

PREDICTING OUTCOMES OF TRAUMA-EXPOSED WOMEN IN SUBSTANCE
USE TREATMENT PROGRAMS

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ABSTRACT

PREDICTING OUTCOMES OF TRAUMA-EXPOSED WOMEN IN SUBSTANCE USE TREATMENT PORGRAMS

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Previous research has found various predictors for substance use treatment outcomes, such as relapse and re-entry into treatment. However, there is a distinct gap in the research on treatment outcomes for women. While gender has not been found to be a predictor in and of itself of treatment outcomes, there are distinct differences between predictors for outcomes of men and women. It is also mixed in terms of what factors are indicative of negative or positive outcomes and what is considered effective treatment. Similarly to gender, too little research has been done to efficiently investigate trauma and its role in substance use treatment and it is mixed in terms of whether treating trauma or other mental health issues is effective in substance use treatment. Another issue in the current research is its variability in what trauma is investigated (i.e. revictimization, polyvictimization, single trauma, etc.). The current study was investigated using 3, 078 women in The Comprehensive Addiction and Treatment Outcomes (CATOR) system. Thus, the present study seeks to examine the role of trauma itself, polyvictimization, and revictimization, on treatment outcomes.

CHAPTER ONE: INTRODUCTION

Substance use is common in the general population, particularly legal drugs such as alcohol, nicotine, and in some states, marijuana. This has widespread consequences, such as criminal activity, traffic death rates, and personal relationship strain. Unlike casual or recreational substance use, Substance Use Disorders (SUDs) involve changes in brain circuitry and pathological use, which contributes to the development of addiction. This is associated with impaired control, social impairment, and risky use (American Psychiatric Association, 2013; Chilcoat & Beslau, 1998). In 2014, 8.1% of the population, ages 12 and older, met criteria for a Substance Use Disorder (Substance Abuse and Mental Health Services Administration, 2014). Thus, there is a significant need for treatment services for these individuals. The reality, however, is that the majority of those in need of help with substance misuse do not seek treatment. In 2009, only 11.2 % of those with an identified Substance Use Disorder received services at a specialized treatment center (National Institute on Drug Abuse, 2012). For those who seek treatment, relapse is still a common phenomenon: 40 to 60% percent of patients do not remain in remission following discharge from a given treatment program (NIH, 2012). It is even more difficult for those who have a co-occurring mental health disorder, particularly those with Post Traumatic Stress Disorder (PTSD) and trauma symptoms, to remain in remission following treatment. This is likely due to negative intrapersonal concerns, such as anger and depression and cues for physiological arousal (Norman., Tate, Anderson, & Brown, 2007). In 2014, approximately 39% of those with a Substance Use Disorder had a co-occurring mental health disorder, (SAMHSA, 2014). Women with Substance Use Disorders are especially more likely to have PTSD, to have previously experienced trauma, or have ongoing trauma than men (Hecksher & Hesse,2009).

They face many of the same barriers as others in substance use treatment, albeit more pervasively: financial reasons, interpersonal relationships, society's view on addiction and the stigma associated with women who use substances (Hecksher & Hesse, 2009). In addition, women are more likely to experience adverse outcomes from substance misuse such as rapid relapse, as well as medical and mental health problem severity (Choo, et al., 2014; Piazza, Vrbka, & Yeager, 1989; Randall, et al., 1999). Historically, substance use treatment has been male-centric. There has been much debate in the literature as to whether current modalities are effective for the female population (Timko, Moos, & Finney, 2016; Gerstein & Johnson, 2000; Grella, Scott, Foss, Joshi, & Hser, 2003). Trauma has been widely investigated in the literature as it relates to substance use disorder development and treatment. There are clear associations between childhood trauma and substance misuse, as well as adulthood trauma and substance misuse (Galaif, Stein, Newcomb, & Bernstein, 2001; McKay, Lynch, Pettinati, & Shepard, 2003). Many studies have investigated different types of trauma, primarily physical and sexual victimization. Those who have experienced childhood trauma are likely to experience adulthood trauma (Afifi, et al., 2009). Both physical and sexual trauma are associated with negative substance use treatment outcomes, such as relapse and poorer treatment retention (Brady, Back, & Coffey, 2004; Jacobsen, Southwick, & Kosten, 2001; Simpson, 1979). Emotional trauma has been investigated in the substance use literature as well, albeit not as thoroughly (Kuksis, Di Prospero, Hawken, & Finch, 2017; Scheidell, et al., 2018; Weiss, et al., 2018). One study found in a sample of 132 participants, a correlation between addiction severity and emotional trauma severity and PTSD symptomology (Kuksis, et al., 2017). The present study aims to provide further insight into predictors of substance use treatment outcomes, particularly as it relates to women and

those who have experienced trauma, as well as discerning the effect of age and trauma type on these outcomes.

CHAPTER TWO: LITERATURE REVIEW

Substance Use Treatment

Substance Use Disorders are related to habitual and compulsive use (Cooper, Frone, Russel, & Mudar, 1995; Kuntsche, Knibbe, Engels, & Gmel, 2010). Development of SUDs and motivations for substance misuse are related to both positive and negative reinforcement: pleasure seeking and relief from other issues (Cooper, et al., 1995; Verheul, van den Brink, & Geerlings, 1993). Substance use can be used as a coping strategy to deal with problems, which results in dependent and problematic use (Folkman & Lazarus, 1988; Wong, et al., 2013). One study investigated the differences in common coping strategies among patients with SUDs with co-occurring mental health diagnoses, such as avoidant coping, palliative coping (i.e. breathing exercises, relaxation techniques), passive coping, active problem solving, and socialization (Kronenberg, Goossens, Busschback, Achterberg, & van den Brink, 2015). Avoidant coping, or disengagement coping, is an adverse coping strategy in which substances are used to avoid dealing with other stressors or issues in a person's life and is associated with negative treatment outcomes (Blomqvist, 1999; Folkman & Lazarus, 1988; Hasking, Lyvers, & Carlopio, 2011; Kronenberg, et al., 2015). Palliative coping is a strategy in which substances are used to feel better about problems. Passive coping is associated with rumination and retreating from problems. Positive coping strategies for dealing with SUDs are active problem solving and socialization, or seeking help from others (Kronenberg, et al., 2015). Thus, substance use can itself be a coping strategy that results in maladaptive behaviors and substance misuse, precipitating a need for treatment.

The goal of substance use treatment is to achieve abstinence or at a minimum reduce substance use and its adverse effects, such as poor personal health, interpersonal relationships, and overall functioning. There is some inconsistency in how to define remission in terms of substance use itself. Historically, abstinence has been the primary SUD treatment goal (Mignon, 2015). Some research has indicated that "controlled drinking" or drug moderation management, in which problem use can be reduced and social use is made possible, may be effective for some with SUDs (Heather & Dawes, 2005). For milder cases, or those without criteria indicating a more chronic condition, moderation may be a logical initial goal for treatment. However, abstinence is still the standard for most SUD treatment programs and is most appropriate for those with indications of a chronic condition (Kilpatrick, et al., 1978; Kopak, Proctor, & Hoffmann, 2014). Thus, treatment goals are not the same for every individual with a SUD.

Level of Treatment

There are many types of substance use treatment. There is acute treatment, such as detoxification, which focuses on the short-term goal of removing toxins from substances in the bloodstream and overcoming possible medical complications through monitoring the individuals' conditions as they recover from acute use. This treatment often occurs in hospitals. Medical detoxification involves trained staff who monitor this process to avoid complications, such as seizures, during detoxification. This treatment is especially helpful for those who have been using substances for an extended period of time or have engaged in excessive use (Mignon, 2015). There are many risk factors associated with unsupervised detoxification. For example, immediate withdrawal for severe and or long-term use, without proper monitoring and medical treatment, is associated with high mortality rates (Mignon,

2015). Withdrawal does not always cause severe symptoms and is different across each substance. For example, heroin withdrawal is typically much more severe than cannabis withdrawal (Darke, Larney, & Farrell, 2017; Rogerson & Jacups, 2016). On the other hand, withdrawal from alcohol can be more dangerous or life threatening than withdrawal from heroin or other opiates (Trevisan, Boutros, Petrakis, & Krystal, 1998).

Another level of acute treatment is inpatient, or residential. Detoxification is often a part of this treatment. However, the primary focus is not the physical withdrawal, but rather “rehabilitation” from the psychological dependence and adverse behaviors resulting from substance use (Mignon, 2015). This treatment typically lasts about a month, though it can be longer (McNeese-Smith, Faivre, Grauvogi, Warda, & Kurzbard, 2014). Inpatient treatment is often associated with more severe SUDs, previous suicidal ideation and attempt history, and is typically much more intensive than outpatient or community treatment (Budde, Rounsaville, & Bryant, 1992; Manhapra, Stefanovics, & Rosenheck, 2015). Positive outcomes are associated with inpatient treatment, such as self-efficacy, effective coping strategies, participation in self- help groups, and abstinence. However, those in inpatient treatment who struggle with heroin and opioid misuse are at a higher risk of overdose, in many cases due to loss of tolerance (Schuman- Olivier, Greene, Bergman, & Kelly, 2014; Strang, et al., 2003). In recent years, medication assisted treatment (MAT) has become more prevalent, with some research suggesting that medications such as methadone, buprenorphine, and naltrexone are associated with better treatment outcomes in conjunction with other treatment such as outpatient care, despite some stigma surrounding the practice (Desmarais, et al., 2016; Littrell, 2017; Mohlman, Tanzman, Finison, Pinette, & Jones, 2016; NIH, 2016; Robinson & Adinoff, 2018). MAT is also used in treating the chronic use and withdrawal symptoms of other substances, such as

alcohol with the aid of the medications such as naltrexone, Acamprosate, and disulfiram (Desmarais, et al., 2016; Stein, et al., 2017).

The last main level of substance use treatment is outpatient. It is the most commonly used, as it is less time-constrictive and easier to utilize for those with limited resources and who maintain employment (Mignon, 2015). It is typically much longer than inpatient, usually lasting between 60-120 days (McNeese-Smith, et al., 2014) Self-help groups, such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA), are support systems led by those in recovery that can improve treatment outcomes following treatment (Hoffmann, Harrison & Belille, 1983; Zywiak, Hoffmann, & Floyd, 1999). Attendance to self-help groups such as AA are associated with positive outcomes, such as treatment satisfaction, lowered risk of relapse, decreased mental health symptomology, self-efficacy, effective coping skills, and positive social support (Kendra, Weingardt, Cucciare, & Timko, 2015; Walton, Blow, & Booth, 2001). Additionally, engaging in treatment aftercare has also been associated with positive outcomes (Harris, Humphreys, Bowe, Kivlahan, & Finney, 2009; McLellan, et al., 2005b; Schaefer, Cronkite, & Ingudomnukul, 2004).

Predictors of Treatment Outcomes

There are many correlates and predictors of substance use treatment outcomes. Treatment retention is associated with completion and other positive outcomes, such as long-term abstinence (Cunningham, 2005). Unfortunately, an overwhelming majority of those with substance use issues do not seek treatment (Burton & Williamson, 1995; Cunningham, 2005; Cunningham & Breslin, 2004). One national survey collected data from 5,730 people in the general population with a DSM-IV categorized Alcohol Abuse Disorder or Alcohol Dependence Disorder. Less than 13% of those who responded had ever sought

any type of substance use treatment, including self-help groups, emergency room visits, and medical doctor visits. Those who did engage in substance use treatment reported higher abstinence rates as well as lower binge-drinking rates than most of the sample that had not. (Cunningham, 2005). Common factors for those who do not seek treatment are financial limitations, inability to access care, stigma associated with substance use, lack of readiness to address addiction, and lack of prioritization of treatment (Ali, Teich, & Mutter, 2016).

Another predictor of positive outcomes is length of treatment: longer participation is associated with lowered risk of relapse (Condelli & Hubbard, 1994; Hubbard, Craddock, & Anderson, 2003). Admission to SUD treatment, however, is not predictive of positive outcomes. The rate of patient drop-out from SUD treatment is high as well as the risk of relapse (Laudet, 2003; Simpson, 1979). Prematurely leaving treatment elevates the risk of relapse (Gordon, et al., 2009) as well as mortality rates (Decker, Peglow, Samples, & Cunningham, 2017).

There are many common factors related to negative treatment outcomes. For example, some personality traits are indicative of poor treatment outcomes. Research suggests that high impulsivity prior to admission to treatment is associated with poor treatment retention and post-treatment abstinence (Loree, Lundahl, & Ledgerwood, 2015). Studies on the Big Five personality traits (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) in substance use treatment clients indicate that impulsivity is associated with substance use dependence and chronic use, which may explain why these individuals are more likely to experience adverse treatment outcomes (Delic, Kajdiž, & Pregelj, 2016; Kotov, Gamez, Schmidt, & Watson, 2010; Lackner, Unterrainer, & Neubauer, 2013). Also, it is

common for those who experienced more adverse outcomes from SUDs to enter treatment. However, participation and engagement can be problematic for this population, sometimes resulting in treatment dropout (Burton & Williamson, 1995). Other common predictors of relapse include legal problems, criminal justice involvement, homelessness, younger age, family stability, low socio-economic status, lack of social support, unemployment, and SUD severity (Dobkins, Civita, Paraherakis, & Gill, 2002; Flannagan & Briggs, 2015; Harrison & Asche, 1999; Kopak, Haugh, & Hoffmann, 2016a; Kopak, Hoffmann, & Proctor, 2015; Kopak, et al., 2016b; Van Straaten, et al., 2016). Comorbid disorders, polysubstance use, and psychiatric hospitalizations are also common predictors of relapse and treatment drop out (Branson, Clemmy, Harrell, Subramaniam, & Geetha 2012; Decker, et al., 2017; Kreyenbuhl, Nossel, & Dixon, 2009; Ullman, Najdowski, & Filipas, 2009). In addition, monitoring those who have completed treatment is especially important for those with a chronic history of severe SUDs, as they may always be at a higher risk of relapse without proper support (Humphreys & Tucker, 2002).

Moreover, there are also predictors of positive treatment outcomes. Some studies found that age is a predictor of successful treatment outcomes; older SUD patients are more likely to be successful than younger SUD patients (Brennan, Nichol, & Moos, 2003; Kopak, Hurt, Proctor, & Hoffmann, 2016c). Another predictor of retention and long-term remission is positive social support (Dobkins, et al., 2002). Marriages and long-term relationships are associated with positive treatment outcomes (Beattie, 2001; Heinz, Wu, Witkiewitz, Epstein, & Preston, 2009; Kopak, et al., 2015). Employment is also a positive indicator of successful treatment outcomes (Sahker, Acion, & Arndt, 2015; Wickizer, et al., 1994). In essence, there are many well-known demographic predictors of treatment outcomes.

Treatment Challenges and Barriers

To ascertain treatment outcomes for those who have undergone substance use treatment, providers follow up with patients following completion. However, research has indicated that standard follow-up monitoring procedures may not be effective in both ascertaining accurate information and providing additional assistance for these individuals. This procedure is often performed by clinical staff contacting former patients at 1 month, 6 month, and or 12 month intervals following treatment (Dobkins, et al., 2002; McNeese-Smith, et al., 2014; Schuman-Olivier, et al., 2014). One factor that may impact the efficacy of this process is a multitude of complicating, outside factors that cannot be controlled for as well as the financial cost and need for resources, such as trained clinical staff (McLellan, McKay, Forman, Cacciola, & Kemp, 2004). Furthermore, most follow-ups after treatment completion are based on self-report. There are conflicting results in the literature regarding the reliability of self-reports, with some findings indicating that they are (Calhoun, et al., 2000; Darke, 1998), and some indicating that they are not (Timko, et al., 2016). One study found that self-reports are more reliable and more consistent with others' reports of the individual when the questions are more concrete, and the experiences and events are more memorable (Hoffmann & Ninoneuvo, 1994).

In contrast, mutual-help groups such as AA and NA are considered to be effective monitoring treatment for those who have completed treatment. They also encourage seeking formal treatment for those with no previous treatment history (Hodges, Markward, Keele, & Evans, 2003; McLellan, et al., 2004; Weisner, Delucchi, Matzger, & Schmidt, 2003a; Weisner, Matzger, & Kaskutas, 2003b). Although treatment is associated with positive outcomes, there are many barriers to treatment, both systemic and individual. Common individual predictors are poor patient motivation, lacking readiness for change,

lack of problem recognition, and no perceived need for help (Laudet, 2003; Laudet, Stanick, & Sands, 2009). Treatment satisfaction is another major obstacle to seeking treatment as well as treatment retention. One study examined the reasons that 250 patients left SUD treatment. Common reasons were dissatisfaction with clinical staff, scheduling difficulty, and unmet social service needs (Laudet, et al., 2009). The amount of time it takes for those with SUDs to receive treatment services decreases treatment satisfaction, which by proxy, also decreases utilization and effectiveness of treatment (Marsden, Ogborne, Farrell, & Rush, 2000). One way to increase treatment satisfaction is to include SUD patients in the treatment decisions. Other factors that increase satisfaction are policy clarity, peer support, and structure (Kasprow, Frisman, & Rosenheck, 1999).

Furthermore, building trust between patients and treatment providers is especially important in increasing patient satisfaction for those with severe SUDs and Mental Health Disorders (MHDs) (Bohnert, Zivin, Welsh, & Kilbourne, 2011). Some research suggests that the patient-clinician relationship is more important than treatment modalities for positive outcomes (Miller, Mee-Lee, Plum, & Hubble, 2005). The assessment of patient satisfaction is essential to increasing treatment rates, retention, and positive outcomes (Kendra, et al., 2015; Manary, Boudling, Staelin, & Glickman, 2013; Villafranca, McKeller, Trafton, & Humphreys, 2006). In essence, there are several known barriers to treatment and predictors of treatment outcomes.

Treatment Efficacy for Women

Early research found that Substance Use Disorders were exponentially more prevalent in men than women (Robins & Regier, 1991). Recent research, however, indicates that the gap in reported substance use across the genders is closing at an alarming

rate, with rates of SUDs for women rising and remaining stable for men (Grucza, Bucholz, Rice, & Bierut, 2008; Grucza, Norberg, Bucholz, & Bierut, 2008; SAMHSA, 2012). Some research suggests that men and women have similar experiences with addiction and negative outcomes from SUDs (Alterman, Randall, & McLellan, 2003; Gerstein & Johnson, 2000). However, other research suggests that women may experience more adverse effects from substance use than men (Grella, et al., 2003; Hser, Huang, Teruya, & Anglin, 2004; McCrady & Raytek, 1993). Typically, women become intoxicated with smaller quantities of alcohol than men (Walter, Gutierrez, Ramskogler, Hertling, & Lesch, 2003). Women are also more likely than men to have co-occurring mental health disorders, such as depression, anxiety, eating disorders, and trauma-related disorders, which is often associated with less positive treatment outcomes (Greenfield, et al., 2007; Pinchevsky, Wright, & Fagan, 2013).

Additionally, women with SUDs are more likely than men with SUDs to have experienced childhood and adulthood trauma (McKay, et al., 2003; Pinchevsky, et al., 2013). Women with Alcohol Use Disorders are more likely to have resulting medical issues, such as liver problems (Bradley, Badrinath, Bush, Boyd-Wickizer, & Anawalt, 1998; Walton, et al., 2001). The mortality rates for women with alcohol use are much higher than their male counterparts (Walter, et. al, 2003; Walton, et. al, 2001; United States Department of Health and Human Services & National Institute on Alcohol Abuse and Alcoholism, & NIAAA, 2015). In contrast, women with SUDs experience less exposure to substances than men, have fewer negative social influences, and may have stronger coping skills (Walton, et al., 2001).

Furthermore, there are differences in both Substance Use Disorder development and treatment outcomes between men and women (Greenfield, Back,

Lawson, & Brady, 2010). Women with SUDs are at a higher risk of the telescoping effect: shorter time intervals between first use, then risky use, then dependence, then treatment. In addition, women with SUDs have higher rates of clinical distress, severe medical and co-occurring mental health issues, and interpersonal problems. (Choo, et al., 2014; Hernandez-Avila, Rounsaville, & Kranzler, 2004; Piazza, et al., 1999). Also, compared to men, women face more treatment barriers (Greenfield, et al., 2007). Women are more likely to have less education, lower socio-economic status, more family responsibilities such as child care, custody concerns, and pregnancy, which are all indicative of poorer treatment outcomes (Bernstein, et al., 2015; Fox, Oliver, & Ellis, 2013; Hecksher & Hesse, 2009; Zilberman, Tavares, Andrade, & El- Guebaly, 2003).

In contrast to established research, marriage is not as strong of a predictor for positive outcomes for women than men; this indicates that they may receive less support from their partners than their male counterparts and that it is more likely that their spouse will leave the relationship when the woman is the substance misuser (Walitzer & Dearing, 2006). The self-in-relation theory states that relationships are very important to the psychological development and well-being of women such that women see these relationships as part of their self-concept, indicating that support from loved ones is crucial to recovery, which further indicates that the lack of support for women with SUDS is harmful to their recovery (Covington & Surrey, 1997; Manhal-Baugus, 1998). In addition, most current SUD treatment providers do not offer services many women need, such as child care and services for pregnant women (Bernstein, et al., 2015). Women are also more likely to wait for significant longer periods to enter treatment than men, which may be due to both

systemic bias and personal characteristics such as perceived passivity in women who are seeking treatment (Downey, Rosengren, & Donovan, 2003).

Despite these barriers, approximately one third of those seeking substance use treatment are women (Brady & Ashley, 2005). Women are also more likely to complete treatment than men (Kosten, Gawin, Kosten, & Rounsaville, 1993). However, women are less likely than men to seek help from a formal SUD treatment program and more likely to seek treatment from less effective providers, such as a primary care physician or solely acute medical SUD treatment; this is likely due to the stigma associated with women who have SUDs (Bernstein, et al., 2015; Hecksher & Hesse, 2009; Green, 2006) This stigma is related to the more severe social consequences women experience as compared to men (Bradley, et al., 1998).

Unfortunately, women have long been underrepresented in substance use treatment research (Timko, et al., 2016). Recent research indicates that women who complete treatment are more likely to have positive outcomes, such as long-term remission, as compared to men (Kosten, et al., 1993). However, there are concerns that the current treatment modalities are not as effective for women as they are for men. While some of the research indicates that men and women have similar treatment success rates (Gerstein & Johnson, 2000; Greenfield, et al., 2007), other studies have found that long-term posttreatment outcomes may differ between genders (Hser, et al., 2004; McCrady & Raytek, 1993). The literature is also mixed in terms of whether men and women have similar treatment success rates. indicating that gender may not be the best predictor of treatment outcomes. However, other secondary factors in women with SUDs have been associated with positive outcomes such as coping and resilience (Asberg & Renk, 2012; Banyard & Williams, 2007; Walton, et. al., 2000) while other have been

associated with negative outcomes such as co-occurring MHDs and psychological distress (Kranzler & Tinsley, 2004).

Like research on Substance Use Disorder development, rates, and consequences for women, there has been a historic lack of focus on specialized treatment for this population (Trepper, Nelson, McCollum, & McAvoy, 1997). In particular, previous research on women- only (WO) substance use treatment was minimal (Sugarman, et al., 2006). Recent research has found that many women report that they prefer WO treatment, as they feel that it is a more comfortable environment (Copeland & Hall, 1992; Sugarman, et. al, 2016). Also, women are typically less comfortable discussing trauma related issues in mixed-gender (MG) SUD treatment, are more likely to withdraw from group discussions, and to have adverse treatment experiences such as feelings of guilt and failure (Hodgins & El-Guebaly, 2007; Nelson-Zlupko, Dore, Kauffman, & Kaltenbach, 1996). While there have been some studies that have found no differences in treatment retention between WO treatment and MG treatment (Bride, 2001; Niv & Hser, 2007), other research has found that retention rates are higher in WO programs, particularly for those with more severe SUDs (Zilberman, et al., 2003).

In addition, women who have experienced childhood sexual trauma, are of a sexual minority, and have children are all more likely to prefer WO substance use treatment (Copeland & Hall, 1992). Women who prefer WO treatment are more likely to have had prior SUD treatment, to have more severe symptoms and adverse experiences, to be pregnant, homeless, and have either current or previous involvement in the Criminal Justice System (Grella, 1999). Further, they are more likely to have experienced recent physical trauma, especially those in inpatient treatment (Niv & Hser, 2007). Some benefits of WO

substance use treatment are higher rates of treatment completion, less perceived discrimination due to gender, and education on issues that are specific to women, such as child care, pregnancy, trauma, etc. (Copeland & Hall, 1992). For instance, one longitudinal study included 789 women, either pregnant or with children, who completed substance use treatment in California. They were in either WO or MG treatment. Treatment outcomes were followed up at 8 and 10 years after program completion. Those who received women-only treatment were less involved in the criminal justice system (Evans, Li, Pierce, & Hser, 2013). One substance use treatment program for women that found that trauma may be a moderator between outcomes and gender is Stephanie Covington's *Beyond Trauma: A Healing Journey for Women* (Ackley, 2011).

Thus, MG substance use treatment is not as effective as WO treatment for many women in recovery (Greenfeld, et al., 2007; Sugarman, et al., 2016). Despite this, only 32% of substance use treatment centers offer specialized services for women (SAMHSA, 2012). In essence, there are many established treatment barriers for women with Substance Use Disorders. However, further research is needed on SUD development, predictors of treatment outcomes, and on effective treatment modalities for this population.

Trauma and Treatment Outcomes

Co-occurring Mental Health Disorders and Substance Use Disorders are related to a higher risk of negative treatment outcomes (Kreyenbuhl, et al., 2009; Norman, et al., 2007). The American Psychological Association (APA) defines trauma as an emotional reaction to an adverse event, such as sexual assault or physical abuse (2013). Trauma often manifests in mental health symptoms that impair a persons' well-being and functioning, such as anxiety and depression, and have been associated with other issues such as eating

disorders (APA, 2013; Edman, Watson, & Patron, 2016). Trauma history and symptomology are common in those with SUDs (Giordano, et al., 2016). Some groups in treatment are at a higher risk than others for this comorbidity, such as women and homeless populations (Asberg & Renk, 2016; Flannagan & Briggs, 2015; Van Straaten, et al., 2016). Those who have experienced trauma are at a higher risk of treatment dropout and post treatment relapse (Gil-Rivas, Prause, & Grella, 2009; Simpson, 1979). In addition, those with a history of trauma are at a higher risk of severe SUD symptoms, which further increase the likelihood of adverse treatment outcomes (Brown & Anderson, 1991; Gibson & Leitenberg, 2001; Moncrieff & Farmer, 1998; Schuck & Widom, 2001). Trauma is linked to substance misuse, as those who have more adverse experiences are more likely to engage in risky behaviors and experience negative outcomes (Clark, Zyambo, Li, & Cropsey, 2014; Sharp, Peck, & Hartsfield, 2012). Substance use tends to increase when symptoms and life stressors are severe; this is related to increased reactivity to stress. (Lijffijt, Hu, & Swann, 2014).

In terms of trauma's impact on substance misuse, research suggests that craving increases when Substance Use Disorder patients are confronted with trauma, or cue-reactive craving (Banducci, Bumarski, Bonn-Miller, Patel, & Connolly, 2016; Coffey, et al., 2002; Waldrop, Back, Verduin, & Brady, 2007). This may be why many have argued that trauma should not be a focus of SUD treatment (Potthast & Catani, 2012). However, some research has indicated that trauma-focused therapy, notably from women-focused studies, can be effective and not cause adverse reactions (Coffey, Stasiewicz, Hughes, & Brimo, 2006; Hien, et al., 2010a; Najavits, Schmitz, Gotthardt, & Weiss, 2005; Toussaint, VandeMark, Bornemann, & Graeber, 2007; van Dam, Ehring, Vedel, & Emmelkamp, 2013). One theory

suggests that when hyper arousal associated with traumatic events is triggered by external events after release from treatment, relapse may occur, which suggests that addressing trauma in treatment could act as a preventative measure (Gerwe, 2010). Other studies have found that dialectical behavior therapy (DBT) can be an effective form of treatment for those with MHD and SUD comorbidity (Courbasson, Nishikawa, & Dixon, 2012; Brown & Dahlin, 2017; Lee, Cameron, & Jenner, 2015). Thus, it is unlikely that there is a global negative effect of trauma and SUD symptoms; the variability in outcomes may be due to outlying factors, such as demographics (Brown, 2003; Hofler, Gloster, & Hoyer, 2010).

Posttraumatic Stress Disorder is highly prevalent in the Substance Use Disorder population (Driessen, et al., 2008; Ouimette, Brown, & Najavits, 1998; Schäfer & Najavits, 2007). One meta-analysis study found that one-third of SUD patients in 22 different studies met criteria for PTSD (Hildebrand, Behrendt, & Hoyer, 2015) Many of these studies have veteran samples (Back, et al. 2014; Banducci, et al., 2016; Decker, et al., 2017; Ouimette, Moos, & Brown, 2003). In addition, one national epidemiologic study found that 46.4% of those with PTSD had a co-occurring SUD, (Pietrzak., Goldstein, Southwick, & Grant, 2011). Those with PTSD symptomology are less likely to develop effective strategies for coping with stress and are more likely to engage in excessive substance use, which affects their brain circuitry (Brown, 2003; Chilcoat & Breslau, 1998).

Moreover, research has indicated that substance misuse and SUD development in those with severe co-occurring MHDs, such as PTSD, is related to self-medication; this coping strategy has been associated with short-term relief from other symptoms, which results in higher rates of habitual and dysfunctional use (Chilcoat & Breslau, 1998; Khantzian, 1985; Khantzian, 1997; Miranda, Meverson, Long, Marx, & Simpson, 2002; Tronnier, 2015). One

factor that may be related to self-medication is the epigenetic influence that certain substances have. For example, nicotine and alcohol may increase reactivity to illicit substances such as cocaine; higher reactivity to substances increases the risk of substance misuse, particularly if the intent of use is to relieve mental health symptoms (Jordan & Anderson, 2016; Levine, et al., 2011). Avoidance coping has also been associated with trauma histories (Bal, Crombez, Van Oost, & Debourdeaudhuij, 2003; Kendall-Tackett, Marshall, & Ness, 2000). Research has also found that there may be a relationship between SUD development and PTSD, as those who engage in excessive substance use may engage in more risky behaviors, thus increasing the probability for exposure to traumatic events (Haller & Chassin, 2014). Unfortunately, many individuals with co-occurring trauma and SUD do not feel comfortable disclosing, due to feelings of self-blame, shame, and fear of alienation from their loved ones (Bonnar-White, Hetzel-Riggin, Diamond-Welch, & Tollini, 2018; Schumm, Koucky, & Bartel, 2014).

In addition, co-occurring PTSD and SUD diagnoses are associated with poorer treatment outcomes and barriers to treatment (Driessen, et al., 2008; López-Castro, Hu, Papini, Ruglass, & Hein, 2015; Ouitmette, et al., 1998). Those who do not meet the criteria for PTSD but have related symptoms are also at risk for adverse treatment outcomes (Norman, Tate, Anderson, & Brown, 2007). There is some research that found that PTSD symptoms of those with co-occurring SUDs negatively impacted their ability to benefit from SUD treatment (Ouitmette, et al., 1998; Schäfer & Najavits, 2007). Common risk factors for this population are low socio-economic status, feelings of guilt and shame, interpersonal problems, and avoidance coping (Vujanovic, Bonn-Miller, & Petry, 2016). Other risk factors for those with co-occurring SUDs and PTSD were poor interpersonal relationships and life

stressors (Brown, Read, & Kahler, 2003; Gil-Rivas, et al., 2009; Ouimette, Coolhart, Funderburk, Wade, & Brown, 2007; Read, Brown, & Kahler, 2004). Research suggests that craving and active discomfort is more prevalent in those with PTSD and PTSD related symptoms than others in the substance use treatment population (Kaczurkin, Asnaani, Alpert, & Foa, 2016; Kaysen, et al., 2014; Proctor, Llorca, Perez, & Hoffmann, 2016; Tripp, et al., 2015) One study found that craving in SUD-PTSD patients was related to distress, nightmares, emotional numbing, and hypervigilance (Simpson, Stappenbeck, Varra, Moore, & Kaysen, 2012).

Furthermore, some research has indicated that those with co-occurring SUDs and MHDs who are in treatment for one may experience "spillover effects" of improvement in the other domain that is not being targeted in treatment (Ramchand, Griffin, Slaughter, Almirall, & McCaffrey, 2014). However, some studies show that those with comorbid MHDs who seek substance use treatment often do not experience a reduction in symptoms for both issues (Back, Brady, Sonne, & Verduin, 2006; McCauley, Killeen, Gros, Brady, & Back, 2012). Other research has found that SUD treatment can reduce symptoms of co-occurring mental health concerns, notably PTSD and trauma (Back, et al., 2006; Coffey, et al., 2002; Gossop, Marden, & Stewart, 2006; Herzog, et al., 2016; Hien, et al., 2010b; McCauley, et al., 2012; Nosen, Littlefield, Schumacher, Stasiewicz, & Coffey, 2014). In addition, one study found that reduction in SUD symptoms preceded PTSD symptom reduction (Back, et al., 2014). Informal treatment has been associated with positive outcomes as well. Those with co-occurring MHDs, including PTSD and PTSD symptomology, benefit from mutual-help groups such as AA (Kendra, et al., 2015; Magura, 2008).

In terms of trauma prevalence, both childhood trauma and adulthood trauma are common in

SUD patients and are associated with a higher risk of treatment dropout and relapse (Brady, et al., 2004; Jacobsen, et al., 2001; Wu, Schairer, Dellor, & Grella, 2010). Women are more likely to report both sexual and physical trauma histories as compared to men (Brems, Johnson, Neal, & Freemon, 2004). Other studies have indicated that women experience both sexual and physical abuse at a higher rate than men (Brown & Anderson, 1991; Cosden, Larson, Donahue, & Nylund-Gibson, 2015). There is an abundance of research that has explored associations between childhood trauma and substance misuse. There have been several studies indicating that childhood sexual abuse (CSA) is associated with substance misuse, many of which used a female sample (Galaif, et al., 2001; Ireland, Smith, & Thornberry, 2002; Wilsnack, Vogeltanz, Klassen, & Harris, 1997). For example, one study found that females who experienced CSA are ten times more likely to report drug misuse and two times more likely to report alcohol misuse than those who had not (Briere & Runtz, 1989). Childhood physical trauma is also associated with substance misuse (Cosden, et al., 2016; Giordano, et al., 2015). In addition, there have been several studies indicating that adulthood physical trauma, such as intimate partner violence, is associated with substance misuse (Afifi, Henriksen, Asmundson, & Sareen, 2012; Low, Tiberio, Shortt, Capaldi, & Eddy, 2017). Research has also indicated that adulthood sexual trauma is related to adverse outcomes (Resnick, Walsh, Schumacher, Kilpatrick, & Acierno, 2013; Schumm, Hobfoll, & Keogh, 2004).

In contrast, there is a paucity of studies that have investigated differences across both age and type of trauma in relation to treatment outcomes. There are some studies that compare the difference in type of trauma and outcomes associated with them, such as Brems' 2004 study and Giardano's 2016 study, which both looked at physical and sexual trauma in male

and female participants. Another study investigated three different types of childhood trauma and their association with alcohol and drug dependence in a sample of 22,544 persons: sexual abuse, physical abuse, and exposure to parental domestic violence. All three types were found to be predictors of substance dependence (Fuller-Thomson, Roane, & Brennenstuhl, 2016).

There have also been studies that investigated the age at which trauma was experienced, which have indicated that those who have experienced childhood trauma are at risk of revictimization as an adult (Cannon, Bonomi, Anderson, Rivara, & Thompson, 2010; Widom, Czaja, & Dutton, 2008), thus experiencing similar negative treatment outcomes.

In essence, trauma is prevalent in those with Substance Use Disorders and is associated with negative outcomes. Polyvictimization, when a person experiences different types of trauma (e.g., physical, sexual) is also common in those who experience substance use problems (Barnes, Howell, & Miller-Graff, 2016; Voisin, 2013). Thus, it is imperative that those entering SUD treatment be screened and evaluated for trauma symptomology and trauma history as they frequently co-occur within the population and are predictive of outcomes (Ouitmette, et. al, 1998). It would be beneficial to investigate the interactions of age and type of trauma further in substance use treatment populations. Addressing trauma in SUD treatment may decrease the risk of relapse and other adverse outcomes.

The Present Study

Previous research has found various predictors for substance use treatment outcomes. There is a wealth of literature on correlates of treatment dropout and posttreatment relapse. However, there is a distinct gap in the research on treatment outcomes for women. While gender has not been found to be a predictor in and of itself of treatment outcomes, there are distinct differences between predictors for outcomes of men and women. Much of what has

been done to investigate women's needs in substance use treatment has been done very recently. It is mixed in terms of what factors are indicative of negative or positive outcomes and what is effective treatment. The majority of studies have included very few women and have almost always used mixed-gender treatment samples. This is relevant, as some research suggests that women- focused substance use treatment is more effective than mixed-gender treatment. Similarly to gender, too little research has been done to efficiently investigate trauma and its role in substance use treatment. There have also been recent studies conducted that investigated trauma- focused substance use treatment, such as Seeking Safety. However, the literature continues to be mixed in terms of whether treating trauma or other mental health issues is effective in substance use treatment. Another issue with the current research on trauma and treatment outcomes is its variability in what trauma is investigated; there has been a historic focus on childhood sexual abuse and physical abuse, but not as much on adulthood physical trauma outside of Interpersonal Violence, for example. Thus, the present study seeks to examine the role of trauma itself, polyvictimization, and revictimization on treatment outcomes.

Hypotheses

The present study explores the following hypotheses:

Hypothesis 1

Previous research has suggested that trauma history is associated with severe SUD symptomology, a predictor of negative treatment outcomes (Humphreys & Tucker, 2002; Ouimette, et al., 2003). Thus, women who have experienced physical or sexual trauma will have more negative treatment outcomes than women who have never experienced trauma: relapse and re-entry into treatment.

Hypothesis 2

Research has indicated that polyvictimization is indicative of severe SUD symptomology, which is a predictor of negative treatment outcomes (Haller & Chassin, 2014). Thus, women who have experienced polyvictimization, two different types of trauma (e.g., physical, sexual), will have more negative treatment outcomes than those who have only experienced one type of trauma.

Hypothesis 3

Research indicates that both childhood and adulthood trauma are associated with negative treatment outcomes (Brady, et al., 2004; Jacobsen, et al., 2001; Wu, et al., 2010), thereby suggesting that those who have been revictimized, exposure to trauma earlier in life and again later in life, may have worse treatment outcomes than those who have experienced it once. Thus, women who have experienced revictimization will have more negative treatment outcomes than those who have only experienced childhood trauma or adulthood trauma.

CHAPTER THREE: METHOD

Participants

Data was collected from an archival database: The Comprehensive Addiction and Treatment Outcome (CATOR) system was used for the purposes of this study. The CATOR database is the largest independent evaluation service of substance use treatment programs across the United States. The purpose of this service was to ascertain whether treatment providers were successful in helping patients remain abstinent from substance use. The wealth of information that was collected from around 40,000 patients aided researchers in finding correlates of both positive and negative treatment outcomes. This data was collected in the late 1980's to the early 1990's. There are about 4,000 female participants in the database that will be included in this study. These participants are between the ages of 18 and 65 years and are predominately white.

Demographics

Cross tabulations were conducted to determine demographic, clinical factors, and protective factors prevalence within the sample of the study. The sample was comprised of 3,078 women, with an age range of 18 to 65 and an average age of 36.7 years. Regarding race, 87.0% of the sample was white and 13.0%% identified as any other race. The majority of the sample was employed at the time of their entrance into treatment (56.8%) and the unemployed group was similar in size (43.2%). A large majority was married (76.5%), while the rest reported being single (23.5%). The overwhelming majority of the sample reported graduating high school/receiving their GED in addition to higher education (92.1%), with only 7.9% reported less than a high school/GED education. The sample was almost evenly

split in terms of having dependent children under the age of 18 in their care: 50.7% did not.

Clinical Factors

Most of the sample reported experiencing trauma, with 65.0% indicating at least one type. Of those who experienced trauma, 28.7% reported physical trauma only, 60.4% reported sexual trauma only, and 10.9% reported polyvictimization. Additionally, 30.1% reported experiencing trauma only before the age of 18, 20.1% reported experiencing trauma only after the age of 18, and 49.9% reported experiencing revictimization. Many participants reported having at least five or more positive criteria of depression (67.5%) and the remainder reported no symptomology (32.5%). In contrast, only 15.8% met criteria for a DSM-IV eating disorder diagnosis. Around 32.9% met criteria for more than one substance abuse disorder or substance dependence disorder (DSM-IV).

In terms of polysubstance use, 66% reported using 2 or more substances prior to admittance. Of those reporting use of two or more substances, 93% reported alcohol use, 45% reported cocaine use, 60% reported marijuana use, 30% reported stimulant use, and 12% reported opiate use. Recent use was determined based on whether the participants used substances in the 24 hours prior to treatment: 55.3% reported no recent use and 44.7% reported recent use. Injection was also measured based on whether participants used needles, with the majority not using needles (87.4%). Many participants reported experiencing one of more withdrawal symptoms upon admittance to treatment (51.6%). Treatment completion was higher than the national average, with 86.6% staying the full amount of time, which may be due to the programs' confidence in their efficacy, thus prompting them to join this study

Protective Factors

Of the entire sample, a large majority reported attending AA 6 months after their release from treatment (84.5%). Similarly, 62.9% reported engaging in treatment after-care 6 months after treatment. Only 32.3% reported attending other support groups besides AA 6 months after treatment.

Measures

The CATOR Intake/History/Discharge/Follow-Up Instruments

Participating substance use treatment programs' clinical staff administered the intake, history, and demographic forms to patients at intake and during the course of treatment. Trained follow-up interviewers employed by the independent organization operating the CATOR administered the follow-up form at 6 and 12 months over the telephone to former patients. This database includes question regarding demographic information, reason for treatment, diagnostic criteria, mental health concerns, and treatment outcomes. There are four items that ask about first-hand trauma. Table 1 in the appendices includes these items; the present study will explore trauma with these concrete definitions.

The variables for the trauma items are coded dichotomously as 0 "no" or 1 "yes." They were used to create trauma-groups: No Trauma, Physical Trauma Only, Sexual Trauma Only, Both Physical and Sexual Trauma (polyvictimization), Trauma before 18 only, Trauma after 18 only, and Trauma before and after 18 (revictimization). Similarly, treatment outcomes are all coded as "0" and "1." Relapse is coded as 0 for "did not relapse" and 1 for "relapsed" and Re-Entry into Treatment is coded as 0 for "did not re-enter" and 1

for “re-entered treatment.” This study investigated these outcomes at both the 6-month follow-up and the 12-month follow-up.

Other variables that were included are demographics such as age, race, employment status, marital status, welfare status, and education, as well as protective factors such as AA attendance, support group attendance, and engagement in aftercare. Many of these variables are known demographic risk factors (age, employment, having dependent children, socio-economic status, and education). Mental health symptoms and clinical distress are also addressed with the following variables: depression, eating disorders, polysubstance use, recent use prior to admission, number of days used in week prior to admission, injection, withdrawal, number of SUD diagnoses, and premature discharge from treatment. These diagnoses are under DSM-IV categorization. However, research has found that previous dependence and abuse diagnoses from the DSM-IV are compatible with the current DSM-5 diagnoses (Agrawal, Heath, & Lynskey, 2011; Boscarino, Rustails, Hoffman, Han, Erlich, & Ross, 2011; Kopak, Metz, & Hoffmann, 2014; Kopak, Proctor, & Hoffmann, 2016b; Proctor, Kopak, & Hoffmann, 2012).

Statistical Analyses

Cross-tabulations of independent variables (i.e. demographics, protective factors, clinical factors) were done to show the results in a way that is more communicable than other analyses. This is important, as the implications of the results will be more effectively communicated to treatment providers. In this way, treatment providers can provide better informed services. To address the hypotheses, Chi-square Tests of Independences were conducted to compare group differences. Chi-Square tests were done to determine whether

hypothesis, as to whether trauma itself is associated with negative treatment outcomes

This was done by condensing the trauma groups Physical Trauma only, Sexual Trauma only, and Both Physical and Sexual Trauma into one group and comparing it to the No Trauma group to measure whether trauma is associated with each of the treatment outcome variables. The next series of Chi-Square tests address the second hypothesis, as to whether polyvictimization (Both Physical and Sexual Trauma group) is associated with worse treatment outcomes than a single type of trauma. This was done by comparing the trauma groups Physical Trauma only, Sexual Trauma only, and Both Physical and Sexual Trauma to measure whether polyvictimization is associated with each of the treatment outcome variables. The third series of Chi-Square tests address the third hypothesis, as to whether revictimization (Trauma before and after 18) is associated with worse treatment outcomes. This was done by comparing the trauma groups Trauma before 18 only, Trauma after 18 only, and Trauma before and after 18 to measure whether revictimization is associated with each of the treatment outcome variables. These analyses were done for both the 6 month follow-up and the 12 month follow-up.

Logistical regressions were also conducted to address the first hypothesis, in that trauma is predictive of treatment outcomes. This was done at the 6 month follow-up and the 12 month follow-up. This will determine the strength of trauma as a predictor of each treatment outcome variable against known predictors of treatment outcomes: age, marital status, employment, socio-economic status, education, having dependent children, co-occurring mental health diagnoses, polysubstance use, recent use prior to admission, number of days used in week prior to admission, injection, withdrawal, number of SUD diagnoses, and premature discharge from treatment.

CHAPTER FOUR: RESULTS

Hypothesis 1

To determine whether women who have experienced physical and/or sexual trauma will have more negative treatment outcomes (relapse and re-entry into treatment) than women who have never experienced trauma, Chi Square Tests of Independence were conducted to look at treatment outcome differences between the “Trauma” group and the “No Trauma” group. Both relapse and treatment re-entry at 6 months were investigated. The percentage of participants that relapsed did not differ by whether they had reported experiencing trauma, $X^2(1, N= 3, 078) = 5.69, p = 0.017$. See Table 2 in appendix. The percentage of participants that re- entered treatment did not differ by whether they had reported experiencing trauma, $X^2(1, N= 3,078) = 4.91, p = 0.027$. See Table 3 in appendix. Both relapse and treatment re-entry at 12 months were also investigated. The percentage of participants that relapsed did not differ by whether they had reported experiencing trauma, $X^2(1, N= 3, 078) = 10.56, p = 0.001$. See Table 4 in appendix. The percentage of participants that re-entered treatment did not differ by whether they had experienced trauma, $X^2(1, N= 3, 078) = 5.94, p = 0.015$. See Table 5 in appendix.

To determine the strength of trauma as a predictive factor for treatment outcomes, logistical regressions were conducted, which included demographic risk factors, clinical risk factors, and protective factors at 6 and 12 months. It is important to note that many of the demographic risk factors are lopsided, such as ethnicity and education. For regressions at 12 months, we included both treatment outcomes as variables. At 6 months, trauma was not predictive of relapse, OR = 1.01, 95% C.I. = 0.92-1.30. See Table 6 in appendix. Age, ethnicity, recent use, injection, and treatment completion were significant predictors. At 6

months, trauma was not predictive of re-entry into treatment, OR = 1.10, 95% C.I. = 0.81-1.47. Ethnicity injection, and the constant variable were significant predictors. See Table 7 in appendix. At 12 months, trauma approached significant as a predictive factor of relapse, OR= 1.20, 95% C.I. = 1.01-1.43. See Table 8 in appendix. Employment, marriage status, depression, recent use, injection, AA attendance, support group attendance, after-care, and re-entry into treatment were significant predictors. At 12 months, trauma was not predictive of re-entry into treatment, OR = 1.02, 95% C.I. = 0.73-1.41. See Table 9 in appendix. Age, ethnicity, employment, marriage status, withdrawal, treatment completion, support group attendance, and relapse were significant predictors. Based on these results, trauma does not appear to be a strong predictive factor in treatment outcomes such as relapse and re-entry into treatment.

Hypothesis 2

To determine whether women who have experienced both physical and sexual trauma (polyvictimization) will have more negative treatment outcomes (relapse and re-entry into treatment) than women who have experienced only physical or only sexual trauma, Chi Square Tests of Independence were conducted to look at treatment outcome differences between the “Single Trauma” group and the “Both Physical and Sexual Trauma” group. The “Both Physical and Sexual Trauma” group was much smaller than the “Single Trauma” group, resulting in lopsided groups. Both relapse and treatment re-entry at 6 months were investigated. The percentage of participants that relapsed did not differ by whether they experienced polyvictimization, $X^2(1, N= 3, 078) = 2.9, p = 0.089$. See table 10 in appendix. The percentage of participants that re-entered treatment did not differ by whether they experienced polyvictimization, $X^2(1, N= 3, 078)=1.1, p = 0.294$. See Table 11

The percentage of participants that relapsed did significantly differ by whether they experienced polyvictimization: those who experienced only one type of trauma Those who experienced only one type of trauma were more likely to relapse, $\chi^2(1, N= 3,078) = 4.83, p = 0.028$. See Table 12 in appendix. The percentage of participants that re- entered treatment did not differ by whether they experienced polyvictimization, $\chi^2(1, N= 3,078) = 1.53, p = 0.216$. See Table 13 in appendix.

Hypothesis 3

To determine whether women who have experienced trauma more than once (revictimization) will have more negative treatment outcomes (relapse and re-entry into treatment) than women who have experienced only childhood or adulthood trauma, Chi Square Tests of Independence were conducted to look at treatment outcome differences between the “Single Trauma” group and the “Both Physical and Sexual Trauma” group. Both relapse and treatment re-entry at 6 months were investigated. The percentage of participants that relapsed did not differ by whether they experienced revictimization, $\chi^2(1, N= 3, 078) = 2.02, p = 0.155$. See Table 14 in appendix. The percentage of participants that re-entered treatment did not differ by whether they experienced revictimization, $\chi^2(1, N= 3, 078) = 2.46, p = 0.117$. See Table 15 in appendix. Both relapse and treatment re-entry at 12 months were also investigated. The percentage of participants that relapsed did significantly differ by whether they experienced revictimization: those who experienced trauma before and after 18 were more likely to relapse, $\chi^2(1, N= 3, 078) = 6.36, p = 0.012$. See Table 16 in appendix. The percentage of participants that re-entered treatment did significantly differ by whether they experienced revictimization: those who experienced trauma before and after 18 were more likely to re-enter treatment, $\chi^2(1, N= 3,078) = 5.94, p = 0.015$. See 17 in appendix.

CHAPTER FIVE: DISCUSSION

The results of this study indicate that while trauma in and of itself may not be a strong predictor of relapse and re-entry into treatment, there is merit in identifying it in the course of treatment. To test the first hypothesis, group differences and the strength of trauma as a predictor were investigated. Chi Square Tests of Independence determined that there were no significant differences between participants who experienced trauma and those who had not in terms of relapse and re-entry into treatment at both 6 and 12 months after initial treatment. Logistical Regressions determined that trauma was not predictive of either treatment outcomes at 6 months. However, trauma approached significance as a predictor for relapse at 12 months. The literature on trauma and its impact on substance use treatment is mixed in terms of its relevance and on whether it should be addressed during treatment. However, it is important to note that trauma approaching significance for relapse at 12 months may indicate that it has a long-term impact on substance use; while 6 and 12 months post treatment results are commonly used and are a strong indicator of treatment success, significance at 12 months can indicate a stronger connection than significance at 6 months (Buckheit, Moskal, Spinola, Maisto, & Chung, 2018; Proctor, Wainwright, & Herschman, 2017). It is also important to note that while 12 month outcomes may be stronger than 6 months, it is more difficult to parse out whether relapse or re-entry into treatment is related to the efficacy of the first treatment or if it is another factor (Ham, Compton, Blanco, & Colpe, 2017; Sayegh, Huey, Zara, & Jhaveri, 2017). Trauma was not a significant predictor for re-entry into treatment at 12 months.

While there were no significant group differences when trauma alone was investigated, there were some when testing the second hypothesis: polyvictimization and its impact on treatment outcomes. At 6 months, there were no significant differences for either relapse or

trauma. However, at 12 months, there was a disparity in relapse between those who had only experienced one type of trauma, either physical or sexual, and those who had experienced polyvictimization. While the original hypothesis posited that the polyvictimization would likely indicate more negative outcomes than those who had experienced a single type of trauma, the Chi Square Tests of Independence indicate that the opposite is true. Those who belonged to the single trauma group were more likely to relapse than those who had experienced more than one type. This may be due to greater resilience fostered in those who have experienced polyvictimization than those who have only experienced one type of trauma (Wolfe, 2018). Additionally, those who had experienced multiple traumas may be more likely to have already sought mental health treatment prior to their intake, depending on the severity of the trauma (Moncrieff & Farmer, 1998; Schuck & Widom, 2001). There were no significant differences in re-entry to treatment at 12 months.

To test the third hypothesis, that revictimization would be more associated with relapse and re-entry into treatment, Chi Square Tests of Independence were conducted. Similarly to the second hypothesis testing, there were no significant group differences in treatment outcomes between those who had experienced trauma before 18 or after 18 and those who had experienced revictimization, or both childhood and adulthood trauma. At 12 months, however, there were significant differences in both relapse and re-entry into treatment. For both outcomes, those who had experienced revictimization were more likely to experience them than those who had not. This is consistent with results from previous literature (Schumm, et al., 2004; Ullman, et al., 2009). Thus, the 12 month outcomes were consistent with the third hypothesis.

Each statistically significant finding was found at 12 months following treatment, which indicates that these findings are reflective of longer term outcomes. Additionally, there were

significant findings or, for the first hypothesis, approaching significance findings when addressing relapse for all three hypotheses, which indicates a relationship with trauma and relapse as well as problem use.

Limitations

This database is over 30 years old, which suggests that substance use trends, methodology of treatment, the demographics of the participants, and many other factors may not reflect the current substance use treatment population. Additionally, there were only four questions that asked about sexual and physical trauma that defined the abuse in very narrow terms. Emotional trauma was not accounted for. These questions only asked whether abuse had occurred and did not specify the severity of trauma, the actual number of times that the abuse happened, and did not include items about the symptomology of PTSD or any other trauma-related disorder that participants may have met criterion for. Therefore, polyvictimization could only be measured by combining sexual and physical trauma data, with the absence of other types of trauma, such as emotional and verbal. Also, revictimization was defined by whether a participant experienced trauma before and after 18, which leaves gaps in the data such as: at what exact age did the trauma occur? Was it a singular incident or did it continue for days, weeks, months, years? Or did it occur once and then years later? The age of 18 may be considered an arbitrary line between childhood and adulthood trauma, especially for those who may have experienced trauma once at 18 and then again the following year. Additionally, while participants may not have reported trauma, it is extremely likely that the “no trauma” group did in fact experience trauma, which likely impacted the results. In this sense, this study can only offer rudimentary information on the nuances of trauma and its impact on treatment. However,

the large sample size does give the study ample effect size and power, thus suggesting that its results may still be applicable.

This study was conducted using data from substance use treatment programs that participated in the hopes of gaining something from its results, such as government funds and acknowledgement of their efficacy. Therefore, the treatment outcomes of this study are not necessarily reflective of the average substance use treatment program. In addition, the participants of this study were predominantly white, well educated, and were able to afford the cost of inpatient care, which has consistently been higher than other levels of treatment over the past several years. Also, the average age of the women in this sample was higher than that of typical patients in substance use inpatient programs and the majority of them were employed prior to their intake. Thus, the treatment outcomes of these individuals may not necessarily be representative of women in treatment who belong to racial minority groups, have less education, are not gainfully employed, are younger, and are of a lower socio-economic status; individuals who share some of these characteristics may be at a higher risk of experiencing trauma and also not having the resources to address any mental health concerns that they may be experiencing (Gil-Rivas, et al., 2009; Vujanovic, et al., 2016). Additionally, there were some lop-sided groups within the Chi-Square and Logistical regression analyses. To address the second hypothesis, individuals who reported experiencing both sexual and physical trauma comprised a group much smaller than the single trauma group, which decreases the probability of an accurate comparison. To address the first hypothesis, other lopsided variables such as age, ethnicity, marriage, and education, which may decrease the probability of an accurate comparison.

Implications

The results of this study suggest that trauma may impact substance use treatment outcomes. In particular, revictimization may be a risk factor. While the very presence of trauma may not be a risk factor, research suggests that severity of trauma, PTSD symptomology, and other trauma-related issues may be. Additionally, while polyvictimization did not have a significant impact on treatment outcomes, it is apparent that type of trauma may be indicative of other clinical factors. Also, participants in the study who experienced polyvictimization were less likely to relapse than those who had only experienced one type of trauma, which suggests that those who have experienced multiple forms of trauma may be more likely to garner resiliency and to have addressed trauma prior to substance use treatment.

There are many conclusions for future research and for substance use treatment providers that can be drawn from the results of this study. Future studies should include a more diverse population of participants in order to promote understanding of any nuances in treatment between groups and to make the sample as representative as possible. Further, a greater effort is needed in researching treatment practices of outpatient programs and programs that are accessible to a wider group of social classes. Also, identifying trauma and trauma related information such as specifics of the trauma, PTSD symptomology, and severity should be included in both intake protocols for substance use treatment programs and for research tools for future studies. In terms of type of trauma, emotional trauma should be investigated in addition to physical and sexual. Regarding substance use treatment methodology, further research is needed on the efficacy of trauma informed, women specific substance use treatment in order to determine the strength of trauma and trauma related issues' impact on treatment outcomes.

In this way, substance use treatment providers can offer the most effective, relevant services to women who seek care.

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APPENDICES

Table 1: Trauma-Related Items		
Type of Trauma	Age of Trauma	Trauma Item
Physical	Childhood	“BEFORE you turned 18, were you hit or beaten so hard or so often that you had marks or bruises?”
Sexual	Childhood	“BEFORE you turned 18, has anyone ever forced you to have any kind of sexual intercourse or other genital contact with you against your wishes?”
Physical	Adulthood	“SINCE you were 18, did anyone hit or beat you so hard or so often that you had marks?”
Sexual	Adulthood	“SINCE you were 18, has anyone ever forced you to have any kind of sexual intercourse against your wishes?”

Table 2

Any Trauma vs. No Trauma Group Differences in Relapse at 6 Months Post-Treatment

Source	Abstained	Relapsed	Total
No Trauma	1, 077 (70.3%)	455 (29.7%)	1,532 (49.77%)
Trauma	1, 025 (66.43)	521 (33.7%)	1,546 (50.23%)
Total	68.30%	31.70%	3, 078

*Not significant

Table 3

Any Trauma vs. No Trauma Group Differences in Re-Entry to Treatment at 6 Months

Source	No Re-Entry	Re-Entry	Total
No Trauma	1,001 (92.9%)	77 (7.1%)	1,078 (35.02%)
Trauma	1,810 (90.5%)	190 (9.5%)	2,000 (64.98%)
Total	91.33%	8.67%	3, 078

*Not significant

Table 4

Any Trauma vs. No Trauma Group Differences in Relapse at 12 Months Post-Treatment

Source	Abstained	Relapsed	Total
No Trauma	785 (72.8%)	293 (27.2%)	1,078 (35.02%)
Trauma	1,343 (67.2%)	657 (32.8%)	2,000 (64.98%)
Total	69.14%	30.86%	3,078

*Not significant

Table 5

Any Trauma vs. No Trauma Group Differences in Re-Entry to Treatment at 12 Months

Source	No Re-Entry	Re-Entry	Total
No Trauma	1,439(93.9%)	93 (6.1%)	1,532 (49.77%)
Trauma	1,417(91.66%)	129 (8.34%)	1,546 (50.23%)
Total	92.78%	7.22%	3, 078

*Not significant

Table 6

Logistical Regression For Relapse at 6 Months

Source	Odds Ratio	Std. Error	Z	95% CI	95% CI
Trauma	1.09	0.1	1.01	0.92	1.30
Age*	0.99	0.01	-3.07	1.16	1.82
Ethnicity*	1.45	0.17	3.23	1.16	1.82
Employment	1.12	0.09	1.36	0.95	1.31
Marriage Status	1.08	0.12	0.73	0.87	1.342
Education	1.20	0.17	1.26	0.90	1.59
Children	0.90	0.08	-1.16	0.76	1.07
Depression	0.10	0.09	-0.02	0.84	1.19
Eating Disorders	1.12	0.12	1.03	0.90	1.39
Polysubstance	0.95	0.08	-0.35	0.79	1.18
Recent Use*	1.24	0.10	2.62	1.05	1.45
Injection*	1.55	0.19	3.68	1.23	1.97
Withdrawal	0.95	0.08	-0.59	0.81	1.12
Multiple SUDs	1.20	0.12	1.78	0.98	1.46
Treatment Completion*	1.67	0.19	4.60	1.34	2.07
Constant	0.59	0.18	-1.78	0.33	1.06

*Indicates significance

Table 7

Logistical Regression for Re-Entry to Treatment at 6 Months

Source	Odds Ratio	Std. Error	Z	95% CI	95% CI
Trauma	1.10	0.17	0.60	0.81	1.47
Age	1.00	0.01	-0.56	0.98	1.01
Ethnicity*	1.82	0.31	3.53	1.30	2.54
Employment	1.20	0.16	1.35	0.92	1.56
Marriage Status	1.15	0.20	0.82	0.82	1.62
Education	0.87	0.20	-0.61	0.56	1.36
Children	1.02	0.15	0.12	0.77	1.37
Depression	1.02	0.15	0.13	0.76	1.37
Eating Disorders	1.24	0.21	1.29	0.89	1.74
Polysubstance Use	1.15	0.21	0.75	0.81	1.64
Recent Use	1.11	0.15	0.78	0.85	1.44
Injection*	1.63	0.28	2.83	1.16	2.28
Withdrawal	1.44	0.21	2.49	1.08	1.91
Multiple SUDs	1.22	0.12	1.25	0.89	1.68
TXT Completion	2.40	0.37	5.68	1.78	3.25
Constant*	0.04	0.02	-6.40	0.01	0.11

*Indicates significance

Table 8

Logistical Regression For Relapse at 12 Months

Source	Odds Ratio	Std. Error	Z	95% CI	95% CI
Trauma**	1.20	0.11	1.98	1.01	1.43
Age*	0.98	0.01	-3.72	0.97	0.99
Ethnicity	1.05	0.13	0.39	0.83	1.33
Employment*	1.19	0.10	2.09	1.01	1.40
Marriage Status*	1.34	0.15	2.62	1.08	1.67
Education	1.15	0.17	0.96	0.86	1.54
Children	0.92	0.08	-0.89	0.78	1.10
Depression*	1.21	0.11	2.07	1.01	1.45
Eating Disorders	0.84	0.10	-1.53	0.67	1.05
Polysubstance	1.10	0.12	0.93	0.90	1.35
Recent Use*	1.47	0.12	4.63	1.25	1.73
Injection*	1.50	0.18	3.27	1.17	1.90
Withdrawal	0.92	0.08	-1.00	0.77	1.09
Multiple SUDs	1.04	0.11	0.36	0.85	1.27
Treatment Completion	1.12	0.13	0.94	0.89	1.41
Constant	1.03	0.33	0.10	0.55	1.92
AA Attendance*	0.52	0.06	-5.88	0.42	0.65
Support Group*	0.77	0.07	-2.93	0.64	0.92
After Care*	0.78	0.07	-2.83	0.66	0.93
Re-Entry to Treatment*	1.63	0.23	3.49	1.24	2.13

*Indicates significance

**Approaches significance

Table 9

Logistical Regression for Re-Entry Into Treatment at 12 Months

Source	Odds Ratio	Std. Error	Z	95% CI	95% CI
Trauma	1.02	0.17	0.10	0.73	1.41
Age*	0.98	0.01	-2.70	0.96	0.99
Ethnicity*	1.73	0.33	2.93	1.20	2.50
Employment*	1.37	0.20	2.11	1.02	1.83
Marriage Status*	0.63	0.13	-2.31	0.43	0.93
Education	0.89	0.22	-0.44	0.55	1.46
Children	0.85	0.13	-1.07	0.62	1.15
Depression	1.11	0.18	0.60	0.80	1.53
Eating Disorders	0.88	0.17	-0.67	0.59	1.29
Polysubstance	1.14	0.23	0.66	0.77	1.69
Recent Use	1.06	0.16	0.39	0.79	1.41
Injection	1.29	0.24	1.34	0.89	1.87
Withdrawal*	1.65	0.27	3.14	1.21	2.27
Multiple SUDs	1.00	0.18	0.00	0.71	1.41
Treatment Completion*	1.65	0.30	2.70	1.15	2.37
Constant	0.05	0.03	-5.22	0.02	0.15
AA Attendance	1.15	0.24	0.69	0.77	1.73
Support Group*	1.42	0.21	2.31	1.05	1.90
After Care	1.16	0.18	0.95	0.85	1.59
Relapse*	3.41	0.51	8.21	2.55	4.58

*Indicates significance

Table 10

Single Trauma vs. Polyvictimization Group Differences in Relapse at 6 Months Post-Treatment

Source	Abstained	Relapsed	Total
Single Trauma	1,198 (67.23%)	584 (32.77%)	1,782 (89.1%)
Poly Trauma	134 (61.47%)	84 (38.53%)	218 (10.9%)
Total	66.6%	33.4%	2,000

*Not significant

Table 11

Single Traumas. Polyvictimization Group Differences in Re-Entry to Treatment at 6 Months

Source	No Re-Entry	Re-Entry	Total
Single Trauma	1,617 (90.74%)	165 (9.26%)	1,782 (89.1%)
Poly Trauma	193 (88.53%)	25 (11.47%)	218 (10.9%)
Total	90.5%	9.5%	2,000

*Not significant

Table 12

Single Trauma vs. Polyvictimization Group Differences in Relapse at 12 Months Post-Treatment

Source	Abstained	Relapsed	Total
Single Trauma*	1,211 (67.96%)	571 (32.04%)	1,782 (89.1%)
Poly Trauma	132 (60.55%)	86 (39.45%)	219 (10.9%)
Total	67.15%	32.85%	2, 000

*Indicates significant difference

Table 13

Single Trauma vs. Polyvictimization Group Differences in Re-Entry to Treatment at 12 Months

Source	No Re-Entry	Re-Entry	Total
Single Trauma	1,645 (92.31%)	137 (7.69%)	1,782 (89.1%)
Poly Trauma	196 (89.91%)	22 (10.09%)	218 (10.9%)
Total	92.05%	7.95%	2,000

*Not significant

Table 14

Before/After 18vs. Revictimization Group Differences in Relapse at 6 Months Post-Treatment

Source	Abstained	Relapsed	Total
Childhood or Adulthood	683 (68.1%)	320 (31.9%)	1,003 (50.15%)
Both	649 (65.1%)	348 (34.9%)	997 (49.85%)
Total	66.6%	33.4%	2, 000

*Not significant

Table 15

Before/After 18 vs. Revictimization Group Differences in Re-Entry to Treatment at 6 Months

Source	No Re-Entry	Re-Entry	Total
Childhood or Adulthood	918(91.53%)	85(8.47%)	1,003(50.15%)
Both	892(89.47%)	105(10.53%)	997(49.85%)
Total	90.5%	9.5%	2,000

Table 16

Before/After 18vs. Revictimization Group Differences in Relapse at 12 Months Post-Treatment

Source	Abstained	Relapsed	Total
Childhood or Adulthood	700 (69.79%)	303 (30.21%)	1,003 (50.15%)
Both*	643 (64.49%)	354 (35.51%)	997 (49.85%)
Total	67.15%	32.85%	2, 000

*Indicates significant difference

Table 17

Before / After 18 vs. Revictimization Group Differences in Re-Entry to Treatment at 12 Months

Source	No Re-Entry	Re-Entry	Total
Childhood or Adulthood	938 (93.52%)	65 (6.48%)	1,003 (50.15%)
Both*	903 (90.57%)	94 (9.43%)	997 (49.85%)
Total	92.05%	7.95%	2,000

*Indicates significant difference