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Childhood Abuse, Posttraumatic Stress Symptoms, and Alcohol Misuse Among African American Women

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Abstract

The study explored associations among childhood abuse, posttraumatic stress symptoms (PTSS), and alcohol misuse in a sample of low-income African American women ($N = 172$). Using bootstrapping techniques, a mediation effect was found of childhood physical and emotional abuse on alcohol misuse via PTSS symptom severity, avoidance, and hyperarousal, as well as for childhood sexual abuse on alcohol misuse via PTSS symptom severity and hyperarousal. Our results suggest that PTSS indicators, particularly symptom severity and hyperarousal, may be important mechanisms underlying the association of experiences of abuse during childhood and alcohol misuse in adulthood.

Keywords

low-income; African American women; alcohol misuse; childhood abuse; posttraumatic stress disorder

Experiencing abuse in childhood is associated with a myriad of negative mental health outcomes in adulthood, including substance use disorders and specifically, alcohol misuse (Dube, Anda, Felitti, Edwards, & Croft, 2002; Kendall-Tackett, 2002; Lee & Chen, 2017; Widom, Ireland, & Glynn, 1995). There is evidence that this link may be especially strong for African American women (Lee & Chen, 2017) who disproportionately experience childhood abuse compared to White Americans (Kim, Wildeman, Johnson-Reid, & Drake, 2017). Despite these disparities, it is unclear what factors may explain the direct and indirect effects of childhood maltreatment on alcohol misuse. Although a nascent body of work suggests that at least some types of childhood abuse are indirectly associated with subsequent alcohol problems through posttraumatic stress symptoms (PTSS; (Hannan, Orcutt, Miron, & Thompson, 2017), it is uncertain whether these effects generalize to African Americans and whether they exist across different forms of childhood maltreatment

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(i.e., physical, sexual, emotional) and PTSS types (e.g., avoidance, hyperarousal, intrusion). Thus, the goal of this study was to test whether childhood abuse was indirectly associated with alcohol misuse through PTSS in a clinical sample of African-American women.

Alcohol misuse, a major sequela of childhood abuse (Green et al., 2010), is associated with negative biopsychosocial outcomes and accounts for significant mortality (Morbidity and Mortality Weekly Report, 2014). Although African Americans initiate alcohol use at a later age than White Americans, they progress to problematic use more rapidly and are less likely to seek treatment (Lewis, Hoffman, Garcia, & Nixon, 2018). Among African Americans, childhood abuse has been shown to have a direct effect on current alcohol use (Cross, Crow, Powers, & Bradley, 2015). In a large community sample, compared to non-abused counterparts, African Americans abused during childhood were three times more likely to drink heavily whereas White Americans were only one and a half to two times more likely to do so (Lee & Chen, 2017). However, another study found that childhood physical abuse had a strong association with later alcohol use disorders in White Americans, but not in African Americans (Werner et al., 2016). Thus, although an increasing number of studies have found an association between each specific type of childhood abuse and later alcohol misuse (Fenton et al., 2014; Lansford, Dodge, Pettit, & Bates, 2010; Shin, Lee, Jeon, & Wills, 2015), it is unclear if this pattern is replicable in African Americans and if so, what possible mechanisms play a role.

One psychological factor that may explain the process through which alcohol misuse develops is PTSS. Consistent with this idea, one study of a largely African American, urban primary care patients found correlations between childhood physical, sexual, and emotional abuse; abuse of different substances; and PTSS clusters (Khoury, Tang, Bradley, Cubells, & Ressler, 2010). Further, there is evidence that the magnitude of associations may differ for different PTSS clusters (Gekker et al., 2018), suggesting that there may be unique functional pathways through which these processes occur. There is considerable theoretical work supporting the idea that childhood abuse may be associated with alcohol misuse through its effect on various PTSS clusters. For example, the self-medication posits that individuals with post-traumatic stress disorder (PTSD) use alcohol to relieve their trauma-related symptoms, highlighting the role of avoidance symptoms (Kaysen et al., 2014; Simpson, Stappenbeck, Luterek, Lehavot, & Kaysen, 2014). The tension-reduction model of alcohol use (Capell & Greeley, 1987) posits that individuals use alcohol – specifically due to its anxiolytic qualities – during times of stress as a “numbing” agent. Thus, rather than avoidance of psychological distress or cues that may elicit psychological distress, alcohol may be used as a way to cope with the negative affect characteristic of hyperarousal symptoms. Relevant specifically for symptoms of intrusion, research examining content-dependent memory patterns among individuals with PTSD has found evidence of enhanced recall of trauma-related materials (McNally, 1997). Stewart et al. (1998) therefore posited that individuals experiencing post-traumatic stress symptoms of intrusion may use alcohol due to its negative impact on memory and recall. Thus, there is strong theoretical rationale for the mediating role of posttraumatic stress.

Research focused on better understanding associations between childhood abuse, PTSS and alcohol use is sparse. The few studies focused on associations among childhood

abuse, PTSS, and alcohol misuse indicate that adults with co-occurring PTSD and alcohol misuse endorse more severe childhood physical, sexual, and emotional abuse than those with substance use disorders without PTSD (Weiss, Tull, Lavender, & Gratz, 2013). Among African Americans, data from a community sample showed that PTSS mediated the childhood maltreatment (all types of abuse and neglect) - alcohol misuse link; childhood abuse was associated with greater PTSS, which in turn correlated with greater alcohol use (Cross et al., 2015). Gender moderated the mediational association; the effect was weaker for women than men. Given the heterogeneity of PTSS and gender differences in symptom structure (Carragher et al., 2016), it is unclear if the gender effect that emerged reflects etiological differences in alcohol misuse for men and women or methodological issues related to the aggregation of PTSS. Parsing PTSS by cluster (intrusive re-experiencing, avoidance, hyperarousal) thus may allow for more nuanced study of the potential mediational relations in African American women (Langdon et al., 2016), which is important as trauma-related cognitions are more strongly associated with alcohol craving and adverse consequences for drinking for African Americans than White Americans (Williams, Jayawickreme, Sposato, & Foa, 2012).

Thus, although there is strong theoretical and some empirical support for the idea that childhood abuse may be associated with alcohol misuse through PTSS, there is relatively little work examining specific types of childhood abuse and particular symptom clusters in African American women. This is an unfortunate as abuse exposure type differentially impacts physical and mental health and adjustment (Carr et al., 2013; Labella et al., 2018; Westermair et al., 2018). To address these gaps in the literature, we explored the direct effect of three types of childhood (physical, emotional, sexual) abuse on later alcohol misuse in a sample of low-income African American women, as well as the indirect effects of PTSS indicators (symptom severity, intrusive re-experiencing, avoidance, hyperarousal) on the relations between each type of childhood abuse and alcohol misuse. Separate analyses were conducted by type of childhood abuse and PTSS indicator to ascertain if each of these multi-faceted constructs played differential roles in these linkages. We predicted a direct effect of each type of childhood abuse on later alcohol misuse. We further hypothesized that PTSS severity, avoidance, and hyperarousal would indirectly affect the link between each type of childhood abuse and alcohol misuse. Given limited data on re-experiencing/intrusion, the hypothesis that this PTSS cluster would mediate the childhood abuse – alcohol misuse link is more tentative. This research is important because despite the fact that African American women report higher rates of childhood abuse than White American women (Werner et al., 2016), the childhood abuse – alcohol misuse link is not reliably found, which suggests that other factors, such as PTSS, may influence the relation. Better understanding this link will identify factors to target in preventive interventions.

Method

Participants

Data were collected from 172 African American women ($M_{\text{age}} = 34.49$, $SD = 9.17$), the majority of whom had a partner but were not married (34.9%), were single (28.6%) or were separated/divorced (26.3%). The sample was predominantly low income, as 93%

reported an individual monthly income of \$1000 or less and 70% reported a household income of \$1000 or less, which is below the federal poverty level of approximate \$12,000 annually for a one-person house. Moreover 67.4% had 12th grade level of education or less, 82.3% were unemployed, and 53.1% were homeless. We excluded women unable to complete the interview due to cognitive deficits or acute psychosis, which were assessed in the recruitment stage using the Mini Mental Status Exam (MMSE) and a psychotic screen examining hallucinations and delusions created for the purpose of this study. Women that score below 23 (or 21 for women with low health literacy) in the MMSE or endorsed any active symptoms of psychosis were excluded from participation.

Measures

Childhood physical, emotional, and sexual abuse was assessed via the 28-item Childhood Trauma Questionnaire (CTQ) (Bernstein & Fink, 1998). Respondents rated the validity of each statement on a Likert-Type Scale (1= never true to 5= very often true). An example is: "When I was growing up, I believed that I was physically abused." Higher scores on each subscale are indicative of greater levels of the type of childhood abuse. The CTQ has demonstrated adequate reliability, including for African American women; alpha Cronbach's coefficients range from .85 to .93 for the abuse subscales and the abuse cumulative score (Allbaugh et al., 2017; Bernstein & Fink, 1998; Cammack et al., 2016). The CTQ has good divergent and convergent validity and its proposed five factors have been confirmed, reflecting good construct validity (Spinhoven et al., 2014). For this study, reliability coefficients for the physical, emotional, sexual and total scales of abuse were .86, .88, .76 and .90, respectively.

PTSS symptom severity was measured with the Davidson Trauma Scale (DTS) (Davidson, 2003; Davidson et al., 1997). The DTS's 17 items correspond to each of the Diagnostic Statistical Manual of Mental Disorders (DSM-IV) symptoms of PTSD (American Psychiatric Association, 2000). These items are categorized within each of the three DSM-IV PTSD symptom clusters: intrusive re-experiencing, avoidance, hyperarousal. For each item, participants rate frequency and severity during the prior week; for this study, only the three severity subscales (but not frequency) were used (i.e., 6-point Likert-type response format ranging from 0 (*not at all distressing*) to 5 (*extremely distressing*). Higher scores reflect more severe symptoms. An example item is: "Have you ever had painful images, memories, or thoughts of the event?" In addition, an open-ended question asking for the type of trauma experienced is included at the beginning of the questionnaire. This item was not anchored to their experience of IPV but was left open for participants to indicate the type of trauma recalled to answer the questionnaire. The DTS has demonstrated good convergent and divergent validity, as well as test-retest and internal consistency reliability ($\alpha = .85 - .99$) (Davidson, 2003; Davidson et al., 1997; McDonald, Beckham, Morey, & Calhoun, 2009), including among African American childhood trauma survivors (Zhang et al., 2015). In this sample, the internal consistency coefficient for the combined DTS severity scale was .90 and for the subscales it was .77 for intrusive re-experiencing, .80 for avoidance, and .82 for hyperarousal.

To assess alcohol misuse, we used the frequently administered 10-item self-report screening tool, the Brief Michigan Alcoholism Screening Test (bMAST) (Pokorny, Miller, & Kaplan, 1972). The bMAST examines negative consequences of alcohol use and self-perception of current drinking. Respondents answer “yes=1” or “no=0” to each question. An example item is: “Have you ever been arrested for drunk driving or driving after drinking?” Greater scores indicate higher levels of misuse. A recent comprehensive examination of the psychometric properties of this measure that aggregated and synthesized data from across 21 studies revealed that the measure has moderate levels of internal consistency reliability (.73), which is higher in clinical samples (.82); adequate test-retest reliability; and robust convergent validity (Minnich et al., 2019). Adequate internal consistency was obtained in the current study ($\alpha = .83$).

Procedures

Upon approval by the University’s Institutional Review Board and the hospital’s research committee, participants were recruited at a large southern, university-affiliated public hospital for an intervention study for African American women suicide attempters with a history of intimate partner violence (Kaslow et al., 2010). For this study, only data from the pre-intervention assessment was used. This 3-hour assessment included 24 measures administered by trained undergraduates. Measures were read to the participants due to low literacy levels. Participants were compensated \$20 for their completion of this assessment.

Data Analytic Plan

We performed all statistical analyses using SPSS statistical software. Missing data were missing completely at random (MCAR) according to Little’s MCAR test ($\chi^2 = 23.68$, $p = .85$). We examined descriptive statistics for each measure and calculated bivariate correlations to establish initial relations.

The direct and indirect effects of twelve proposed models were tested using the PROCESS macro program (Model 4) (Hayes, 2018), which uses bootstrapping techniques (5000 bootstrapped samples) through standard-path analytical approaches (Preacher & Hayes, 2008). Bootstrapping allows for the testing of indirect effects whether or not a significant direct effect between the independent and dependent variable is present (Hayes, 2013). It was decided to analyze each relationship separately and not through a multiple mediation approach considering the high collinearity between PTSS core symptoms, which could lead to these variables cancelling out each other’s effects (Hayes, 2018). For the same reason, we did not use types of abuse as covariates to avoid the covering of effects due to the high correlation between types of abuse.

With this in mind we examined twelve models. For each model, type of childhood abuse (physical, emotional, sexual) was entered as the independent variable, the four indicators of PTSS (total symptom severity and symptom clusters (intrusive re-experiencing, avoidance, hyperarousal) were entered as mediators, and alcohol misuse was entered as the dependent variable (see Figures 1–4 for a visual depiction of the models). The resultant data includes the direct effects of each type of childhood abuse on alcohol misuse and the indirect effects for each mediator (four indicators of PTSS) in this association [insert Figures 1–4 near here].

Results

Preliminary Analyses

Descriptive statistics for the CTQ indicated that on average participants endorsed low to moderate levels of childhood physical, emotional, and sexual trauma (Bernstein & Fink, 1998; Scher, Stein, Asmundson, McCreary, & Forde, 2001) (See Table 1 for descriptive statistics and correlations) [insert Table 1 near here]. With regard to PTSS, this sample of women indicated a mean score of 41.2 for the total PTSS severity scale, which is above the cut-off of 35 documented in previous research as the optimal score to identify the presence of PTSS in a clinical sample (Davidson, Tharwani, & Connor, 2002; McDonald et al., 2009). Types of traumatic events reported were: intimate partner violence, childhood and adult sexual and physical abuse, death or loss of loved ones, and adverse life events such as homelessness and going to jail. In terms of alcohol misuse, the mean score in the brief MAST was 6.78, which is slightly below of the recommended cutoff of 8 to identify alcohol abuse, indicating low to moderate scores of alcohol misuse in the sample as a whole.

Bivariate Pearson correlations demonstrated positive and moderately significant associations among the three types of childhood abuse (Table 1). All types of childhood abuse had positive and small correlations with PTSS severity and the PTSS symptom clusters of re-experiencing/intrusion and hyperarousal. Avoidance symptoms were linked positively to physical and emotional but not sexual abuse. In terms of alcohol misuse, only physical abuse correlated significantly with scores of the bMAST, and all but the intrusive re-experiencing symptoms of PTSS were positively related with alcohol misuse.

Mediational Analyses

Childhood physical abuse.—Four models were conducted with childhood physical abuse as the independent variable, one for each of the four PTSS clusters assessed. In all of the models, childhood physical abuse had a total but not direct effect on alcohol misuse (Table 2).

In the model in which PTSS severity scores served as the mediator, childhood physical abuse was a significant predictor of this PTSS indicator ($B=3.06$, $SE=1.01$, 95% CI [1.07 – 5.06, $R^2=.05$]). In this model, childhood physical abuse and PTSS severity predicted 3% of the variance of alcohol misuse scores. In terms of indirect effects, PTSS severity mediated the childhood physical abuse-alcohol misuse link ($B=.31$, $SE=.17$, 95% CI [.05 – .71]).

In the model in which avoidance served as the mediator, childhood physical abuse was a significant predictor of this PTSS indicator ($B=1.04$, $SE=.45$, 95% CI [.15 – 1.94, $R^2=.03$]). Six percent of the variance of alcohol misuse scores was predicted by childhood physical abuse and the avoidance symptom cluster. In terms of indirect effects, avoidance mediated the childhood physical abuse-alcohol misuse link ($B=.24$, $SE=.14$, 95% CI [.01 – .56]).

In the model in which hyperarousal served as the mediator, childhood physical abuse was a significant predictor of this PTSS indicator ($B=.78$, $SE=.35$, 95% CI [.08 – 1.47, $R^2=.03$]). Six percent of the variance of alcohol misuse scores was predicted by childhood physical

abuse and the hyperarousal cluster of PTSS. In terms of indirect effects, hyperarousal mediated the childhood physical abuse-alcohol misuse link ($B=.21$, $SE=.13$, 95% CI [.01 – .53]).

However, in the model in which re-experiencing/intrusion served as the mediator, although childhood physical abuse was a significant predictor of this PTSS indicator ($B=1.19$, $SE=.33$, 95% CI [.55 – 1.85, $R^2=.07$]), the combination of childhood physical abuse and re-experiencing/intrusion did not significantly predict alcohol misuse scores. Further, re-experiencing/intrusion symptoms did not have a significant indirect effect in the relation between childhood physical abuse and alcohol misuse ($B=.15$, $SE=.14$, 95% CI [–.09 – .48]).

Childhood emotional abuse.—Four models were conducted with childhood emotional abuse as the independent variable, one for each of the four PTSS indicators. In all of the models, childhood emotional abuse did not have a total or a direct effect on alcohol misuse (Table 3).

In the model in which PTSS severity scores served as the mediator, childhood emotional abuse was a significant predictor of this PTSS indicator ($B=3.59$, $SE=1.04$, 95% CI [1.53 – 5.66, $R^2=.07$]). Six percent of the variance of alcohol misuse scores was predicted by childhood emotional abuse and PTSS severity scores. In terms of indirect effects, PTSS severity mediated the childhood emotional abuse-alcohol misuse link ($B=.40$, $SE=.19$, 95% CI [.08 – .84]).

In the model in which avoidance served as the mediator, childhood emotional abuse was a significant predictor of this PTSS indicator ($B=1.26$, $SE=.47$, 95% CI [.33 – 2.19, $R^2=.04$]). Five percent of the variance of alcohol misuse scores was predicted by childhood emotional abuse and the avoidance symptom cluster of PTSS. In terms of indirect effects, avoidance mediated the childhood emotional abuse-alcohol misuse link ($B=.31$, $SE=.16$, 95% CI [.05 – .68]).

In the model in which hyperarousal served as the mediator, childhood emotional abuse was a significant predictor of this PTSS indicator ($B=1.02$, $SE=.36$, 95% CI [.30 – 1.74, $R^2=.05$]). Five percent of the variance of alcohol misuse scores was predicted by childhood emotional abuse and the hyperarousal cluster of PTSS. In terms of indirect effects, hyperarousal mediated the childhood emotional abuse-alcohol misuse link ($B=.30$, $SE=.17$, 95% CI [.03 – .70]).

Once again, in the model in which re-experiencing/intrusion served as the mediator, although childhood emotional abuse was a significant predictor of this PTSS indicator ($B=1.27$, $SE=.34$, 95% CI [.60 – 1.94, $R^2=.08$]), the combination of childhood emotional abuse and re-experiencing/intrusion did not predict alcohol misuse scores. Further, re-experiencing/intrusion symptoms did not have an indirect effect in the relation between childhood emotional abuse and alcohol misuse ($B=.20$, $SE=.16$, 95% CI [–.06 – .58]).

Childhood sexual abuse.—Four models were conducted with childhood sexual abuse as the independent variable, one for each of the four PTSS clusters. In these four models, childhood sexual abuse did not have a total or a direct effect on alcohol misuse (Table 4).

In the model in which PTSS severity scores served as the mediator, childhood sexual abuse was a significant predictor of this PTSS indicator ($B=2.77$, $SE=.85$, 95% CI [1.09 – 4.44, $R^2=.06$]). Six percent of the variance of alcohol misuse scores was predicted by childhood sexual abuse and PTSS severity scores. In terms of indirect effects, PTSS severity mediated the childhood sexual abuse-alcohol misuse link ($B=.34$, $SE=.15$, 95% CI [.09 – .69]).

In the model in which avoidance served as the mediator, unlike for the other two types of childhood abuse, childhood sexual abuse was not a significant predictor of this PTSS indicator ($B=.73$, $SE=.38$, 95% CI [–.02 – 1.49, $R^2=.02$]). Despite this fact, however, five percent of the variance of alcohol misuse scores was predicted by childhood sexual abuse and the avoidance symptom cluster of PTSS. Furthermore, avoidance did not mediate the association between childhood sexual abuse and later alcohol misuse ($B=.19$, $SE=.11$, 95% CI [–.01 – .43]).

In the model in which hyperarousal served as the mediator, childhood sexual abuse was a significant predictor of this PTSS indicator ($B=.86$, $SE=.29$, 95% CI [.29 – 1.44, $R^2=.05$]). Five percent of the variance of alcohol misuse scores was predicted by childhood sexual abuse and the hyperarousal cluster of PTSS. In terms of indirect effects, hyperarousal mediated the childhood sexual abuse-alcohol misuse link ($B=.28$, $SE=.14$, 95% CI [.05 – .60]).

In the model in which re-experiencing/intrusion served as the mediator, childhood physical abuse was a significant predictor of this PTSS indicator ($B=1.07$, $SE=.27$, 95% CI [.53 – 1.60, $R^2=.08$]). However, once again, the combination of childhood sexual abuse and re-experiencing/intrusion did not predict alcohol misuse scores. Further, as was the case when the other types of childhood abuse were considered, re-experiencing/intrusion symptoms did not have an indirect effect in the relation between childhood sexual abuse and alcohol misuse ($B=.21$, $SE=.14$, 95% CI [–.04 – .52]).

Discussion

Understanding mechanisms that underlie alcohol misuse in low-income African American survivors of childhood abuse, a population underrepresented in research in this area despite their increased vulnerability to alcohol misuse, is essential for bolstering prevention and intervention efforts (Lee & Chen, 2017; Lewis et al., 2018). Findings from this study revealed that among low-income African American women, no type of childhood abuse had a direct effect on alcohol misuse, highlighting the need to focus on mediators of this association. PTSS clusters largely served to mediate the childhood abuse – alcohol misuse link and thus must be a target for preventive interventions. Specifically, two of four PTSS indicators, symptom severity and hyperarousal, mediated the association between each type of retrospectively reported childhood abuse (physical, emotional, sexual) and adult alcohol misuse. Avoidance mediated two of three associations: childhood physical abuse - alcohol

misuse and childhood emotional abuse - alcohol misuse. Interestingly, the re-experiencing/intrusion symptom cluster did not mediate any of the links. Taken together, results indicate that African American women who reported being abused as children may be at increased risk for substance use in adulthood if they develop PTSS that are severe, particularly if the symptoms associated with hyperarousal and/or avoidance are severe in nature.

This is the first study to test for a direct link between each type of childhood abuse and later alcohol use in African American women. Results replicate and expand the groundbreaking work of Khoury and colleagues (2010). Similar to the prior work, we found an association between PTS symptom severity, avoidance, and hyperarousal, but not intrusive re-experiencing, and alcohol misuse, and did not find a direct association between childhood abuse and alcohol misuse. However, contrary to the prior study, we demonstrated a link in this female-only sample between types of childhood abuse and alcohol misuse when PTSS indicators were included. These differences highlight the value of the mediational design used in this study.

Contrary to our hypotheses, no form of childhood abuse had a direct effect on alcohol misuse when controlling for PTSS severity. However, the results are in keeping with both that of Khoury and colleagues (2010) and a study that found no linkage between childhood physical abuse and alcohol use in African Americans, despite finding an association in White Americans (Werner et al., 2016). In this latter investigation, different constructs mediated the links in African Americans and White Americans; depression was a key mediator in the African American subsample (Werner et al., 2016). The lack of the hypothesized direct effects may be due to unexplored mediators, such as emotion dysregulation, which has been demonstrated to underlie the relation between different types of childhood abuse and PTSD in individuals with substance use histories (Weiss et al., 2013) and between childhood emotional abuse and later substance use in a predominantly African American urban population (Mandavia, Robinson, Ressler, & Powers, 2016). Further, characteristics such as resilience and spirituality serve a protective function against some adverse effects of trauma, including substance abuse, in inner-city and African American populations (Blakey, 2016; Wingo, Ressler, & Bradley, 2014). Future studies should consider risk and resilience factors that may serve as mediators.

In alignment with our hypotheses, PTSS severity mediated the association between each type of childhood abuse and later alcohol misuse. This suggests that symptom severity is critically linked to increased risk for alcohol misuse in African American women, regardless of the type of childhood abuse experienced. This suggests that it is not only the presence or absence of PTSS, but symptom severity that may be associated to the development of alcohol misuse. Indeed, other researchers have found that the severity of PTSD symptoms is linked to alcohol and drug cravings (Saladin et al., 2003). The mediational findings also are consistent with previous studies showing that PTSS influences the relation between trauma and problematic substance use. For example, in an ethnically diverse sample of women with both child and adult sexual trauma histories and a broad history of traumatic life events, PTSD symptom severity mediated the link between trauma history and use of substances to cope (Ullman et al., 2013). Thus, findings from the current study help build the case that the comorbidity frequently observed between histories of trauma and later substance abuse

diagnoses in women may be linked to the severity of PTSD symptoms (Cross et al., 2015). The results also augment the literature by demonstrating that PTSS severity is a mediator of the childhood abuse – alcohol abuse link for all types of childhood abuse and by showing the relevance of this PTSD indicator in low-income African American women.

As noted above and in keeping with our predictions, the PTS hyperarousal symptom cluster emerged as a significant mediator of the link between each of the three types of childhood abuse and alcohol misuse. In the DSM-IV, hyperarousal refers to persistent symptoms of increased arousal such as sleep problems, hypervigilance, exaggerated startle response, irritability or anger outbursts, and concentration difficulties. The DSM-5 adds risky or destructive behaviors to this list of symptoms. The tension-reduction model of alcohol use posits that individuals consume alcohol, specifically due to its anxiolytic qualities, during times of stress as a “numbing” agent (Capell & Greeley, 1987). In other words, alcohol may be used to cope with the negative affect characteristic of hyperarousal and associated hypersensitivity to physiological reactivity or poor distress tolerance. This hyperarousal may intensify when individuals experience withdrawal symptoms from alcohol and subsequent increases in distressing emotions. Individuals then become trapped in a maladaptive cycle of self-medication of hyperarousal and the resultant difficulties managing physiological and emotional distress, alcohol withdrawal and additional negative affect, and further urges to drink to relieve these physiological and psychological sensations (Duranceau, Fetzner, & Carleton, 2014). Our results add to the literature showing associations between PTS hyperarousal symptoms and substance use (Back, Brady, Sonne, & Verduin, 2006; Back et al., 2014; Khoury et al., 2010; Saladin, Brady, Dansky, & Kilpatrick, 1995; Sullivan & Holt, 2008), including among women who have experienced interpersonal violence during adulthood (Sullivan & Holt, 2008). Thus, the association between childhood abuse and alcohol misuse may be linked to hyperarousal symptoms, which should, according to the tension-reduction model, predict alcohol misuse.

Our results indicate that childhood abuse, particularly physical and emotional abuse, may be associated with problematic alcohol use through avoidance. The avoidance symptom cluster of PTSD in the DSM-IV entails avoiding thoughts, feelings, conversations, activities, places or people linked to the trauma; having problems remembering specific details of the trauma; exhibiting reduced interest or engagement in activities; feeling detached or estranged from other people; demonstrating affective restriction; and perceiving a more limited future. The DSM-5 separates these avoidance symptoms into two subtypes: avoidance and negative alterations in cognitions and mood. The self-medication hypothesis, which posits that individuals with PTSD use alcohol to relieve their trauma-related symptoms, may explain why avoidant coping serves as a risk factor for alcohol misuse (Kaysen et al., 2014; Simpson et al., 2014). There is evidence that women with PTSD and alcohol misuse rely on avoidance more than men (Sonne, Back, Zuniga, Randall, & Brady, 2003). Childhood abuse may increase the likelihood of the development of avoidance symptoms; people may use coping strategies, such as avoidance, to manage their response to being traumatized. When used over time, this strategy may become maladaptive (Batchelder et al., 2018). Avoidance symptoms may lend themselves to repeated self-medication through alcohol consumption; the relief resulting from alcohol use may maintain the avoidance symptoms. The finding from the current study that the avoidance symptom cluster of PTSD mediated

the associations between both physical and emotional abuse and alcohol misuse has been shown by others (Gratz, Bornovalova, Delany-Brumsey, Nick, & Lejuez, 2007). However, the fact that the avoidance symptom cluster did not mediate the childhood sexual abuse – alcohol misuse link was surprising and not in keeping with earlier research. For example, in a community sample of adults in Switzerland, avoidance, but not other PTSD symptom clusters, mediated the pathway between childhood sexual abuse and later alcohol abuse (Muller et al., 2015). This finding was argued to support the self-medication hypothesis. Similarly, in female college students with a history of childhood sexual abuse or assault, an association was found between days of reported increased avoidance symptoms and both stronger urges to consume alcohol and a greater likelihood of alcohol consumption on that day (Kaysen et al., 2014), suggesting that in this group of women alcohol misuse might function as an attempt to avoid distressing thoughts or feelings associated with earlier trauma.

Given our findings associating avoidance and hyperarousal symptoms with substance misuse, it is surprising that intrusive re-experiencing symptoms (i.e., intrusive and recurrent thoughts and memories of the trauma, nightmares, flashbacks) did not serve a mediational role. While these results are in keeping with research with an urban civilian population (Khoury et al., 2010), they contrast with data from investigations showing associations between intrusive re-experiencing symptoms and substance misuse in individuals exposed to war trauma (Maguen, Stalnaker, McCaslin, & Litz, 2009) and disaster relief workers (Simons, Gaher, Jacobs, Meyer, & Johnson-Jimenez, 2005). Individuals with comorbid PTSS and alcohol use may attempt to reduce the severity of their intrusive re-experiencing symptoms, albeit in problematic ways, through their substance use. Doing so may suppress symptom cluster severity and thus the strength of relations between intrusive re-experiencing and alcohol misuse in our sample. One study of symptom interactions immediately following a traumatic event and 12 months later found that intrusive thoughts influenced symptoms in the acute phase, but by 12-months post-trauma, this symptom cluster was less relevant (Bryant et al., 2017). This pattern suggests that the temporal distance between childhood traumatic events and the time of our study might have resulted in a reduced role of re-experiencing symptoms in the relation between trauma and substance misuse.

Our results must be interpreted in light of several limitations related to sample, design, and measurement issues. Our sample was very specific (low SES, all women, all African American, all exposed to only civilian trauma) and thus results may not generalize to other populations with different sociodemographic backgrounds and those with varying types of traumas (De Bellis, 2002; Jakupcak et al., 2010; Lee & Chen, 2017; Saladin et al., 1995; Sullivan & Holt, 2008). In addition, the overall alcohol use severity reported was in the low to moderate range and below the recommended cutoff of 8 on the MAST to identify alcohol abuse. If anything, our results may underrepresent the relations that exist between PTSS severity and symptom clusters and alcohol use/misuse or other substance use disorders. The cross-sectional nature of our study design limits the conclusions that can be drawn regarding a causal link between child abuse and lifetime alcohol misuse. Moreover, considering the high collinearity between types of abuse and PTS symptom clusters, we did not include types of abuse as covariates or use more complex models such as multiple mediation to avoid the covering of effects. This is a limitation in terms of increasing the chances of type

I error, and thus, results have to be considered with caution. With regard to measurement issues, each of the constructs was assessed using self-report measures only, which may lead to bias in reporting. Furthermore, considering that measures were read aloud to participants and that the information gathered was sensitive in nature, social desirability bias could have been introduced (Davis, Couper, Janz, Caldwell, & Resnicow, 2010) and the race of the interviewer could have influenced participant's responses (Samples et al., 2014).

Lastly, the DTS scale is based on the symptom criteria listed on the DSM-IV and therefore is missing the negative cognition cluster of symptoms included in the DSM-5. Our use of the DSM-IV in this study is accordingly a limitation as our findings do not include this cluster. In future studies, it will be important to include the negative cognition cluster symptoms and use DSM-5 based PTSD criteria to expand on these preliminary results. However, we believe that despite the use of the DSM-IV rather than the DSM-5, our results are impactful due to the focus on clusters rather than on overall PTSD diagnosis. Although the diagnostic requirements have changed from the DSM-IV to the DSM-5, from the symptom-level many features of the clusters are consistent. Indeed, a direct comparison of the PTSD Checklist (PCL) versions for DSM-IV and DSM-5 in a population of US infantry soldiers found that while the final diagnostic results were different, the participants performed nearly identically on the symptom criteria themselves (Hoge, Riviere, Wilk, Herrell, & Weathers, 2014). The authors of this study hypothesized that the wording changes and inclusion of new symptoms did not influence responding itself, only whether or not participants met criteria (Hoge et al., 2014).

Despite these limitations, our findings lay the groundwork for future investigations. Such studies may be more compelling if they compare relations among major study constructs across demographic groups to ascertain which associational patterns are similar and which differ. This work would be strengthened if it were longitudinal in nature, ideally starting with young people who have been traumatized. Future investigations may wish to incorporate network analytic approaches to delineate the temporal associations between each PTSS cluster and substance misuse (Borsboom & Cramer, 2013). The research could shed more light on relevant mechanisms and have more clinical implications if a broader array of potential risk and resilience factors were considered as mediators. To ensure the cultural relevance of such work, culture-specific risk and protective factors, such as spiritual well-being, should be considered.

Our findings also have several areas of clinical applicability. It is recommended that clinicians working with African American women with childhood abuse, PTSS, and/or alcohol misuse assess for the other constructs (e.g., if a woman presents with a history of childhood physical abuse and PTSS, assess thoroughly for prior or current alcohol use) given their frequent co-occurrence. Interventions with African American women with a history of childhood abuse along with substance abuse problems should target directly the reduction of PTSS, particularly hyperarousal and avoidance related symptoms. Several interventions have been established that could be implemented in this area; specifically, mindfulness- and acceptance based interventions, such as Acceptance and Commitment Therapy (ACT) (Hayes, Strosahl, & Wilson, 1999) may be promising in targeting avoidance symptoms in particular (Roche, Kroska, Miller, Kroska, & O'Hara, 2019), as well as those

developed that account for the unique impact of childhood trauma (e.g., Skills Training in Affective and Interpersonal Regulation (STAIR) (Cloitre, Cohen, Koenen, & Han, 2002). Additionally, given our findings, building on established interventions that do address co-occurring PTSD and substance use disorders, such as Concurrent Treatment of PTSD and Substance Use Disorders Using Prolonged Exposure (COPE) (Mills et al., 2012) and testing effectiveness for low income African American women with a history of childhood abuse, may be particularly impactful.

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Figure 1.

Conceptual mediational model of Posttraumatic Stress Disorder symptom severity, childhood abuse, and alcohol misuse among African America females. This figure illustrates the hypothesized relation between childhood abuse, the aggregate severity of all symptoms of Posttraumatic Stress Disorder, and alcohol misuse in this population. PTSD = Posttraumatic Stress Disorder.

Figure 2.

Conceptual mediational model of re-experiencing/intrusion Posttraumatic Stress Disorder symptoms, childhood abuse, and alcohol misuse. This figure illustrates the hypothesized relation between childhood abuse, the severity of the re-experiencing/intrusion symptom cluster of Posttraumatic Stress Disorder, and alcohol misuse in this population.

PTSD = Posttraumatic Stress Disorder.

Figure 3.

Conceptual mediational model of avoidance Posttraumatic Stress Disorder symptoms, childhood abuse, and alcohol misuse among African America females. This figure illustrates the hypothesized relation between childhood abuse, the severity of the avoidance symptom cluster of Posttraumatic Stress Disorder, and alcohol misuse in this population.

PTSD = Posttraumatic Stress Disorder.

Figure 4. Conceptual mediational model of hyperarousal Posttraumatic Stress Disorder Symptoms, childhood abuse, and alcohol misuse among African America females. This figure illustrates the hypothesized relation between childhood abuse, the severity of the hyperarousal symptom cluster of Posttraumatic Stress Disorder, and alcohol misuse in this population. PTSD = Posttraumatic Stress Disorder.

Table 1.

Bivariate Correlations for Variables of Interest

	Mean (<i>sd</i>)	1.	2.	3.	4.	5.	6.	7.
1. CPA	2.58 (1.33)	1						
2. CEA	2.86 (1.28)	.65 **	1					
3. CSA	2.84 (1.59)	.51 **	.59 **	1				
4. Intrusive re-experiencing	12.11 (5.84)	.27 **	.28 **	.29 **	1			
5. Avoidance	16.13 (7.85)	.18 *	.20 **	.15	.66 **	1		
6. Hyperarousal	13.08 (6.09)	.17 *	.22 **	.23 **	.56 **	.72 **	1	
7. PTSD-SS Total	41.2 (17.51)	.23 **	.26 **	.25 **	.83 **	.92 **	.86 **	1
8. Alcohol Misuse	6.93 (8.73)	.16 *	.09	.02	.01	.23 **	.21 **	.23 **

Note.

**
 $p < .001$, two-tailed

*
 $p < .05$, two-tailed.

CPA= Childhood Physical Abuse; CEA = Childhood Emotional Abuse; CSA =Childhood Sexual Abuse; PTSD-SS Total= PTSD Symptom Severity Total.

Table 2*Statistics for the Single Mediation Models for CPA as Predictor (Valid N =160)*

Predictor	Pathway	B	SE	p	95% CI	
					LL	UL
CPA predicting PTSS	<i>a</i>	3.06	1.01	.002	1.1	5.1
CPA predicting AM (Total effect)	<i>c</i>	1.09	.51	.03	.08	2.11
PTSS predicting AM	<i>b</i>	.10	.04	.01	.02	.18
CPA on AM (Direct effect)	<i>c'</i>	.78	.51	.13	-.24	1.80
Indirect effect of CPA on AM via PTSS	<i>ab</i>	.31	.17		.05	.71
CPA predicting Avoidance	<i>a</i>	1.04	.45	.02	.15	1.9
CPA predicting AM (Total effect)	<i>c</i>	1.02	.51	.04	.02	2.03
Avoidance predicting AM	<i>b</i>	.23	.08	.008	.06	.40
CPA on AM (Direct effect)	<i>c'</i>	.78	.51	.12	-.22	1.78
Indirect effect of CPA on AM via Avoidance	<i>ab</i>	.24	.14		.01	.56
CPA predicting Hyperarousal	<i>a</i>	.78	.35	.03	.08	1.47
CPA predicting AM (Total effect)	<i>c</i>	1.07	.51	.04	.06	2.08
Hyperarousal predicting AM	<i>b</i>	.27	.11	.01	.05	.49
CPA on AM (Direct effect)	<i>c'</i>	.86	.51	.09	-.15	1.87
Indirect effect of CPA on AM via Hyperarousal	<i>ab</i>	.21	.13		.01	.53
CPA predicting Intrusion	<i>a</i>	1.19	.33	.0003	.55	1.85
CPA predicting AM (Total effect)	<i>c</i>	1.08	.51	.03	.08	2.09
Intrusion predicting AM	<i>b</i>	.13	.12	.27	-.11	.37
CPA on AM (Direct effect)	<i>c'</i>	.93	.53	.08	-.11	1.96
Indirect effect of CPA on AM via Intrusion	<i>ab</i>	.15	.14		-.09	.48

Note. CPA= Childhood Physical Abuse, AM= Alcohol misuse, PTSS= Posttraumatic stress symptoms severity, *B*= Standardized Beta, *SE*= Standard Error.

Table 3*Statistics for the Single Mediation Models for CEA as Predictor (Valid N =165)*

Predictor	Pathway	B	SE	p	95% CI	
					LL	UL
CEA predicting PTSS	<i>a</i>	3.59	1.04	.0007	1.53	5.66
CEA predicting AM (Total effect)	<i>c</i>	.68	.53	.21	-.38	1.74
PTSS predicting AM	<i>b</i>	.11	.04	.006	.03	.19
CEA on AM (Direct effect)	<i>c'</i>	.29	.54	.61	-.80	1.36
Indirect effect of CEA on AM via PTSS	<i>ab</i>	.40	.19		.08	.85
CEA predicting Avoidance	<i>a</i>	1.26	.47	.008	.33	2.19
CEA predicting AM (Total effect)	<i>c</i>	.62	.53	.24	-.43	1.68
Avoidance predicting AM	<i>b</i>	.24	.08	.005	.07	.41
CEA on AM (Direct effect)	<i>c'</i>	.31	.16	.55	-.74	1.37
Indirect effect of CEA on AM via Avoidance	<i>ab</i>	.30	.16		.05	.68
CEA predicting Hyperarousal	<i>a</i>	1.02	.36	.005	.30	1.74
CEA predicting AM (Total effect)	<i>c</i>	.60	.53	.25	-.45	1.66
Hyperarousal predicting AM	<i>b</i>	.29	.22	.01	.07	.52
CEA on AM (Direct effect)	<i>c'</i>	.30	.53	.57	-.76	1.37
Indirect effect of CEA on AM via Hyperarousal	<i>ab</i>	.30	.17		.04	.70
CEA predicting Intrusion	<i>a</i>	1.27	.34	.0003	.60	1.94
CEA predicting AM (Total effect)	<i>c</i>	.67	.53	.22	-.39	1.71
Intrusion predicting AM	<i>b</i>	1.62	.12	.18	-.07	.40
CEA on AM (Direct effect)	<i>c'</i>	.45	.55	.41	-.64	1.54
Indirect effect of CEA on AM via Intrusion	<i>ab</i>	.20	.16		-.06	.58

Note. CEA = Childhood Emotional Abuse, AM= Alcohol misuse, PTSS= Posttraumatic stress symptoms severity, *B*= Standardized Beta, *SE*= Standard Error.

Table 4*Statistics for the Single Mediation Models for CSA as Predictor (Valid N =167)*

Predictor	Pathway	B	SE	p	95% CI	
					LL	UL
CSA predicting PTSS	<i>a</i>	2.77	.85	.001	1.09	4.44
CSA predicting AM (Total effect)	<i>c</i>	.02	.44	.95	-.84	.89
PTSS predicting AM	<i>b</i>	.12	.04	.0023	.04	.20
CSA on AM (Direct effect)	<i>c'</i>	-.32	.44	.47	-.19	.55
Indirect effect of CSA on AM via PTSS	<i>ab</i>	.34	.15		.09	.68
CSA predicting Avoidance	<i>a</i>	.73	.38	.05	-.01	1.48
CSA predicting AM (Total effect)	<i>c</i>	.09	.43	.83	-.76	.94
Avoidance predicting AM	<i>b</i>	.25	.08	.003	.08	.42
CSA on AM (Direct effect)	<i>c'</i>	-.09	.42	.81	-.94	.74
Indirect effect of CSA on AM via Avoidance	<i>ab</i>	.18	.11		-.007	.43
CSA predicting Hyperarousal	<i>a</i>	.86	.29	.003	.29	1.44
CSA predicting AM (Total effect)	<i>c</i>	-.04	.43	.92	-.89	.82
Hyperarousal predicting AM	<i>b</i>	.32	.11	.004	.10	.55
CSA on AM (Direct effect)	<i>c'</i>	-.32	.43	.45	-.18	.53
Indirect effect of CSA on AM via Hyperarousal	<i>ab</i>	.28	.14		.05	.60
CSA predicting Intrusion	<i>a</i>	1.06	.27	.001	.52	1.60
CSA predicting AM (Total effect)	<i>c</i>	.14	.43	.74	-.71	.99
Intrusion predicting AM	<i>b</i>	.19	.12	.11	-.04	.43
CSA on AM (Direct effect)	<i>c'</i>	-.06	.44	.88	-.95	.81
Indirect effect of CSA on AM via Intrusion	<i>ab</i>	.20	.14		-.04	.52

Note. CPA= Childhood Physical Abuse, AM= Alcohol misuse, PTSS= Posttraumatic stress symptoms severity, *B*= Standardized Beta, *SE*= Standard Error.