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An exploratory investigation of the relationship between PTSD symptoms and substance abuse in undergraduate college students

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AN EXPLORATORY INVESTIGATION OF THE RELATIONSHIP BETWEEN PTSD SYMPTOMS AND SUBSTANCE ABUSE IN UNGERGRADUATE COLLEGE STUDENTS

by
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Abstract

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The purpose of this exploratory study was to determine a significant correlation between post-traumatic stress (PTSD) symptoms and substance use in undergraduate college students. A review of the existing literature was examined and showed a significant correlation between PTSD and substance use, including alcohol, marijuana and other drugs. Literature also showed correlations between PTSD and cigarette use in undergraduate college students. A PTSD questionnaire was conducted based on DSM-5 criteria scale. A personal Experience Screening questionnaire for adults (PESQ-A) was also used to examine the frequency and degree of substances used by participants. Correlational analyses for this study revealed no significant relationship between PTSD symptoms and substance use. However, due to the limitations of this study, including a very small sample size, the interpretations of the findings are discussed.

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Chapter 1

Introduction

Post-traumatic stress disorder, or PTSD, can cause anxiety and disconnection and can lead to forms of negative behavior, such as high-risk behavior, substance use and/or academic failure of students. Many times PTSD can go unseen or unaware in a classroom by students or teachers and can occur in almost any age group. The prevalence of PTSD going untreated in students can cause an increase of alcohol or substance use as a means of self-medication. Prior research has showed that the effects of PTSD on substance use in university students need consideration as "the college years are a time of increased autonomy, decreased adult supervision and new social opportunities and relationships. Together these can contribute to experimentation with or even permanent adoption of high-risk health behaviors" (Read, 2012). By the time a student reaches college, they may have had the unfortunate experience of being in a traumatic car wreck, a victim of physical abuse or had experience in combat. Due to the increasing traumatic events experienced by individuals and the unlimited use of alcohol or other substances of college students, the relationship between the two variables need to be addressed. In this study, a correlation of PTSD and substance use will be examined by the use of a substance abuse survey and a PTSD questionnaire which was generated based on the criteria from the DSM-5.

This study explored the relationship between PTSD symptoms and substance use in undergraduate college students. The study focused on the amount of traumatic events experienced by the students and how many symptoms they acquired within a twelve-month span. It also focused on whether the amount of symptoms or traumas experienced

had a significant relationship with the amount of alcohol or substances used/consumed. Not only was frequency of consumption examined but also motives for use of alcohol and other drugs were taken into consideration and interpreted based on results from the questionnaire. I propose that college students with post-traumatic stress disorder or those who experience PTSD symptoms will have a greater degree of risk in terms of alcohol than those who do not. I also propose that college students experiencing PTSD symptoms will report greater marijuana and other drug use.

Operational Definition

> Stress: a state of mental tension and worry caused by problems in your life, work, etc.: something that causes strong feelings of worry or anxiety (Merriam-Webster, 2014).

Assumptions

It is important to note that this study was designed based on certain assumptions. An assumption is that the university students participating in this study are at the age-appropriate reading level and have no problem understanding and answering the questions in the survey. It was also assumed that all participants answered the questions as honestly as they can; no participants underreported or overreported any alcohol or drug use.

Limitations

A limitation of this study was the use of an extremely small sample size. Only eight participants responded to the survey and the study did not use participants from other universities. The population was represented by students from only one university. Also, the instrument used for measurement of significance in the relationship of PTSD

and substance use was closed-questioned; it did not allow for open-ended questions or elaboration on degree of stress or substance use.

Summary

Chapter two will review literature on effects of PTSD in college students, the amount of alcohol consumed by students with and without PTSD and a correlation of PTSD, high-risk behaviors and academic performance. This study will compare results from students experiencing PTSD symptoms to those who do not experience these symptoms. Student's participating in this study were asked to complete a questionnaire pertaining to the amount of traumatic stress exposure they have experienced, amount of alcohol consumption and illicit drug use they have taken part in during the past twelve months, and the degree to which the individual is at risk for substance abuse.

Chapter 2

Literature Review

The following is a review of the literature on the definitions, symptoms and effects of post-traumatic stress disorder in a variety of ages and events. The chapter will lead to a review of PTSD in a school-based setting and behaviors that can be accompanied with lack of treatment or coping in individuals with PTSD.

Importance of Understanding Post-Traumatic Stress Disorder

Post-traumatic stress disorder, or PTSD, is a stress-related disorder and is followed by "exposure to actual or threatened death, serious injury or sexual violation" (American Psychiatric Association, 2013). PTSD can occur from a variety of extremely stressful situations such as witnessing a death or having one's own life threatened, such as in a car accident, or in violent experiences- combat experiences, domestic violence or sexual assault (Morris,2012; Lancaster, 2011). These extreme-stress events can cause a number of symptoms and have many effects on the life of the individual. The Diagnostic and Statistical Manual (fifth edition) puts PTSD symptoms into categories depending on symptoms of intrusion, avoidance, negative alterations in cognition and mood, and alterations in arousal and activity.

PTSD can be acquired by "directly experiencing a traumatic event, witnessing the traumatic event in person, learning that the traumatic event has occurred to a close family member or close friend (with the actual or threatened death being either violent or accidental) or experiencing first-hand repeated or extreme exposure to aversive details of the traumatic event (not through media, pictures, television or movies unless work-related)" (American Psychiatric Association, 2013).

The DSM-5 presents four criteria for the diagnosis of PTSD. This includes re-experiencing the traumatic event (criteria A), avoidance (criteria B), negative cognitions and mood (criteria C) and arousal (criteria D). Intrusion, one of the more common symptoms of PTSD, includes re-experiencing the traumatic event in a number of ways, such as nightmares involving the event, involuntary memories, flashbacks, distress or physiologic reactivity. Some people may feel that the traumatic event is actually reoccurring due to hallucinations, illusions or flashbacks when intoxicated. Avoidance, another symptom, can be seen as reactions to external factors or stimuli, such as people, places or specific conversations. They may try to avoid thoughts, feelings or activities, have a lack of interest in what they used to like, or feel like they have a shortened future; they do not expect to get married, have a career or a normal lifespan. Those who suffer from the disease may also find that they are unable to recall the event or may even blame themselves for the event that occurred. They may also have alterations in arousal which includes irritable or aggressive behavior, self-destructive or reckless behavior, hypervigilance, exaggerated startle response, problems in concentration and sleep disturbance (American Psychiatric Association, 2013).

A Review of Existing Research: Factors Related to PTSD

Brown, Alfano & Weems (2011) found in their study of PTSD and related symptoms that sleep disturbance and fear of sleeping alone were related to post-traumatic stress symptoms in children. Sleep disturbance appears to have an important influence on the development and persistence of PTSD and co-occurring conditions in adults. It is estimated that as many as 70% of individuals with PTSD have some form of sleep disturbance (Ohayon, 2000). Insomnia is the most common symptom reported following

trauma exposure and is predictive of the onset of mood and anxiety disorders including and/or following PTSD (Bryant, 2010; Brown, 2011).

Research concerning the long-term consequences of trauma exposure has shown that the deleterious effects of traumatic experiences can persist for decades (Hiskey, 2008; Ogle, 2013). Researchers found that there is a correlation between the developmental timing of trauma exposure and PTSD symptoms. They found that negative consequences of exposure to traumatic events were greater for traumas experienced during childhood, adolescence, young adult-hood, midlife, or older adulthood. Each of these developmental periods is characterized by age-related changes in cognitive and social processes that may influence psychological adjustment following trauma exposure (Ogle, 2013). Their participants, older adults, who claimed to have had their most traumatic event happen during childhood, had more severe PTSD symptoms than those who claimed to have their most traumatic event happen later in life.

A factor taken into consideration in recent studies is the different outcomes of PTSD related to the magnitude of the traumatic event, as some events can cause more trauma or stress than others. The magnitude of an event involves the characteristics involving the actual threat of death or serious injury and characteristics involving emotional responses such as fear or helplessness (Kaysen, Rosen, Bowman, & Resick, 2010). Spitzer, Abraham, Reschke, Michels, Siebel & Freyberger (2000) completed a study to determine a correlation between high and low magnitude stressors and PTSD symptoms. They found that there were significant differences in in PTSD. However, they also found that those who suffer from low-magnitude stressors can also suffer from PTSD.

The duration of exposure to the traumatic event is another predictor of PTSD and can have an effect on the amount or magnitude of stress or threat of an individual (Kaysen, 2010). Kaysen, Rosen, Bowman & Resick (2010) conducted a study regarding the length of exposure and perception of threat in the prediction of PTSD severity found in women with violent sexual assault trauma. They found that duration alone had a significant effect on severity of PTSD and perception of threat alone did not have a significant effect. They also found that the duration and perception of threat combined had an effect on the length of time the women suffered from PTSD. Smyth (2008) found in his study of "prevalence, type, disclosure and severity of adverse life events in college students" (Smyth, 2008) that there was a correlation in the amount of disclosure, or amount they confided about their stressful event to someone else, and severity and duration of the events. Prevalence, severity and disclosure were studied in the first part of two part study and there seemed to be a significant relationship in that the more severe the trauma was, the more the individual confided in someone. Smyth (2008) found that 66.1% of the participants reported experiencing at least one traumatic event in their lifetime and 4.5% reported experiencing 4 or more traumatic events. The participants rated the severity of their experiences and the study showed that the higher the severity of the event, the more the individuals disclosed the information or talked about it with a friend or family member.

The second part of the study looked the prevalence, duration and disclosure of a traumatic experience. In this study, 55.8% reported experiencing a traumatic event. Of these participants, 45.1% reported the duration of the consequences of the event to be less than 3 months, 19.7% estimated the duration to be between 3 and 6 months, 13.9%

reported that the duration lasted 6 months to 1 year and 21.3% reported that the duration lasted over 1 year. The results also showed that longer the duration of the event, the greater the degree of disclosure (Smyth, 2008).

Bernat (1998) also found that the number of lifetime traumatic events experienced was a significant vulnerability factor of PTSD. Another significant factor was whether they perceived their life to be in danger during this event. Peritraumatic reactions also posed as a vulnerability factor in PTSD symptoms, with much concentration on negative emotional reactions, panic symptoms and dissociation; the peritraumatic reactions former involved were also shown to be interrelated.

An individual's response to a stressful or traumatic event can predict PTSD symptoms. Peritraumatic reactions, immediate reactions experienced at the time of the trauma, such as dissociation, extreme anxiety, panic and/or negative emotions, may be important predictors of PTSD symptoms (Bernat, Ronfeldt, Calhoun & Arlas, 1998). This can include the way the event was perceived and psychological and physiological reactions to the event, such as anxiety or panic and negative emotions. There are other factors that may play a role in vulnerability of PTSD which are exposure variables. "Three variables that have been shown to increase risk of PTSD across a variety of traumatic events characterized objective dimensions of the stressor: the receipt of physical injury, perception of life threat, and witnessing serious injury or death of another person during a traumatic event" (Bernat, 1998). Bernat et al. (1998) compared these variables to individual peritraumatic reactions to determine the vulnerability of PTSD. Numerous emotional reactions were evaluated in participants including fear, dissociation/numbing, interpersonal guilt or shame and anger or disgust. There were also

peritraumatic physical reactions determined such as shortness of breath, dizziness or feeling faint, rapid heart rate, trembling or shaking, sweating, nausea or abdominal distress, body numbness or tingling sensation, hot flashes or chills, choking and chest pain or discomfort (Bernat, Rondfeldt, Calhoun & Arias, 1998).

Lancaster et al. (2011) conducted a study on the emotional predictors of PTSD symptoms to examine the correlation of emotions experienced during the traumatic event and level of PTSD. The American Psychiatric Association (2000) claimed that emotions such as fear, helplessness and horror predict PTSD symptoms and Lancaster et al. wanted to test the hypothesis that other emotions could predict PTSD symptoms as well.

Of the participants in Lancaster et al. (2011) study, over half had experienced a potentially traumatic event, such as combat experience, car accident or death of a close friend or family member. The participants answered questions about certain emotions that they felt after their experience such as fear, shame, guilt, anger, horror, helplessness, terror, confusion, disgust, sadness and surprise. Results showed that emotions experienced were not limited to the A2 criteria emotions and were associated with gender, as the final mode for men was anger and guilt; the mode for women was disgust and sadness.

Several studies show that there is also a significant correlation between gender and PTSD (Frans, Rimmo & Aberg, 2005). These gender differences may be attributable both to different exposure to traumatic events and to different responses to traumatic events between genders (Tolin & Foa, 2006). Kline, Ciccons, Weiner, Interian, Hill, Falca-Dodson, Black & Losonczy (2013) found that there was a gender difference in post-traumatic stress symptoms (PTSS) and PTSS risk and protective factors. Kline et al.

(2013) study included male and female participants who were part of the national guard and were deployed to Iraq. The researchers used a pre-deployment and post-deployment survey and found that women soldiers had a higher prevalence of probable post-deployment PTSD than men. They also had significantly higher post-deployment PTSS. They also scored higher on pre-deployment PTSS and there were no gender differences in combat exposure, showing that women are more likely to experience PTSD symptoms than men.

In contrast to research formerly mentioned, Yasan, Saka, Ozkan & Ertem (2009) showed that men are exposed to stressful events more than women and that there was no difference in PTSD prevalence among gender. Yasan et al. (2009) also included war veterans as participants and found that the risk of PTSD for those who experienced military conflict was actually higher in men than women. A reason for the fluctuation of outcomes in PTSD studies focused on gender can be due to methodology used in different studies, the different coping styles of women and men, the limited socioeconomic resources of women, or biological sex differences (Gavronido & Rosner, 2003). Luxton, Skopp & Maguen (2010) also looked at gender differences in gender in PTSD and depression and also found that in a sample of over 6,000, the percentage of men and women who measured positive for PTSD and depression to be very close. The results showed that of the sample of women, 15.31% showed positive signs of PTSD and of the sample of men, 15.68% showed positive signs of PTSD.

Genetics was studied by Morris, Gabert-Quillen, & Delahanty (2012) as they thought this could play a role in the onset of PTSD. In this study, they wanted to find an association between parents with PTSD and their children who had PTSD after

experiencing a traumatic event. 68% of children in the United States experience at least one traumatic event before the age of 16 (Copeland, Keeler, Angold & Costello, 2007; Morris et al., 2012) and Morris et al. (2012) identified parental PTSD as being a risk factor for the onset of PTSD in children.

Morris et al. (2012) found that PTSD in parents was significantly associated with the onset of PTSD in their children. It was noted that parents who met criteria for depression was also associated with childhood PTSD but the gender of the parent with depression did not have a significant effect. The gender of the parent with PTSD did however have a significant effect as maternal PTSD had a greater effect on childhood PTSD than paternal PTSD.

Nugent (2012) found that stress hormones may be related to the vulnerability of obtaining PTSD. Nugent found in a study of children that genes that code for stress hormones, such as cortisol, can predict who will develop PTSD as well as if their symptoms will decrease and if so, how long it would take for these symptoms to decrease. Weems & Carrion (2007) also examined the association between cortisol levels and symptoms of PTSD. They also looked at the time between the experience trauma and the time that the symptoms of PTSD seemed to decrease.

Environmental factors have also been studied as research suggests that the role of family and lack of support can increase the symptoms of PTSD after a traumatic event (Bokszczanin, 2008). Bokszczanin's study of family conflict, parental support and overprotectiveness was conducted on children in grade school and high school from Poland who had experienced a tragic flood. Researchers believe that stress symptoms are likely to appear after experiencing an event such as a flood due to the loss of important

resources. “The next elements of the chain are negative events following the disaster, such as challenges and losses that intensify the crisis; the loss of one’s home, the difficulties of relocating, the necessity for a job change, somatic complaints and living in damaged surroundings” (Bokszczanin, 2008, p. 326; Hutchins & Norris, 1989;). This added stress, after the initial traumatic event, can cause spouses to fight (around their children) and deterioration of the family or family relations. Also, Bokszczanin that overprotectiveness or excessive parental control for a long period of time after the event can harmful towards the child or adolescent’s mental health, inflicting on the recovery process.

Not only does PTSD take a toll on an individual’s mental health but it can also have an effect on academia or academic performance. Rutkowski, Proctor, Vasterling & Anderson (2010) studied the effects of PTSD on standardized test taking ability. They felt understanding factors that influence ability in standardized testing is important because many colleges and universities require SAT scores for admittance into their school. Rutkowski et al. (2010) had a sample size of 654 participants with an average age of 25.03 years, only 56 of which were female. The participants included active-duty soldiers, soldiers who were deployed to Iraq during the time of data collection and completed predeployment and postdeployment assessments.

The participants in Rutkowski et al. (2010) study were tested on logical reasoning tasks and vocabulary tasks, questions similar to those on a standardized test. They found a significant association between diminished ability to answer items correctly and severity of PTSD or posttraumatic stress symptoms. More specifically, they found that those with higher posttraumatic stress symptoms would face a 13% reduction in the

probability of correctly answering a typical logical reasoning or vocabulary reasoning question compared to those with less severe symptoms.

Another study was conducted on the association of academic achievement and posttraumatic stress disorder in college students. Duncan (2000) found in a study that PTSD or PTSD symptoms play a role in whether a student will remain in college as PTSD was found to be associated with college drop-out rates or result in lower grade point average. This study, by Boyraz, Owens, Horne & Armstrong (2013) focused on academic achievement and college persistence of African American students with trauma exposure. These participants were first-year students and came from two universities. Of the participants, 74% reported exposure to traumatic events and 20.6% of this sample met criteria for PTSD. The most common traumatic event of the participants in this sample was losing a loved one. There was also no significant gender difference on the severity of PTSD or PTSD symptoms. Of these participants, 33% did not enroll in the spring semester of their first year of college. There were also no significant gender differences in drop-out rates. However, those who met criteria for PTSD had a higher drop-out rate than those who experienced a traumatic event but did not necessarily meet criteria for diagnosis. It was also noted that there was no significant difference of drop-out rates between the two universities leading researchers to believe that PTSD diagnosis and symptoms have a significant effect on college persistence and drop-out rates. It is important to recognize the influence of trauma in college students as the estimated lifetime prevalence of exposure to a potentially traumatic event (PTE) in college students ranges from 67% to 85% (Moser, 2007).

Research on PTSD has also looked at areas of execution and cognition such as attention, response inhibition and the ability to shift between different tasks. It was thought that individuals with impairments in cognition or execution would relate to an increasing chance of attaining PTSD (Aupperle, 2012). Gilbertson, Gurvits, Lasko, Orr & Pitman (2006) conducted a study on this theory and added twins as participants. Gilbertson et al. examined twins who had combat exposure with and without PTSD and found that measures of overall IQ, verbal memory, attention and executive functioning was decreased for the PTSD group as well as their twins in the PTSD group compared to those who did not have PTSD.

It is thought that people diagnosed with PTSD have an increase in alcohol intake because the effects of alcohol are a way for the individual to ameliorate or suppress the symptoms of the PTSD or thoughts of the traumatic event (Boscarino, Adams, & Galea, 2006). Boscarino et al. (2006) focused on a study that related increased alcohol use and misuse and binge drinking to exposure to the terrorist attack on the World Trade Center. They found that greater exposure to the terrorist attacks was related to higher alcohol consumption 1 and 2 years after the attack.

Boscarino, Kirchner, Hoffman & Sartorius (2011) also conducted a similar study on New York City adults 2 years after the World Trade Center attacks to assess alcohol use, binge drinking, PTSD symptoms and psychotropic medication use. They found that although the alcohol use levels were still considered to be in the 'safe' zone, there was a modest increase of alcohol use and binge drinking from prior to the WTC attacks to 24 months after the attack. This was also only seen among those with later or delayed-onset PTSD. PTSD onset was also associated with a significant population-level increase in

psychotropic medication use. A study on war veterans who were diagnosed with PTSD or showed PTSD symptoms (Petrakis, 2011) showed that veterans who were diagnosed with PTSD also showed comorbidity with substance use or abuse but they also showed signs of other mental health disorders such as anxiety, bipolar disorder, depression and schizophrenia.

There are other traumatic events that can lead to an increase in alcohol use or some form of substance use disorder. Bailey, Webster, Baker & Kavanagh (2012) explored the relationship between childhood traumatic events and alcohol use disorder. These childhood events included dysfunctional parenting such as neglect or physical abuse. Sexual abuse during childhood was also taken into consideration. Bailey et al. (2012) also focused on the prevalence of major depressive disorder (MDD) in those children with PTSD symptoms. They found that 71.6% of participants experienced a traumatic event and 38% met DSM-IV criteria for PTSD symptoms. No gender differences were found but there was a significant relationship between severe PTSD symptoms and childhood neglect, severe depression and increased alcohol use.

Alcohol and other drug use can also follow PTSD in college students (Read, Colder & Merrill, 2012). College is known to be accompanied by high prevalence of alcohol use as it marks the beginning of a transition period where there may be new freedoms for many of the individuals, especially those who transition to a school away from home (Read et al., 2012). Those who have experienced some sort of extreme trauma may use alcohol and drug use as a means of self-medication, in an effort to manage distressing symptoms associated with trauma (Saladin, Brady, Dansky & Kilpatrick, 1995). Even though women are at greater risk for PTSD following extreme trauma or

stress (Breslau, Davis, Andreski, Peterson, & Schultz, 1997), the make gender is a risk factor for substance use and consequences (Lex, 1991).

Read, Colder & Merrill (2012) examined the relationship between traumas, PTSD and substance involvement in students transitioning into college, hypothesizing that individual with significant PTSD symptoms would show more problematic substance involvement across the first year of college. In this study, 997 students participated and of these participants, 65% were female. Of the 997 participants, 735 (74%) met experienced at least one criteria A trauma. The average number of traumas was 3.09 and 65% of the participants reported experiencing the death of someone close to them as being their traumatic event. Read et al. also wanted to determine the number of PTSD symptoms that stemmed from their experiences and found the average number of symptoms to be 4.60 and 152 participants (15%) met full PTSD criteria.

Findings in Read et al.'s (2012) study showed that those with PTSD symptoms were at a higher risk of alcohol and drug consequences than those without PTSD. The mean number of alcohol problems in the fall semester was 2.71 for the participants who did not meet Criteria A for PTSD symptoms and the mean for those who met full criteria for PTSD was 5.95 for the fall semester. They found that these consequences are higher in the beginning of the first academic year; those in the PTSD group started college with almost twice as many consequences as those in the non-symptom groups, which slowly declined throughout the first year of college (Read et al., 2012).

Jayawickreme, N., Yasinski, C., Williams, M., & Foa, E.B. (2012) focused on gender-specific associations between trauma cognitions, alcohol cravings and alcohol-related consequences in individuals who were diagnosed as having posttraumatic stress

disorder and alcohol dependence. They thought that men and women with PTSD would have different consequences in regards to trauma cognition and alcohol withdrawal. Jayawickreme et al. examined 167 men and women who were seeking treatment for comorbid PTSD and alcohol dependence. However, the only substance dependence they included was alcohol nicotine and cannabis.

With use of surveys, they were able to determine that views of negative self, negative world and self-blame were significantly associated with the severity of alcohol cravings in men but they were not significant in the severity of alcohol cravings in women. There was also a significant relationship between trauma-related cognitions and increased alcohol cravings in men but not in women. It is thought that the reasoning behind this is that women are more vocal and seem to acknowledge their emotions more than men. Men seem to hide their emotions thus leading to heavier drinking to cope with these feelings or emotions (Nolen-Hoeksema, 2000).

There is known to be a correlation between PTSD and substance use disorder (SUD). It is also an association between PTSD and other psychiatric disorders, with 50% of individuals who were diagnosed as having PTSD symptoms as meeting criteria of at least 3 other psychiatric diagnoses. The most common disorders include depression, substance use disorder and anxiety disorders (Brady K.T., Killeen T.K., Brewerton T., Lucerini S., 2000). Brady et al., (2000) also found that those with PTSD diagnosis are at a higher risk of poorer clinical outcomes, higher rates of relapse and readmission into treatment, more drug use and poorer health than those who were not diagnosed with PTSD.

A study was conducted by Dore, Mills, Murray, Teesson & Farrugia (2012) to determine the prevalence of PTSD, suicidality and depression in inpatients with substance use disorders in in Australians. 253 inpatients completed a questionnaire. Of the 253 participants, 66.8% were male. The majority of inpatients participating (80.6%) were elf-referred into the treatment and alcohol was the most common drug of concern by the participants. Polydrug use was also noted as a little over 60% of those participating reported having more than one drug of concern. 80.7% of the individuals reported experiencing at least one traumatic event in their life and gender was not a significant factor. However, more women were more likely to be raped or molested than men.

Dore et al., (2012) also found that the drug of concern had a relationship with the type of trauma experienced as benzodiazepines were the most common drug of concern by those who reported to have been seriously physically attacked or assaulted. In this study, women had experienced more traumatic events than men but the number of traumas experienced did not have a significant effect on the principal drug of concern. However, it was noticed that those reported having more than one drug of concern depended on the number of traumatic events experienced.

PTSD symptoms were found in 44.9% of participants in the study and were highest among those who nominated benzodiazepines as their principal drug of concern. The symptoms were also associated with a younger age of first trauma experienced and the number of traumas experienced. Also, of all the participants screened for the study, 59.9% had depressive symptoms (most were mildly depressed) and those with PTSD symptoms were significantly more likely to have depressive symptoms.

Drinking motives were given a closer look in relation to PTSD or PTSD symptoms by Stappenbeck, Bedard-Gilligan, Lee & Kaysen (2013) as they looked at drinking motives and perception of alcohol consumption of college women. This is an important study as 40% of college women reported a history of childhood sexual abuse and 50% of college women reported experiences of sexual assault (Abbey, Ross, McDuffie & McAusian, 1996). It has also been reported that college women who reported sexual abuse or assault have an increased risk of academic dropout and mental health problems, including PTSD or PTSD symptoms (Porche, Fortuna, Lin, & Alegria, 2011).

Another theory of PTSD effects on college students involves the prevalence of smoking cigarettes as a result of posttraumatic stress (Read, Wardell, Vermont & Colder, 2012). Cigarette smoking is known to help calm anxiety and reduce negative effects of stress, therefore being used as a coping mechanism (Feldner, et al., 2007). Read et al. (2012) tested the hypothesis that college students with PTSD may be at a higher risk for smoking cigarettes. They thought that college matriculation could trigger this if they were already experiencing PTSD symptoms and thought that the likelihood of smoking would increase during the first year of college.

Read et al. (2012) found that 81% of the participants in his study had experienced a traumatic event and the average number of traumas experienced was 3.46. Of these participants, 61% reported not experiencing any consequences or minimal consequences after the trauma. However, about 19% met criteria for partial PTSD and 21% met full PTSD criteria. Read et al. also found that 62% of the participants reported first smoking cigarettes during their first year of college. However, there was not a significant

association between PTSD symptoms and smoking cigarettes. PTSD did not predict the risk of smoking in the first year of college but it actually showed a modest decline in smoking across PTSD groups.

Although it seems that PTSD can be difficult to overcome, there are several coping mechanisms that can decrease the severity of the symptoms, such as using proactive coping. Proactive coping has been conceptualized as future-oriented thoughts and behaviors performed with the purpose of increasing one's resources (Schwarzer & Taubert, 2002; Vernon, 2012, p. 116). Rather than experiencing negative reactions to prior or anticipated stress or stressful events, proactive coping involves a "stable, ongoing set of behaviors and thoughts and a positive perception of stress" (Vernon, 2012, p. 116). Vernon (2009) found that proactive coping was negatively associated with PTSD and PTSD symptoms even when magnitude of event, number of events and time since last stressful event was taken into consideration. This is believed to be due to the combination of positive cognitions and positive behaviors which are included in proactive coping.

Another potential coping mechanism for extreme stress or trauma is positive emotion, or gratitude. Gratitude can be defined as "the emotional response stemming from the recognition and/or appreciation of the receipt of the benefit" (Vernon, 2009 & Vernon, 2012, p. 117). A study by Kashdan, Uswatte and Julian (2006) looked at the relationship between gratitude and PTSD in war veterans. They found that the male veterans who did not suffer from PTSD showed more positive emotions such as gratitude and those with PTSD showed less positive emotions.

Since there is a correlation between PTSD and substance use disorder (SUD) combined treatment for coping becomes more complex as it is harder to get clients to stay

in treatment (Litt, 2013). Those who suffer from PTSD and SUD combined suffer from more severe complaints and more relapses in substance use than SUD patients without comorbid PTSD (Back, 2000; Dam, 2013). This is thought to be due to the 'self-medicating' theory which suggests that substances are used to alleviate or suppress PTSD symptoms (Khantzian, 1985; Dam, 2013). This theory also goes in line with evidence showing that substance use is preceded by PTSD more often than PTSD is preceded by substance use (Watt, 2012). A reason for this is because memories or reoccurrence of trauma can trigger a craving response. Therefore, treatment for this population should be done concurrently because improvement in PTSD symptoms is associated with improvement in substance dependence (Back, 2006).

There is another factor involved in the lack of PTSD for many people after a stressful event called resilience. Resilience has been defined by many researchers and many believe it is the ability to recover from extreme experiences (Atkinson, 2009) and others believe it to be a stable personality trait (Rutter, 2007). It is thought that resilience is correlated with both environmental and personal factors along with risk and protective factors (Tran, 2013). Therefore, some factors included in the stressful situation or event may have an effect on the resilience of PTSD in the individual. Some environmental factors that can promote resilience against PTSD (protective factors) are social acknowledgement, social support, relationships and relationship quality, and stable living conditions during adolescence (Tran, 2013). Among the elderly, "greater social engagement, defined as visiting with friends and family, was also reported to be associated with psychometrically assessed resilience" (Lamond, 2008; Tran, 2013, p. 2).

Tsai, Harpez-Rotem, Pietrzak & Southwick (2012), studied the relationship between PTSD and social functioning or support, such as how satisfied they were with their relationships and family functioning. They found that 52% of participants who screened positive for PTSD reported greater difficulties with their relationships, less social support, poorer social functioning and lower life satisfaction than the participants who reported having better relationships and support. Having a secure, close relationship seemed to be a mediator in PTSD and resilience.

Implications

Implications of the findings from the existing research show how important it is to not only understand the factors that can cause PTSD but also the effect that PTSD can have on individuals. Individuals can experience extreme stress due to physical/mental/sexual abuse, car accidents, the loss of a close friend or family and many other experiences in which occur more often than many people are probably aware of. Post-traumatic stress disorder can cause a difficulty with social interactions, helplessness and can cause an individual to self-medicate with the use of alcohol and other drugs.

The relationship between PTSD symptoms and substance use in college students should be examined because many college students are starting a new freedom during this time. For many, it is their first time away from home, allowing them this awareness that they are able to do as they please, which for many includes experimenting with drugs and alcohol. If a student is suffering from PTSD or is showing signs of extreme-stress symptoms and this goes unrecognized or untreated the student can find themselves failing academically and socially and may try to find relief in alcohol, marijuana and other drugs. Research has also showed that individuals also take part in cigarette smoking to

help relieve the feelings of anxiety or fear. Students who are able to find treatment for their PTSD symptoms have a better chance of academic achievement and staying away from drugs and alcohol.

Chapter 3

Methodology

Participants

The participants of this study consisted of college students from Rowan University. They were a sample that reflect the Rowan University population and included only undergraduates, freshmen to seniors. Rowan University has a student body of approximately 13,349 students, 10, 951 of which are undergraduates. The student's participation was self-selecting. Students who participated in this study received a class credit for completion of the survey. All graduate students and anyone under the age of 18 were excluded from this study.

The surveys were distributed electronically via an experiment management system through Rowan University. This online system allowed undergraduate psychology students to voluntarily answer any surveys to receive class credit. Due to the reward of class credits to each student who completed the survey, anonymity was not possible. Since students were not able to remain completely anonymous from myself they were allowed to decline a response to any question they did not feel comfortable answering.

The electronic system allowed for 100 participants to complete the survey; of these open spots, only eight were filled and used as participation in the study. The survey received responses from five males and four females.

Materials

A questionnaire used in the study was the Personal Experience Screening Questionnaire for Adults (PESQ-A) and was provided by the Western Psychological Services. It was used to measure the experiences of alcohol and/or other drugs used by

the participants. The survey is broken up into three parts which include questions on how often something has happened regarding substance use and other questions ask the participant if they agree with a certain answer. A four-level Likert scale was used for the first section of this survey. The possible answers for responses to the given questions consisted of: (1) *Never*, (2) *Once or Twice*, (3) *Sometimes*, (4) *Often*. For data analysis purposes, the numerical value correlating the response was used for scoring. The higher the scores, the more severe the substance use was.

The second part of the survey consisted of two available responses, *yes* and *no*. This section of the survey included fifteen questions regarding defensive and psychosocial indication. However, only five questions were included in the scoring for data analysis. The rest of the questions were left out of the numerical scores but were used for interpretation.

The third part of the survey consisted of 4 additional questions in the form of a seven-level Likert scale: *Never*, *1-2 times*, *3-5times*, *6-9 times*, *10-19 times*, *20-39 times*, *40+ times*. The questions included in this section asked the participant to share how often they drank in the past year and which drugs other than marijuana and alcohol have been used by the participants. The final two questions in this section include a *yes* or *no* question on the use of needles by the participant and a question regarding the use of cigarettes daily; possible responses include: *None*, *Less than half a pack*, *about half a pack or more*. The questions in this section of the questionnaire were not scored for the use of data analysis but were interpreted to look at additional correlations.

A second questionnaire was generated to measure the extent of post-traumatic stress disorder (PTSD) symptoms in the participants. The questions used in this survey

were generated based on the criteria for diagnosis listed in the Diagnostic and Statistical manual, fifth ed. (DSM-5). The responses for the questions were in the form of a four-level Likert scale: (1) *Never*, (2) *Once or Twice*, (3) *Sometimes*, (4) *Often*. The scoring of these responses were recorded the same as the PESQ-A survey; the numerical value associated with the responses were added and used for data analysis.

A limitation of using the survey is that it does not allow for open-ended questions. This does not give maximum validity or show whether the question truly reflects the participant's feelings and perceptions. Also, the sample was used only by Rowan undergraduate students; students from other universities were excluded.

Design

The study investigated a correlational relationship between the number and extent of extremely-stressful experiences and the use of alcohol and other drugs in undergraduate college students. The study also looked at defensive indicators and its' relationship with the extent and severity of alcohol and other drugs used. The appropriate responses perceived by the participants regarding amount of alcohol use and specific other drugs used were also investigated and interpreted to find a significant correlation with extreme-stress symptoms.

The first section of the complete survey, which was electronically given to participants, included the generated PTSD questionnaire. This questionnaire consisted of nine questions in the form of the four-level Likert scale. These questions investigated any extremely-stressful situations that the participant has experienced within the past twelve months: "*in the past twelve months have you been exposed to a traumatic event such as death, threatened death, actual or threatened serious injury or actual or threatened*

sexual violence". The remaining questions investigated whether or not the participants felt any lasting negative emotions or responses to this stressful experience. The questionnaire also included questions which examined if the participant was showing any symptoms of post-traumatic stress such as flashbacks, nightmares, avoidance of reminders of the incident and troubles in concentration and mood. The scoring for each question ranged from 1 point to 4 points depending on how often these symptoms occurred. Participants who scored an accumulation of 20 points or more showed to have symptoms significantly related to PTSD.

The second section of completed survey consisted of the three-part PESQ-A questionnaire. The first part of this questionnaire consisted of twenty-five questions. These twenty-five questions were then separated into two groups. The first group of fourteen questions formed the first 'problem severity' group (PS1). Questions fifteen to twenty-five formed the second problem severity group (PS2). The first fourteen questions investigated the participant's motivation for drinking and began with "during the past twelve months, how often have you used alcohol or other drugs…" and ended with fillers such as "to feel mellow, calm or happy"; "to get high"; "when you were bored"; "when you felt sad or depressed". The first eight questions of PS2 investigated the severity of the participant's extent of alcohol and drug use by showing the extent to which the participant avoids other responsibilities and priorities to drink or use drugs in the past twelve months. Questions regarded topics such as how often the participant avoided family activities or work responsibilities so that they could get high; how often the participant made excuses or lied to people about having drugs to make sure they had enough for themselves; how often has the participant made plans to be with friends or

family and then canceled them so that they could get drunk or high. The last three questions investigated the extent to which the participant will go to pay for alcohol or other drugs such as conning or using people or going without things that they wanted or needed. These twenty-five questions were all in the form of the four-level Likert scale and allowed the participant to make such possible responses: *Never* , *Once or Twice*, *Sometimes*, *Often*.

The second section of the PESQ-A questionnaire contained fifteen *yes* or *no* questions regarding defensive and psychosocial indicators. However, not all of these fifteen questions were included in the scoring for data analysis. Of the fifteen questions, only five were used for scoring purposes. The five questions used were items that measured defensiveness or 'faking good'; participants who scored higher on these questions may have been underreporting alcohol or drug use. The other ten questions not being used for scoring are questions related to psychosocial adjustment and can show an individual's area of stress. The questions consist of answering yes or no if the questions are true for the participant. Some of the questions included in the scoring were "when I do not know something, I easily admit it" and "there have been times when I let someone else take blame for my mistakes".

The final section of the PESQ-A questionnaire consisted of question regarding specific, recent drug use. Three of these questions were in the form of a seven-level Likert scale to decipher how often the participant consumed alcohol and marijuana in the past twelve months. It also asked a question which asked participants to elaborate on whether or not they have consumed other drugs besides marijuana and alcohol and if so, which drugs. This section also held a yes or no question as to whether or not the

participant has ever injected themselves with a needle and a question asking how many cigarettes the participant smokes daily, allowing a correlation between cigarette smoking and alcohol use and/or PTSD to be measured.

Procedure

After proceeding with my hypothesis based on former literature and research, a pool of subjects was created through Rowan University. A method of questionnaire was determined for measurements regarding the study. Through the use of an electronic system through Rowan, participants were able to self-select their participation in this study. The participants were repaid by receiving class credit for completion of the fifteen-minute survey. Electronic means of use of the survey was preferred as participant's names not able to be anonymous and therefore was easier to remain confidential with the use of electronics as minimal researchers are able to view the responses of the participants. The participants were given three weeks to complete the survey.

The treatment of the participants was handled so that minimal anxiety was produced. The survey asks some questions that may bring up past extremely stressful or anxious situations or experiences. Because of this, consent and debriefing forms were included with the survey and participation was voluntary. In case of re-experiencing these past events or feelings, the debriefing form included a number to reach the Wellness Center at Rowan University. If the participant felt stressed or did not feel comfortable answering the questions they could end the survey at any time and their data would not be used in research. They also had an option of declining an answer a specific question if they still wanted to complete the survey for class credit.

Data was analyzed by the use of the Statistical Package for Social Sciences (SPSS) program. A bivariate correlation test was used to perform the qualitative research to determine a correlation between PTSD symptoms and substance use in students. After analyzing, coding and interpreting the data, results show that there was not a significant relationship between PTSD and alcohol use. However there was a correlation of severity indices; those who scored high on PS1 also scored high on PS2. A significant correlation was also found between PTSD and marijuana use.

Chapter 4

Results

Scoring and Analysis Investigating PTSD Symptoms

Understanding the way that the responses to the questionnaire were scored is important when using a Likert-type scaling system. Each section of the survey was scored differently. In the first section of the questionnaire regarding PTSD or extreme-stress symptoms, the numerical scale corresponded to each possible response as shown: (1) *Never*, (2) *Once or Twice*, (3) *Sometimes*, (4) *Often*. The higher the participant scored on the response scale, the more severe their experiences had been regarding a certain stressful situation or PTSD symptom. The lowest score the participant could have received in this section of the survey is nine. This says that the participant had no experiences with extreme stress or reported experiencing any sort of PTSD symptoms. The highest possible score was a 36, which would show complete PTSD diagnosis. If a participant scored a nine to nineteen on this section of the survey, they were seen to have none to minimal extreme-stress experiences or symptoms related to PTSD diagnosis. If the participant scored higher than a 19, their responses were looked at further to decipher whether or not they had met the criteria for PTSD according to the DSM-5.

Of the eight participants that responded to the survey only one participant met criteria for post-traumatic stress disorder. This participant received the highest score of a 26 out of 36 possible points. The mean score in this section was 11.63 with five of the eight participants reporting having never experienced any extremely-stressful situation or reporting any symptoms of PTSD.

Scoring and Analysis Investigating Problem Severity

The second portion of the survey contained items that made up a problem severity scale. This scale consisted of two sets of questions, problem severity one (PS1) and problem severity two (PS2). This scale is used to indicate whether or not the participant is in need of a more complete and reliable drug abuse assessment as they may show a higher degree of risk regarding substance abuse. The problem severity score is either in the Red Flag range (men: ≥ 47; women: ≥45) or the Green Flag range (men: ≤ 46; women: ≤44). A participant in the Red Flag range showed high degrees of risk and suggests further assessment due to possible problem use. A Green Flag suggests that no further assessments are needed. This section of the questionnaire was also set up as a four-level Likert scale where participants could choose of the possible responses: (1) *Never*, (2) *Once or Twice*, (3) *Sometimes*, (4) *Often*. The problem severity scale is split into two subgroups as PS1 and PS2 and these sections had separate scoring. The two scores were then added together for a total of problem severity (PST). This allowed indication of whether or not there is a correlation of severity indices; if a participant scored high in PS1 they will score high in PS2. The final scoring showing if the participant fell in the Red Flag or Green Flag range corresponded to the PST.

Statistical analyses were completed by using a bivariate correlation test to find a significant relationship between PS1 and PS2. Results showed that the relationship between PS1 and PS2 was statistically significant; p - .000, two-tailed. There was also significance in PS2 and PST; p = .000, two-tailed.

A bivariate correlation test was done to examine the relationship between PTSD symptoms and substance use in Rowan University, undergraduate students. The

relationship viewed was based on the score reported for PTSD symptom and the score for the total problem severity (PST). Analysis showed that there was no significant correlation ($p = .467$, two-tailed).

Scoring and Analysis of Defensiveness

The next section of the PESQ-A survey consisted of fifteen questions where only five of those questions were used for scoring. The questions included in the scoring used for data analysis were used to measure defensiveness (DEF) or 'faking good". Each question allowed a *yes* or *no* response; the score for each question can result in either a one or two depending on the question, allowing the highest score to be a ten. The scoring also places the participant in a Green Flag or Red Flag range. If the participants DEF score was 5-8 they were in the Green Flag range they were seen as answering the questions honestly; if they landed in the Red Flag range the participant may have been underreporting drug abuse. The relationship between PST and DEF were looked at to gain better awareness of whether or not the participants were answering honestly. If a participant scored in the Green Flag range by their PST score but landed in the Red Flag range by their DEF score then the participant may have been underreporting drug involvement.

The ten remaining questions of this section of the survey which were not used in scoring for data analysis but were used for supplemental information were psychosocial indicators and were also based on a yes/no response scale. They were used to address psychological and emotional distress (including suicidality), sexual or physical abuse, risky sexual behavior, drug abuse by significant others, and heavy smoking. Endorsement of one or more of these psychosocial indicators can suggest problems unrelated to or in

addition to drug abuse. If a participant answered yes to the following questions they may suffer from psychological or emotional distress: “there are some unpleasant secrets in my life”, “my mind doesn’t seem to work quite right”, “I make plans to kill myself”. Answering yes to the following questions may indicate family or interpersonal problems: “I live with someone who uses a lot of drugs”, “my spouse/partner argue a lot”, “things happen in my household that nobody wants to talk about”. There were also questions that pertained to unsafe sex and heavy smoking. Data analysis showed that there was not a significant correlation between PTSD symptoms and defensiveness (DEF) ($p = .018$, two-tailed). There was also no significant correlation between DEF and PST ($p = .390$, two-tailed).

Supplemental Information

The final section of the survey provided supplemental information about the participant’s specific drug use history. This information was not used in scoring for data analysis purposes but allowed for interpretation of the relationship between the frequency of alcohol or drug use and extreme-stress symptoms in participants. The survey asked three questions regarding frequency of consuming alcoholic beverages, using marijuana or hashish, and using drugs other than marijuana and alcohol in the past twelve months. Possible responses included *never*, *1-2 times*, *3-5 times*, *6-9 times*, *10-19 times*, *19-39 times* and *40+ times*. Of the participants, 25% (n=2) reported using marijuana/hashish and alcohol more than forty times within the past twelve months. These participants have also reported experiences some sort of PTSD symptom within the past twelve months. One of these participants actually met PTSD criteria for diagnosis. This section of the survey also asks participants to report daily cigarette use; possible answers included:

none, *less than half a pack*, and *about half a pack or more*. All participants answered "none".

Chapter 5

Discussion

The findings of the study showed significant information from the sample in terms of substance use severity. However, due to the size of the sample and the lack of reported PTSD symptoms, it may not have accurately represented the population. Of only eight participants, three reported experiencing any sort of PTSD symptoms within the past twelve months. Only one participant met criteria for PTSD diagnosis. Therefore, an accurate sample to represent the population was not given in this study.

Conclusions Regarding Extreme Stress and Substance Use in Sample

Of the eight participants who completed the questionnaire, only one participant met PTSD criteria based on the DSM-5. This participant was a male and scored a twenty-six out of thirty-six possible points. This participant reported having experienced a traumatic event within the past twelve months "once or twice". The participant also reported answering "often" for the following questions regarding symptoms related to extreme stress within the past twelve months: "have experienced persistent negative emotions (fear, horror, anger, guilt or shame) related to the stressful experience"; "had flashbacks or nightmares of the event"; "experienced negative changes in mood related to the stressful event". The participant also reported that they "sometimes" felt persistent blame of themselves or others for causing the traumatic event or the resulting consequences and noticed changes in their behavior and the way they react to certain things after the event, such as irritable or aggressive behavior, reckless behavior, problems in concentration or sleep disturbance. The participant also reported experiencing an inability to recall key features related to the event (unrelated to head

injury), avoided things after the event, such as thoughts or reminders and had involuntary recollections of the event.

Only two other participants reported experiencing any symptoms related to PTSD or extreme stress. One participant was female and scored ten out of thirty-six possible points; she reported only experiencing flashback or nightmares of an event 'once or twice'. The other participant was female and scored twelve out of thirty-six possible points. She also answered the following questions with "once or twice": had persistent, negative emotions related to the event, experienced flashback or nightmares related to the event and had recurrent and involuntary recollections of the event.

The participant who scored twenty-six points on the PTSD questionnaire also scored in the Red Flag range of the 'problem severity' section of the PESQ-A survey, reporting a score of forty-eight. The participant reported using alcohol and other drugs often to feel calm, mellow or happy; when they were bored; to get high; when they were angry or irritated; when they felt irritated or depressed. The reported answers given from the participant are similar to the information given from existing research. Simons, Gaher, Jacobs, Meyer & Johnson-Jimenez (2005) emphasize that individual's experiencing symptoms of PTSD tend to use alcohol and other drugs as a coping mechanism to alleviate the PTSD symptoms. Since the participant in this study reported using alcohol when irritated and to feel calm, the results of this study coincide with previous research. However, even though this participant's reported experiences supported my hypothesis of a correlation of PTSD symptoms and substance use and also supported findings of past studies, there were other participants in the study who also

scored in the Red Flag range but did not experience any PTSD symptoms, showing that the relationship is not significant.

There were several reported PTSD symptoms that averaged across participant's responses and included: having persistent, negative emotions related to a stressful experience, having recurrent and involuntary recollections of the event and having flashbacks or nightmares of event. The average number of participants, regardless of PTSD symptoms, also showed avoidance of family activities or work responsibilities so you could get high and kept on using drugs or drinking when they know they should have stopped. There was a specific defensive and psychosocial indicator that the majority of participants scored high in which was allowing others to take the blame for the individual's mistakes. This however was not significantly correlated with PTSD or alcohol or other drug use.

The 2 part problem-Severity scale was used to determine the estimation of participant's degree of risk in terms of alcohol and other drug use. Of the participants in the study, 62.5% were in the 'green flag' range. This score range is generally characteristic of no drug use or infrequent use at low levels. The other 37.5% of the participants landed in the 'red flag' range which suggests at least a moderate use of one or more drugs and may suggest dependent use of one or more of them. Those who scored high of part 1 of the problem severity scale also scored high on part 2. There was no significant gender difference.

66% of the participants who reported experiencing any of the PTSD symptoms also reported using marijuana more than 40 times, within the past 12 months. One of these participants also reported experimenting with other drugs such as psychedelics,

cocaine and designer/club drugs. Of the participants who did not report any extreme stress symptoms, none reported experimenting with drugs other than marijuana. Although this information was not used in the scoring for data analysis purposes, viewing this information shows that there is a possible correlation between PTSD symptoms and marijuana use. The results of the study in terms of marijuana use are similar to former research. Vlahov, Galea, Resnick, Ahern, Boscarino Bucuvalas, Gold & Kilpatrick (2002) discovered in their study that the use of marijuana by their participants increased after experiencing the World Trade Center attack in 2011. Vlahov et al. (2002) also found that alcohol and cigarette smoking also increased after the attack. However, in this study none of the participants who reported experiencing PTSD symptoms reported smoking cigarettes.

Limitations of the Study

The limitations of the study included the small sample size, the use of students from one university and the use of a closed-question survey. The current study had a sample size of eight participants, with only three participants reported experiencing an extremely stressful situation or event during the past twelve months. If the study had included more participants who met PTSD criteria for diagnosis reliability would have been increased and comparisons might have been made to previous research. Studies that were formerly reviewed showed that individuals suffering from PTSD also showed signs of alcohol and/or other drug abuse (Boscarino, Adams, & Galea, 2006; Boscarino, Kirchner, Hoffman & Sartorius, 2011; Bailey, Webster, Baker & Kavanagh, 2012).

Another limitation of the study is that participants may not have been answering honestly. The questionnaire included a section that tested for the participant's response

distortion. This scale included a five-item scale measuring the individuals defensiveness or 'faking good'. Less than half of the participants scored high in this section which put them in the red flag range which means they may have been responding in a socially desirable way and may be denying or hiding personal problems. If a defensiveness score is high and the problem severity score is low, the participant may be under-reporting. This occurred with one participant in the study.

It is important to consider the reliability and validity of the questionnaire that was used as a means of measurement to determine whether or not there was a correlation of PTSD symptoms and substance use. It is also important for a drug abuse instrument to detect response distortion. The PESQ-A included a five-item scale measuring defensiveness or "faking good". However, there is no scale assessing the opposite response bias, "faking bad" which decreases the validity of the instrument. Also, the participant's identity could not be completely anonymous. As the researcher, I was able to view the names of the participants who completed the survey so that they were able to receive class credit as payment for completion. Due to this, there is a possibility that the participants were answering the questions in a more favorable fashion; not being completely honest and under-reporting alcohol and illicit drug use. This would also decrease the validity of the instrument.

The questionnaire did not consist of any open-ended or free-flowing questions. These types of questions could allow elaboration for stress-related symptoms. By using closed-ended questions in the form of a Likert scale, there was not a way to consider the type of stressful situation that participants had experienced (car accident, sexual/physical abuse etc.).There was also no way to allow the participant to expand on how much the

stressful event affected them, aside from the use of a likert scale; participants could not describe emotions that they experienced from these stressful events in their own words.

Future Research

The study should be replicated for numerous reasons. For instance, due to the lack of a large sample size the results can be argued as being reliable. Also, since the small sample represents college students the fact that some of the participants showed excessive drinking or drug use does not show that is due to any experience with extreme stress. The college years are a time when many students begin to experiment with drugs and alcohol (Read, 2012). Therefore, the severity or extent of substance use in college students may not be seen as unusual. Perhaps a replication of this study could be revised to include a comparison of the relationship of substance use and PTSD in college students with that of individuals not enrolled in college. Future research could also include instruments that allow the participants to expand on their experiences with PTSD symptoms and substance use as answers such as “sometimes” or “often” do not allow for much interpretation. A replication of this study could also include a way for participants to be completely anonymous. Due to the possibility of participants’ responses being linked to their identity, it was very difficult for participants to elaborate on drugs used, other than marijuana. If there was a relationship between PTSD and drugs used, such as cocaine, heroin or methamphetamines, it was not able to be determined.

The topic of the severity of alcohol and other substance use due to the impact of extreme stress is one that should be researched further. The purpose of this study was to determine if there was a significant relationship between PTSD symptoms and the severity and extent of alcohol and substance use. However, there are numerous

instruments that can be used to determine this relationship. Further research could also be conducted using a much larger sample size so that the representation of the population is more reliable. PTSD can lead to risky behavior such as alcohol and drug use and may also lead to a lower quality of life for individuals. Further research may lead to findings of other factors related to the onset of PTSD. This can lead to awareness of the dangers associated with this disorder and hopefully prevent future risky behavior in individuals.

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