal of the American Geriatrics Society, 40*, 922–935. https://doi.org/10.1111/j.1532-5415.1992.tb01992.x.

Vujanovic, A. A., Bakhshaie, J., Martin, C., Reddy, M. K., & Anestis, M. D. (2017a). Posttraumatic stress and distress tolerance: Associations with suicidality in acute-care psychiatric inpatients. *Journal of Nervous and Mental Disease, 205*, 531–541. https://doi.org/10.1097/NMD.0000000000000690.

Vujanovic, A. A., Dutcher, C. D., & Berenz, E. C. (2017b). Multimodal examination of distress tolerance and posttraumatic stress disorder symptoms in acute-care psychiatric inpatients. *Journal of Anxiety Disorders, 48*, 45–53. https://doi.org/10.1016/j.janxdis.2016.08.005.

Vujanovic, A. A., Niles, B. L., & Abrams, J. L. (2016). Mindfulness and meditation in the conceptualization and treatment of posttraumatic stress disorder. In E. Shonin, W. Van Gorden, & M. Griffiths (Eds.), *Mindfulness and Buddhist-derived approaches in mental health and addictions* (pp. 225–246). New York: Spring Press. https://doi.org/10.1007/978-3-319-22255-4_11.

Vujanovic, A. A., Niles, B., Pietrefesa, A., Schmertz, S. K., & Potter, C. M. (2011). Mindfulness in the treatment of posttraumatic stress disorder among military veterans. *Professional Psychology: Research and Practice, 42*, 24–31. https://doi.org/10.1037/a0022272.

Vujanovic, A. A., Youngwirth, N. E., Johnson, K. A., & Zvolensky, M. J. (2009). Mindfulness-based acceptance and posttraumatic stress symptoms among trauma-exposed adults without axis I psychopathology. *Journal of Anxiety Disorders, 23*(2), 297–303.

Wahbeh, H., Lu, M., & Oken, B. (2011). Mindful awareness and non-judging in relation to posttraumatic stress symptoms. *Mindfulness, 2*, 219–227. https://doi.org/10.1007/s12671-011-0064-3.

Walsh, E., Moran, P., Scott, C., McKenzie, K., Burns, T., Creed, F., Tyrer, P., Murray, R. M., Fahy, T., & UK700 Group. (2003). Prevalence of violent victimization in severe mental illness. *British Journal of Psychiatry, 183*, 233–238. https://doi.org/10.1192/bjp.183.3.233.

Weathers, F.W., Litz, B.T., Keane, T.M., Palmieri, P.A., Marx, B.P., & Schnurr, P.P. (2013). The PTSD checklist for DSM-5 (PCL-5). Scale available from the National Center for PTSD at www.ptsd.va.gov.

Weiss, N. H., Tull, M. T., Borne, M. E. R., & Gratz, K. L. (2013). Posttraumatic stress disorder symptom severity and HIV-risk behaviors among substance-dependent inpatients. *AIDS Care, 25*, 1219–1226. https://doi.org/10.1080/09540121.2013.764381.

Zuromski, K. L., Davis, M. T., Witte, T. K., Weathers, F., & Blevins, C. (2014). PTSD symptom clusters are differentially associated with components of the acquired capability for suicide. *Suicide and Life-threatening Behavior, 44*, 682–697. https://doi.org/10.1111/sltb.12098.