The Center for Collegiate Mental Health (CCMH; 2014), in its survey of over 120 counseling centers across the nation, reported that about half of the students who utilize psychotherapy during their college years are new to mental health services. This report reflects the recent clinical trend of increasing demand for mental health services on college campuses for those students who arrive with documented and treated psychiatric conditions and for students who cope with traumatic stress, anxiety, depression, and other emerging mental health concerns while in college.

In addition to the increase in demand for psychotherapy, the use of prescription medication for students with mental illness also has been on the rise (Eisenberg, Hunt, Speer, & Zivin, 2011). A recent survey conducted by the Association for University Counseling Center Directors (AUCCD, 2014) of over 400 counseling centers found that about 25 percent of patients were receiving psychotropic medication.

This *StressPoints* article presents an integrated perspective on managing the psychological and psychiatric care of college students with histories of acute or chronic trauma exposure. We outline some of the literature that speaks to the clinical challenges that universities are contending with due to the increased prevalence of traumatic stress among the emerging

adult population. Efforts to address some of the developmental considerations in the treatment of traumatic stress within a college mental health setting are discussed.

Critical Time Periods

Campus life is known to have its daily share of normative stressors that can impact student well-being. There is a growing recognition that stress during this developmental phase has taken an increasingly challenging departure from the norm, where high rates of exposure to traumatic events among college students such as sexual assault (Humphrey & White, 2000) are now a widely prevalent health concern (Kilpatrick, et al., 2013). Recent analyses using large representative samples of matriculating college students estimated that 66 percent of students met criteria for exposure to a traumatic event (Read, Ouimette, White, Colder, & Farrow, 2011). Of note, two trauma-related disorders have increasingly been associated with poorer academic outcomes for students: post-traumatic stress disorder (PTSD) and alcohol misuse (Kessler, 2000; Staff, Patrick, Loken, & Maggs, 2008).

The impact of adverse childhood experiences on health and wellness across the lifespan is also widely documented in the literature (Anda, Butchart, Felitti, & Brown, 2010). Psychological adjustment to major life transitions can have an additive effect for students with a prior history of exposure to trauma. A 23-year longitudinal study of the impact of sexual abuse on women found that difficulties occur across a range of domains including cognitive deficits, depression, dissociative symptoms, maladaptive sexual development, dysregulated stress responses, major illnesses and increased healthcare utilization, persistent PTSD, and drug and alcohol abuse (Trickett, Noll, & Putnam, 2011). The trends described in this section have implications for the developmental tasks that college students are meant to pursue, such as individuation from family, greater adult responsibilities, increased autonomy in decision-making, the ability to enjoy greater freedom, negotiate academic and social commitments, and the exploration of identity.

Neurobiological Underpinnings of PTSD

Animal studies demonstrate structural plasticity of the brain in response to both acute and chronic stress (Davidson and McEwen 2012). The effects of stress on the brain are in part determined by the age of the individual and the developmental stage of the brain ranging from the prenatal period into adulthood. Childhood and adolescence may be thought of as a unique period during which there is a progression of physiologic, behavioral, cognitive and emotional development. Traumatic stress may cause deficits in ability to achieve age-appropriate self-regulation which can have a negative impact on the development of biological stress systems (Pynoos, Steinberg, & Wraith, 1995). The presence or absence of a trauma history may contribute to modulation of physiologic systems contributing to behavioral expression in response to stress (Davidson and McEwen 2012; Stankiewicz et al., 2013). This contributes to the considerable complexity of PTSD presentation and management in transitional age youth.

However, it is important to note that not all individuals that experience traumatic stress develop PTSD. Expression of PTSD symptoms is determined by a balance of risk and protective factors; neurobiological risk can negatively impact cognitive perceptions and emotional reactivity in the context of specific traumatic events (Castro-Vale, 2016). The developmental stage, psychological makeup of the individual, and life experience all contribute to physiologic and behavioral responses to trauma. Studies have shown that cortisol affects the brain's response to stress through action on the hypothalamic-pituitary-adrenal system (HPA axis). The normal physiologic response is designed to help the brain adapt to stress in the environment but some individuals have dysregulation of the normal response contributing to symptom expression in PTSD. Additionally, the adolescent period is associated with heightened basal and stress-induced activity of the HPA axis potentially complicating the stress response (Lupien, 2009). Increases in mood and anxiety disorders in adolescence may further impact the stress response and predict the onset of PTSD (Kiliç, Kiliç, & Yilmaz, 2008). Finally, animal research in epigenetics has identified biochemical changes that alter the transcription of genes in response to exposure to

environmental stressors where the developmental age and context of stress appear to influence phenotypic expression of the individual stress response (Zannas, 2015).This body of research on the physiologic stress response during adolescence can be integral in understanding how the cognitive and emotional development of college students might be shaped when exposed to potentially traumatic events.

Problematic Substance Use

Problematic substance use among college students can lead to acute and dangerous consequences (e.g., interpersonal violence, overdose) as well as more chronic concerns (e.g., abuse or dependence; Arria, Vincent, & Caldeira, 2009; McCabe, West, &Wechsler, 2007). One important reason for the increase in problematic substance use in the past few years is the increase in the prevalence of PTSD.

For instance, national estimates of PTSD in a sample of U.S. adults were found to be about 8.5 percent (Kipatrick et al., 2013) and Read, Ouimette, White, Colder, and Farrow (2011) estimated the prevalence of PTSD among college students at about 9 percent (n = 3014). Additionally, the AUCCUD surveys in 2011 reported that about 9 percent of counseling center patients endorsed sexual assault as the presenting concern and in 2014 the mean was at about 11 percent. A study following recently matriculated students showed that those with partial and full PTSD symptoms started their freshman year with higher drug and alcohol related consequences compared to those with no trauma exposure and no PTSD symptoms (Bachrach & Read, 2012).

The challenge in addressing this problem effectively is that drinking and substance use is also a normative college experience and students are likely to be reticent to viewing their drinking behaviors as problematic. Newer research also provides support for a pathway from childhood abuse to risky sexual behavior in emerging adulthood in which traumatic intrusions are mediated by alcohol-related behavior (Walsh, Latzman, & Latzman, 2014). These factors combined can layer the levels of risk facing students and present challenges

to academic institutions in helping students transition through college and achieve academic and social success.

Efforts to address some of the developmental issues described in this paper are outlined below to highlight the different access points through which students may receive psychological care via a stepped care approach particularly when PTSD among college students is often treated in the context of substance use.

PTSD and Pharmacologic Treatment

Given the high demand for psychotropic medications on college campuses mentioned earlier in this paper, medical interventions for PTSD are briefly reviewed. While trauma focused psychotherapy is the first line treatment for PTSD, many individuals do not respond to psychotherapy alone. Pharmacologic studies have focused on the current understanding of physiologic mechanisms in PTSD (Bernardy and Friedman 2015).

The current medications that are approved by the Food and Drug Administration (FDA) for treatment of PTSD are sertraline and paroxetine, both serotonin reuptake inhibitors (SSRI's), and fluoxetine has also demonstrated efficacy. Venlafaxine extended release, a serotonin norepinephrine reuptake inhibitor (SNRI) contributed to symptom improvement in PTSD in at least two multi-center trials (Davidson et al., 2006). The SSRI/SNRI medications are also recommended when there is co-morbid moderate to severe depression, however, there is a strong placebo response in many of the trials and the chronicity of PTSD appears to decrease response to these medications. Individual resilience has been shown to be a predictor of response to pharmacotherapy, emphasizing the importance of psychological therapies that facilitate the development of resilience when treating PTSD (Davidson et al., 2012), which also reflects the increasingly integrative nature of mental health services in the treatment of trauma.

While antidepressants have not consistently demonstrated efficacy with sleep disruption in PTSD, studies show that the symptoms of arousal and nightmares may be responsive to the alpha-adrenergic antagonist prazosin (Bernardy and Friedman 2015). One randomized controlled trial in the military showed a decrease in both day and nighttime symptoms of PTSD when prazosin was prescribed twice per day. Prazosin may be useful when prescribed as an adjunct to psychotherapy and to the antidepressant medications (Raskind et al, 2013). It is significant to note that atypical antipsychotics have not been consistently identified as effective in PTSD and other medications are being studied with a focus on mechanism of action that can target the physiologic disruption which occurs in PTSD.

A unique aspect of pharmacology in PTSD is treatment of co-morbid substance use disorders. Many individuals with PTSD use substances in an effort to avoid the trauma related thoughts and feelings, a factor that is also prevalent on college campuses. Treatment of substance use disorder is critical to effective treatment of PTSD (Bernardy and Friedman 2015). The following three drugs are approved by the FDA for treatment of alcohol use disorder (AUD): disulfiram, naltrexone, and acamprosate. These medications alone have not been shown to treat the symptoms of PTSD although they can decrease alcohol consumption.

However, work by Foa and colleagues (2013) suggest that combining naltrexone with prolonged exposure therapy may lead to a decrease in AUD and in PTSD symptoms. Additionally, topiramate, an anti-epileptic agent, has been shown to decrease craving for alcohol and to target PTSD symptoms but is not FDA approved for AUD. The drug prazosin has also been shown to decrease alcohol use in men without PTSD raising the possibility of use as an adjunct treatment for co-morbid AUD and PTSD. While much work remains to understand effective pharmacotherapy strategies, there are several medications that appear to be promising for treating PTSD alone or with co-morbid disorders.

Psychological Intervention

In efforts to balance the university resources and flow of services in college counseling centers in the context of rising demand for services, trauma-focused interventions can be more efficiently structured based on whether the traumatic exposure is repeated/chronic or an acute or discrete event. The interventions then are based on the developmental progression of symptoms and extent of exposure to trauma. Within this framework, a phase-based approach can help organize points of intervention towards specific areas of dysregulation. For instance, many universities now recognize the need to support students in an acute stress phase following an assault or other form of traumatic exposure, and the creation of programs or services that offer a time-sensitive response to access services can go a long way in preventing further development of PTSD symptoms. Time-sensitive care with a focus on psychoeducation, grounding strategies and understanding the role of different campus resources can be useful to students. This type of programming is consistent with guidelines about trauma-specific treatment services such as enhancing safety from physical harm and re-traumatization as well as education about adaptive responses after a traumatic event (Fallot & Harris, 2008).

The interventional component of treatment includes building coping skills around emotional regulation, interpersonal skills, anxiety, eating disorders, comorbid substance use, and safety. These skills if warranted, could then serve as the platform for a student to work on trauma processing, which requires that the student learn tools for coping. The treatment for Complex PTSD emphasizes not only the reduction of psychiatric symptoms but also improvement in key functional capacities for self-regulation and strengthening of psychosocial competencies and resources (Cloitre et al., 2011). The use of Dialectical Behavioral Therapy skills, seeking safety groups, and groups with a motivational component can help strengthen protective factors. In addition, an important competency interwoven across all interventions is recognizing the cross-cultural differences in students' response to a traumatic event (e.g., international students from countries with ethnic strife, migrant immigrant experiences, social factors impacting trust).

Levels of Care in Substance Use

Self-regulation within an individual who struggles with trust due to traumatic exposure may lead to increased vulnerabilities for the subset of students that also struggle with substance use. Within a stepped care framework, different levels of intervention are linked together with clinical guidelines that are used to determine referrals for higher levels of care.

For instance, low levels of intervention may range from simple education and prevention efforts while higher levels indicate the need for a focus on psychological or psychiatric interventions and treatment. At the lower levels, protective behavioral strategies (PBS) that minimize the negative consequences from drinking and have been widely represented in the literature on behavioral interventions for substance use. The use of protective behavioral strategies (PBS; Pearson, 2013) includes strategies such as alternating between alcohol and non-alcoholic drinks, setting drink limits, refraining from drinking behaviors such as drinking games in efforts to reduce heavy alcohol consumption and related risk in college populations. Campus-wide suicide prevention and training efforts to educate the campus community about depression and suicide can be a wide-reaching platform within which to include the connections between traumatic life events, substance use, and depression. The use of brief motivational programs help students make better alcohol-use decisions based on a clear understanding of the genuine risks associated with problem drinking, motivation to change, and the development of skills to moderate drinking.

Conclusion

Given the impact of traumatic stress on brain development at a crucial time period and age, when newly matriculated students are likely to have increased sensitivity to stress, physiologically and environmentally, campus services are turning towards more integrative models of care that provide intervention based on the student's level of need. Students who experience trauma may be more likely to move towards resilient outcomes when they are able to flexibly move between multiple coping behaviors (Galatzer-Levy, 2012).

Psychological care for students within an interdisciplinary team of professionals can help to ensure that providers are conceptualizing trauma-related concerns with the required knowledge of physiology, emotional health, and awareness of environmental and contextual factors that are impacting students with trauma exposure.

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Developmental Traumatology

Developmental Considerations in the Treatment of Traumatic Stress and PTSD: A University Mental Health Perspective

By Divya Kannan, PhD and D. Catherine Fuchs, MD