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Posttraumatic stress disorder and coping strategies in the postpartum period: A symptomics approach

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Abstract

Posttraumatic stress disorder (PTSD) has been increasingly recognized as a potential mental health concern for new mothers. Elevated PTSD symptoms have been associated with maladaptive coping strategies in the postpartum period, a time when women face many challenges, demands, and stressors. However, PTSD symptoms manifest in heterogeneous ways, and focusing only on total symptom scores may obscure more nuanced associations with particular coping styles. In a large, ethnically diverse sample of postpartum women from across the United States (*N*=1,315), first we examined associations between total PTSD symptom severity with three distinct coping styles: active-emotional, avoidant-emotional, and problem-focused. In models adjusting for race and educational attainment, total PTSD symptom severity was significantly positively associated with tendencies to use active- and avoidant-emotional, but not problem-focused, coping. We then adopted a novel "symptomics" approach, employing relative importance analyses to examine associations between individual PTSD symptoms with the coping styles. These analyses identified PTSD symptoms that were most strongly associated with each coping style. Notably, whereas several symptoms explained variance in avoidant-emotional coping, only a few symptoms contributed most to active-emotional and problem-focused coping. Moreover, non-specific symptoms of PTSD that are shared with other psychopathology (e.g., difficulty concentrating, loss of interest) explained significant proportions of variance across all coping styles. Collectively, results suggest that a symptomics approach may provide more nuanced insight into how PTSD symptoms are linked to various coping styles in postpartum women, which can help inform potential screening and intervention targets for at-risk women during this period.

Keywords

Posttraumatic stress disorder; PTSD; Coping; Symptomics; Postpartum women; Dimensional approach

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Introduction

The postpartum period represents a unique time in a woman's life, filled with many psychological, biological, and social changes. Women's mental health during this period can have important consequences for the health of the mother, child, and family system (Garthus-Niegel et al., 2017; Garthus-Niegel et al., 2018), and posttraumatic stress disorder (PTSD) has been recognized as a potential mental health concern for mothers (Onoye et al., 2009). In a recent meta-analysis, the mean prevalence of PTSD during the first postpartum year was 4.0% in community-based samples, with even higher rates (18.5%) in high-risk groups (e.g., women with pregnancy complications; Yildiz et al., 2017).

Coping strategies encompass a range of responses that can be used to manage stress, making them particularly relevant to the postpartum period given the demands faced by mothers. Coping can be broadly categorized in many ways, including as problem- vs. emotion-focused strategies. Whereas problem-focused coping encompasses taking actions to address a source of stress, emotion-focused coping involves strategies to regulate one's emotions (Lazarus and Folkman, 1984) and can be classified as active or avoidant (Holahan and Moos, 1987). Active-emotional coping involves engaging in emotional experiences (e.g., seeking emotional support, reframing experiences), whereas avoidant-emotional coping involves methods such as self-distraction and denial to suppress emotions. Although what is considered successful coping can vary depending on the situation (DeLongis and Holtzman, 2005; Tennen et al., 2000), generally problem-focused and active-emotional coping strategies are considered adaptive (Carver et al., 1989; Lazarus and Folkman, 1984). Although avoidant-emotional coping may provide short-term relief from a stressor, long-term use is associated with worse mental health (Carver et al., 1992; Coyne and Racioppo, 2000; Schnider and Gray, 2007). Further, coping styles are not mutually exclusive, and individuals may engage different styles in response to different problems.

Previous studies have demonstrated associations between PTSD symptoms and coping in postpartum samples (Ayers et al., 2016; Söderquist et al., 2009). For example, coping by self-blame and rumination (avoidant-emotional strategies) was associated with greater PTSD symptoms (Tomsis et al., 2018). However, research in postpartum populations considering a range of coping strategies is lacking. Further, the existing literature has examined PTSD as a dichotomous diagnosis, or as a total symptom severity score, despite the heterogeneity of this disorder (Galatzer-Levy and Bryant, 2013; Zoellner et al., 2014). Indeed, we previously identified distinct dimensions of PTSD symptoms in a diverse sample of postpartum women and demonstrated their unique associations with maternal health (Thomas et al., 2021a; Thomas et al., 2021b).

In this study, we addressed these limitations by examining the relations between PTSD symptoms and three distinct coping styles—active-emotional, avoidant-emotional, and problem-focused—in a diverse sample of postpartum women. We predicted that PTSD symptom severity would be positively associated with avoidant-emotional coping and negatively associated with active-emotional and problem-focused coping. Additionally, given the heterogeneous nature of PTSD, we adopted a "symptomics" approach to generate

a more fine-grained understanding of how individual PTSD symptoms were related to coping by calculating the relative importance of each symptom in relation to the coping styles while accounting for intercorrelations among symptoms. With these analyses, we investigated whether patterns of individual symptom contributions to coping might be similar or different across coping styles. Using this symptom-level approach provides a nuanced understanding of disorders, with recent research demonstrating the distinct nature of individual PTSD symptoms in relation to various functional outcomes (Kachadourian et al., 2021; Kachadourian et al., 2019).

Methods

Participants and Procedure

This project used data from the Community and Child Health Network (CCHN), a multi-site community-academic partnership conducted across five sites in the United States between 2003–2008. Women were recruited in-hospital after giving birth; racial/ethnic minorities and low-income women were oversampled for participation in this study of maternal and child health (for details, see Ramey et al., 2015). This research was conducted in accordance with the Declaration of Helsinki. All sites obtained Institutional Review Board approval, and participants provided informed consent. Measures for this study were administered by interviewers during in-home visits 6 and 12 months postpartum.

Measures

PTSD.—PTSD symptoms were assessed at 6 months postpartum using the PTSD Checklist-Civilian Version (Weathers et al., 1993), which has been used in perinatal samples (Gelaye et al., 2017; Levey et al., 2018; for details in CCHN, see Thomas et al., 2021b). Mothers rated how bothered they were by each of the 17 *DSM-IV-TR* PTSD symptoms in the past month on a 5-point scale indexed to “stressful life experiences.” We summed responses to generate a measure of total PTSD symptom severity; symptomics analyses examined item-level symptom severity.

Coping.—Coping was assessed at 12 months postpartum using the Brief COPE scale, a 28-item measure of dispositional coping styles (Carver, 1997). This measure includes 14 scales composed of 2 items rated on a 4-point scale. Based on conceptual literature on coping (Holahan and Moos, 1987; Lazarus and Folkman, 1984) and prior studies (e.g., Schnider and Gray, 2007), we derived three coping scores by summing responses for these corresponding scales: 1) active-emotional (venting, positive reframing, humor, emotional support, acceptance), 2) avoidant-emotional (self-distraction, denial, behavioral disengagement, self-blame, substance use), and 3) problem-focused (planning, instrumental support, religion, active coping).

Sociodemographics.—Women reported on race/ethnicity, age, and educational attainment at enrollment.

Analytic Approach

First, to determine whether PTSD symptom severity was associated with coping, we conducted three linear regression analyses examining total PTSD symptoms and active-emotional, avoidant-emotional, and problem-focused coping. Second, to investigate associations between individual PTSD symptoms and coping styles, we conducted a linear regression analysis for each coping measure with all 17 PTSD symptoms entered as independent variables, as in prior symptomics research (Fried and Nesse, 2014; Kachadourian et al., 2021; Kachadourian et al., 2019). Race/ethnicity and education were included as covariates given significant associations with coping and PTSD in this sample. We estimated R^2 values to determine the total variance in coping accounted for by these symptoms, collectively. Third, to determine the unique proportion of variance in coping accounted for by individual PTSD symptoms, we performed relative importance (RI) analyses using the Relaimpo package (Groemping, 2006). These analyses divide the observed variance in a dependent variable (coping styles) associated with each independent variable (the 17 PTSD symptoms) while accounting for intercorrelations between independent variables. Using the LMG metric, the contribution of each independent variable was computed by calculating all possible regressions and taking the average of these R^2 values to calculate a "RI" value for each symptom. These estimates were scaled to sum to 100% for easier interpretation. Bootstrapped 95% confidence intervals and *p*-values of RI estimates were calculated to determine which PTSD symptoms were significantly associated with coping styles. Finally, to determine whether associations between individual PTSD symptoms and coping were explained by overall PTSD symptom severity, we covaried total PTSD symptoms in RI analyses. Analyses were conducted in SPSS Version 27 and RStudio.

Results

Participant Characteristics

The analytic sample comprised 1,315 mothers with complete PTSD and coping data. At enrollment, mothers were 25.7 years old, on average, and the sample was diverse with respect to race/ethnicity (53.8% Black, 22.4% Latina, 23.8% White) and educational attainment (18.2% less than high school, 42% high school graduate, 23.4% some college, 15.9% at least college graduate). Active-emotional coping was significantly positively correlated with problem-focused coping (r=0.61, p<.001) and avoidant-emotional coping (r=0.19, p<.001); problem-focused coping was not significantly correlated with avoidant-emotional coping (r=0.03, p=.212).

PTSD Symptoms and Coping

Mean total PTSD symptom severity was 26.5 (SD=10.0;range=17–80). In models adjusting for race/ethnicity and education, total PTSD symptoms were significantly positively associated with active-emotional (β=0.09; p=.002) and avoidant-emotional coping (β=0.33; p<.001), but not with problem-focused coping (β=−0.01; p=.613; Table 1).

Select PTSD symptoms emerged as significantly linked with coping measures in regression analyses with individual PTSD symptoms (see Table 2 for coping measure descriptives,

regression coefficients, and R^2 values). RI analyses indicated that difficulty concentrating accounted for the largest proportion of explained variance within active-emotional coping (10.0%), followed by restricted affect (6.2%), loss of interest (5.4%), and hypervigilance (4.2%), as shown in Figure 1. These four symptoms explained 25.8% of the variance in this coping style. Notably, the direction of associations differed; difficulty concentrating was positively associated with active-emotional coping, whereas restricted affect and loss of interest were negatively associated. For avoidant-emotional coping, the variance was relatively evenly distributed across all PTSD symptoms, although sense of foreshortened future (10.8%), difficulty concentrating (10.7%), and avoiding trauma reminders (8.5%) had the strongest associations (Figure 2). These three symptoms were all positively associated with avoidant-emotional coping, accounting for 30% of the variance. In contrast, most (32.1%) of the variance in problem-focused coping was concentrated among the following symptoms: hypervigilance (11.8%), loss of interest (11.6%), and detachment (8.7%; Figure 3). Hypervigilance was positively associated, whereas detachment and loss of interest were negatively associated with this coping style. For all coping styles, total PTSD symptom severity only accounted for a small (2.7–5.9%) proportion of variance in models with individual symptoms.

Discussion

PTSD during the postpartum period can adversely impact maternal and child health (Onoye et al., 2009). Better understanding of relations between PTSD symptoms and coping during this time may reveal intervention targets. This study used a novel symptomics approach to examine associations of PTSD symptoms with various coping styles in postpartum women. We observed significant positive associations between total PTSD symptom severity with active-emotional and avoidant-emotional, but not problem-focused, coping. However, a more nuanced understanding emerged with symptom-level analyses, suggesting differential associations of select PTSD symptoms with coping strategies.

Our results with respect to total PTSD symptom severity and avoidant-emotional and active-emotional coping in postpartum women parallel some, but not all, findings in the PTSD and coping literature. Indeed, avoidant coping is characteristic of those with PTSD when facing trauma reminders (Feeny and Foa, 2006), and greater PTSD symptoms have been linked to avoidant-emotional coping in postpartum (Nakić Radoš et al., 2018; Tomsis et al., 2018) and other trauma-exposed samples (Badour et al., 2012; Schnider and Gray, 2007). However, contrary to prior literature documenting a negative association between PTSD symptoms over time and active-emotional coping in veterans (Boden et al., 2014), we found that active-emotional coping was positively associated with total PTSD symptoms. Nevertheless, differential effect directions emerged for symptom-level associations, such that certain PTSD symptoms (e.g., hypervigilance, difficulty concentrating) were positively associated with this coping style, whereas others (e.g., anhedonia, restricted affect) had negative associations, which may explain discrepancies across studies. With respect to problem-focused coping, some studies have demonstrated a negative association between problem-focused coping and PTSD symptoms (Kastello et al., 2016), whereas others have found no association (Gilbar et al., 2011), as was observed in this study.

Symptomics analyses revealed different patterns of individual symptom contributions to the coping styles, adding greater nuance than when examining total PTSD symptom severity. Notably, a multitude of symptoms contributed to the explained variance in avoidant-emotional coping—suggesting consistent links between numerous PTSD symptoms and this coping style—whereas a select few symptoms contributed most to active-emotional and problem-focused coping. Additionally, there were some similarities in the PTSD symptoms most strongly associated with coping styles. Greater difficulty concentrating was among the symptoms most strongly related to avoidant-emotional and active-emotional coping, and loss of interest and hypervigilance were among the symptoms most strongly related to active-emotional and problem-focused coping. However, unique symptoms emerged as explaining variance in different coping styles as well; some of these symptoms may share underlying processes with these coping tendencies. For example, less restricted affect was associated with active-emotional coping, and avoiding trauma reminders was associated with avoidant-emotional coping. Similarly, greater hypervigilance contributed most to problem-focused coping; hypervigilance may reflect a tendency to seek out ways to solve threats in the environment. Notably, across all coping styles, individual symptoms captured more variance in coping than did total symptom severity, highlighting the added value of a symptom-level approach.

PTSD can be conceptualized as comprising dimensions of fear and dysphoria (Zoellner et al., 2014), which broadly map onto trauma-specific and non-specific symptoms. Fear has been proposed as a core feature of PTSD, and fear-related symptoms such as re-experiencing and avoidance are often triggered by trauma-related stimuli. In contrast, dysphoric symptoms such as loss of interest and difficulty concentrating are characteristic of other psychopathology, including depression, and not viewed as central to the disorder (Simms et al., 2002; Zoellner et al., 2014). In our study, although fear-based symptoms (e.g., hypervigilance, avoiding trauma reminders) explained some of the variance in coping, non-specific PTSD symptoms (e.g., difficulty concentrating, loss of interest) explained the most variance across all three coping styles. This predominance of non-specific PTSD symptoms parallels previous PTSD symptomics research in which non-specific symptoms contributed most to measures of functioning, quality of life, and suicidal ideation in veterans (Kachadourian et al., 2019). Additionally, a study of PTSD dimensions and coping found that negative affect symptoms that overlap with depression were associated with alcohol use disorder through greater avoidant-emotional coping (Palmisano et al., 2022). Together, these findings suggest that non-specific PTSD symptoms may be a useful intervention target, particularly for individuals who engage in avoidant-emotional coping.

Study limitations include that PTSD symptoms were anchored to stressful life experiences generally rather than an index trauma that women specified, therefore we could not ascertain the nature of the event that triggered PTSD symptoms. However, research in this sample revealed high rates of recent trauma exposure and a positive association with PTSD symptoms (Thomas et al., 2021b). Additionally, as CCHN was not designed as a study of PTSD in postpartum women, several relevant PTSD risk factors (e.g., lifetime trauma history) were not queried. Symptomics research using *DSM-5* PTSD criteria is also needed, as CCHN was conducted prior to this revision. Further, by focusing on a symptomics approach to PTSD and coping, we did not take into account other psychopathology

(e.g., depression). It is of interest for future research to extend this work by adopting a transdiagnostic symptomics approach to trauma-related psychopathology. Additionally, relatively small amounts of variance in coping styles were explained by PTSD symptoms. Further, longitudinal research is needed to extend this work, as we were unable to address the directional and causal nature of these relations. Nevertheless, this study has important strengths, including the large sample of Black, Latina, and White women. Additionally, whereas most research on PTSD and coping in postpartum women focuses on those with traumatic birth experiences (Söderquist et al., 2009), women in CCHN were not selected for pregnancy-related trauma, and many experienced various recent traumas (e.g., serious injury/illness, threat of harm; Thomas et al., 2021b). Moreover, this is the first investigation to use a symptomics approach to studying PTSD symptoms and coping in postpartum women.

Conclusions

In this diverse sample of postpartum women, adopting a symptomics approach revealed a more nuanced understanding of associations between PTSD symptoms and coping styles relative to when considering total PTSD symptoms. Not only was there a unique distribution of PTSD symptom contributions across each coping style, but certain non-specific PTSD symptoms explained the greatest proportion of variance across three coping tendencies. Focusing on these symptoms through targeted clinical intervention may improve coping and reduce the burden of PTSD in postpartum women.

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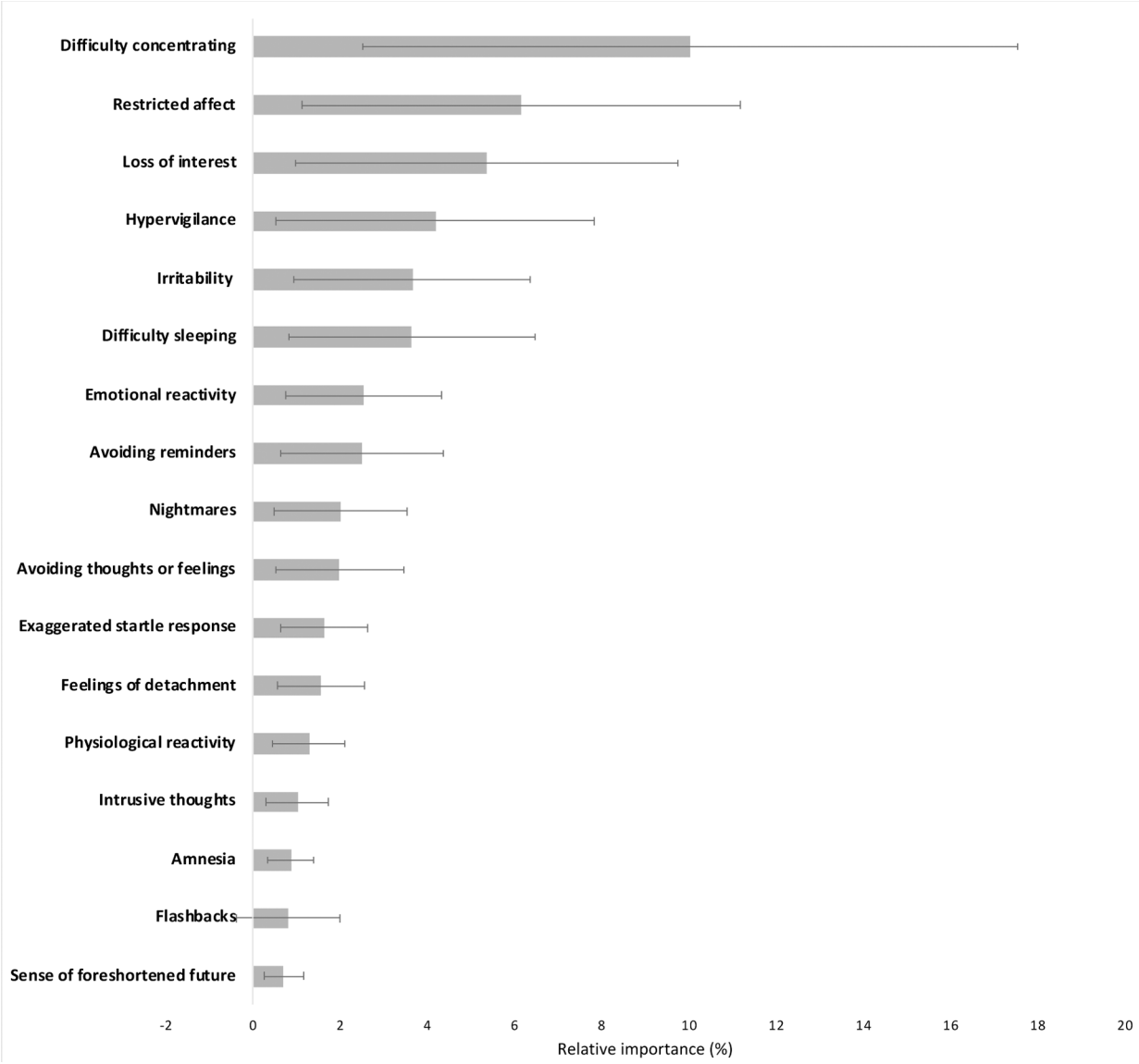

Figure 1. Relative importance coefficients of posttraumatic stress disorder (PTSD) symptoms on active-emotional coping.

Values correspond to relative importance coefficients, or the unique shared variance between PTSD symptoms and active-emotional coping and are summed to 100%. Error bars represent 95% confidence intervals. Relative importance explained by Latina ethnicity and less than a high school degree was 21.81% and 28.21%, respectively.

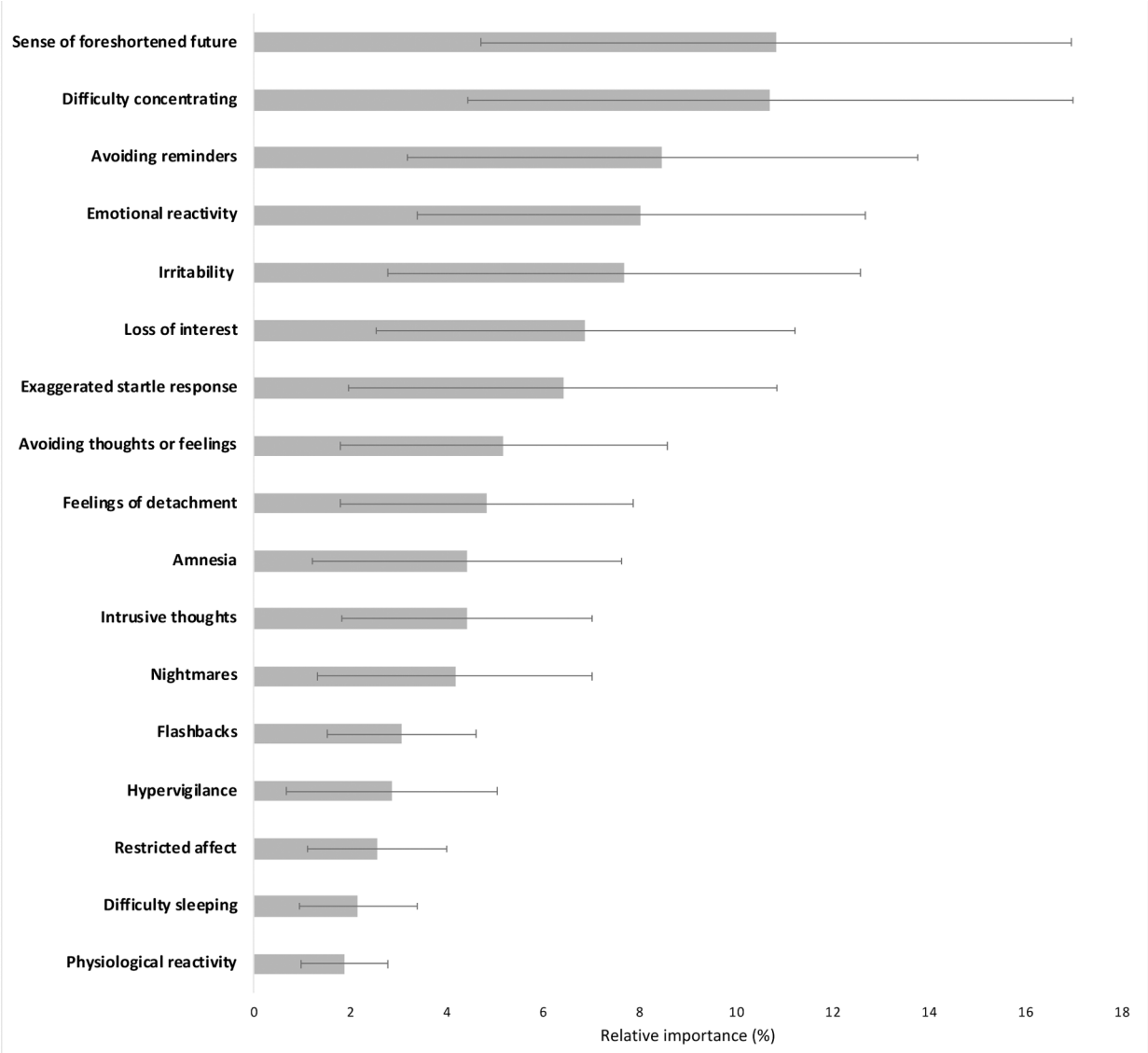

Figure 2. Relative importance coefficients of posttraumatic stress disorder (PTSD) symptoms on avoidant-emotional coping.

Values correspond to relative importance coefficients, or the unique shared variance between PTSD symptoms and avoidant-emotional coping and are summed to 100%. Error bars represent 95% confidence intervals. Relative importance explained by Black race was 5.47%.

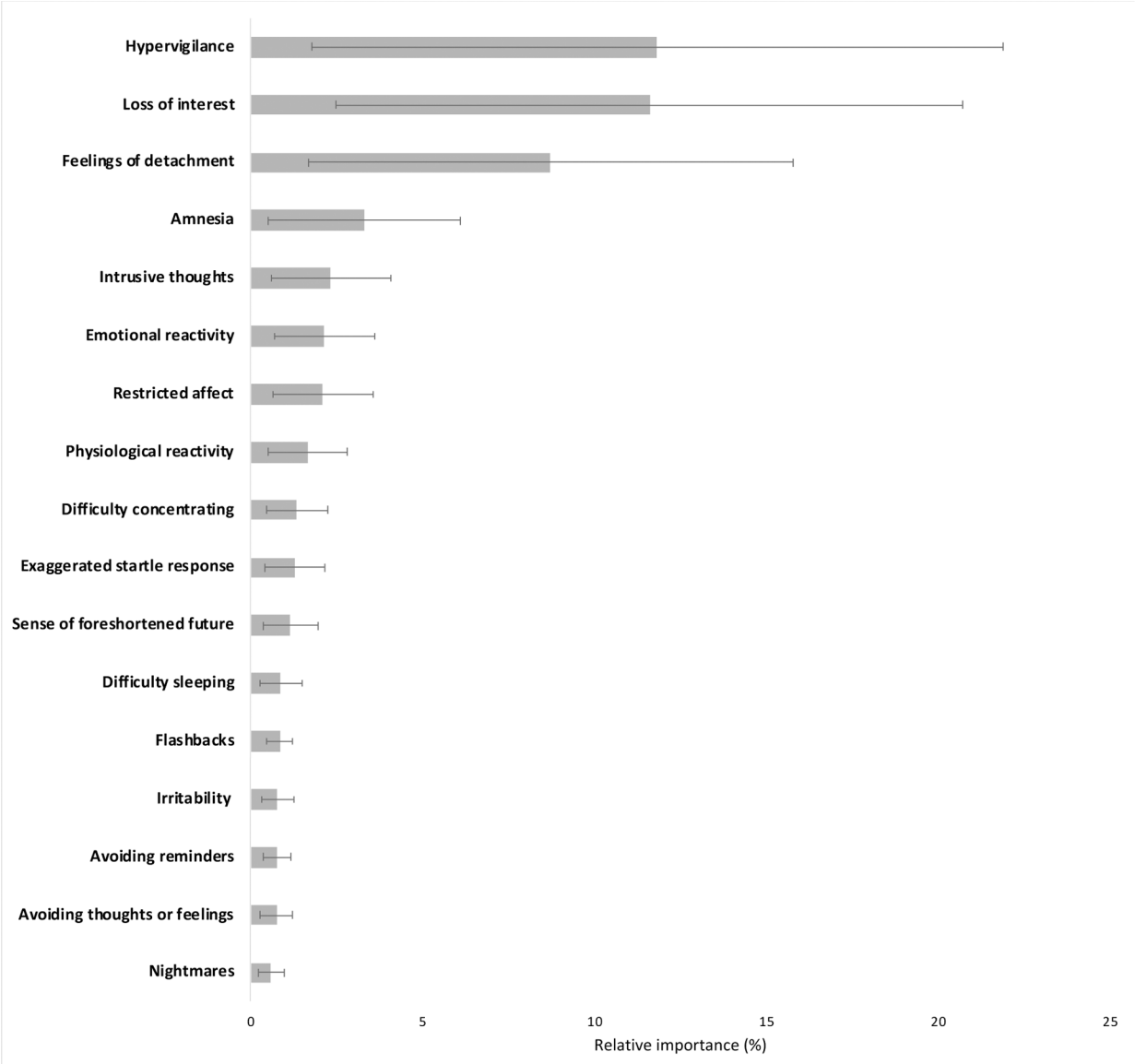

Figure 3. Relative importance coefficients of posttraumatic stress disorder (PTSD) symptoms on problem-focused coping.

Values correspond to relative importance coefficients, or the unique shared variance between PTSD symptoms and problem-focused coping and are summed to 100%. Error bars represent 95% confidence intervals. Relative importance explained by Black race and less than a high school degree was 18.32% and 29.66%, respectively.

Table 1.

Regression parameters and 95% confidence intervals for associations of total PTSD symptom severity and demographics with coping styles.

	b (95% CI)	*β*	*p*
Active-emotional coping			
Total PTSD symptom severity	0.04 (0.02 – 0.07)	0.09	.002
Race/ethnicity			
White (ref)	--	--	--
Black	−0.54 (−1.28 – 0.20)	−0.05	.150
Latina	−1.71 (−2.60 – −0.82)	−0.14	<.001
Education status			
< HS graduate	−3.33 (−4.34 – −2.29)	−0.25	<.001
HS graduate	−1.94 (−2.83 – −1.04)	−0.19	<.001
Some college	−1.19 (−2.87 – 4.37)	−0.10	.013
College graduate or more (ref)	--	--	--
Other/no information	0.93 (−2.87 – 4.74)	0.01	.631
Avoidant-emotional coping			
Total PTSD symptom severity	0.13 (0.11 – 0.15)	0.33	<.001
Race/ethnicity			
White (ref)	--	--	--
Black	1.11 (0.56 – 1.66)	0.14	<.001
Latina	1.19 (0.53 – 1.85)	0.13	<.001
Education status			
< HS graduate	0.49 (−0.28 – 1.26)	0.05	.214
HS graduate	0.52 (−0.14 – 1.18)	0.07	.122
Some college	−0.06 (−0.76 – 0.63)	−0.01	.857
College graduate or more (ref)	--	--	--
Other/no information	0.23 (−2.56 – 3.04)	0.00	.873
Problem-focused coping			
Total PTSD symptom severity	−0.01 (−0.03 – 0.02)	−0.01	.613
Race/ethnicity			
White (ref)	--		
Black	1.32 (0.67 – 1.96)	0.15	<.001
Latina	0.12 (−0.66 – 0.90)	0.01	.761
Education status			
< HS graduate	−2.83 (−3.74 – −1.91)	−0.24	<.001
HS graduate	−2.09 (−2.87 – −1.31)	−0.23	<.001
Some college	−1.10 (−1.92 – −0.28)	−0.11	.008
College graduate or more (ref)	--	--	--
Other/no information	3.50 (0.18 – 6.82)	0.06	.039

Note. HS=high school. PTSD=posttraumatic stress disorder.

Table 2.

Standardized regression coefficients for associations of individual PTSD symptoms with coping styles.

	Active-emotional Coping	Problem-focused Coping	Avoidant-emotional Coping
Coping Measure Descriptive Statistics			
Mean (*SD*)	27.7 (5.2)	24.3 (4.5)	17.8 (4.0)
Range	(12–40)	(8–32)	(10–34)
Regression Model Results			
R^2	0.103	0.085	0.161
	β	*β*	*β*
Intrusive thoughts	−0.01	0.05	0.02
Nightmares	0.05	0.01	0.01
Flashbacks	−0.01	0.00	−0.04
Emotional reactivity	0.06	0.05	0.07
Physiological reactivity	−0.05	−0.04	−0.03
Avoiding thoughts or feelings	0.03	−0.02	0.03
Avoiding reminders	0.06	0.01	0.07
Amnesia	−0.03	−0.04	0.03
Loss of interest	−0.08*	−0.09*	0.02
Feelings of detachment	−0.03	−0.07*	0.03
Restricted affect	−0.09**	−0.02	−0.04
Sense of foreshortened future	0.02	0.06	0.09**
Difficulty sleeping	0.03	0.02	0.00
Irritability	0.03	0.02	0.08*
Difficulty concentrating	0.09	−0.03	0.12***
Hypervigilance	0.08	0.10**	0.00
Exaggerated startle response	−0.04	−0.01	0.04
Race			
White (ref)	--	--	--
Black	−0.04	0.14***	0.16***
Latina	−0.11**	0.01	0.14***
Education			
< HS graduate	−0.25***	−0.26***	0.06
HS graduate	−0.19***	−0.25***	0.08
Some college	−0.11**	−0.12**	0.00
College graduate or more (ref)	--	--	--
Other/no information	0.01	0.05	0.02

Note. HS=high school. M=mean. SD=standard deviation.

* $p<.05$

** $p<.01$

*** $p<.001$.