ACUTE CLINICAL FEATURES IN A MALE ADDICTION TREATMENT POPULATION

A DISSERTATION SUBMITTED TO THE FACULTY

OF

THE GRADUATE SCHOOL OF APPLIED AND PROFESSIONAL PSYCHOLOGY

OF

RUTGERS,

THE STATE UNIVERSITY OF NEW JERSEY

BY

TALIA Y. GENACK

IN PARTIAL FULFILLMENT OF THE

REQUIREMENTS FOR THE DEGREE

OF

DOCTOR OF PSYCHOLOGY

NEW BRUNSWICK, NEW JERSEY MAY 2017

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ABSTRACT

There is a well-established body of literature that supports that individuals with substance use disorders are at-risk of being diagnosed with a comorbid mental health disorders (Lai et al, 2015). These disorders complicate treatment and impact treatment outcomes. The purpose of this study was to explore clinical features and disorders in an adult male inpatient population. Data were collected from 45 patients in a drug and alcohol rehabilitation facility. Research utilized measures of anxiety, depression, trauma, impulsivity and coping responses in addition to a demographic questionnaire, in order to assess descriptive features and pathology in the population. Bivariate correlations were computed to assess the relationship between the clinical disorders and diagnostic features. Results indicated high associations ($p<.01$) between the clinical disorders that were measured: depression, anxiety, and trauma. In terms of clinical features that were measured, impulsivity was positively correlated ($p=<.01$) with all clinical disorders (depression, anxiety, and trauma). Finally, trauma scores were positively correlated with avoidant coping responses. Limitations to the study include sample size, correlational design, and the design of the study (one-shot as opposed to pre-posttest). Implications based on this research such as importance of assessment of mental health problems in inpatient facility and staff trainings are discussed.

Acknowledgements

I would like to express my endless gratitude to G-d for achieving this milestone in my life. It is my hope that I will be able to use the knowledge and skills that I have acquired to help make the world a better place.

Mommy and Daddy, your love and unwavering encouragement have shaped me into the person I am today and I can never thank you enough for that. I am endlessly grateful for the values you have instilled in me and your support during these years.

Mom and Dad, I feel so blessed to have such wonderful in laws. You are role models of kindness and generosity. Thank you for helping make this dream a reality.

To my wonderful **siblings, grandparents**, and **aunts and uncles**, who have been on the sidelines of this journey, thank you for your encouragement and love.

To my wonderful children, **Shana and Aryeh,** you are more precious to me than anything in this world. Thank you for giving me my most important title. I love you more than anything.

To **Jim,** thank you for being so generous with your time and for your constant encouragement throughout this dissertation process. To the wonderful faculty and staff at GSAPP, specifically **Susan,** the co-chair of this dissertation, thank you for the time and energy that you put into our education. I feel so blessed to be a part of the GSAPP family. To the wonderful **Sylvia**, thank you for your tireless energy, patience and encouragement.

It is difficult to complete this milestone in my professional journey without two special individuals **Karen Haboush** and **Kathy McLean.** Karen and Kathy embodied the spirit of GSAPP. I miss them both.

Finally, to you my wonderful husband, **Elie**. We did it! You have been on the front lines these last four and a half years and I recognize that without you none of this would have been possible. Thank you for constantly encouraging me to be the best person I can be. I feel so incredibly blessed to have you in my life.

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Introduction

There is a well-established body of literature that supports the connection between substance use disorders (SUDs) and comorbid mental health problems (Brook, Zhang, Rubenstone, Primack, Brook, 2016; Cerda, Sagdeo & Galea, 2008, Hildebrand, Behrendt & Hoyer, 2015; Kessler, Nelson, McGonagle, Edlund, Frank, Leaf, 1996; Lai, Cleary, Sitharthan, Hunt, 2015). Psychiatric comorbidity refers to individuals who have a two or more disorders either simultaneously or in sequence of one another (de Graaf, Bijil, Spikjker, 2003). Research indicates that SUDs are more prevalent among people who have comorbid mental health disorders than among those in the general population (Kessler, 2004; Rosenthal, Nunes, Le Fauve, 2012). In the United States, up to 53% of respondents in a population based mental health survey reported meeting criteria for a SUD and at least one comorbid psychiatric disorder (Regier, Farmer, Rae, Locke, Keith & Judd, 1999). Furthermore, in treatment populations, the comorbidity between mental disorders and SUDs is more common that in untreated community samples (Woodruff, Guze, Clayton, & Carr, 1973).

Substance Use and Comorbid Mental Health Disorders

There are many theories that describe the emergence and mechanisms of substance use problems. As with many psychological disorders, there are both genetic factors that predispose an individual to mental health risks in addition to various environmental factors that play a role in the expression of this predisposition. In terms of SUDs, some environmental features that have been found to be risk factors include: poor family relationships, affiliation with deviant peers, and drug accessibility (Van Ryzin, Fosco & Dishion, 2012).

There has been much research devoted to understanding the causality between psychiatric disorders and SUDs and alcohol dependence. This literature shows evidence of different pathways that link these comorbid disorders. One approach to understanding this connection is that of self-medicating in order to treat a disorder by reducing symptoms. Research on anxiety disorders indicates that using psychoactive substances can help a person reduce tension, thereby reducing anxiety (Quitkin, Rifkin, Kaplan, & Klein, 1972). In fact, on self-report measures, men who have comorbid SUDs and mood or anxiety disorders reported having an anxiety or mood disorder prior to the SUD (Kessler, Nelson, McGonagle, Edlund, Frank, Leaf, 1996). This suggests that substances, in some instances, are used to self-medicate for these other disorders or to manage the impact of symptoms. Similar results can be observed in individuals with social anxiety disorder, where social situations were found to impact a person's incident use of alcohol or substance (Robinson, Sareen, Cox, & Bolton, 2011). Self-medicating can become problematic for many reasons, using a substance to reduce or alleviate symptoms of another disorder may then indirectly cause dependence to the substance (Lai et al., 2015).

There is evidence that indicates that substance use contributes to the development of comorbid mental health disorders, or substance induced disorders. An example of this causal pathway can be observed in alcohol dependent individuals who exhibit symptoms of depression that were not observed prior to their dependency (Cerda et al., 2008). Similarly, substance use may impact an individual physiologically which then may increase their vulnerabilities to anxiety disorders (Goodwin, Fergusson, & Horwood, 2004). A study that looked at individuals from birth through age twenty-one found that frequency of cannabis use is associated with increased levels of anxiety and depression in young adults independently of other substances the individual uses (Hayatbakhsh, Najman, Jamrozik, Mamun, Alati,& Bor, 2007). Mental health

conditions that can be induced by substances can also include hallucinations and/ or paranoid delusions that are induced by stimulants (Schuckit, 2006). (There is clinical relevance to this distinction as the treatment of these secondary disorders is short-term anti-psychotic medication as opposed to treatment of schizophrenia, which entails long-term medication for these problems (Kane & Marder, 2004). These substance induced mental health conditions can have long-term or short-term effects. In individuals who are predisposed to schizophrenia substance use can trigger a secondary disorder that is like schizophrenia (Schuckit, 2006). The distinction of substance-induced disorders has important clinical implications in terms of diagnostic clarity and treatment implications.

Another theory regarding substance use and mental health disorders describes a reciprocal relationship; that the disorders contribute to the maintenance of one another. Although the mechanisms that connect specific disorders are not well developed, Cerda et al. (2008) discuss three links between comorbid disorders: indirectly causal (primary disorder increases vulnerability to secondary disorder), disorders are directly linked (similar to the substance-induced model), and lastly, a set of risk factors (environmental or genetic) may explain the connection between both disorders. This could be expressed in a multitude of ways. An individual who has a psychiatric disorder may use a substance as a form of self-medicating. Ultimately, the prolonged use of the psychoactive substance could then contribute to relapse or sustain the psychiatric disorder. Another model of reciprocal relationship between disorders could be the emergence of psychiatric issues as a result of using a substance which could then lead to a reinforced pattern of continued use of the substance. However, once a person develops abuse or dependence through regular and excessive use of alcohol or substance they will experience distressing withdrawal symptoms. During withdrawal phase the individual will have

heightened anxiety which will then cause the individual to use alcohol or the substance to reduce these symptoms.

Although this has been discussed theoretically, research has investigated certain pathways of the reciprocal relationship between psychiatric disorders and SUDs. One such example is depicted in findings that revealed that individuals who have anxiety disorders have 3.5 to 5 times higher odds of developing new alcohol dependence. The odds of developing a new anxiety disorder were approximately four times higher for individuals diagnosed previously with alcohol dependence (Kushner, Sher, Erickson, 1999). Another reciprocal relationship is that individuals who have a polydrug problem in young adulthood reported increased anxiety in adulthood (Newcomb, Vargas-Carmona & Galaif, 1999). It is interesting to note that later in life higher anxiety levels were found to be associated with fewer cocaine problems, which may be attributed to individuals with anxiety not wanting to heighten their already heightened arousal state (Newcomb et al., 1999).

Research on comorbidity between SUDs and mental health disorders illustrates a broader constellation of pathology. In fact, some researchers have called into question the current diagnostic approach of categorical classification, in favor of a dimensional approach. A dimensional diagnostic system may be a more meaningful and accurate way of capturing a patient's experience and pathology due to the high prevalence of comorbidity in the substance use population (Schoevers, Deeg, van Tilburg & Beekman, 2005).

Comorbidity and Treatment Outcomes

Individuals who struggle with SUDs and comorbid mental health disorders have been associated with poor treatment outcomes and are found to utilize high levels of health services

(Kessler, 2004). This population is also associated with more severe psychiatric symptoms, longer illness duration, less social competence, and more functionally disabled than other individuals who do not have comorbid disorders (de Graaf, Bijl, ten Have, 2004; Landheim, Bakken, Vaglum, 2007; Renouf, Kovacs, Mukerji, 1997). It is imperative for health service organizations to understand what symptomology is present in their population in order to provide better treatment and ultimately facilitate positive treatment outcomes. The above research discusses the prevalence of comorbidity and how it impacts treatment of these individuals. The current research study aims to understand acute clinical features of various symptomology in a male addiction inpatient population. The specific domains that will be investigated are: depression, anxiety, trauma, impulsivity, and coping responses.

The above listed disorders and characteristics were selected for investigation for the current research project due to the reported high prevalence in this specific facility that was investigated in this study. Similarly, the clinical features, impulsivity and coping responses, were identified by members of the staff of the rehabilitation facility as traits that impact treatment and success of members in the program.

Depression

There is much research that supports the high level of comorbidity between SUDs and internalizing disorders such as depression (Grant, Stinson, Dawson, Chou, Dufour, Compton, Pickering & Kaplan, 2004). Results from a meta-analysis revealed a strng association between drug use and major depression (Lai et al, 2015). Another meta-analysis (Davis, Uezato, Newell & Frazier, 2008) measured major depression and SUDs and baseline characteristics. Findings revealed that one-third of patients who had a diagnosis of major depressive disorder also had a

SUD. Furthermore, this comorbidity was found to yield higher risk of suicide, greater impairment on both the personal level and social level, and put these patients at risk for other psychiatric conditions.

In treatment facilities, research suggests that more than half of patients have depression. These patients often present with a greater severity of problems when commencing treatment (Leventhal, Mooney, DeLaune & Schmitz, 2006). In terms of treatment efficacy, patients who suffer from comorbid depression and SUDs have poorer outcomes from drug or alcohol treatment (Glasner-Edwards, Marinelli-Casey, Hillhouse, Ang, Mooney, Rawson, 2009, Curran, Flynn, Kirchner & Booth, 2000), as depression is a significant risk factor for continued drug use (Kosten et al., 1986). Hasin and colleagues (2002) found that patients who had substance induced depression or a history of depression prior to substance dependence were less likely to have a reduction in substance use symptoms. Findings also suggest that comorbid depression leads to a more prolonged and chronic course of SUDs. However, research also suggests that when an enhanced case management model is utilized in treatment, better outcomes can be achieved in treating both of these disorders (Striley, Nattala, Ben Abdallah, Dennis & Cottler, 2013). Drug and alcohol rehabilitation facilities should not only assess for depression in their patients but also provide treatment for this disorder in order to achieve optimal treatment outcomes.

Anxiety

Similar to depression, anxiety disorders often co-occur with substance abuse and dependence. In a meta-analysis study conducted by Lai et al. (2015), studies from 1990 until 2014 were reviewed to assess the comorbidity between various psychopathology and SUDs from

non-clinical populations. The prevalence of SUDs, anxiety and mood disorders were assessed and revealed that anxiety disorders are highly associated with illicit drug use. This is specifically found in individuals who have a lifetime drug dependence problem. This association was strongest for dependence problems (50%), indicating that these individuals suffer from frequent anxiety. All of the sixteen studies examined, excluding one, had findings that reported significant associations between any type of anxiety disorder and illicit drug abuse and dependence.

The connection between anxiety disorders and SUDs impacts the prognosis and recovery for both the disorders. A research study examined comorbid anxiety and alcohol treatment among 71 clients in an out-patient treatment facility (Burns, Teesson & O'Neil, 2005). Results indicated that subjects with comorbid anxiety disorders drank more heavily upon entering treatment and at a three month follow up drank significantly less alcohol than at baseline. However, at follow-up, the comorbid group still drank more heavily than the non-comorbid group. This study illustrates how treatment outcomes are compromised when anxiety disorders are coupled with an alcohol use disorder. Furthermore, research indicates that the presence of an anxiety disorder has a negative effect on treatment retention and engagement, yields poor treatment outcomes, and a high relapse rate (Arunogiri & Lubman, 2015). Individuals who have comorbid disorders may need an altered course of treatment or a more appropriate model of treatment to address both disorders.

Trauma

The association between trauma and SUDs has been established through many research studies. In terms of childhood trauma, individuals with SUDs have reported high rates of childhood neglect, trauma, and abuse (Buikhuisen, Bontekoe, Plas-Korenhoff, & van Buuren,

1984). These experiences put individuals at risk for developing substance abuse as well as for many other problems (Wu, Schairer, Dellor, & Grella, 2010). Research using survey responses indicated that as compared to individuals who do not use any psychoactive substance, individuals with SUDs are more likely to have experienced a traumatic event at any point in the lifespan (Kilpatrick, Ruggiero, Acierno, Saunders, Resnick & Best, 2003). Trauma can impacts a client's overall functioning and is not only associated with SUDs. Trauma is linked to suicide attempts, depression, relationship problems, along with problems in physical health (Chapman, Whitfield, Felitti, Dube, Edwards & Anda, 2004, Felitti, Anda, Nordenberg, Williamson, Spitz & Edwards, 1998).

A study was conducted to estimate the prevalence of trauma history in clinical populations (Farley, Golding, Young, Mulligan & Minkoff, 2004). Two outpatient chemical dependence clinics were included in the study, with a sample of 959 patients. Of this sample, 89% of patients reported a history of at least one a traumatic event. Results also indicated that one-third of the patients reported substance abuse disorder relapse. Results from a study assessing the association between SUD and PTSD revealed that 55% of participants reported experiencing childhood sexual abuse (Farrugia, Mills, Barrett, Back, Teesson, Baker, Sannibale, Hopwood, Rosenfeld, Merz & Brady, 2011). Patients with childhood trauma history reported having more severe substance use, earlier first intoxication age, and more extensive trauma exposure over their lifetime. Trauma informed treatment can help these patients manage both disorders by utilizing trauma informed interventions (Elliott, Bjelajac, Fallot, Markoff & Reed, 2005). When trauma is untreated or unacknowledged, the related symptoms can interfere with seeking help for problems, and impact treatment engagement, and ultimately make relapse more likely (Brown, 2000; Melchoir, Huba, Brown & Slaughter, 1999).

Impulsivity

Impulsivity is defined as a predisposition towards unplanned reactions to external or internal stimuli without regard to consequences of the reactions to other or themselves (Moeller, Dougherty & Barratt, 2001). Impulsivity is a critical component and feature of the larger executive functioning system which involves reduced sensitivity to consequences and impaired decision making (Bechara, Dolan, Denburg, Hindes, Anderson, Nathan, 2001). Executive functioning refers to the neurocognitive processes that guide behavior and development (Pentz, 2009) such as decision making, emotion regulation and impulse control (Bardo and Pentz, 2015).

Drug abusing patients have been found to have increased impulsivity as compared to control groups (King, Jones, Scheuer, 1990; Moss et al., 1990). Substance users show impairment on tasks that assess different aspects of executive functioning, including emotional control and decision-making (Barry and Petry, 2008, Bechara, 2005, Verdejo-Garcia et al., 2006), in addition to the inability to suppress responses or evaluate consequences (Cardinal, Winstanley, Robbins & Everitt, 2004).

Researchers have investigated whether impulsivity is a trait that predicts substance use or is exhibited as a result of substance use. In a study that looked at impulsivity in adolescents results indicated that impulsivity at this developmental stage predicted later problems with substance use (Verdejo-Garcia, Lawrence, Clark, 2008). In studies that looked at large clinical samples of psychiatric diagnoses and their association with impulsivity and aggression, results indicated that SUD severity is correlated with impulsivity, aggression, and anger. Impulsivity scores were found to uniquely predict the severity of the SUD, thereby enhancing the intensity of the disorder (Coccaro, Fridberg, Fanning, Grant, King, Lee, 2016). Other research indicates that

problems with executive functioning and impulsivity are commonly present after 6 months of abstinence in polysubstance users (Fernandez-Serrano, Perez-Garcia, Verdejo-Garcia, 2011). As compared to a control group, patient's in an inpatient rehabilitation facility score lower on performance-based executive functioning measures (Moreno-Lopez, Stamatakis, Farnandez-Serrano, Gomez-Rio, Rodriguez-Fernandex, Perez Garcia, Verdejo-Garcia, 2012). These results indicate that as compared to the general public substance user's exhibit problems with executive functioning. In college students, students who met criteria for substance abuse disorder also reported higher impulsivity levels **(**Patton et al, 1995). Similar results were found in a study that measured impulsivity using self-report measures in an adult sample (Allen, Moeller, Rhoades & Cherek, 1998) indicated that impulsivity scores were found to be significantly higher in individuals who had a history of substance dependence. These studies demonstrate the connection between impulsivity and substance abuse.

High levels of impulsivity, or deficits in executive functioning, impact treatment of substance related problems. Executive functioning is conceptually tied to outcomes in treatment and the maintenance of abstinences (Bates, Buckman, Nguyen, 2013). In a study conducted by Moeller and his colleagues (2001), cocaine dependent individuals were measured on levels of impulsivity and treatment outcomes. Results revealed that there was a significant positive correlation between self-reported average daily cocaine use and impulsivity scores. Interestingly, findings also showed that subjects with a high baseline level of impulsivity remained in the study for a significantly shorter period than subjects that had a lower baseline impulsivity rating. This research demonstrates that impulsivity not only predicts substance use, but it also negatively impacts treatment for these individuals. Although sustained abstinence results in partial neurocognitive recovery, more studies on this population are needed to determine whether a full

recovery can be made (Schulte, Cousijn, den Uyl, Goudriaan, van der Brink, Veltman, Schilt, Weirs, 2014). There are new ways of helping patients in treatment improve their neurocognitive functioning, for example stimulant medication, neurofeedback, and biofeedback, which will impact their behavior once completing treatment, ultimately making treatment more effective.

Coping Responses

Coping responses refer to the process of how an individual copes with stress. Coping is defined as a person's cognitive and behavioral efforts to manage internal or external demands. Lazarus and his colleagues (Folkman, Lazarus, Dunkel-Schetter, DeLongis & Gruen,1986) identified cognitive appraisal and coping as two processes that contribute to how individuals mediate a stress. Cognitive appraisal can be defined as assessing a situation to see what to benefits or risks it presents. How a person appraises a stressful situation will impact how they cope with that situation (Folkman et al., 1986).

Roth and Cohen (1986) identified and categorized reactions that a person can have to a trauma as approach or avoidance responses. An approach response can be thought of as problem focused, as it is focused on resolution to an issue. Avoidance responses, on the other hand, can be viewed as emotion focused, since the individual is managing the emotions that arise from the issue. Using psychoactive drugs or alcohol can be viewed as a strategy to avoid distress or reduce depression (Forys, McKellar &Moos, 2007). A study that investigated the relationship between different coping styles and problem behaviors among homeless and substance abusing youth revealed that those who utilized emotion oriented coping had higher levels of reported depression and anxiety (Dashora, Erdem and Slesnick, 2011). Avoiding stressful situations has

been shown to contribute to substance abuse disorders (Ouimette, Ahrens, Moos & Finney, 1997).

There has been much research that supports the connection between stress, substance abuse, and relapse. Research on mechanisms that underlie drug related disorders has indicated that stress is a strong predictor (if not one of the strongest) of relapse (Dawes et al., 2000; Kosten, Rounsaville, & Kleber, 1986). When coping responses are associated with negative emotions, relapse rates are higher (Weaver, Turner, & O'Dell, 2000). Research studying women in drug treatment facilities indicated that stress was significantly associated with drug addiction severity (Weaver, Turner, & O'Dell, 2000).

Coping responses are an important mediator in the effects of stress. Research has shown that individuals who have positive coping skills can increase their ability to manage craving and to remain abstinent despite severely stressful situations (Brown et al., 2001; Grusser et al., 2007; Rask et al., 2006). Understanding how patients respond to stressful situations may provide useful information regarding treatment progress and prognosis.

Rationale for Current Study and Research Questions

The above literature indicates that the assessment of comorbid disorders or various characteristics in patients' in inpatient drug and alcohol treatment centers are critical for patient outcomes. Knowledge of the prevalence of various disorders and characteristics of a cohort in the facility will help inform the treatment of these individuals by impacting the services the patients receive.

The current study utilized a non-experimental design to describe the unique features of a cohort of male patients in a drug and alcohol inpatient treatment facility by using self-report measures.

Research Questions and Predictions:

The current study hopes to answer the following questions:

1. What is the prevalence of depression, anxiety and trauma in the population of the treatment facility? This will be evaluated by scores from various self-report measures.
2. It is predicted that younger clients will have higher ratings of impulsivity than older patients, as there is research that suggests that adolescent ratings of impulsivity indicate severity of substance use (Verdejo-Garcia et al, 2008). (Impulsivity scores are negatively correlated with age.)
3. It is predicted that scores on the trauma measure will be positively correlated with scores of avoidant coping responses.
4. It is hypothesized that there will be a positive correlation between trauma symptoms and anxiety and between depression and anxiety.
5. It is hypothesized that across all disorders (depression, anxiety and trauma) scores will be negatively associated with week the facility, as symptomology is expected to reduce as treatment progresses (i.e. via individual and group therapy).

Methods

Participants

The sample of the current study consisted of 45 adult males in a drug and alcohol addiction treatment facility in New Jersey. Participants completed three self-report measures in

addition to a demographic questionnaire. Participants also provided consent to obtain and use previously collected data. Of the 46 participants, two did not have computer data available. For these data point the mean score was inserted so that the correlations would remain unaffected by the lack of data. Ethnicity of this sample was 15.53% African-American, 19.57% Latino, 63.04% White, and 2.17% reported as "Other" (indicating that they were mix-raced).

Setting

The setting for the research study was in an adult inpatient drug and alcohol rehabilitation facility in New Jersey. The facility consists of approximately 67 patients (60 male, 7 female). The facilities catchment area is from all over the state of New Jersey. Ages of clients range from 18 to 55 with a median age of 29.

Therapeutic Community

The facility is run in a Therapeutic Community (TC) model (Galassi, Mpofu, Athanasou, 2015). The goal of a TC is to provide patients with a drug-free environment to rebuild their lives in addition to working on social, psychological and emotional problems that can lead or contribute to substance use disorders. In this model, the community is used as a therapist and teacher in the treatment process. Another core feature of this model is a well-defined, highly structured process of self-reliant program operations. Patients who participated in the current study were at different stages of the program, as will be discussed.

Referral Process

The majority of patients are referred to the facility through the drug court system. A small percentage of patients (approximately 5%) are self-referred. After completing the program

clients are discharged to half-way houses and usually need to complete an outpatient or assisted outpatient program. There a small percentage of patients (approximately 2%) who reside in the facility and have jobs in the area in order to begin regaining financial stability.

Program Phases

When patients are admitted to the facility the initial two weeks of the program are spent in an orientation phase. During the orientation phase the patients are taught the facilities rules and creed. Patients are also tested for various psychological problems (using the Personality Assessment Inventory in addition to other measures) and educational/ learning evaluation is also conducted. Patients are assessed during this time by a multi-disciplinary team to see if they have any co-occurring disorders and require additional services. The multi-disciplinary team consists of the clinical director, a psychologist, staff therapists, a learning consultant, the staff nurse, drug counselors and at times a psychiatrist. At that meeting the patient will either be placed in the regular treatment program or in the co-occurring program. The co-occurring program allows patients to receive more services including: individual counseling, psychiatric medication, family therapy, or group programs (anxiety, trauma, anger management).

After the orientation phase, patients are placed into a three tier system. Patients are initially placed into the third tier which consists of being a part of the cleaning crew, kitchen staff or maintenance team. The second tier consists of office staff and the first tier is comprised of various administrative duties (monitoring program activities and operations). Different tiers are not only reflected in roles in the facility, but are also indicated in the patient's required dress or uniform. Moving up in the tier system is determined by the clinical staff at a weekly meeting. The decision is based on the patient's performance in their current tier, including factors such as

timeliness, cleanliness, and mood. The staff presents their decisions at a “House meeting” on Friday afternoon. If a patient is punished for breaking one of the house rules, they are sent back down the tier system and need to wear different clothing (sweat pants) to signal their lower status (called ‘GI Strings’).

There are several tracks in the facility. There is a standard long term track where patients stay for 6 months. Upon completion of the six months some clients remain in the facility as a half-way house option. Most clients are transferred to other half-way houses or intensive outpatient programs from the facility. Some clients from the Drug Court system may stay for fewer than six months, however, this is uncommon as most patients remain for the duration of the program unless they drop-out. The doors of the facility are unlocked and if a patient chooses to leave the staff calls the police (if they are within the legal system and court mandated for services) to update them on the patients behavior.

Measures

Demographic Questionnaire

In the current study, participants were asked to complete a demographic questionnaire on paper which included information such as gender, age, educational level, and ethnic/racial background.

Depression and Anxiety

The Personality Assessment inventory (PAI; Morey, 2007) is administered to all patients at the treatment facility. The PAI is a computer administered self-report assessment that contains 344 items and 22 scales. Items are answered on a four-point Likert scale. The 22 scales of the

PAI exhibit a high degree of internal consistency (test-retest correlation .80). The PAI was normed on sample of 1,000 community dwelling adults and a sample of 1,265 patients from various clinical sites. The PAI has demonstrated convergent and discriminant validity with other measures of psychopathology. Of the 22 scales, the data from the Depression scale (DEP), Anxiety scale (ANX), and Anxiety Related Disorders- Traumatic Stress (ARD-T) subscale will be examined for the current study.

Depression Scale: Reliability and Validity

The Depression scale has demonstrated reliability and validity. Reliability for this scale was found to be .93 (Morey, 2007). The Depression scale exhibited convergent and discriminant validity. This Scale was correlated with over twenty measures of depression. Large correlations were found between this measure and the Beck Depression Inventory, and MMPI Wiggins Depression Content scale. These strong correlations were expected as these measures are also used as diagnostic assessment tools. Discriminant validity can be observed in the weak relationship between Depression subscales and anxiety measures.

Anxiety Scale: Reliability and Validity

The Anxiety scale demonstrated reliability of .94 in the clinical sample (Morey, 2007). Substantial validity was identified by correlations between the Anxiety scale and other measures of this construct. More specifically, strong correlations were observed from the NEO-PI, MMPI, the State-Trait Anxiety Inventory, in addition to the Beck Anxiety Inventory (among others). Weak correlations with measures of scales of dissimilar constructs provided discriminant validity. Some of these weak correlations were observed in measures of psychasthenia, self-esteem, tension, and trust problems.

Anxiety Related Disorder: Traumatic Stress Scale: Reliability and Validity

This subscale represents various behavioral expressions of anxiety across different diagnostic disorders. The ARD-T, a subscale of the ARD scale, provides a more specific look at diagnostic features of traumatic stress. Reliability for the Anxiety Related Disorders: Traumatic Stress (ARD-T) was .89 in the clinical sample (Morey, 2007). In terms of validity, ARD-T was correlated to the NEO-PI (neuroticism domain), the TSI, and the Mississippi PTSD Scale (Morey, 2007). Moderate to large correlations were found between these measures and the ARD-T subscale thus demonstrating convergent validity. Discriminant validity was demonstrated in weak correlations with the ARD-O and ARD-P.

Impulsivity

The Barrett Impulsiveness Scale-11 (BIS-11; Patton et al., 1995; Stanford et al., 2009) is a 30-item self-report instrument designed to assess impulsivity. There are six subscales (first order factors) that consist of: Attention, Motor, Self-Control, Cognitive Complexity, Perseverance, Cognitive Instability. These scales form three second-order factors: Attentional Impulsiveness (assesses task-focus, racing thoughts, intrusive thoughts), Motor Impulsiveness (assesses acting on the spur of the moment and lifestyle consistency), and Nonplanning Impulsiveness (assesses planning, careful thinking, and enjoying challenging mental tasks). Scores are on a four-point Likert scale, ranging from 1 to 4.

The BIS-11 has been normed in both clinical and community samples (Patten et al, 1995). Reliability (test-retest at one month) for the BIS-11 total score is 0.83. Validity of the BIS-11 was demonstrated in many correlations with this measures and other behavioral measures of impulsiveness. The total score of the BIS-11 yielded moderately correlations with measures of

impulsiveness such as the Eysenck Impulsiveness Scale. Correlations within the various subscales were not significant, indicating discriminant validity.

Trauma

The Trauma Symptom Checklist-40 (TSC; Briere & Runtz, 1989) is a research instrument that measures trauma-related problems. The TSC is a 40-item self-report instrument that contains six subscales as well as a total score. The subscales consist of: Dissociation, Anxiety, Depression, Sexual Abuse Trauma Index, Sleep Disturbance, and Sexual Problems and a total score. Each symptom is rated according to frequency using a four point Likert scale. Higher scores indicate more trauma symptomology.

The TSC is a reliable measure with alpha's averaging from .89 to .91 for the total score. The TSC has demonstrated criterion-related validity in relation to childhood sexual abuse (Elliot & Briere, 1992). The reliability and internal consistency for the TSC has been established (Elliot & Guy, 1993). Convergent validity has also been demonstrated for three of the subscales (Depression, Anxiety, and Dissociation) with measures of similar constructs (The Dissociative Experience Scale, SCL: Depression, SCL: Anxiety) with moderate to large correlations. Discriminant validity was demonstrated between analyses run on the correlations between subscales and the total TSC-40 score was established as compared to the Multidimensional Scale of Perceived Social Support (Zlotnick, Shea, Begin, Pearlstein, Simpson & Costello, 1996).

Coping Response

The Coping Response Inventory-Adult (CRI; Moos, 2004) is used to assess different coping responses and is able to differentiate between approach and avoidant behaviors and thoughts. The CRI consists of 8 scales include Approach Coping Styles (Logical Analysis,

Positive Reappraisal, Seeking Guidance and Support, and Problem Solving) and Avoidant Coping Styles (Cognitive Avoidance, Acceptance or Resignation, Seeking Alternative Rewards, and Emotional Discharge). There are 48 questions asked on the CRI and answers are provided on a four-point Likert scale, ranging from 1-4.

Reliability was demonstrated using Cronbach's alpha. Coefficient's for Approach and Avoidance domains were .73 and .75 (Chinaveh, 2013), with moderate test-retest reliability (.52) (Moos, 1988). Correlation Coefficients conducted for these two factors with the total score of the CRI was .88 ($p<.001$) (Chinaveh, 2013). In terms of validity, concurrent validity was demonstrated with other mental health scales. Approach responses were associated with lower levels of anxiety, depression and social dysfunction (Chinaveh, 2013). Confirmatory factor analysis in various studies confirmed the approach and avoidance dichotomy that was proposed by the author (Aguilar-Vafaie & Abiari, 2007). The CRI demonstrated moderate convergent validity as compared a measure of a similar construct (Coping Symptom Inventory) (Kirschner, Forns, Munoz & Pereda, 2008).

Procedures

Phase 1.

On the day that the research study took place, the clinical director of the facility announced during the morning meeting, where all patients are present, that a research study would take place in the early afternoon. Patients were told by the clinical director what participating in the research study would entail. This included: filling out three rating forms and providing authorization for utilization of previous data. Male patients who were interested in

participating in the research study for one hour were able to sign up on a sign-up sheet at the front office.

General Study Procedures

Subjects who chose to participate arrived at the multi-purpose room the facility at the time of the study. Subjects received a code number. The Principal Investigator, Talia Genack, put the names of the participants and the corresponding number in a code book which was placed in a locked file. Only the Principal Investigator has access to the code book. (Once the study is completed, personal information will be stored for three and a half years and then it will be destroyed.)

Initial Procedures

Participants were asked by the Principal Investigator to fill out an initial form regarding demographic information. This form included information regarding age, sex, ethnicity, religion, education level, and learning problems. At this time subjects were read the consent and authorization forms out loud by the Principal Investigator. Subjects who wished to participate completed the consent form and then completed the rating form. They were provided with an hour of time; however, most subjects completed the rating forms in thirty minutes.

Declining Participation

In this study there were many patients at the facility who did not wish to sign the consent form and did not complete the study. In total, there were 25 individuals who declined participation. All individuals who declined participation remained in the testing room for the duration of the testing session without completing the measures.

Consent Procedures

Consent procedures consisted of an introduction to the study as well as outlining the voluntary nature of the subject's participation in the study in order to ensure that there was no coercion. Subjects received a copy of the consent forms which were placed in their individual files. A second copy of the consent form was kept by the principal investigator. Once the consent forms were completed, subjects were able to begin completing the rating forms. Subjects completed the self-report measures in a group setting. Subjects were told that they had one hour to complete the measures, it took most participants 30 minutes to complete the packet. After subjects handed in their rating forms they received a debriefing form. 46 patients participated in the research study; however one was removed due to completing the research packet twice. This left the total number of participants to 45.

This procedure took place over two separate occasions that spanned three months. The first study date there were two sessions, each session had 15 participants (yielding a total of 30 participants). Three months later the examiner returned to the facility for a final testing session where another 16 participants completed the study.

Phase 2.

The Personality Assessment Inventory (PAI) is administered to all patients at the facility within two weeks from their entrance to the program. Participants in the study authorized the principal investigator to access their data which allowed the use of the data for the current study. The Principal Investigator coded the data from the computer according to patient's previous code from their hand-written assessments (from part 1). Out of the 45 participants who consented to having their computer data analyzed, only 43 had files completed on the computer. Data

completion method was used to insure results would not be adversely affected by missing data. Missing data was replaced by the mean score so as not to reduce power. This method was used in two locations where there was no data from the PAI.

Results

In order to answer the research questions above, descriptive statistics were computed for demographic information and each scale (scores are reported in Table 1). Measures of central tendency were obtained, as well as information regarding age, ethnicity, education level and week in program.

In order to assess severe or impairing level of reported symptomology, scores on the measures that were over 65 were included in this chart as percentages. These scores are important to report as they indicate that many subjects reported high levels of depression, anxiety and trauma. Since the score of 65 is 1.5 standard deviations from the mean, it was assumed that this score would account for severity. The 'elevated score' category was primarily conducted for the clinical measures (depression, anxiety and trauma). Elevated scores were also reported for the BIS-11. Research on the BIS-11 implicated that a raw score of 74 should be used as an indication of severe impairment in aggression and impulsivity (Patton et al, 2005). Therefore, a score of 74 or higher was used as a benchmark in calculating the percentage of patients who met the 'elevated' criteria in this study.

Correlations were computed among the categorical variables. Measures of association (Pearson's *r*) were utilized to assess the subdomains of the various variables (depression, anxiety, trauma, impulsivity, and coping responses) and the association between the demographics (age and week in program). The correlations are listed in Table 2.

Table 1

Descriptive statistics, mean, and range of scores.

	Mean	SD	Range Min-Max	Elevated Scores
Total N				
45				
Age	31.09		19-58	
Week	10.18		1-26	
Ethnicity	3**		1-6	
Education Level	3**		1-5	
Depression (PAI)	60.16	11.59	42-85	34.88%
Anxiety (PAI)	61.12	11.28	43-82	39.53%
Trauma (PAI)	63.63	16.20	41-99	44.19%
Trauma Symptom Inventory	33.53	21.59	0-76	
Coping Response Inventory				
Avoidance	60.87	10.72	37-86	
Approach	65.09	13.14	36-93	
Barret Impulsiveness Scale	74.27	11.93	46-101	46.67%*

* For the BIS-11, a score of 74 or over was determined to be significant as implied by research findings (Patton et al, 1995).

****These scores were rounded since they represent a nominal category.**

Table 2

Correlations among clinical measures and demographic information.

	Age	Week	Dep	Anxiety	PAI:T	TSI
Depression	.05	.05		.79**	.60**	.50**
Anxiety	-.04	.02	.79**		.67**	.62**
PAI: Trauma	.07	.08	.60**	.67**		.64**
Impulsivity	.076	-.003	.38**	.48**	.43**	.52**
Avoidance	-.14	.29*	.08	.16	.18	.29*

Note: Adult sample N=46

*Correlation statistically significant at p<.05

**Correlation statistically significant at p< .01.

Hypothesis 1

It was predicted that younger clients would have higher ratings of impulsivity than older clients (impulsivity scores would be negatively correlated with age). Results from the Pearson correlations indicated that there is no significant linear relationship between impulsivity and age (r=.08). Power tables (Cohen, 1977) indicate that power was 10%, 54%, and 95% to detect a small, medium and large effect, if there were such effects in the population. Thus, findings are inconclusive regarding small or medium effects due to this variable (due to Cohen's benchmark of 80% power).

Hypothesis 2

It was predicted that scores on the trauma measure will be positively correlated with scores of avoidant coping responses. In order to assess whether there was a significant linear relationship between these variables, Pearson correlations were computed between both trauma measures (PAI Anxiety Related Disorders and the TSI) and the Coping Responses Inventory: Avoidance scale. Results of this correlation indicated that there is no significant linear relationship between these avoidant coping responses and the PAI Trauma scale ($r=.18$). Power for this correlation was at 10%, 54%, and 95% to detect small, medium, and large effects, if there were such effects in the population. Therefore, our results regarding small and medium effects with this variable are inconclusive.

A second correlation was conducted between the TSI and CRI: Avoid scale. Results of the correlation was significant at the $p<.05$ level ($r=.29$). R-squared was computed to assess the strength of association for this correlation (sometimes referred to as magnitude of effect). This indicates that, for the r of .29, 8.4% of the variance in trauma symptoms is associated linearly with avoidant coping responses (and vice versa). Trauma, as measured by the TSI, yielded significant results as opposed to the PAI scores.

Hypothesis 3

It is hypothesized that there will be a positive correlation between trauma symptoms and anxiety and between depression and anxiety. Anxiety was correlated with the PAI: Trauma and was significant at the $p<.01$ level ($r=.67$). R-squared indicated that 4.5% of the variance in trauma symptoms is associated linearly with anxiety (and vice versa). The next correlation was computed between the TSI and anxiety. Results indicated that the correlation was significant at

the p<.01 level (r=.62). R-squared indicated that 3.8% of the variance in trauma symptoms as measured by the TSI is linearly associated with anxiety (and vice versa). A third correlation was computed to assess the linear relationship between depression symptoms and anxiety. Results indicated that there is a significant relationship at the p<.01 level (r=.79). R-squared indicated that 6.2% of the variance in depression symptoms are linearly associated with anxiety (and vice versa).

Hypothesis 4

It was hypothesized that across various clinical features (depression, anxiety, trauma, and avoidance) scores will be negatively correlated with week in the facility. A correlation was computed between (CRI) avoidance and week in the facility. The correlation was found to be significant p<.05 (r=.29). R-squared was computed to assess the magnitude of the effect and indicated that .8% of the variance in avoidance scores were linearly associated with week in the facility. When looking at a scatter plot of the results, it is apparent that the although there is a positive linear association there is more variability in scores from earlier weeks in treatment and as the weeks go on less variability in scores.

Three correlations between various clinical features (depression, anxiety and trauma) and week in the facility were computed and were found to be not significant (depression: r=.05, anxiety: r=.02, and trauma: r= .08). Power tests for the correlation between week in the clinic and depression, anxiety and trauma indicate that power was at the 10%, 54%, and 95% to detect a small, medium and large effects (if there were such effects in the population). Therefore, results are inconclusive for small and medium effects for these variables.

Discussion

There is research that supports that individuals who suffer from substance use disorders also may suffer from comorbid disorders. These symptoms and characteristics ultimately impact treatment outcomes and sustainability of treatment gains. This study explores the pathology and characteristics present in an adult male inpatient treatment population to understand what features are present in the population. This study also sought to identify relationships within these disorders and characteristics in the sample.

Significant Results

Results of this study indicate that the clinical features that were investigated were significantly linearly associated with each other as well as with one of the clinical characteristics studied (impulsivity). This connection provides insight into how these results coincide with research on broader traumatic symptom constellations as well as research on impulsivity in substance users.

Depression, Trauma, Anxiety, Impulsivity

When studying the results, depression, anxiety, and both trauma measures scores were significantly associated with each other. These clinical features were also all significantly correlated with scores on the Impulsivity measure. In addition to being consistent with the literature on the specific constructs, the results may also point to a new area of research.

High levels of comorbidity between depression and anxiety have been established in the literature. Individuals who suffer from depression are more likely to get diagnosed with an

anxiety disorder (Murphy, Horton, Laird, 2003). Therefore, results of the high correlation between depression and anxiety scores are consistent with previous literature on this subject.

Results from this study are also consistent with research on Complex Post-Traumatic Stress Disorder (CPTSD). CPTSD is a proposed diagnosis that captures the diverse symptoms that are observed in individuals who suffered from prolonged, severe, or repeated trauma. Trauma that is experience early on in life can effect functioning in a more pervasive way than the symptoms of PTSD diagnosis (van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005). This may be due to the disruption trauma causes in the development of self-regulation (Kearney, Wechler, Kaur & Lemos-Miller, 2010). CPTSD encompasses a constellation of symptoms that reflect disturbances in self-regulation functioning (Herman, 1992).

This includes the classic PTSD symptoms and also includes disturbances in affect, relationships, and self (Cloitre, Courtois, Ford, 2012). However, in CPTSD the individual presents with symptoms of other disorders in addition to PTSD symptomology. CPTSD shares features of major depressive disorders and borderline personality disorder. Depressive symptoms include: guilt, helplessness, concentration difficulties, anhedonia, and sleep disturbance. Symptoms of borderline personality disorders can include reckless or self-destructive behavior, irritability, impulsivity, and dissociative symptoms (Resnick, Bovin, Calloway, Dick, King, Mitchell, Suvak, Wells, Stirman, Wolf, 2012).

Research on patients in substance use treatments revealed that 45% of adults in treatment met criteria for CPTSD (Ford & Smith, 2008). Furthermore, many of these patients had reported being sexually abused in the past (Ford & Smith 2008). Childhood trauma and problematic substance use may be accounted for by disruptions in self-regulatory abilities (characterized by

CPTSD) (Rosenkranz, Muller & Henderson, 2014). In other words, increased substance use is one way that self-regulatory impairments can be expressed, especially in adolescence and young adulthood (Rosenkranz, Muller & Henderson, 2014).

Results from the current study indicate that there is a strong linear relationship between scores of depression, trauma, and impulsivity. This study may be capturing a broader picture of symptoms as opposed to symptoms of discrete disorders and would thereby impact treatment approach. In order to diagnose CPTSD a thorough assessment using appropriate diagnostic tools would need to be utilized, such as the SIDES (Pelcovitz et al, 1997). Furthermore, treatment would need to adapt to working on treating CPTSD in order to help the substance use problems. Treatment approaches using a Phase Oriented treatment approach as proposed by van der Kolk (2001) is an example of a comprehensive approach to manage symptoms, identify traumatic memories, and learn interpersonal connections.

Mental Health and Treatment

Results from the current study indicate that over a third of clients who are admitted to the treatment facility are suffering from mental health problems. The correlations that were computed are consistent with previous research on comorbidity in substance users that these problems are highly correlated with other problems such as depression, anxiety, and trauma.

This study demonstrates the importance of awareness of co-occurring disorders within the treatment facility not only on a case-by-case basis but also to recognize larger comorbidity trends that impact substance use. The broader implications of this research indicate that the ‘comorbid track’ in the facility should not just include a group to treat anxiety problems, but to work with trauma (which is now only used for the women) as well as depression services.

Non-significant Results

This study predicted that younger clients would have higher ratings of impulsivity than older clients (Hypothesis 1). Results indicated that there was no significant linear relationship between these two variables. These results suggest that impulsivity may be stable over time within an individual in the clinical population. These results are interesting in light of current research on executive dysfunction which discusses implementing and enforcing strict behavioral principles to help individuals who struggle with impulsivity. It is unclear whether the measure was capturing information on past behavior it would not be an indication of how well patients are managing their impulsivity while in treatment**.** It is possible that results were inconclusive due to impulsivity not reducing with age and may even be a result of substance use.

Another interesting hypothesis that yielded questionable results in this study was the relationship between avoidant coping responses and trauma symptoms. Since two measures were utilized to measure trauma, both were used in the analyses. One measure, the ARD-T, did not yield significant results, however, the TSI did. The assumption behind this question is that individuals who have been traumatized may exhibit avoidant coping responses. The TSI may have been able to pick up avoidant coping responses as there are more questions that are asked than the ARD-T. The TSI has a Dissociation scale which asks about flashbacks, "spacing out," feeling like things are unreal, and feeling out of your body among other questions. In comparison, the ARD-T asks about nightmares, sudden anxiety reactions and feeling changed by a trauma but does not emphasize dissociation as a separate scale. Perhaps the difference in the types of questions that were asked that influenced the results of the correlation.

Finally, no significant linear relationship was found between the clinical disorders and week in the program. It was predicted that as patients in the facility progressed in the program they would present with less symptomology. It can be assumed that there were no findings because data from these disorders were taken within the patients first two weeks of the program. In the treatment facility where the study took place the PAI is administered in the 'orientation' phase of the program, which is the first two weeks in the facility. A more appropriate way of measuring this would have been to have provided depression, anxiety and trauma measures at the time of the patient's arrival in the program, three months into the program, and upon exiting the program. However, given this information the results regarding week in the program and avoidant coping responses having a significant relationship provides clarity in how week in the program may change the way individuals cope with stressors. Perhaps the relationship between week in the program and coping responses would have been stronger if comparisons would have tracked an individual's growth on this measure pretreatment and post treatment.

Ethical Considerations

This study included subjects who were members of the drug court system, and therefore were considered prisoners by the Institutional Review Board. This placed our subjects in a category of protected population (along with pregnant woman and children). This study was approved by a full-board review at the Rutgers Institutional Review Board to insure that there was no coercion of the subjects.

Implications

The results from this study highlight the importance of assessment in substance use treatment facilities. A thorough assessment can lead to successful intervention and treatment. It

is important for treatment programs to match clients to treatment plans that will help reduce their mental health problems. Furthermore, it is not enough to assess for various problems, such as trauma, without providing a treatment option for a patient who needs trauma based therapy. Knowing that this population has high levels of comorbidity with other mental health issues it is essential that treatment programs have various formats for treatment (i.e. individual, group, family) and modalities to better service their patients.

Other related implications of the current study include the staff at treatment facilities. It is important that clinicians receive sophisticated training in order to adequately deal with the multiple problems that patients present with. Often times treatment programs are staffed with drug counselors that may not have a broader conceptualization or understanding of other mental health disorders. Having staff that are well-trained or providing additional training for staff will hopefully impact treatment outcomes for this population.

Limitations and Future Research

It would have been beneficial had the current research utilized pre and post data in addition to longitudinal data regarding the patients at the treatment facility. Due to the nature of this study, it is difficult to make larger implications of efficacy of treatment on these comorbid disorders and since patients who participated in the study were at different stages of treatment at the time of participation. Furthermore, determining moderators and mediators would have been helpful in determining causality in this study.

Other limitations include how missing data were handled in the current study. Missing data were replaced by the mean score so as not to reduce power. However, this may have reduced variability in the sample (weakening covariance and correlation estimates in the data by

ignoring relationship between the variables.) This method was utilized in the study due to the small sample size. It would have been beneficial if the current study had a larger sample size in order to assess the impact of the findings, specifically regarding correlations that were determined to be inconclusive.

Future research should focus not only on descriptive characteristics of this population but also on whether some of the characteristics mediate the disorders and vice versa. It would also be beneficial for future research to focus on implementing services to alleviate these problems in the population and to evaluate efficacy of treatment for this population.

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