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Sex and Gender Differences in Co-Occurring Alcohol Use Disorder and PTSD

Tanya C. Saraiya[1,2], **Sudie E. Back**[2,3], **Amber M. Jarnecke**[2], **Shannon M. Blakey**[4], **Alexandria G. Bauer**[1], **Delisa G. Brown**[2], **Lesia M. Ruglass**[1,5], **Therese Killeen**[2], **Denise A. Hien**[1]

[1]Center of Alcohol & Substance Use Studies, Rutgers University-New Brunswick, 607 Allison Road, Piscataway, NJ 08854, USA

[2]Department of Psychiatry and Behavioral Sciences, College of Medicine, Medical University of South Carolina, 125 Doughty Street, Suite 300, Charleston, SC 29425, USA

[3]Ralph H. Johnson Veterans Affairs Healthcare System, Charleston, SC, USA

[4]RTI International, Research Triangle Park, NC, USA

[5]Department of Psychology, City College of New York, New York, NY, USA

Abstract

Purpose of Review—Research demonstrates a strong association between alcohol use disorder (AUD) and posttraumatic stress disorder (PTSD). However, less is known about sex- and gender-based differences among individuals with AUD + PTSD. This narrative review examines recent literature in this area and aims to be a reference for future research endeavors.

Recent Findings—Extant literature shows that intertwining biological systems increase females' risk of developing PTSD and experiencing more adverse effects from AUD compared to males. Sex-based physiological differences further interact with gendered sociocultural environments to influence the risk of AUD + PTSD. Emerging research suggests potential gender-specific pathways between PTSD, coping, and AUD which may inform prevention and treatment. However, barriers to care are often gender-specific and tailored approaches are needed to improve reach and uptake.

Summary—Additional research is needed to examine intersectional and contextual factors that synergistically influence sex/gender differences in AUD + PTSD, particularly beyond cisgender identities, and mechanisms of action.

Keywords

Sex; Gender; Posttraumatic stress disorder; Alcohol use disorder; Comorbidity

✉Tanya C. Saraiya, tanya.saraiya@rutgers.edu.

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Introduction

Alcohol use disorder (AUD) and posttraumatic stress disorder (PTSD) commonly co-occur, but less research to date has focused on sex or gender differences in co-occurring AUD + PTSD. Early research examining AUD and PTSD was initiated as separate lines of research, with clinical research primarily focused on cisgender men [1] and pre-clinical work conducted almost exclusively on male rodents [2, 3]. In addition, PTSD was originally conceptualized for combat-related trauma and therefore disproportionately focused on men/males [4]. Over the past two decades, accumulating research has begun to examine sex/gender differences in AUD alone and PTSD alone, with findings demonstrating important biopsychosocial differences that have implications for prevention and treatment efforts. Much less is known, however, about sex/gender differences in co-occurring AUD + PTSD.

To address this gap, we conducted a narrative review with a focus on recent empirical findings (i.e., in the past five years from 2018–2023) on sex and gender differences in AUD + PTSD. The PubMed database was searched using the appropriate terms for alcohol (e.g., “alcohol use”, “alcohol use disorder”, “drink[ing]”), for trauma and PTSD (e.g., “posttraumatic stress symptoms”, “violence”), and for sex and gender (e.g., “gender differences”). The initial search led to approximately 834 articles. When reducing search parameters to “alcohol use disorder” and “posttraumatic stress disorder,” the search yielded 72 articles. Selected articles were reviewed and organized by sex/gender differences in the a) epidemiology of AUD + PTSD; b) trauma exposure and PTSD; c) alcohol use and AUD; d) neurobiology of AUD + PTSD; e) mechanisms linking AUD + PTSD; and f) treatment barriers and outcomes. Although the focus of this narrative review is sex/gender differences in AUD + PTSD, the scant amount of research in this area and the tendency to focus on differences in AUD or PTSD alone led us to include relevant literature on each singular diagnosis in addition to contemporary literature on co-occurring AUD + PTSD. Seminal works and select articles published prior to 2018 that are particularly relevant to the topic are also included.

It should be noted that one challenge to understanding sex and gender differences in AUD + PTSD relates to how sex/gender are measured and reported. Sex and gender are typically assessed and reported as binary constructs (i.e., male or female for sex; man or woman for gender), resulting in gaps in our understanding of individuals with diverse sexual and gender identities [5] and making it difficult to interpret and extrapolate some findings. Moreover, the terms *sex* and *gender* are often used interchangeably, which obscures potential differences that may be due to biology versus psychosocial factors. For the purposes of this review, we report on findings for both sex and gender as they are described in the literature, and we provide recommendations for future research to address current limitations. We note that differences observed may be best conceptualized as interactions between sex-based physiology and gendered sociocultural environments [1, 6–8].

Epidemiology of Co-Occurring AUD + PTSD by Sex and Gender

Epidemiological studies show that past-year AUD is more common among men (13.2%–13.9%) than women (9.5%–10.4%) [9, 10], whereas past-year PTSD is more common

among women (6%) than men (3%) [11]. The sex/gender prevalence gap for AUD has meaningfully narrowed in the past decade, however, due to increases in alcohol use among women [12]. An analysis of six national datasets showed that from 2000 to 2016, women increased alcohol consumption by 6% whereas men decreased consumption by 0.2% [13]. Sex-related comparisons of comorbid AUD + PTSD mirror single-diagnosis estimates that place men at higher risk for AUD and women at higher risk for PTSD. For example, one national study found that adults with AUD + PTSD, compared to AUD-only, were more likely to be female, but adults with AUD + PTSD, compared to PTSD only, were more likely to be male [14•]. Indeed, previous studies show that 30–59% of adults with AUD have co-occurring PTSD [15–18] and that 10.3% of men and 26.2% of women with lifetime alcohol dependence also have lifetime PTSD [19]. Among adults with PTSD, previous research has also shown that approximately 28% of women and 52% of men also meet criteria for AUD [15, 20, 21].

A growing body of research underscores the importance of intersectionality when examining the epidemiology of AUD + PTSD. A secondary analysis found that the prevalence of comorbid PTSD was even higher among adults with AUD who identified as bisexual, gay, or lesbian, compared to adults with AUD who identified as heterosexual, *especially* among females [22]. Similarly, other research shows that AUD + PTSD is more prevalent among those who are unmarried, unemployed, homeless, below the poverty line, on public assistance, or have experienced incarceration [14•].

Sex and Gender Differences in Trauma and PTSD Severity

Although men are more likely to experience trauma, women have a two-fold risk of developing lifetime PTSD [23, 24], partly due to differences in types of trauma exposure. Starting in childhood, girls experience over twice the rate of childhood sexual abuse (19.7%) in comparison to boys (7.9%), and adult women are 22.5 times more likely to be raped than men [25, 26••, 27–30]. Even after controlling for sexual abuse, girls have more severe PTSD symptoms than boys [31•]. Thus, sex has been considered a risk factor for PTSD [32].

However, recent studies show disparate findings, contending that sexual trauma is more accountable for gender differences in PTSD than gender itself [33•]. Despite these contradictory findings, most research has found that gender differences in PTSD risk are not solely due to trauma type, but also due to differences in gender roles and socialization [34]. For instance, in one study of military service members, both men and women with military sexual trauma showed greater PTSD severity and alcohol use. Yet, solely for women, stronger experiences of deployment disrupting their lives were associated with more severe PTSD and AUD severity [35]. This points to how sexual trauma alone does not seem to account for gender differences in PTSD. Indeed, gender differences in types of trauma exposure and PTSD severity are greater in societies where gender inequality, discrimination, and cultural norms of gender-based violence are more widely accepted [36].

Emerging research has also begun to highlight the importance of the intersectionality of race and gender in influencing risk of trauma exposure and PTSD severity. In a novel study, Valentine et al. (2019) compared gender differences between racial/ethnic groups

among N = 13,649 individuals and found that women who identified as white, Black/African American, or Afro-Caribbean showed a higher risk of PTSD than their male counterparts, whereas gender differences were not observed in Latinx and Asian racial/ethnic minority groups. The authors suggest that such variation in gender differences by race may be due to contextual factors (e.g., acculturative stress, immigration, urban context) that increase risk of trauma exposure among Latinx participants, and that underreporting of trauma due to cultural norms lowered the amount of trauma exposure reported among Asian women [37••]. Additional research shows that racial/ethnic discrimination increases the propensity of developing PTSD among Black/African Americans regardless of gender [38], an area of much needed additional investigation.

Sex-specific biological differences also increase the risk of PTSD among women and females. The last five years has shown a plethora of investigations targeting sex differences in the neurobiological development and presentation of PTSD. Pre-clinical and clinical literature consistently demonstrates sex differences in stress reactivity. In general, females show hypoactive hypothalamic–pituitary–adrenal (HPA) axis reactivity in response to stress and trauma, especially repeated childhood trauma, which is influenced by sex differences in gonadal hormones and sex chromosomes [34, 39–41]. Thus, particularly in post-pubertal women, changes in gonadal hormones with the menstrual cycle are linked to gender differences in fear learning, conditioning, and extinction [2, 42]. Together, this research has shown that across several intertwining biological systems–genes, neurological substrates, neural circuitry, hormonal changes, and the HPA axis–females show a greater risk of developing PTSD than males and this risk is further influenced by sociocultural risk factors. Ultimately, the biological risk factors for PTSD among females may increase the risk of using alcohol to cope with PTSD symptoms [43].

Sex and Gender Differences in Alcohol Use and AUD

Given a history of research conflating sex and gender, understanding the role of sex compared to gender in alcohol metabolism and the development of AUD is complicated. For instance, factors that affect alcohol metabolism (e.g., hormone profiles, total body water, muscle and fat composition) differ by sex, and hormone therapies may change alcohol metabolism [44•, 45]. Given the same amount of alcohol consumption, females tend to have higher blood alcohol concentrations relative to males due to metabolic differences [46•]. Additionally, females are more susceptible to alcohol's adverse effects on the brain and liver, even at lower levels of alcohol intake [44•, 46•] and they tend to demonstrate quicker progression from alcohol use to development of AUD (i.e., telescoping).

As mentioned above, the gender gap in AUD rates is narrowing such that across most adult age groups, drinking, binge drinking, and AUD have increased at a greater rate for women than men [47•]. Reasons for this change include fewer social sanctions around alcohol use today for women and girls, greater stress from women's increasingly complex social roles (e.g., spouse, parent, employee, administrator) which may then increase drinking [47•, 48, 49], and gender-specific targeting of women in alcohol marketing [50]. In comparison, the decreases in drinking among younger age cohorts may be due, in part, to policy changes (e.g., increased legal drinking ages in the 1980s, restrictions on alcohol advertising to youth)

and public health messaging targeting youth [47•]. Changes in rates of drinking and AUD among women also intersect with race. From 2000–2010, rates of AUD increased for white and Black women but decreased for Latina women [51]. Another study found that male African Americans with psychiatric comorbidities had a greater likelihood of engaging in alcohol use relative to female African Americans [52]. More research is needed to better understand how intersections with gender and race are associated with drinking rates of AUD.

Motives for alcohol use and triggers for alcohol craving may also differ by gender. Women tend to demonstrate more craving and drinking during stressful situations or when negative affect is amplified, whereas men show greater drinking in more rewarding situations or when presented with a conditioned alcohol cue [53•, 54]. Akin to work in PTSD, differences in the salience of cues for drinking may be related, in part, to sex differences in HPA axis functioning. Some studies show that females have hypoactive HPA axes in response to stress, which confers risk for AUD [53•]. In addition, repeated stress and childhood trauma can impact the HPA axis as well as autonomic and immune responses which may be associated with sex-specific risk for alcohol use and AUD [53•]. More research is needed to better understand the role of hormones and hormone therapies on associations between stress, HPA axis functioning, and alcohol use.

Sex Differences in Neurobiology of AUD + PTSD

Literature on sex differences in the shared neurobiology of AUD + PTSD has grown in the past five years. Prior reviews have highlighted that AUD + PTSD share neurobiological underpinnings in neurotransmitters (i.e., dopamine, norepinephrine, and serotonin), brain substrates (i.e., prefrontal cortex, hippocampus, and amygdala), neuroendocrine systems (i.e., HPA axis and corticotropin-releasing hormone), and genetics [55]. However, a recent review highlighted new pre-clinical studies modeling comorbid AUD + PTSD in novel paradigms, suggesting shared physiological bases for the AUD + PTSD comorbidity [56••]. This review showed that across studies, co-occurring AUD + PTSD appear to share a hypoactive ventromedial prefrontal cortex and hyper-active amygdala [56••, 57].

Although this research is emerging, sex differences are already being found in these preclinical studies. Across two studies, female rats showed a greater consumption of ethanol relative to males [58, 59]. Specifically, in one study, female rats showed a greater consumption of ethanol in response to novel stressors [58], and in the other study, females exposed to early life stress engaged in more aversion-resistant drinking (i.e., continuing to engage in compulsive drinking despite negative consequences, a core symptom of AUD) [59]. Notably, some of this literature has found divergent results [60], but others have qualified that findings in sex differences for preclinical AUD + PTSD studies are dependent on the stressor [58]. This suggests that preclinical models on the AUD + PTSD comorbidity are not only at an exciting stage of development, but also are mirroring complex sex differences where the stressor and environment influence drinking behaviors and associated neurobiological changes.

Genetics research also shows nascent findings on sex differences in the neurobiology of AUD + PTSD. A series of studies have begun to examine the genetic overlap between AUD + PTSD in European Ancestry data, where in general, there is a positive correlation between AUD and PTSD, but a negative correlation between alcohol use and PTSD [61]. However, one study evidenced sex differences in the association between AUD and PTSD, where this association was stronger in females than in males [62]. The authors note that their findings are limited due to models not converging, but nonetheless, suggest possible sex differences in the genetic risk for AUD + PTSD [62].

Mechanisms Linking Alcohol and PTSD by Sex and Gender

There are several empirically supported models commonly used to explain the associations between AUD and PTSD: the self-medication hypothesis (i.e., PTSD symptoms lead to alcohol use to cope), the high-risk hypothesis (i.e., engagement in alcohol use increases risk of trauma exposure and subsequent PTSD), the shared vulnerability model (i.e., shared risk factors of neural circuitry, genetics, and personality traits underlie both diagnoses), the early life stress model (i.e., early trauma leads to biological changes increasing susceptibility to AUD+PTSD), and the mutual maintenance model (i.e., an addition to the self-medication hypothesis where using alcohol to cope increases the severity of PTSD symptoms) [43, 63, 64]. To date, research on sex/gender differences in these associations linking alcohol use, AUD, and PTSD is scarce.

Early research examining gender-specific pathways shows women have a greater vulnerability to developing AUD + PTSD. In particular, one study found that women with a recent diagnosis of PTSD showed greater odds of developing a substance use disorder (SUD) than men, suggesting a higher sex-specific susceptibility of developing AUD + PTSD [65•]. Another study showed that among military service members (N = 16,004), women with AUD + PTSD showed a higher likelihood to engage in intentional self-harm (e.g., cutting) than men with AUD + PTSD and age- and gender-matched controls. Some recent studies suggest that coping motives are the crucial link between PTSD and subsequent AUD rather than trauma exposure or PTSD severity alone [66, 67]. For instance, one study showed that women who experienced childbirth as traumatic compared to those who didn’t reported greater hazardous alcohol use as a means to cope, particularly to enhance positive affect, contrary to other literature [67]. However, it seems that gender differences in coping motives are, unsurprisingly, context- and culture-dependent. The latter study consisted of Australian women (no race reported), whereas qualitative work among Latinx individuals with heavy drinking showed that reasons to drink varied by time of immigration and gender [68]. Prior to immigration, men reported drinking to enhance positive affect whereas after immigration, women reported drinking to cope with gender role expectations. Furthermore, because of immigration and acculturative stress, both men and women reported loss of social connections as a motivation to drink. This suggests that there are gender-specific pathways between AUD + PTSD influenced by culture, context, and coping, and thus, precludes generalizable conclusions.

Recent work also highlights how protective behavioral strategies (e.g., sipping instead of chugging drinks, using a designated driver, alternating between alcoholic and non-alcoholic

beverages) may reduce alcohol-related problems among women with PTSD. A study of college students with PTSD symptoms found that women were more likely than men to engage in protective behavioral strategies to mitigate alcohol-related risks and harms [69]. Importantly, when women engaged in protective behavioral strategies, the relationship between PTSD and alcohol-related problems attenuated. This suggests that not only are there gender-specific pathways between PTSD, coping, and AUD, but also that there are gender-specific means to weaken the strength of these relationships, which may be crucial for the development of prevention strategies and treatments.

Despite these findings, other studies find no gender differences in AUD + PTSD or gender differences solely for men. In one study of N = 835 undergraduates (56% men), solely men showed a significant association between sexual abuse, impaired alcohol control, and PTSD symptoms [70]. Another study among young adults found that the frequency of PTSD symptoms was associated with AUD symptoms two years later, but only among men [71]. Indeed, novel research demonstrates that drinking to cope with PTSD symptoms (i.e., the self-medication hypothesis) explains the relationship between PTSD symptoms and alcohol use problems better for men than for women [72•]. This suggests that even though some gender differences have been found in mechanistic pathways between AUD and PTSD (e.g., [67] described above), explanatory models may be historically biased given their genesis at a time when research was primarily sanctioned to males. Additional research on mechanisms between AUD and PTSD, including coping, will elucidate the nuanced and possible gender-specific pathways leading to AUD + PTSD.

Sex and Gender Differences in AUD + PTSD Treatment

Historically, individuals with AUD + PTSD were provided with sequential treatment where AUD was first treated followed by treating PTSD. However, this approach risks dropout due to a failure to attend to underlying trauma/PTSD that often precipitates substance use [73]. Alternatively, decades of research demonstrates that AUD + PTSD can be effectively treated concurrently [74, 75, 76••]. Evidence-based interventions for co-occurring AUD + PTSD include primarily behavioral integrated interventions where both conditions are attended to synergistically in the same treatment, and non-integrated interventions where behavioral or pharmacological treatments focus on one condition within the comorbidity. Integrated behavioral treatments for AUD + PTSD have been further categorized into traumafocused treatments, where the treatment directly attends to the traumatic event(s), and non-trauma-focused interventions where the focus of treatment is on coping skills to manage symptoms [77]. Hien and colleagues (2023) compared the efficacy of integrated and non-integrated behavioral and pharmacological treatments for co-occurring AUD + PTSD (47% female) and found that the most efficacious treatments were trauma-focused behavioral treatments combined with medications for AUD [75]. However, the authors reported no gender differences and few studies have examined sex or gender differences in pharmacotherapies for AUD partly because pharmaco-therapy trials historically focused on males [78] or sample sizes did not allow for gender comparisons [79•]. One review examined the effects of naltrexone on alcohol outcomes by gender and found that among women with AUD, naltrexone was positively associated with reductions in drinking quantity

and time to relapse but not drinking frequency [80], suggesting gendered-specific effects in AUD pharmacotherapy that warrants further investigation.

Relatively less work has examined gender differences in behavioral treatments for AUD + PTSD, with most research instead focusing on gender differences in solely AUD, or PTSD, treatment. Nevertheless, one recent study compared men and women with SUD (current or in remission) and found that women in recovery from SUD had more severe PTSD symptom profiles relative to males in recovery [26••]. The authors concluded that such evidence points to a need for gender-specific behavioral treatment models for SUD + PTSD. Nonetheless, most studies that have examined gender-specific treatments or examined solely women have not found a significant difference in SUD + PTSD symptoms between experimental and control conditions [81–87], even though women report preferring gender-specific behavioral treatment and it is associated with greater satisfaction, comfort, increased continuity of care post-treatment, and greater long-term economic stability [46•, 88•, 89]. This is even in spite of work showing that treatment programs at clinics designed for subpopulations of women (e.g., displaying cultural humility around women's issues, offering childcare services or the ability for children to be with mother, services for incarcerated women) that are trauma-informed and address co-occurring disorders may yield greater short-term and long-term benefits for women [46•, 88•, 90, 91]. These findings suggest that gender-focused behavioral treatments and treatment programs provide greater comfort and long-term benefits even though current research on outcomes is inconclusive.

Three recent reviews have further examined how women fare in behavioral SUD + PTSD treatment. Johnstone et al. (2023) completed a systematic review of 24 gender-focused integrated behavioral interventions for women with substance use and co-occurring psychiatric conditions [92]. Overall, they found reductions in substance use and mental health symptoms for women, but they did not specify reductions in PTSD. In contrast, Molina and Whittaker (2022) completed a systematic review of five SUD + PTSD behavioral interventions for individuals with adverse childhood experiences (77% women) and found significant reductions in PTSD symptoms but not substance use [93••]. The authors also noted a high risk of bias among studies and called for a need to enhance behavioral interventions to better reduce SUD outcomes in women with SUD + PTSD and childhood trauma. Finally, Masin-Moyer and colleagues (2022) examined outcomes for the Trauma Recovery Empowerment Model (TREM) behavioral intervention for women [94]. Among the included 12 studies, three studies showed significant reductions in substance use and four showed reductions in PTSD, overall leading to inconclusive results. Together, these findings point out that while women who receive integrated behavioral AUD + PTSD interventions show reductions in AUD and PTSD symptoms, there is significant room for improvement, especially for AUD outcomes.

Another area for significant improvement is reducing the numerous gendered barriers to engaging in AUD + PTSD treatment. Men and women with SUD and co-occurring psychiatric conditions, including PTSD, show a similar number of barriers to engaging in treatment, but women report more barriers of family, relationships, stigma, feeling shame and guilt, and their own mental health (e.g., depression, anxiety, posttraumatic stress symptoms) [95]. It has been well documented that women with AUD are less likely than

men to seek treatment (past-year prevalence of treatment seeking is 7% for men and 5% for women) [96], regardless of race or ethnicity [97]. Rates of *entering* treatment may also differ by gender. Women experience more barriers to treatment entry and retention, including systemic barriers (e.g., laws asserting child abuse for women who engage in substance use while pregnant), disparities in employment, lower financial well-being, less health insurance coverage, transportation needs, and lower perceived need for treatment. In addition, treatment entry is compounded by intersectionality. Women of minority racial/ethnic backgrounds, who live in rural areas, who speak different languages or don't have citizenship status, or who are involved in the justice system experience significantly more barriers and inequity in entering AUD treatment [98•, 99, 100•]. These barriers are likely further exacerbated among nonbinary and transgender individuals, but the research in this area is limited.

Perhaps due to these barriers, there has been a recent increase in the examination of technology-based interventions with noticeable gender differences [101]. Women are overrepresented in online interventions for AUD [102], and a recent secondary analysis assessed gender differences in the efficacy of online telehealth interventions. Livingston et al. (2021) examined gender differences in VetChange, a smartphone application for veterans with AUD and co-occurring posttraumatic stress symptoms [103]. Results showed that relative to female veterans, male veterans showed better outcomes with significant reductions in average weekly drinks and the number of drinks per drinking day. In comparison, women were less likely to show low-risk levels of drinking after using the app for one month [103]. This suggests that even when technology is leveraged to provide care to women with AUD + PTSD, there remains a gender difference in treatment outcomes. It will be imperative for future treatment research to examine how to improve the quality and reach of interventions for women with AUD + PTSD, particularly for minority women with inequitable access to care.

Conclusions

Summary

To date, minimal research has focused on sex/gender differences in co-occurring AUD + PTSD (for a summary see Table 1). However, it remains imperative to better understand sex- and gender-specific risk factors that influence the development of AUD + PTSD as well as ways to enhance treatment access and improve clinical outcomes to attend to the increasing number of women and other gender identities with AUD + PTSD. Extant findings have highlighted numerous ways in which unique aspects of male and female physiology coupled with psychosocial gender-based norms in the environment interact to influence AUD + PTSD. These interactions impact, for example, triggers and cravings for alcohol, severity, disease progression of AUD + PTSD, and treatment-seeking behaviors. Notably, women are twice as likely to have PTSD and they experience more adverse medical and physical consequences from alcohol use relative to men, even after consuming less alcohol over a shorter period. From a public health perspective, it is important to ensure that girls and women, their loved ones, and the professionals who work with them are aware of these issues and regularly assess for PTSD symptoms and alcohol use and refer to treatment

when needed. However, advances in research to understand the gender-specific pathways from PTSD to AUD and gender-specific treatments followed by dissemination of such interventions will be as necessary to adequately care for women and girls with AUD + PTSD referred for treatment.

Future Directions

It is crucial for future research and practice to utilize an intersectionality framework for AUD + PTSD. Most studies to date are focused on predominantly white, cisgender, heterosexual men and women with a dearth of research targeting sexual, gender identity, and racial/ethnic minorities despite their additive risk for AUD + PTSD. Of research that has begun to examine the intersectionality of sex/gender and race, findings show both conditions significantly impact the risk for trauma exposure and PTSD, and motives for using alcohol. More research is needed to elucidate interactions between sex/gender, race/ethnicity, and context (i.e., how alcohol is marketed to specific communities) to aid in the development of culturally-tailored and contextually-congruent approaches to eliminate mental health disparities among minoritized individuals with AUD + PTSD. Greater attention is also needed to develop treatments and delivery formats (e.g., technology-based interventions) that remove barriers to care and reach individuals in need of treatment.

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•• Of major importance

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Table 1

Summary of Sex and Gender Differences in Co-Occurring AUD and PTSD

Domain	Sex and Gender Differences
Lifetime Prevalence of PTSD[1]	• Women: 10–12% • Men: 5–6%
Lifetime Prevalence of AUD[2]	• Women: 19.5% • Men: 42% • Note, the gap in alcohol use between men and women has decreased
Lifetime Prevalence of AUD + PTSD[3]	• Among adults with alcohol dependence, 26.2% women and 10.3% men have PTSD • Among adults with PTSD, 28% women and 52% men have AUD • Comorbid AUD + PTSD is more likely among minoritized identities
Trauma Exposure[4]	• Girls show a greater risk for childhood sexual abuse than boys • Women show a greater risk for sexual trauma exposure than men • Sexual trauma exposure is associated with more severe PTSD
Risks for PTSD[5]	• Women show a two-fold risk for developing PTSD relative to men • Biological, psychosocial, and contextual factors increase the risk of PTSD among women/females
Risks for AUD[6]	• Females show higher blood alcohol concentration compared to males • Women develop medical problems from alcohol use faster than men, even with less alcohol use and in less time from onset of use • Women tend to crave alcohol to cope with stress and negative affect whereas men tend to crave alcohol for reward and in response to cues
Treatments[7]	• Early evidence suggests women with AUD + PTSD in treatment show more severe PTSD profiles than men • Minimal research has examined sex/gender differences in integrated psychosocial or pharmacological AUD + PTSD treatments • Women-focused psychosocial interventions for AUD + PTSD have not shown empirical differences between experimental and control conditions in symptoms • However, gender-focused treatment is preferred by women and shows better long-term outcomes in quality of life • Technology interventions have a greater number of female participants, but men appear to benefit more from such interventions
Barriers to Treatment[8]	• Men and women show the same number of barriers, but women report more barriers related to stigma, family and relationships, transportation, employment, insurance, and fewer financial resources • Barriers are compounded by intersectional identities (e.g., race/ethnicity, immigration and generational status, language, rural context, citizenship, non-binary, sexual minorities)

[1] Olff et al. [23]

[2] Hasin et al. [104]

[3] Baker et al. [21]; Kessler et al. [19]; Ralevski et al. [15]

[4] Ainamani et al.[25]; Belfrage et al. [26••]; Mundy et al. [29]; Wamser-Nanney et al. [31•]

[5] Bauer et al. [2]; Olff et al. [23]

[6] Keyes et al. [47•]; Kezer et al. [44•]; Klaver et al. [45]; McHugh et al. [46•]

[7] Belfrage et al. [26••]; Berge et al. [88•]; McHugh et al. [46•]; Livingston et al. [103]

[8] Agterberg et al. [95]; Alvanzo et al. [97]