

# Chapter 3

## Posttraumatic Stress and Alcohol Use Among First Responders

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### **ABSTRACT**

*Developing research suggests that the co-occurrence of posttraumatic stress disorder (PTSD) and alcohol use disorder (AUD) is a significant clinical concern across first responder populations. This comorbidity is difficult to treat and marked by a more costly, complex, and chronic clinical course when compared to either disorder alone. Significant associations between PTSD/AUD comorbidity and various psychological, behavioral, and physical health outcomes among first responder samples have been documented. This chapter provides a theoretical framework and empirical review of the literature relevant to PTSD/AUD in the context of firefighter, police, and other first responder populations (e.g., emergency medical technicians). Future directions, utilizing varied methodologies and assessment tools, and focusing upon varied first responder populations are enumerated to build upon this preliminary, yet clinically meaningful, empirical foundation. This research domain has great potential to inform specialized, evidence-based clinical care for first responders.*

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## **INTRODUCTION**

The co-occurrence of posttraumatic stress disorder (PTSD) and alcohol use disorder (AUD) is an increasingly significant clinical concern across first responder populations (e.g., firefighters, police officers, rescue workers; Chopko, Palmieri, & Adams, 2013; Harvey et al., 2016; Ménard & Arter, 2013; Paulus, Vujanovic, Schuhmann, Smith, & Tran, 2017). While the PTSD/AUD comorbidity is well-established and highly prevalent among both the general population and military veterans (e.g., Fuehrlein et al., 2016; Grant et al., 2015; Kessler, Chiu, Demler, & Walters, 2005; Milliken, Auchterlonie, & Hoge, 2007; Pietrzak, Goldstein, Southwick, & Grant, 2011), our understanding of PTSD/AUD among first responders is much more limited. Broadly, across populations, both research and clinical practice have demonstrated that PTSD/AUD is difficult-to-treat and marked by a more costly, complex, and chronic clinical course when compared to either disorder alone (e.g., McCauley, Killeen, Gros, Brady, & Back, 2012; Mills, Teesson, Ross, & Peters, 2006; Schafer & Najavits, 2007; Vujanovic, Bonn-Miller, & Petry, 2016). Among first responder populations, available literature suggests that first responders may use alcohol to cope with PTSD-related symptomatology (Simons, Gaher, Jacobs, Meyer, & Johnson-Jimenez, 2005; Smith, Gallagher, Tran, & Vujanovic, 2018; Tomaka, Magoc, Morales-Monks, & Reyes, 2017). Further, emergent literature suggests that PTSD/AUD has important clinical implications among first responders due to documented associations with various mental health concerns (e.g., depression and suicidality; Chopko et al., 2013; Pietrzak et al., 2012; Violanti, 2004), behavioral health issues (e.g., sleep disturbance; Yun, Ahn, Jeong, Joo, & Choi, 2015), and occupational problems (e.g., occupational stress, critical incidents, work productivity; Chopko et al., 2013; Kim, Park, & Kim, 2017; Ménard & Arter, 2013, 2014).

Available research among first responders suggests that PTSD and AUD symptoms are both highly prevalent. This extant research also underscores the potential clinical relevance of this comorbidity, although epidemiological studies documenting actual prevalence rates within first responder populations are lacking. Building upon our understanding of the PTSD/AUD comorbidity among first responders can inform evidence-based prevention and intervention efforts. While attention to first responders has increased in recent years, several methodological challenges and gaps exist, which warrant future scientific attention. Thus, the objective of the current chapter is to provide a clinically-informed theoretical framework and summary of the literature regarding PTSD/AUD among first responders. Current methodological limitations will be enumerated and future directions will be discussed to propel this domain of inquiry further and to advance evidence-based mental health services for first responders.

## **BACKGROUND**

First responders represent an at-risk population with regard to alcohol misuse and AUD (e.g., Jones, 2017). Among firefighters, for example, nearly half report current excessive alcohol use (i.e., 3 or more drinks per occasion) and one-third report past-month heavy episodic drinking (i.e., 5 or more drinks per occasion; Haddock, Day, Poston, Jahnke, & Jitnarin, 2015). Lifetime AUD prevalence rates are substantial among firefighters, with approximately 47% reporting a lifetime AUD (North, Tivis, McMullen, Pfefferbaum, Spitznagel, et al., 2002), which is significantly higher than the 29.1% lifetime AUD prevalence documented in the general population (Grant et al., 2015). Further, among urban police officers, 18.1% of men and 15.9% of women report experiencing adverse consequences from alcohol use

(e.g., driving while intoxicated, occupational problems), with 7.8% of the sample meeting criteria for lifetime AUD (Ballenger et al., 2011). Overall, the prevalence of alcohol misuse and AUD symptoms among first responders underscores the importance of better understanding factors related to alcohol use among this unique population.

PTSD symptomatology provides an important avenue to better understand alcohol use among first responders. Indeed, by virtue of their careers, first responders are particularly at-risk for exposure to traumatic events and PTSD symptomatology (e.g., Jones, 2017). Duty-related trauma exposure has been estimated to be as high as 91.5% among firefighters (Meyer et al., 2012) and 94% among paramedic trainees (Fjeldheim et al., 2014). Furthermore, research among police officers has found that those within small and midsize departments had an average exposure rate of 188 work-related potentially traumatic events over the course of their careers (Chopko, Palmieri, & Adams, 2015). The estimated prevalence of current (i.e., present in the past month) PTSD among first responders varies widely. For example, estimates among firefighters range from 8% (Del Ben, Scotti, Chen, & Fortson, 2006) to 22.2% in the United States ([US]; Corneil, Beaton, Murphy, Johnson, & Pike, 1999), depending upon the assessment methods utilized and samples studied. Estimates also suggest that 21% of emergency medical personnel (EMS) and paramedics (Jones, 2017) and 24% of police officers meet diagnostic criteria for current PTSD (Fox et al., 2012). General US population estimates, in contrast, have reported that the 12-month prevalence of PTSD is 4.7% and lifetime prevalence is 8.3% (Kilpatrick et al., 2013). Many more first responders may also suffer from subclinical PTSD, which is associated with similar levels of impairment as diagnostic PTSD in general population samples (e.g., Bergman, Przeworski, & Feeny, 2016; Pietrzak et al., 2011; Zlotnick, Franklin, & Zimmerman, 2002).

While PTSD/AUD remains understudied among first responders, mounting work has evaluated the associations between PTSD and AUD symptoms among first responders with attention to psychological mechanisms underlying and related to this association (e.g. Chopko et al., 2013; Harvey et al., 2016; Ménard & Arter, 2013; Paulus et al., 2017; Wagner, Heinrichs, & Ehlert, 1998). Across studies, the self-medication model of PTSD/AUD comorbidity has been highlighted, positing that first responders with PTSD symptomatology may be at a heightened risk for alcohol misuse and AUD due to a tendency to use alcohol as a means of coping with negative affect (Khantzian, 1999; Ménard & Arter, 2013; Simpson, Stappenbeck, Luterek, Lehavot, & Kaysen, 2014; Smith et al., 2018; Tomaka et al., 2017). Despite the focus on the self-medication model of comorbidity, it is important to note that other trajectories may also be pertinent to understand PTSD/AUD among first responders. For example, AUD might lead to greater off-hours drinking behavior among first responders, which may in turn lead to increased risk of non-duty-related trauma exposure (e.g., motor vehicle accidents, physical violence). Alternatively, AUD and PTSD may develop concurrently following trauma exposure (e.g., Murphy, Beaton, Pike, & Johnson, 1999). Given the clinical complexity of PTSD/AUD comorbidity, it is important to better understand this relationship within specific first responder populations.

## MAIN FOCUS OF THE CHAPTER

### Empirical Research in Firefighters Populations

Empirical research among firefighters has exploded within the past few years, facilitating increased understanding of PTSD/AUD associations in this vulnerable population. Most of the work in this area has been limited to the documentation of positive associations between PTSD symptoms and alcohol use, using survey-based cross-sectional designs (e.g., Ci, Lan, Zhang, Zhou, & De, 2015; Smith et al., 2011; Stanley, Boffa, Hom, Kimbrel, & Joiner, 2017). However, an increasing number of studies have focused on specific alcohol- and PTSD-related outcomes, as enumerated below.

*Alcohol outcomes.* Studies examining alcohol outcomes, specifically, have found evidence for heavy alcohol use throughout various firefighter populations. For example, within a sample of male urban firefighters ( $N=2,707$ ), 30% met criteria for *Diagnostic and Statistical Manual of Mental Disorders* (4<sup>th</sup> ed; *DSM-IV*) probable alcohol dependence (RAPS4; Cherpitel, 2000). This study further demonstrated that higher levels of depression were positively correlated with alcohol-related outcomes for firefighters with lower, but not higher, levels of PTSD symptoms (Paulus et al., 2017). Longitudinal research conducted prospectively over 3 years demonstrated that PTSD symptoms predicted a greater number of alcoholic drinks consumed per week among firefighters recruited from seven US cities (Gulliver et al., 2018). Furthermore, associations have been documented between PTSD symptom severity and probable alcohol misuse (Smith et al., 2018) as well as increased alcohol use problems, as based upon self-report screening measures (Chang et al., 2016; Kim et al., 2017; Kim, Park, & Kim, 2018). Heavy alcohol use has also been evidenced within firefighter subgroups, such as women firefighters ( $N=1,913$ ), with findings indicating that women firefighter ‘problem drinkers’ (score of  $\geq 2$  on the CAGE; O’Brien, 2008) were 2.5 times more likely to report symptoms of PTSD than non-problem drinkers (Haddock, Poston, Jahnke, & Jitnarin, 2017). Additionally, longitudinal work in urban fire departments ( $N=188$ ), conducted prospectively across two years (Murphy et al., 1999), found a positive correlation between PTSD ‘caseness’ (IES score of  $\geq 26$ ; Horowitz, Wilner, & Alvarez, 1979) at baseline and self-reported drinking problems at two year follow-up.

Two studies to date have examined the association between the factor structure of PTSD symptom clusters and alcohol outcomes in racial/ethnic minority populations of firefighters. First, Arbona and Schwartz (2016) evaluated the *DSM-IV* dysphoria model of PTSD symptoms (i.e., re-experiencing, avoidance, dysphoria, and hyperarousal; Simms, Watson, & Doebbeling, 2002) among Hispanic male career firefighters ( $N=551$ ) and found that the dysphoria symptom cluster, indexed via the PTSD Checklist (Weathers, Litz, Herman, Huska, & Keane, 1993), showed the strongest correlation with *DSM-IV* alcohol abuse/dependence ( $r=.37$ ), indexed via the RAPS4 (Cherpitel, 2000). Further, when controlling for marital status, PTSD re-experiencing and dysphoria symptom clusters contributed unique variance to *DSM-IV* alcohol abuse/dependence (Arbona & Schwartz, 2016). Relatedly, among African-American male firefighters from the same fire department, Arbona, Fan, and Noor (2016) demonstrated that each PTSD symptom cluster in the dysphoria model had low magnitude ( $r=.20-.29$ ) significant correlations with *DSM-IV* alcohol abuse/dependence, also indexed via the RAPS4 (Cherpitel, 2000).

To date, three studies have examined alcohol use motives, broadly, among firefighters (North, Tivis, McMillen, Pfefferbaum, Cox, et al., 2002; Smith et al., 2018; Tomaka et al., 2017). These studies have demonstrated that drinking to cope with negative affect is associated with greater PTSD symptomatology (Smith et al., 2018; Tomaka et al., 2017) and functional impairment (North, Tivis, McMillen, Pfeff-

ferbaum, Cox, et al., 2002). In addition, coping-oriented alcohol use motives were found to mediate, or account for, the association between PTSD symptoms and problem drinking (Tomaka et al., 2017).

*PTSD outcomes.* Several studies investigating PTSD/AUD associations among firefighters have focused upon PTSD-related outcomes. Much of this work has studied firefighter populations exposed to the World Trade Center disaster on 9/11/2001 (i.e., 9/11; Berninger, Webber, Cohen, et al., 2010; Berninger, Webber, Niles, et al., 2010; Chiu et al., 2011; Soo et al., 2011). For example, a study examining firefighters ( $N = 5,656$ ) exposed to 9/11 demonstrated that an increase in alcohol use in the immediate aftermath of the disaster was associated with probable current PTSD, as indexed by the PTSD Checklist (PCL) for *DSM-5* (PCL-5; Blevins, Weathers, Davis, Witte, & Domino, 2015), and delayed onset of probable PTSD 1.6-3.8 years following 9/11 (Berninger, Webber, Niles, et al., 2010). Furthermore, an analysis of retired firefighters exposed to 9/11 ( $N = 1,915$ ) demonstrated that depression mediated the association between alcohol use and PTSD (Chiu et al., 2011). Overall, results from these studies suggest that firefighters may use alcohol as a means of coping with distress.

*Clinical correlates.* Several studies discussed above have demonstrated that depression symptomatology may be a clinical correlate relevant to both PTSD and alcohol use among firefighters (e.g., Arbona & Schwartz, 2016; Chiu et al., 2011; Lima Ede, Assuncao, & Barreto, 2015; Paulus et al., 2017), as consistent with literature on general population samples (e.g., Lee, Liverant, Lowmaster, Gradus, & Sloan, 2014; Murphy et al., 2013; Weinberger, Maciejewski, McKee, Reutenauer, & Mazure, 2009). In addition, Martin and colleagues (2017) examined male urban firefighters ( $N = 2,883$ ) and found that alcohol dependence, indexed via self-report, was indirectly related to suicide risk through severity of depression and posttraumatic stress. Finally, sleep disturbance has been found to moderate, or exacerbate, the association between PTSD symptom severity and both alcohol use severity alcohol use coping motives among firefighters (Smith et al., 2018). This is an important avenue for further study given that irregular sleep schedules and overnight shifts may lead to chronic sleep disturbance in firefighters.

## **Empirical Research in Police Populations**

Research relevant to PTSD/AUD associations among police populations, as compared to firefighter populations, is scant. Much of the work among police officers has been focused upon documenting average PTSD symptom levels and alcohol use rates (e.g., Fox et al., 2012; Violanti et al., 2011). Similar to the research among firefighter populations, published studies among police (enumerated below) have largely been limited to the documentation of associations between PTSD symptoms and alcohol use, using survey-based cross-sectional designs.

*Alcohol outcomes.* Studies focused on associations between PTSD symptomatology and alcohol use outcomes are limited. Broadly, PTSD symptoms have been related to number of daily alcoholic drinks (e.g., McCanlies, Mnatsakanova, Andrew, Burchfiel, & Violanti, 2014) and probable alcohol problems (e.g., Chopko, Facemire, Palmieri, & Schwartz, 2016; Chopko, Palmieri, & Facemire, 2014; Mumford, Taylor, & Kubu, 2015; Pietrzak et al., 2012). Building upon these associations, a cross-sectional study of urban police officers ( $N = 747$ ) found that higher PTSD severity was related to greater probability of lifetime alcohol-related problems, but not to current alcohol use (i.e., prior week alcohol consumption and past month binge drinking; Ballenger et al., 2011). Additionally, a study examining police from 13 different countries ( $N = 1,453$ ) found that the interaction of more severe critical (i.e., traumatic) incidents and increased PTSD symptom severity predicted heightened problematic drinking for men, but not women, police officers (Ménard & Arter, 2014). Finally, a study examining police officers in a

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mid-western state ( $N = 193$ ) found that greater PTSD avoidance symptoms, specifically, were related to the alcohol dependence and hazardous use but not harmful use (Chopko et al., 2013).

To date, one study has examined alcohol use motives among police officers (Ménard & Arter, 2013). This study ( $N = 750$ ) demonstrated significant positive bivariate associations between problematic alcohol use and *DSM-IV* PTSD symptom severity. Further, negative coping strategies demonstrated direct and indirect associations with problematic alcohol use and *DSM-IV* PTSD symptom severity through critical incident severity.

*PTSD outcomes.* There is a paucity of research examining associations between alcohol use and PTSD-related outcomes among police officers. One study (Inslicht et al., 2010) utilized a prospective longitudinal design to follow urban police officers ( $N = 278$ ) from academy training through the following 12 months of service. Here, family history of substance use, including alcohol, increased the risk for experiencing greater peritraumatic distress during critical incident exposure which, in turn, increased the risk for developing symptoms of PTSD among police officers.

*Clinical correlates.* Clinical correlates of PTSD/AUD-relevant associations among police officers have also been understudied, and existing work has focused almost exclusively on suicidal ideation. First, in an examination of Northeastern police offices in the US ( $N = 115$ ), the comorbid risk of PTSD and problematic alcohol use increased the odds of suicide ideation by a factor of 10 (Violanti, 2004). However, in another report, PTSD symptoms and problematic alcohol use were not significantly associated with suicidal ideation, with only depression emerging as a significant predictor of suicidal ideation among Midwestern police offices in the US ( $N=193$ ; Chopko et al., 2014). Notably, all studies were cross-sectional and utilized self-report measures of the variables of interest.

## **Empirical Research in Other First Responder Populations**

Research relevant to PTSD/AUD associations among other first responder populations is significantly limited. This work has frequently been cross-sectional in nature and often groups together various first responder populations, such as trained volunteers, emergency healthcare providers, psychosocial healthcare providers (e.g., religious counselors, social workers), and civilian rescue workers alongside firefighters and police officers into heterogeneous samples. Much of this work has documented significant positive associations between PTSD symptom levels and alcohol use (Bogstrand, Skogstad, & Ekeberg, 2016), possible alcohol problems (Bromet et al., 2016; Yip, Zeig-Owens, Webber, et al., 2016), and alcohol use coping motives (Stewart, Mitchell, Wright, & Loba, 2004). Overall, similar to work focused on firefighter and police officer populations, high rates of PTSD and alcohol use were noted descriptively (e.g., Carleton et al., 2018; Osofsky et al., 2011; Yip, Zeig-Owens, Hall, et al., 2016). As described below, few articles have examined associations between alcohol use and PTSD outcomes in other first responders. No published studies to date have documented PTSD symptoms with regard to alcohol use outcomes or examined clinical correlates of PTSD/AUD among other first responder populations.

*PTSD outcomes.* First, among American Red Cross workers who responded to 9/11, changes in alcohol use following disaster response use was associated with all *DSM-IV* PTSD symptom cluster severity; and elevated alcohol use severity was associated specifically with *DSM-IV* PTSD avoidance and hyperarousal symptom severity (Simons et al., 2005). Additionally, in a large study of nationally registered emergency medical technicians and paramedics, alcohol use severity was positively related to PTSD symptom severity, particularly for those endorsing higher chronic stress and critical incident stress (Donnelly, 2012). Finally, one study to date examined the association between the factor structure of

PTSD symptom clusters and alcohol use outcomes in first responders, broadly. Specifically, Ruggero et al. (2013) evaluated the *DSM-IV* dysphoria model of PTSD symptoms (i.e., re-experiencing, avoidance, dysphoria, and hyperarousal; Simms et al., 2002) among 9/11 responders ( $N = 954$ ) and found that the PTSD avoidance symptom cluster, indexed via the PCL, showed the strongest association with *DSM-IV* alcohol abuse (Ruggero et al., 2013).

## **SOLUTIONS AND RECOMMENDATIONS**

There is increasing recognition of the prevalence and clinical significance of PTSD/AUD associations among first responder populations. The emergent literature has consistently confirmed positive associations between PTSD symptom severity and alcohol use severity, with limited research documenting associations between PTSD symptom severity and alcohol use coping motives, specifically. This literature suggests that first responders experiencing elevated PTSD symptoms may be at risk for problematic alcohol use, and conversely, that first responders presenting with alcohol use problems may also have heightened PTSD symptoms. It is important to build upon this important literature in order to inform specialized, evidence-based interventions tailored to the unique needs of first responders.

The extant research is limited in several key ways that should be addressed by future work in order to promote a more clinically meaningful understanding of PTSD/AUD comorbidity among first responders. First, extant research has utilized primarily cross-sectional designs, restricting our ability to formulate conclusions about temporality or causality. Relatedly, most studies have relied almost exclusively on self-report indices of PTSD and alcohol use. More concentrated research efforts are needed, utilizing longitudinal designs as well as interview-based and experimental measures to better understand associations between PTSD and AUD symptomatology. Second, more representative national and international samples are needed in order to inform the external validity of findings. With representative samples, researchers will be able to more conclusively determine prevalence rates of diagnostic and subclinical PTSD and AUD as well as to evaluate similarities and differences in functioning and clinical outcomes of clinical versus subclinical symptom ranges. Similarly, exploring racial/ethnic and gender differences in PTSD/AUD associations among first responders will be crucial to enhancing our understanding of the manifestations of this comorbidity across unique segments of the population. Third, the literature has inconsistently assessed trauma exposure per *DSM* criteria, a necessary element to diagnosing and understanding PTSD reactions. Notably, trauma assessment among first responders may require unique approaches as this population may come to normalize their traumatic event exposure, therefore limiting their reporting of events labeled as “traumatic.” Describing events more specifically (e.g., flood or hurricane versus ‘natural disaster’) may aid in more accurate assessments of potentially traumatic experiences. Finally, first responders are often contacted for participation in research studies within their places of work. This may lead to biased and/or under-reporting, and therefore, researchers may consider contacting first responders in forums unrelated to work to improve validity of responses.

## **FUTURE RESEARCH DIRECTIONS**

Future research directions and opportunities are wide and vast. We foresee several areas of inquiry, in addition to those already discussed above, with important implications for first responder populations. First, research examining similarities and differences between various first responder populations with regard to PTSD/AUD symptomatology would elucidate if there are distinct and/or overlapping treatment needs across first responders. Few studies have examined between-group comparisons and this work has largely been limited to descriptive analyses (i.e., mean differences). Second, while emerging research has documented positive associations between PTSD symptom severity with coping-oriented alcohol use (Ménard & Arter, 2013; North, Tivis, McMillen, Pfefferbaum, Cox, et al., 2002; Smith et al., 2018; Stewart et al., 2004; Tomaka et al., 2017), this area of work remains scant. Future work may expand upon these initial studies and contribute vital knowledge about *why* and *in what contexts* first responders consume alcohol in order to inform alcohol reduction intervention and prevention programs. Third, additional research examining associations between PTSD/AUD and relevant clinical correlates (e.g., depression, suicidality, sleep disturbance, occupational outcomes) is needed. More advanced, rigorous study of such correlates can facilitate our understanding of the complex interplay of such factors in the etiology, maintenance, or exacerbation of PTSD/AUD in first responders. This line of work can also inform intervention and prevention efforts for high risk behaviors, such as suicidal behavior or driving while intoxicated. Fourth, studying first responder ‘culture’ is important for better understanding the potential impact of professional identity and mental health-related stigma on emotional awareness and communication as well as treatment initiation (Hom, Stanley, Ringer, & Joiner, 2016). Finally, examining moderators and mediators of PTSD/AUD associations (e.g., sleep disturbance, emotion regulation) will increase our understanding of transdiagnostic and biopsychosocial processes underlying this complex interplay of symptoms to inform treatment programming for first responders.

## **Clinical Considerations**

The extant literature on this topic presents clinically-relevant implications for treatment-seeking first responders who present with elevated levels of PTSD and AUD symptomatology. First, comprehensive screening and assessment of PTSD and AUD among first responders is essential for appropriate treatment planning. Clinicians should assess for PTSD among first responders with AUD and screen for AUD among those presenting with trauma-related concerns. Second, assessment of commonly co-occurring conditions (e.g., depression) and behaviors (e.g., sleep disturbance, suicidality) is imperative for intervening effectively and preventing harm. Third, it is important for clinicians working with first responders to be aware of the potential impact of mental health stigma on symptom reporting, treatment-seeking, and treatment completion (Hom et al., 2016). Fourth, increased clinical attention should be given to unique first responder sub-populations (e.g., women, volunteers, sexual minorities, cultural subgroups) that may experience increased stress, discrimination, and harassment compared to their peers. Fifth, web-based interventions have great potential to increase access to mental health services for first responders living in rural areas, completing long shifts, and/or working multiple jobs. Web-based interventions and telehealth services can dramatically improve dissemination and implementation efforts for evidence-based interventions among first responders. Finally, extant integrated, evidence-based interventions for PTSD/AUD can be adapted for first responders. For example, Concurrent Treatment of PTSD and Substance



Use Disorders Using Prolonged Exposure (COPE; Back et al., 2015) can provide an excellent integrated treatment avenue for addressing PTSD and AUD and can be employed among first responder populations.

## **CONCLUSION**

Taken together, extant literature suggests that both PTSD and AUD as well as the PTSD/AUD comorbidity are significant concerns across first responder populations. More methodologically rigorous research is needed among larger and more representative populations to evaluate the development, maintenance, and treatment of PTSD/AUD among first responder populations. To create effective and engaging prevention and intervention clinical resources targeting PTSD/AUD within this unique and vulnerable population, we need to seek greater understanding of not only the risk factors associated with mental health concerns among first responders, but also the strength and resilience factors that may mitigate the development of PTSD/AUD. It is imperative that increased research attention is given to this vulnerable population characterized by stress and danger for the service of others.

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## **KEY TERMS AND DEFINITIONS**

**Alcohol Use Disorder:** A pattern of problematic alcohol use leading to clinically significant impairment or distress, as manifested by symptoms such as failure to fulfill major role obligations, alcohol craving, and recurrent alcohol use in physically hazardous situations (e.g., while driving).

**Comorbidity:** The presence of one or more mental health conditions occurring at the same time.

**Posttraumatic Stress Disorder:** A mental health problem that some people develop after experiencing or witnessing a violent or life-threatening event, like combat, physical assault, natural disasters, transportation accidents, or sexual or physical abuse or assault.



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**Problematic Alcohol Use:** A drinking pattern that results in significant and recurrent adverse consequences.

**Specialized Evidence-Based Interventions:** Mental health interventions that have been developed and/or modified through research for the needs of unique populations.

**Transdiagnostic:** Beliefs, behaviors, or patterns of emotional responding that are associated with various mental health conditions and may be implicated in their development, maintenance, or treatment.

**Trauma:** Exposure to an event, such as actual or threatened death, serious injury, or sexual violence through direct experience, witnessing an event occurs to others, learning that an event occurred to a close family member or friend, or repeated occupational exposure to details of events.