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Melissa Flannigan
flannigm@csp.edu

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Gender Impact on Trauma-Exposed Populations

Melissa Flannigan

Department of Graduate Teacher Education Concordia University St. Paul

ED 590 Research and Complete Capstone, Cohort M3294

Instructor: Dr. Mandy Kasowicz

Second Reader: Dr. Diane Harr

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Abstract

Gender differences in trauma exposure have been well-established in published research. This paper explored the relationship between gender and its impact on exposure to traumatic events and the outcomes within trauma-exposed populations. Trauma can have profound and lasting effects on physical, mental, social, and behavioral well-being. The literature review identified gender differences in exposure to trauma types, PTSD prevalence and symptomatology, other mental health disorders, behavioral outcomes, and differences in physical health. Additionally, it explored the role of support systems, coping mechanisms, and risk factors for particular trauma-related outcomes. Furthermore, this paper examined the implications of the findings for professional practice and future research. The problem has been significant in the field of education as teachers need to understand the effects of trauma and how to meet the needs of students to help them recover and learn. Through thorough analysis of existing research, there has been an overwhelming disparity of studies on trauma-exposed women. The synthesis of this collection of research created a better understanding of the outlined differences in trauma exposure and outcomes by gender but also highlighted the need for gender-sensitive approaches to research and professional practice. The insights gained from the studies emphasized the need to create interventions and policies to mitigate the effects of trauma differences by gender.

Keywords: trauma, posttraumatic stress disorder (PTSD), outcomes, gender differences, adverse childhood experiences (ACEs)

Chapter One: Introduction

Adverse Childhood Experiences (ACEs) are traumatic or stressful experiences that children have that can enormously impact their outcomes socially, emotionally, mentally, and physically. According to the ACE study, exposure to ACEs dramatically increases the risk for seven out of ten leading causes of death in the United States. Those exposed to high doses have a twenty-year difference in life expectancy (Burke-Harris, 2014). Students that have experienced ACEs tend to have difficulty assimilating into a classroom environment. Students with high ACE scores, meaning they have experienced many ACEs, are more likely to have behavior problems and experience academic failure than their peers with lower scores (Rossen, 2020). Experiencing trauma can slow or prevent the development of executive functioning, which is the use of working memory and organization (Barr, 2018). Without effective executive functioning skills, students struggle in academic environments when held responsible for their learning.

Importance of Topic

Trauma is rampant worldwide, across all genders and ages, with prevalence rates up to 89% throughout a lifespan. "Symptoms of posttraumatic stress disorder (PTSD) affect a substantial proportion of those exposed to trauma and include unwanted re-experiencing of the event, avoidance of trauma reminders, negative changes in thinking and mood, and hyperarousal" (Seligowski et al., 2021, p. 1). Professionals in many fields, particularly those in education, have daily interactions and involvement with populations exposed to trauma. The more informed teachers can be, the better prepared they are to meet the needs of their students and help create and promote successful outcomes. Over several decades of research, numerous studies have suggested that there is an observable higher risk for PTSD among female participants compared to male counterparts (Tolin & Foa, 2006). Additionally, research findings

revealed differences by gender in numerous physical and mental diagnoses, with females who are exposed to trauma being at a higher risk than males (Meltzer-Brody et al., 2007; Almuneef et al., 2017; Hanson et al., 2008). Lastly, there are observable differences in behavior by gender, which can have implications in the classroom (Price et al., 2013). Due to the prevalence of trauma in the world, teachers will continue to have trauma-exposed students in their classes, and the more informed educators are about trauma response and symptomatology, the better equipped they will be to meet their students' needs and help them learn.

Definition of Terms

The term *trauma* is used throughout the paper to describe an event or experience that created distress or injury to an individual. Types of trauma can be sexual assault (SA), witnessed violence (WV), physical assault (PA), natural traumas, such as natural disasters, general traumas, such as accidents or illness, and forms of abuse or neglect.

Adverse childhood experiences (ACEs) are traumatic experiences that occur during childhood, such as abuse, neglect, and domestic and community violence. ACEs put individuals at a higher risk for chronic disease and posttraumatic stress symptoms. An ACE score is the number of categories of traumatic events an individual has been exposed to.

Throughout this paper, the term *gender* will be used. This term refers to the socially constructed characteristics of women, men, girls, boys, and nonbinary individuals. While the modern separation of gender and sex is understood, many studies are older and use gender to describe the biological assignment at birth due to physical differences and presentation of XX or XY chromosomes, which should be classified as sex.

The term *posttraumatic stress disorder (PTSD)* begins with established diagnostic criteria. Two tools are most commonly used to assess and diagnose PTSD, the first is the

Diagnostic and Statistical Manual of Mental Disorders, currently DSM-5, and the International Classification of Disease, ICD-11, produced by the World Health Organization. The two do have differing criteria for PTSD; however broadly defined, PTSD is a trauma and stress-related disorder that can develop from a single specific traumatic event or long-term patterns of regular trauma, abuse, or victimization.

Symptomatology refers to the set of symptoms or characteristics related to a medical condition or as a result of a traumatic event. The term PTSD symptomatology is used throughout the paper to describe exhibited symptoms following trauma exposure.

Scope of Research

Through the review of the research, several considerations were made when gathering data. Careful attention was paid to include a variety of studies in the literature review. The chosen research had a variety of participants, a few studied only one gender, and most used mixed-gender samples to analyze gender-related differences best. Additionally, several studies took place outside the United States, while the ones in the United States were from different parts of the country. There was also consideration for rural, urban, and incarcerated populations and each age group: children, adolescents, teens, and adults. Additionally, research studies included sample sizes as small as 21 for qualitative-focused studies and up to almost 700,000 for national surveys. Studies were selected based on the results contributing to answering the research question. A detailed analysis of qualitative and quantitative peer-reviewed research studies with various samples allowed for considering multiple perspectives and created a more profound understanding by limiting variables based on demographics other than gender. Through the review of the literature, there were four main themes of differences by gender total exposure, mental health outcomes, behavior differences, and physical health outcomes.

Conclusion

Considering the research gathered: How do exposure and outcomes differ by gender in trauma-exposed populations? This topic is related to the program's essential question: "In light of what is known about how children learn, how shall professional educators best promote resilience and recovery for the children and families who have experienced traumatic events?" because all the selected studies on this topic are related to prevalence, responses, and outcomes following traumatic events. Countless surveys and clinical studies have consistently reported a higher prevalence of post-traumatic stress disorder (PTSD) in females than in their male counterparts. Most have found that women have at least double the likelihood of developing PTSD during their lifetime (Hiscox et al., 2021). The paper aims to examine, summarize, and synthesize information and data provided in selected studies related to the research topic. The outcome of the review is to answer the proposed research question. In the next chapter, there will be a review of the literature to synthesize research findings and determine the differences in exposure and outcomes by gender in trauma-exposed populations. The four main differences by gender outlined in the literature were prevalence of trauma and type of event, mental health outcomes, behavior differences, and physical health outcomes.

Chapter Two: Literature Review

Each year in the United States, about five million children experience a traumatic event. Almost half of these children are victims of physical or sexual abuse, and millions live in an atmosphere where they are exposed to domestic violence, natural disasters, or community violence. Many children have experienced car accidents, life-threatening illnesses, or injuries (Perry, 2003). According to Perry (2003), traumatic experiences can significantly impact children's physical, emotional, social, and cognitive development, which can have considerable implications for families and communities. The Kaiser Permanente study in the late nineties found that adverse childhood experiences (ACEs) significantly negatively impact children's brain development and are the root cause of many mental and chronic illnesses. It is understood that approximately 70% of people will be exposed to at least one adverse experience in their lifetime (Felitti et al., 1998). Not all individuals exposed to trauma develop physical or mental health diagnoses or display certain signs or symptoms. However, most of those who have experienced an adverse experience have negative related outcomes, whether short or long-term. Prior research has indicated gender-related differences in trauma exposure and outcomes following trauma (Perry, 2003). It is wondered: How do exposure and outcomes differ by gender in trauma-exposed populations?

The synthesized qualitative and quantitative studies include individuals of all ages and many nationalities. In the collection of research studies, four themes emerged that create differences across gender. The first theme is the prevalence of trauma exposure, both the amount individuals have experienced and the types of traumatic events they have been exposed to. Second is mental health outcomes, including the prevalence of PTSD, depression, and other mental disorders, and the type of mental-related symptoms exhibited by individuals. The third

theme is behavior outcomes, including coping skills and avoidance. Lastly, physical health outcomes are explored, including chronic pain and diagnosis of diseases and autoimmune disorders.

Trauma Prevalence and Type of Event

Trauma prevalence is the number of individuals who have experienced at least one traumatic event, and there are further breakdowns into the type of event. Most research examining trauma exposure focuses primarily on one gender at a time. High rates of trauma exposure and PTSD, and outlined gender differences between the two, were noted in the Kaiser Permanente ACE study in the 1990s; however, there have not been reasonable explanations for this occurrence (Felitti et al., 1998). These findings are apparent in multiple populations, as outlined in the following studies.

Total Exposure

Based on total trauma exposure, more men have adverse experiences than women. Axinn et al. (2013) conducted a quantitative study of 400 adult Nepalese men and women between the ages of 18-90 to determine if there were gender differences associated with trauma exposure prevalence. Their data analysis found that men experienced more trauma than women; 75% of men had experienced any event, whereas only 63% of women had. (Axinn et al., 2013). Similarly, a cross-sectional quantitative study by Hanson et al. (2008) used a survey to sample 3,906 adolescents aged 12-17. Overall, 48% of the participants reported exposure to at least one type of violence, with boys reporting more than girls, 51.3% and 44.1%, respectively. In addition to analyzing the number of individuals exposed to trauma, much of the research further broke down the incidence of events.

In the Nepalese adult population, men were found to have a higher average number of

traumatic events compared to women, 2.18 and 1.41 events, respectively. In a similar study of incarcerated youth, females reported more ACEs than males, and a more significant percentage of those who reported at least one reported more. Females had an average ACE score of 4.29, whereas males had an average of 3.48, indicating that females had been exposed to more ACEs than males (Baglivio et al., 2014). In an adult population in Saudi Arabia, men were found to be significantly more likely to have experienced four or more ACEs, and women had significantly higher percentages of two or fewer (Almuneef et al., 2017). However, in a study of participants in the juvenile justice system, girls reported higher ACE scores than males, with almost a quarter of females reporting a score of nine or ten out of ten event types (Cannon et al., 2016). The higher incidence of adverse events among incarcerated youth compared to the general population is a known occurrence and likely plays a role in the difference in results from other studies of the general population (Cannon et al., 2016).

Type of Event

Traumatic events can be broken down into four categories: witnessed trauma (WT), interpersonal non-sexual trauma, interpersonal sexual trauma, and natural/general trauma (Komarovskaya et al., 2011; Hanson et al., 2008). Witnessed trauma can include neighborhood violence, exposure to war, or witnessing domestic violence at home. Interpersonal non-sexual trauma includes physical neglect, physical assault, and emotional abuse. Interpersonal sexual trauma includes sexual abuse and assault by known and unknown assailants. Natural/general trauma includes life-threatening illness, natural disasters, and car accidents. There are notable differences in the types of traumatic events that men and women are exposed to.

Gwadz et al. (2007) conducted a quantitative study of 85 homeless youth aged 15-23 in New York City. At moderate to severe levels of exposure, more males had experienced physical

neglect, and men seemed to experience serious accidents more than women. Axinn et al. (2013) also found significant differences in the exposure to specific events with men experiencing car accidents, life-threatening illnesses, and natural disasters. In adolescent participant samples, boys were more likely than girls to report WT (Hanson et al., 2008). Also, adult men from Saudi Arabia had higher levels of childhood psychological abuse, physical abuse, sexual abuse, and peer, community, and collective violence exposure (Almuneef et al., 2017). Lastly, according to a qualitative self-report research study of 239 incarcerated men and women conducted by Komarovskaya et al. (2011), almost all the participants reported having experienced at least one traumatic event, with men more likely to have experienced interpersonal nonsexual trauma and witnessing harm to others. Considering there were certain types of events men experience, researchers have also identified events that women experience at higher rates.

Women from Saudi Arabia reported higher rates of living with a household member with mental illness and experiencing parental divorce or separation (Almuneef et al., 2017). There is also a higher prevalence of females experiencing SA. A quantitative study of 4,503 children and youth aged 1-17, conducted by Finkelhor et al. (2013), found that while only 2.2% of their sample experienced SA, 22.8% of female children had, meaning SA was more significantly more prevalent amongst females. These findings are similar in a population of homeless youth, where females reported more emotional abuse, sexual abuse, physical assault, and sexual assault than males (Gwadz et al., 2007). Of the Nepalese adults, women were more likely to report being beaten by a spouse and having a child who had a severe illness. (Axinn et al., 2013). In the adolescent participant samples, girls were more likely than boys to report sexual assault (Hanson et al., 2008). In the incarcerated population, women were more likely to have experienced interpersonal sexual trauma.

Concerning time, men were significantly more likely to have experienced at least one general/natural trauma, interpersonal nonsexual violence, and WT event in childhood and adolescence versus adulthood (Komarovskaya et al., 2011). On the other hand, females were more likely to experience a general/natural trauma in adulthood versus earlier in life (Almuneef et al., 2017). Lastly, in the category of interpersonal sexual trauma, women were more likely than men to have experienced at least one event in childhood, adolescence, and adulthood (Komarovskaya et al., 2011). Overall, there are gender differences in trauma experiences by timing and prevalence, with men experiencing more events total and at an earlier age than females (Komarovskaya et al., 2011; Almuneef et al., 2017). Men experience more witnessed and natural traumas, and women experience more interpersonal trauma, particularly sexual assault (Axinn et al., 2013; Hanson et al., 2008; Gwadz et al., 2007). Men experience general/natural events earlier in life, whereas women experience them later in life. With these notable differences in exposure, there are apparent outcome differences regarding symptoms and mental health.

Mental Health Outcomes

Exposure to traumatic events can often cause harm mentally. Many trauma survivors develop mental health disorders such as depression, PTSD, and anxiety (American Psychiatric Association, 2013). There can be a wide range of mental health outcomes depending on factors such as the nature of the trauma, available support, and pre-existing mental health conditions. As a result, many researchers have begun to question what other factors may influence the development of different diagnoses. Glover (2021) said that when most people picture PTSD, they picture a male veteran. Glover stated that, in reality, the face of PTSD would be a woman since they are over twice as likely to suffer from PTSD than men. Women typically suffer from

PTSD symptoms four times longer than men (Glover, 2021).

Posttraumatic Stress Disorder

One of the most common mental health disorders that individuals develop following trauma is PTSD since symptoms of can include anxiety and depression (American Psychiatric Association, 2013). According to a study of 230 incarcerated adults conducted by Komarovskaya et al. (2011), participants that had experienced at least one traumatic event met the criteria for lifetime PTSD using the DSM-IV, with significantly more women than men meeting it. Women and men differed in reported symptom amount and severity, with women reporting higher severity and number of symptoms. However, a quantitative retrospective cohort study of 666,269 Iraq and Afghanistan veterans had different findings. About one-third of the veterans were diagnosed with PTSD, and one-sixth had psychiatric disorders other than PTSD. Those with psychiatric disorders were more likely to be younger, male, and non-white (O'Donovan et al., 2014). Similar prevalence of PTSD was also noted in younger populations.

In a sample of 797 eighth- to twelfth-grade students from Cape Town, South Africa, researchers outlined that nearly one-third of the trauma-exposed participants had probable PTSD, with females being seven times more likely to meet the criteria compared to male participants (Hiscox et al., 2021). A quantitative study conducted by Wamser-Nanney & Cherry (2018) studied a sample of 167 children and adolescents aged 3-18 using self-report checklists completed by participants or their guardians to identify symptoms that participants displayed. The study's findings indicated that female participants exhibited more symptoms and, therefore, could have an increased risk for higher levels of PTSD symptomatology following trauma exposure compared to males. In an adult group of participants, women also appeared to be at higher risk for developing PTSD symptoms (Horesh et al., 2015). The adolescent study

conducted by Hanson et al. (2008) also indicated that about 8% of those who had experienced a traumatic event did meet the criteria for PTSD in the past six months, and 15% met the criteria for depression in that timeframe. Gender was the variable found to be most strongly associated with both mental health outcomes, with 59% of those that met PTSD criteria and 60% of those that met depression criteria being girls, indicating a gender difference in prevalence rates for both mental health outcomes. Adolescent females exposed to trauma in a different sample also displayed higher depressive symptoms. They possessed more significant symptoms when exposed to both low and moderate interpersonal trauma levels than males (Hiscox et al., 2021). Since PTSD appears to have a significant prevalence and non-veteran females tend to experience it more than males, it is crucial to consider potential risk factors in the development of the condition.

Risk Factors for PTSD Development

In order to better understand trauma-related pathology, it is necessary to understand the risk factors that make some more vulnerable to developing PTSD. To achieve this, Horesh et al. (2015) interviewed 942 adult residents of Detroit, Michigan, to study the long-term associations of PTSD and depression to determine if any variables contributed. During all three waves of interviews, PTSD and depression were noted to be distinct factors, and there were significantly more comorbid and no-disorder cases than stand-alone depression or PTSD cases. This finding indicates that trauma victims are more likely to develop disorders or none at all. In a similar study, Rooney et al. (2022) qualitatively studied 147 adults seeking treatment following a traumatic event in emergency departments, ED, in Ohio. The study's results displayed significant associations of PTSD symptoms over time; greater state anxiety and depression symptoms at baseline were associated with more significant declines in PTSD symptoms over time. Lastly,

Horesh et al. (2015) found a bidirectional association between PTSD and depression symptoms over time. For women, PTSD symptoms in the early wave appeared to predict depression later and vice versa, whereas in men, there only appeared to be an association between early PTSD symptoms and later depression.

Since comorbid depression seems to indicate a higher risk of PTSD in both genders, it is essential to consider other risk factors that may increase the increased likelihood that women develop PTSD. This is important as almost all biomedical research, where most medical understanding comes from, is done exclusively on male animals. The reason for this is due to hormone cycles. Since they are an uncontrollable variable, the changes can alter the results of a study. In a quantitative study of 81 highly traumatized women, researchers found that low estrogen may be a risk factor for developing PTSD (Glover et al., 2012). Another risk factor for PTSD is a polymorphism in the PACAP receptor gene ADCYAP1R1. Stevens et al. (2014) studied 49 adult women and found that this gene influences neural response to threat stimuli due to the association with exaggerated hippocampal and amygdala reactivity. This finding indicates a neurobiological risk factor that could contribute to the higher rates of PTSD in women than men. Fear inhibition determines the difference between danger and safety cues and suppresses fear responses when in safe situations. Glover et al. (2013) studied 28 cycling women. They discovered that lower estrogen levels seemed to impair their fear inhibition, which could increase the risk of anxiety disorders in individuals exposed to trauma.

Sexual Assault and Mental Health Outcomes

Turner et al. (2017) examined the relationship between childhood sexual abuse (CSA) and mental health outcomes through a quantitative study interviewing 14,564 US men over 20. Any childhood maltreatment increased the odds of suicide attempts and all mental disorders,

including depression, dysthymia, mania, panic disorder, social phobia, PTSD, anxiety, and alcohol or drug abuse or dependence, as well as personality disorders: paranoia, narcissism, avoidant, and obsessive-compulsive, with rates doubling for those who experienced CSA. In a similar demographic, a qualitative study of 56 adult women from Norway was conducted by Pelekis et al. (2005). They found that 95% of women who have experienced CSA had a mental disorder, and 50% had PTSD. Conversely, in women without CSA, 70% had a mental disorder, and 14% had PTSD. This shows that females who had experienced CSA had higher rates of mental disorders and PTSD compared to women who had not. Since SA seemed to be a risk factor for PTSD in separate studies of each gender, there should be similar outcomes in a mixed-gender study. Hanson et al. (2008) found a significant interaction of gender by SA for PTSD, which indicated that gender was a moderating variable in the relationship between PTSD and SA, with boys being at greater risk for developing PTSD if they have experienced SA, compared to girls who have experienced SA. While all instances of SA appear to increase the risk of PTSD and other mental disorders, females experience SA at higher rates than males.

Additionally, based on several studies, whether females experience SA or not, they do experience PTSD at about twice the rate of men and tend to experience more mental health-related symptoms over a longer period compared to men (Horesh et al., 2015; Hanson et al., 2008; Wamser-Nanney & Cherry, 2018). These findings emphasize the gender differences in mental health outcomes amongst trauma-exposed populations. Overall, females tend to have higher rates of PTSD compared to males (Horesh et al., 2015; Hanson et al., 2008). Women also had higher rates of anxiety and depression following trauma exposure compared to males (Hanson et al., 2008; Hiscox et al., 2021). With such differences by gender in mental health, considerations for behavior differences are essential.

Effects on Behavior

Through the analyzed research thus far, the history of childhood trauma is widespread in adolescent and adult psychiatric populations, and childhood trauma is highly correlated with future psychiatric care and poor mental and physical health throughout the lifespan. The relationship between trauma exposure and behavior outcomes can vary significantly among individuals, with gender being one factor influencing these differences. It is important to note that gender is not the only influence on differences in behavior outcomes. Other factors, such as individual personality traits, social support, pre-existing conditions, and cultural background, can also play a role. Some behavior challenges that trauma survivors may exhibit include impairment in emotion, behavior regulation, attention, distress, and dissociation. Trauma victims also often display aggressiveness, concentration difficulties, lack of trust, mood swings, impulsivity, inappropriate or problematic behavior, controlled eating habits or rigidly ritualistic behaviors, and avoidance (van der Kolk, 2005). Trauma survivors must also learn how to adapt themselves following the event, which involves using coping skills, a method by which individuals respond to stress. Not all coping mechanisms or skills are healthy or professionally suggested; however, analyzing what survivors turn to to help best meet their needs and build resilience is crucial. Cherewick et al. (2015) conducted a qualitative study interviewing 30 youth aged 10-15 from the Eastern Democratic Republic of Congo (DRC). The participants have all endured conflict due to decades of war in their community. Researchers found that trauma-exposed females coped using prayer and seeking support from others. In contrast, males tended to partake in risk-taking behaviors such as alcohol or other substances.

Male Behavior

Despite being a social construct, gender role expectations influence nearly all aspects of

individuals' lives. Socialized masculinity is a belief that men should be strong, aggressive, and show little to no emotion. Price et al. (2013) conducted a quantitative study of 1,676 individuals aged 4-18 in 80 different neighborhood clusters near Chicago, with results suggesting that males have higher levels of externalizing problems, such as aggression, inattention, and impulsivity. This is similar to the findings of a qualitative study of 21 male veterans exposed to SA; many felt the need to appear more masculine. To do this, many tried to prove their heterosexual attraction and engaged in sex to avoid negative thoughts. Also, many began to express only anger and became rude and aggressive (Elder et al., 2017). Men typically use problem-focused coping more than women, with adult men significantly more likely to smoke, drink, use drugs, and have premarital or out-of-wedlock sexual relationships (Olf, 2017; Almuneef et al., 2017). Additionally, witnessed trauma was associated with conduct trouble, while traumas with high interpersonal proximity were associated with oppositional defiance (Price et al., 2013). Based on prior research, males are more likely to report witnessed trauma which could be a variable in the behavior outcomes associated with witnessed trauma (Hanson et al., 2008).

Female Behavior

On the other hand, females exhibit a different range of behavioral responses following trauma exposure. While not every female will respond to trauma similarly, some behavioral themes have emerged from studies on trauma. Researchers have found that females have higher rates of internalizing problems and are likely to experience higher anxiety levels and other somatic problems (Price et al., 2013). Compared to men, women who experienced CSA display less effective interpersonal skills and more social conflict, such as ending friendships, fighting with family, strained family relationships, difficulty resolving conflict, and compromising (Kim, 2017). Also, in females younger than 18, there was a presence of sexual concerns, and their

caregivers reported higher levels of atypical and dissociation symptoms amongst female children than males (Wamser-Nanney & Cherry, 2018). Similarly, female victims of CSA tend to have lower sexual self-efficacy, sexual dissatisfaction or distress, and unwanted thoughts about sex, which correlates to their lack of assertiveness and feeling incapable of giving or denying consent, which can lead to sexual permissiveness and, therefore at greater risk to being victimized again or engage in risky sex practices (Kim, 2017). Women typically use emotion-focused, defensive, and palliative coping (Olf, 2017). To cope, trauma-exposed adolescents reported participating in risk-taking behavior of pressure to engage in prostitution and marry early (Cherewick et al., 2015). Women also typically handle stressful situations differently than men and tend to react more to threat perception and peritraumatic dissociation than men. Women may use a tend-and-befriend response rather than the expected fight-or-flight response (Olf, 2017). In addition to notable differences in behavior by gender, SA appeared to have further associations with different outcomes.

SA and Behavior

In a study of adults exposed to CSA, females who experienced CSA at an earlier age had significantly higher levels of dissociative cognition than males and those who experienced CSA later into childhood. The higher levels of dissociation are also linked with dysfunctional eating behaviors in females (Kim, 2017). Direct trauma significantly predicted outcomes of attention deficit hyperactivity, oppositional defiant, conduct problems, post-traumatic stress, and dissociative problems in the adolescent population (Price et al., 2013). Based on prior research, females are more likely to experience direct traumas of physical and sexual assault, which means gender could contribute to the behavior outcomes of those exposed to direct trauma (Gwadz et al., 2007). Lastly, research on adolescents found that females who experienced CSA had

decreased sense of agency and control over their lives (Kim, 2017).

Overall, females tend to internalize, whereas males exhibit more externalizing symptoms such as anger, impulsivity, and inattention (Price et al., 2013). For coping mechanisms, males tend to lean towards avoidance and substance use, whereas females seek social support and use emotion-focused coping strategies (Cherewick et al., 2015). With notable behavior differences by gender following trauma exposure, it is essential to consider how physical health outcomes can differ by gender.

Physical Health Differences

The ACE study demonstrated a dose-response relationship, meaning that the more ACEs an individual experienced, the higher their risk for adverse health outcomes became. The findings included an increased risk for heart disease, diabetes, and cancer (Felitti et al., 1998). The results of the ACE study were not divided by gender, nor were gender differences evaluated in the scope of research. Many researchers have used this knowledge of ACE's impact on health risks to study gender-based disparities in different populations.

Almuneef et al. (2017) completed a cross-sectional national study of 10,156 adults in the Kingdom of Saudi Arabia, KSA. Women were significantly more likely to report mental health problems, including depression and anxiety, and more likely to report chronic diseases, including hypertension, diabetes, obesity, and coronary heart disease. In contrast, men were associated with a higher risk of substance dependence. In the veteran population, women were at almost three times the risk than men of being diagnosed with an autoimmune disorder, such as thyroiditis, inflammatory bowel disease, rheumatoid arthritis, multiple sclerosis, and lupus, whether they were diagnosed with a psychiatric disorder or not (O'Donovan et al., 2014).

Pain is another notable aspect of physical health that relates to those exposed to trauma.

Meltzer-Brody et al. (2007) conducted a quantitative study of 713 women aged 18-66 who experienced chronic pelvic pain. Overall, trauma was associated with worse daily functioning, more dysfunction due to pain, more surgeries, more medical symptoms, and more days spent in bed. Similarly, Gros et al. (2016) studied 136 treatment-seeking veterans that had comorbid PTSD, chronic pain, and substance use disorders (SUD) using self-report questionnaires. Researchers found that higher levels of pain were associated with PTSD symptoms, both self-reported and clinician-rated.

Additionally, in the women with chronic pain, a positive screen for PTSD was highly associated with all measures of poor health, with physical functioning similar to or worse than those with severe chronic conditions and pain levels far worse. Additionally, researchers outlined that patients with PTSD are more likely to report severe pain compared to those without PTSD (Meltzer-Brody et al., 2007). In addition to physical health diagnoses, there are notable gendered responses to trauma.

In a quantitative study of 49 healthy adult women, Heim et al. (2000) discovered that women exposed to trauma exhibit increased pituitary-adrenal and autonomic responses to stress compared to those not exposed to trauma. In psychobiological research, "women appear to have a more sensitized hypothalamus-pituitary-axis than men, while men appear to have a sensitized physiological hyperarousal system" (Olf, 2017, p. 1). The insula is the area of the brain responsible for interoceptive processing, attention to stimuli, and awareness of emotions. In studies of adolescents, girls who experienced trauma exhibited a smaller surface area and volume of the brain's insula compared to those in the control group, whereas trauma-exposed boys showed larger volume and surface area (Gard et al., 2014; Klabunde et al., 2017). Overall, females are more likely to suffer from pain or be diagnosed with an autoimmune disorder

(Meltzer-Brody et al., 2007). Additionally, men tended to experience substance abuse more than women following trauma exposure (Gros et al., 2016). Lastly, in trauma-exposed populations, there were notable size differences by gender in the brain insula (Gard et al., 2014; Klabunde et al., 2017).

Conclusion

The reviewed studies each have results that endorse the idea of exposure and outcome differences following trauma exposure by gender. In the exposure to trauma, there were differences in prevalence by gender, with men typically experiencing more traumatic events than women (Axinn et al., 2013). Additionally, there were gender differences by event type, with men experiencing more witnessed and natural traumas and women experiencing more interpersonal trauma, particularly sexual assault (Gwadz et al., 2007). In trauma-exposed populations, there are notable gender differences in a range of mental, physical, and behavioral outcomes, and responses may vary by individual. There have been certain observed and measured patterns.

Regarding mental health outcomes, females tend to have higher rates of PTSD compared to males (Horesh et al., 2015; Hanson et al., 2008). Females also experience more internalizing symptoms, such as anxiety, depression, and other somatic problems, whereas males exhibit more externalizing symptoms, such as anger, impulsivity, and inattention (Price et al., 2013). For coping mechanisms, males tend to lean towards avoidance and substance use, whereas females seek social support and use emotion-focused coping strategies (Cherewick et al., 2015). Physically, there are additional notable differences as females are more likely to suffer from pain or be diagnosed with an autoimmune disorder (Meltzer-Brody et al., 2007). Also, girls' brain insulas had smaller surface area and volume, whereas boys' were larger (Gard et al., 2014; Klabunde et al., 2017).

The lack of understanding of the role of female hormones in the presentation of symptoms and diagnoses has further implications outside of trauma, as females are often not diagnosed with ADHD and ASD until later in life due to scientists' knowledge of both being centered around behavior and signs and symptoms in boys only (Glover, 2021). For teachers, this is important to understand that students may react in different ways simply due to their estrogen levels, whether trauma is involved or not. Since females internalize their problems following trauma, it may not always be visible to teachers when a student struggles post-trauma.

Understanding gender differences in trauma-exposed populations has implications for the field of education. With this knowledge, educators can create a more supportive and inclusive learning environment for students, regardless of gender. Some applications will be discussed further in the next chapter, including professional development, trauma-informed approaches to teaching, social-emotional support and curriculum, making connections within the classroom, and trauma-responsive interventions.

Chapter Three: Discussion, Application, and Future Studies

This capstone aimed to answer the research question: "How do exposure and outcomes differ by gender in trauma-exposed populations?" by analyzing and synthesizing prior research on diverse populations exposed to trauma. The analyzed research included studies of different genders, ages, and nationalities. The purpose of this chapter is to summarize the key findings within the literature and give suggestions for applications to professional practice in the field of education. Additionally, there will be suggestions for future research. Lastly, the chapter will outline the limitations of the research.

Insights Gained from the Research

The research presented in the literature review found apparent outcome differences in trauma-exposed populations based on gender. First, there are apparent differences in the prevalence of trauma and exposure to specific trauma types (Axinn et al., 2013; Almuneef et al., 2017; Cannon et al., 2016; Baglivio et al., 2014). Additionally, there are clear differences in mental health outcomes, with females at higher risk for developing PTSD after trauma (Hanson et al., 2008; Horesh et al., 2015). Third, there are defined differences in exhibited behavior across gender, with males experiencing more hyperactivity and aggression, and females tend to internalize their problems, whereas both males and females have different ways of coping (Price et al., 2013; Elder et al., 2017; Olf, 2017). Also, females are at higher risk of developing chronic health problems and autoimmune disorders, and men tend to develop substance dependence (O'Donovan et al., 2014; Gros et al., 2016; Meltzer-Brody et al., 2007). Lastly, girls who experienced trauma exhibited a smaller surface area and volume of the brain's insula, whereas trauma-exposed boys showed a larger volume and surface area (Gard et al., 2014; Klabunde et al., 2017).

Disruptive behavior from students has become a significant issue in today's schools. This

is mainly in students who experienced an untraditional learning environment during the COVID-19 pandemic. When students are in classrooms that experience frequent disruptive behavior, they have less engagement in their learning and lower academic achievement (Shinn et al., 1987). Additionally, teachers who have to control classroom behavior frequently experience higher amounts of stress and burnout and are challenged with meeting the academic needs of the classroom (Smith & Smith, 2006). Educators need to use effective classroom management approaches to establish a learning environment that is positive and productive for all learners and limits their own stress and burnout. Students who have experienced ACEs need help assimilating into a classroom environment. Students with high ACE scores, meaning they have experienced many ACEs, are more likely to have behavior problems and experience academic failure than their peers with lower scores. Experiencing trauma can slow or prevent the development of executive functioning, which is the use of working memory and organization. These skills are necessary for students to succeed in academic environments when held responsible for their learning (Barr, 2018).

Applications of Research

Due to the prevalence of trauma exposure, the presentation of symptoms in youth and adolescents, and the health outcomes into adulthood, there is a need for trauma-informed care in schools. Being trauma-informed is understanding the prevalence of trauma and acknowledging how trauma may impact individuals. All education professionals must understand that becoming trauma-informed is not a destination that individuals arrive at. Becoming trauma-informed is similar to maintaining a garden; it must be cared for and adjusted throughout the year and revisited at the start of each year (Paradigm Shift Forward, 2021). Trauma-informed interventions in school include professional development for staff, adjustments to discipline practices, and access to programs on violence prevention and mental health resources. All

professionals in the school environment need comprehensive professional development that teaches about trauma-exposed children, resiliency, mental health topics, and prevention strategies ("Position statement - trauma-informed care," n.d.). As part of being a trauma-informed institution, organizations and individuals need to be trauma-responsive. Trauma-responsive involves the creation of a climate that recognizes trauma's impact and uses it to meet the needs of those in the organization who have been affected. Educators and other professionals should be aware that until the students' basic needs are met, there will not be learning. The four essentials of being trauma-responsive are to help students: feel safe, be connected, get regulated, and learn (Alexander & Hinrichs, 2019). Since there are gender differences in experience and response to trauma, especially during adolescent development, creating trauma-informed interventions must account for the differences to be effective.

First, in order to help students feel safe, teachers and other school staff need to shift their perspective and focus their efforts on a safe environment through the establishment of clear, predictable routines, rules, and expectations and use praise to reinforce positive behavior (Guarino & Chagnon, 2018). Staff may need to re-evaluate their discipline policies and behavior expectations that best work for their population of students. Alexander & Hinrichs (2019) states, "District safety initiatives are critical and should be a top priority, including a focus on prevention of crises, preparation for a vast array of emergencies, and plans for how to best respond using the incident command system during an actual event" (p. 119). Discipline practices should be adjusted to create an evidence-based framework, such as positive behavioral interventions and supports (PBIS). This improves the climate, culture, and safety of schools and helps students with self-awareness, emotional regulation, and the building of resilience (Center on PBIS, 2023).

Second, to help students be connected, trauma-informed educators need to create a

climate and culture that "emphasizes healthy relationships among staff members, between educators and students, among classmates" (Alexander & Hinrichs, 2019, p. 120). Additionally, all staff members that interact with students daily should be trained in how to appropriately meet the needs of all students, including, but not limited to, teachers, administrators, paraprofessionals, bus drivers, cafeteria workers, custodians, counselors, secretaries. To help students build connections, they should also be provided a curriculum on social-emotional learning, violence prevention, and mental health topics (Alexander & Hinrichs, 2019). In an educational environment, resilience is a student's ability to maintain regulation and return to normalcy following setbacks. Lew (2018) emphasizes the importance of guiding trauma-exposed students toward resilience. It is important to first teach students how to identify their stressors.

Next, to help students get regulated, "Trauma-sensitive educators understand that regulating arousal, emotion, behavior, and attention is a precursor to learning" (Alexander & Hinrichs, 2019, p. 123). According to Vassar (2018), the best way to approach regulation in the healing of trauma is the use of the 6 R's, "relational (safe), relevant (developmentally matched to the individual), repetitive (patterned), rewarding (pleasurable), rhythmic (resonant with neural patterns), and respectful (of the child, family, and culture)" (p. 3). Additionally, practicing mindfulness is repetitive and rhythmic for students to help them self-regulate before learning begins. Studies find that mindfulness can reduce the adverse effects of stress and trauma, help increase a student's engagement focus, and help with regulation and prevent behavior problems (Tatter, 2019). Lastly, Cognitive Behavioral Intervention for Trauma in Schools (CBITS) can be beneficial in meeting the needs of students exposed to trauma. CBITS is a skills-based group intervention aimed at relieving symptoms of PTSD, depression, and anxiety in students who have been exposed to trauma. While CBITS is targeted at grades K-8, it can be used in high

school with some adjustments and has been used in diverse communities (Nadeem et al., 2013).

Lastly, as part of helping students learn, some supplements to the curriculum can be focused on working memory, shifting focus, cognitive flexibility, and self-monitoring. These skills promote the ability to set and achieve goals and modify behavior and actions to keep students on track (Alexander & Hinrichs, 2019). It is essential to teach all students how to differentiate between actions, emotions, thoughts, and physical sensations while also learning how to identify, express, and healthily regulate emotions. To do this, educators must learn how the brain and these processes work, then instruct students about it developmentally and appropriately (Guarino & Chagnon, 2018). Likewise, trauma-informed practices and interventions should be used in response to individual or community-based stressors. This should include educating staff and parents about trauma, its effects, and how to help traumatized children. Following a traumatic event, Topics such as grief and coping skills should be an ongoing part of the curriculum, then more specific support should be offered when traumatic events occur (Alexander & Hinrichs, 2019).

Future Research Recommendations

Due to the myriad of gender-based outcome differences, there is a need to understand this manifestation as biological sex differences or socio-cultural norms and realities that can alter biology. The presented research results support the dire need to understand the extent of PTSD in women and other marginalized groups. Since there is an association between life experience and susceptibility to PTSD, research examining this will help professionals better understand prevention and treatment.

Additional research is also needed to analyze comorbidities with PTSD explored in some of the presented research, such as pain, autoimmune disorders, and addiction. It would help to understand each and how it relates to certain trauma types, gender, or age of exposure.

Additionally, the literature review provided various population types and touched on most trauma types. However, the prevalence of discussed trauma types in it is not a reality of the prevalence of research on each type. There are large disparities in trauma type and gender in published research. There are significantly more studies on male veterans than female sexual assault victims. Due to this disparity, it appears that PTSD is typical in those who have experienced combat but less in victims of sexual assault. This aligns with PTSD treatment availability as well, with better access to veterans compared to other trauma types (Anzalone, 2022). This research contributes to a broad understanding of PTSD amongst veterans who experience it but not in other populations. The limited research on PTSD in survivors of sexual assault shows significant differences between these two populations. However, the limited data limits understanding of the disease in the population and personalized potential treatment.

Finally, further research on female trauma survivors, in general, to better understand how the biological makeup contributes to PTSD diagnosis and manifestation. Since estrogen levels severely alter the fear response in females, high estrogen levels produce a lower fear response, whereas lower estrogen levels can heighten fear response. This can affect how females react to and recover from trauma (Glover, 2021). Further research centered on PTSD pathogenesis in female trauma survivors is needed, with consideration for hormonal level status during research procedures.

Limitations

One limitation noted in the research is related to the samples of several studies. One study was a mixed-gender sample of adults seeking emergency room treatment following a trauma. However, the sample was over two-thirds male (Rooney et al., 2022). This could skew the study's findings and trauma-related associations as there is no accurate representation of gender, and not all traumas require immediate medical treatment. Similarly, in the study conducted by

Hiscox et al. (2021), there were unequal representations of adolescent populations. There were significantly more females than males because many males in South Africa left school to begin work in adolescence. This could affect the study's findings of gender differences.

A second limitation is the possibility of skewed results. The first factor that could contribute to skewed findings is the self-report nature of many of the studies (Komarovskaya et al., 2011; Wamser-Nanney & Cherry, 2018; Gros et al., 2016). Some participants may over- or under-report their symptoms and exposure, which may be better controlled in a study conducted with a clinician or mental health professional. Also, another factor that could skew the findings is social stigmas related to specific trauma experiences. The first study that noted this was conducted in Nepal by Axinn et al. (2013). Researchers indicated that there may be an underrepresentation of both frequency and type of event. In Nepal, there is a social stigma associated with sexual assault that may have prevented participants from disclosing exposure to it (Axinn et al., 2013). Additionally, Hiscox et al. (2021) emphasized that the stigma surrounding mental health problems in South Africa and face-to-face interviews may have contributed to underreporting.

Lastly, a noted limitation of the research is the lack of research on sexual assault and violence. Some studies omitted sexual violence as a type of trauma which would severely underrepresent the overall prevalence of trauma, particularly for females (Hiscox et al., 2021). Additionally, Anzalone (2022) noted that when using numerous widely-used research search engines, there are ten times as many studies on veterans with PTSD as there are on sexual assault and PTSD. While not all veterans are male, and not all victims of sexual assault are female, the research seems to indicate otherwise. Glover (2021) also states that only 2% of existing neuroscience research on fear conditioning used female subjects in their experiments, and almost all biomedical research is done exclusively on male mice due to the female hormone cycle.

Historically, researchers believe that female behavior and symptoms can be unpredictable, so instead of studying the variations and testing women at certain phases of their cycle, they just avoid it altogether (Glover, 2021). The lack of consideration likely creates holes in knowledge of trauma exposure and outcomes.

Conclusion

Exposure to trauma, especially during childhood, can create many health and behavioral challenges. As displayed in this paper, these challenges can be unique to each gender, which can cause difficulty when providing support. With the disparity in knowledge about biological contributors to these gender differences, it can be challenging for professionals to help those who have been trauma exposed. Teachers must understand the prevalence and effects of trauma and provide resources and interventions to help combat this to guide students toward resilience.

The needed interventions include implementing a PBIS for a classroom management system to help with clear expectations, students' safety, mindfulness practices, and reflective activities. As part of an organization serving students and their families, it is important to teach and provide ways to regulate emotions and share other resources supporting families. This includes teaching healthy coping strategies and developing connections with all students, especially those marginalized, disenfranchised, or maltreated. This group of students requires extensive efforts to avoid devastation (Perry, 2020). CBITS is an additional intervention schools can provide to help students build resilience and achieve academic success. Schools should prioritize mental health resources by implementing these interventions to best support students and their families.

This paper aimed to answer the research question: "How do exposure and outcomes differ by gender in trauma-exposed populations?" Through a review of the literature, four themes were found to have differences by gender. These are the prevalence of trauma, mental health

outcomes, effects on behavior, and physical health differences. In regard to prevalence, men experience more witnessed and natural traumas, and women experience more interpersonal trauma, particularly sexual assault (Gwadz et al., 2007). The mental health and behavior differences include females experiencing higher rates of PTSD and internalizing symptoms such as anxiety, depression, and other somatic problems, whereas males exhibit more externalizing symptoms such as anger, impulsivity, and inattention (Horesh et al., 2015; Hanson et al., 2008; Price et al., 2013). For coping mechanisms, males tend to lean towards avoidance and substance use, whereas females seek social support and use emotion-focused coping strategies (Cherewick et al., 2015). Physically, there are additional notable differences as females are more likely to suffer from pain or be diagnosed with an autoimmune disorder (Meltzer-Brody et al., 2007). Lastly, cycling estrogen levels and polymorphism in the PACAP receptor gene ADCYAP1R1 are risk factors for females' increased likelihood of developing PTSD following exposure to trauma (Stevens et al., 2014). Trauma can significantly impact a range of outcomes; with each gender having different experiences, proper intervention in school can be the key to building resilience to aid in recovery. Perry (2021) reminds educators not to underestimate their abilities to help students regulate, and then once they are regulated, share their knowledge and resources with others to create a trauma-informed environment.

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