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Substance Abuse and Depression: Exploring Changes in Symptomology in Minority Subgroups

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Abstract

While a comorbid relationship between substance abuse and depression in Caucasian adults has been widely documented, comorbid substance abuse and depression in minorities remains unexplored, leaving a gap in knowledge concerning the treatment of these comorbid disorders in the fastest growing population in the United States. Cognitive behavior theory posits that specific stressors increase the likelihood of substance abuse. These factors may include structural discrimination experienced by minorities. This quantitative, pretest-posttest archival study examined the effects of a substance abuse treatment program in reducing comorbid depressive symptoms among 317 participants from 3 minority subgroups and a comparison nonminority group enrolled in a court-mandated residential program in Texas. Depression scores were assessed at intake and 30 days later by the Client Evaluation of Self and Treatment-Psychological Functioning. Using gender and age as covariates, a 2 x 2 and a 2 x 3 mixed ANOVA design evaluated changes in depression scores among different racial groups. All participants who completed treatment experienced a significant decline in symptoms associated with depression. By adding to the existing literature regarding the successful treatment of those who participate in a CBT-oriented therapy, this study informs programs seeking successful strategies in helping minorities to enter and complete treatment, which lends itself to positive social change. Further, the efficacy of CBT-oriented therapies across all groups, regardless of race or ethnic identity, provides a unique opportunity for counselors and doctors to develop successful long-term strategies for patients struggling with comorbid substance abuse and depression.

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Chapter 1: Introduction to the Study

In 2013, the U.S. Department of Health and Human Services (USDHHS) recognized substance abuse, specifically alcoholism, as a major public health problem, noting that 17.7 million Americans met diagnostic criteria for alcohol dependence (Substance Abuse and Mental Health Services Administration [SAMSHA], 2014b). Data have also demonstrated that between 30 and 40% of severe mental disorders occur simultaneously with substance abuse disorders (Fridell & Nilson, 2004; Havassy, Alvidrez, & Owen, 2004; National Institute on Drug Use [NIDA], 2010; Regier et al., 1990). Depression, which was also considered a significant public health problem, often co-occurred with substance abuse disorders (Hides, Samet, & Lubman, 2010; NIDA, 2010). In fact, in the United States, the lifetime prevalence rate for any mood disorder to occur simultaneously with alcohol abuse disorder was found to be 21.8% (Petersen & Zettle, 2009); the 12-month prevalence rate was found to be 19% in recent research (Chou et al., 2012). Further, diagnosis of either depression or a substance abuse disorder has also been shown to increase the risk of developing the other disorder (Pettinati et al., 2010). Researchers have also indicated that individuals with alcohol dependence take longer to recover from depression than those without alcohol dependence (Pettinati et al., 2010).

Treatment outcomes for either depression or substance abuse disorders vary as a function of the comorbidity of these disorders (Doweiko, 2011; Lev-Ran, Balchand, Lefebvre, Araki, & Le Foll, 2012). It has been established that in individuals seeking treatment for alcohol dependence or substance use dependence, depressive symptoms are associated with poorer treatment outcomes (Doweiko, 2011; Dongier, 2005). However,

because most of this research has been conducted with racial/ethnic non minorities, there remains a significant gap in the existing literature concerning whether or not substance abuse treatment impacts levels of depression among individuals from minority subgroups in a similar fashion.

Racial and ethnic minorities have also been shown to have significantly higher rates of unmet treatment needs for substance use disorders and are less likely to seek or complete treatment (Perron et al., 2009). This gap in the current research may have implications for substance abuse theory and practice that may ultimately impact social change. Information on the background of this study's topic, problem statement and purpose of the study, research questions and hypotheses, theoretical framework, the nature of the study, definitions, assumptions, scope and delimitations, limitations, and significance are presented below.

Racial and Ethnic Distinctions

Although the U.S. Census Bureau's 2010 categories clearly defined racial and ethnic distinctions, psychology researchers often have often avoided the term *race,* due to wide disagreement and misunderstanding of the terms' meaning and usage in psychological literature. Further, researchers have often used the terms *race* and *ethnicity* interchangeably (Baer et al., 2013; Shelton, Delgado-Romero, & Wells, 2009; Zaff, Blount, Phillips, & Cohen, 2002). In the current investigation, *race* was defined as a participants' self-identification as Caucasian, African American, Mexican, or other, and ethnicity was defined as self-identification as Hispanic or non-Hispanic. The current data were collected from participants who self-identified with the population subgroups of African American non-Hispanic, Mexican Hispanic, Other Hispanic, and Caucasian non-

Hispanic. Participant race and ethnicity classifications were determined by participant responses to two demographic questions about race and ethnicity.

Background

Substance Abuse

Substance abuse (SA) refers to a cluster of maladaptive behaviors arising from the sustained misuse of a substance. According to the *Diagnostic and Statistical Manual of Mental Disorders*-5th Edition (*DSM-5*), diagnosis of substance use disorder (SUD) is defined by 11 criteria, which include the inability to reduce consumption of the substance, overindulgence in the substance, cravings and negative social impacts resulting from use, among others (American Psychological Association [APA], 2013). Additionally, the maladaptive pattern of substance abuse may lead an individual to experience significant clinical impairment or distress, such as the inability to perform major roles and fulfill obligations at work, home, and school (APA, 2013; Weiten, 2005).

According to the *DSM-5* (APA, 2013), substance abuse can include the abuse of alcohol as well as other drugs such as cocaine, cannabis, and heroin. Historically, humans have abused a wide variety of substances (APA, 2013; Doweiko, 2011; Inaba, Cohen, & Holstein, 1997). Reflective of this, the *DSM-5* currently contains 10 different categories of substances abused, with one major category being alcohol (APA, 2013). The USDHHS reported in 2014 that alcohol abuse is a major public health problem, noting that 17.7 million Americans met the diagnostic criteria for alcohol dependence in 2013. A study conducted by the Substance Abuse and Mental Health Services Administration ([SAMHSA], 2010) further revealed that in 2009, 51.95% Americans endorsed using alcohol. The organization also noted that 6.9% of the population aged 12 or older (17.0

million individuals) reported heavy drinking that same year (NIDA, 2010; SAMHSA, 2010). In a different study conducted by SAMHSA in 2011, it was estimated that 22.5 million Americans aged 12 or older had used illicit drugs (e.g., marijuana, cannabis, cocaine/crack, heroin, hallucinogen, inhalants) prior to study participation. This estimate represents 8.7% of the U.S. population aged 12 or older. Marijuana was reported to be the most commonly used illicit drug, which was used by 18.7 million people (SAMHSA, 2011).

Research on Substance Abuse Treatment Disparities in Minority Subgroups

Researchers have demonstrated that African Americans and Hispanics have similar rates of substance use disorders compared to Caucasian non-Hispanics. Despite this, population-based studies show that African Americans are less likely to seek or use specialty treatment services than their Caucasian counterparts (Perron et al., 2009). Furthermore, some investigations on treatment use disparities in minority subgroups may be considered flawed, as they have not correctly considered ethnic and racial categories. This particularly applies to research conducted prior to 2010 on African American and Hispanic individuals, as the studies may not reflect the current U.S. Census Bureau (2010) categorization, thus creating confusion among researchers. According to the current 2010 U.S. Census categories, information on both an individual's race and ethnicity should both be reported. This study makes use of racial categories and ethnicity information as currently collected by the U.S. Census Bureau in 2010.

Depression

Depression is a debilitating disorder that impacts individuals of all of racial, ethnic, and socioeconomic backgrounds. Further, researchers have noted that the

deleterious impacts of depression affect not only the suffering of the depressed individual but also carry over to impact society at large (Sarmiento & Cardemil, 2009).

Clinically, depression refers to a consuming, oftentimes debilitating mood disorder that includes feelings of sadness, hopelessness, and a loss of pleasure in life that can affect individuals of all races. The *DSM-5* diagnosis of major depressive disorder (MDD) was defined by five criteria, which included depressed mood during most of the day, rapid weight fluctuations, and insomnia, among others (APA, 2013). Authors of recent studies have estimated that up to 16% of the general population will experience a major depressive incident at some point in their lives (Wang, Simon, & Kessler as cited in Sarmiento & Cardemil, 2009). Further, it has been noted that the psychological symptoms experienced by African Americans may be more debilitating than those experienced Caucasian non-Hispanics and that African Americans who experienced depressive symptoms were less likely to succeed in treatment (Salami & Walker, 2013).

Research on Treatment of Depression in Minority Subgroups

According to the U.S. Census Bureau (2009), African Americans have been overrepresented among socially and economically strained subgroups, with approximately 24% of the African American population living below the poverty line. As such, it is possible that African Americans experience relatively more stressors than Caucasian non-Hispanics, a population that has contributed to African American depressive symptoms.

One population with depression that has remained relatively understudied is Hispanics, a fact that has considerable public health implications, given the continuous growth of the Hispanic population in the United States. Although several early

epidemiological studies found that compared with non-Hispanic Americans, Hispanics were at increased risk for depression (Gonzalez-Prendes, Hindo, & Pardo, 2011), there is little research on depression-related factors specific to Hispanics. This lack of racial and ethnic minority research has resulted in a vague understanding of depression among Hispanics and additional research with this population is needed.

In addition to an individual's suffering with the disorder, the effect of depression on society can be relatively significant. For instance, "depression has been suggested to be responsible for productivity losses of more than $44 billion per year in the United States" (Sarmiento & Cardemil, 2009, p. 65). Depression is also related to high rates of suicide and has been implicated in over 30,000 deaths each year in the United States alone. The World Health Organization (as cited in Sarmiento & Cardemil, 2009) confirmed that depression was the second leading cause of disability among all health problems.

Depression and Substance Abuse

Graham and Massak (2007) defined comorbidity as a condition of coexistence of two psychiatric disorders in the same individual. Substance abuse, particularly alcohol abuse, has been a major public health concern since 2013 when 17.7 million Americans were found to abuse alcohol (NIDA, 2013; USDHHS, 2014). Depression, another major public health problem, often co-occurs with alcohol abuse. In fact, the lifetime prevalence rate for any mood disorder to occur comorbidly with an alcohol abuse disorder was 21.8% (Hides et al., 2010; Petersen & Zettle, 2009; McLaughlin, 2011; NIDA, 2010). Being diagnosed with either depression or a substance abuse disorder has also been shown to increase the risk of developing the other (Chou et al., 2012). Further, the

researchers also indicated that individuals with alcohol dependence took longer to recover from depression (Pettinati et al., 2010). Although researchers have begun to accumulate on the comorbidity of these disorders, researchers have yet to agree upon effective treatment strategies when comorbidity is present.

Research on Treatment of Depression and Substance Abuse

According to Schönnesson, Williams, Atkinson, and Timpson (2009), depressive symptoms are more common among illegal drug users than in the general population. Furthermore, Hides et al. (2010) demonstrated that depression and substance abuse disorders often co-occur and that individuals with alcohol or cannabis dependence are 3 to 4.5 times more likely to have a coexisting affective disorder. Rates of these comorbid disorders are even higher in treatment settings; it is estimated that 30% to 50% of participants in substance abuse treatment are also depressed (Hides et al., 2010). Per Hides et al., such high rates of comorbidity are challenging to recover from as they have been related more serious and chronic illness courses, increased risks of relapse in depression and substance abuse disorders, in addition to greater social and vocational impairment and a higher risk of suicidal behavior and greater use of health services. Findings such as these highlight the need for effective interventions that address both conditions.

Statement of the Problem

In 2009, Perron et al. predicted that, beginning in the year 2016, more African Americans and Hispanics of any race were to be added to the population than Caucasian non-Hispanics in the United States. By 2050, Perron et al. further suggested that the African American population will nearly double its size to 61 million. Moreover, as

African Americans and Hispanics receive less treatment for substance abuse than other Americans, substance abuse might go untreated in a larger percentage of U.S. citizens than before, making research on substance abuse treatment issues in these groups an urgently emerging priority (Petersen & Zettle, 2009; Turner & Wallace, 2003). An examination of depressive symptoms and the effect of substance abuse treatment on depression in minority subgroups was essential because such groups are the fastest growing in the United States (Perron et al., 2009) and because the comorbidity of such conditions might exacerbate symptoms or interfere with treatment outcomes (Dongier, 2005; Doweiko, 2011). Although information on treatment disparities exists, a paucity of empirical evidence on the impact of substance abuse treatments on depression, especially across minority subgroups, continues to be a problem. This information was requisite because the demand of treatment for depression in the context of substance abuse has continued to increase, especially in minority populations. The results of the current investigation may inform new approaches for clinical practitioners.

Purpose of the Study

The purpose of this quantitative pretest-posttest study was to examine the effects of a substance abuse treatment program on the change in depression scores among participants from three minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) and a Caucasian non-Hispanic group with substance dependence (e.g., alcoholism and other drugs) in a court-ordered substance abuse treatment program located in Texas. Secondary data were supplied by approximately 317 adults who were referred by the criminal justice system to participate in a residential substance abuse treatment program (consisting of CBT-based groups and psycho-

educational groups) was used. Participants began and terminated their treatment at different times. Only data from participants who completed both pre- and posttests were used.

Data used also included information about the study's two independent variables (time of depression assessment and minority or Caucasian non-Hispanic subgroup) and the study's dependent variable (change in depression score). A comparison was made of depression scores as assessed by the Client Evaluation of Self and Treatment (CEST)–Psychological Functioning at treatment intake (pretest) and again 30 days later at discharge (posttest). The CEST, which was developed by Joe, Broome, Rowan-Szal, and Simpson in 2002 (Appendix B), is a self-administered test, consisting of a 33-item self-report scale that seeks to measure psychological functioning including depression, self-esteem, and anxiety.

Research Questions and Hypotheses

The following research questions were used in the investigation:

1. After controlling for gender and age, are the rates of depressive symptoms after participation in a court-mandated substance abuse treatment program significantly different than the rates of depressive symptoms expressed at intake in the minority population, when the data are compared to the Caucasian population?

H_{01}: After controlling for gender and age, there will be no significant differences between minority participants (African American non-Hispanic, Mexican Hispanic, Other Hispanic) and Caucasian participants in the rates of depressive symptoms expressed by

participants, as measured by the CEST–Psychological Functioning, before and after a court-mandated substance abuse treatment program.

H_{a1}: After controlling for gender and age, there will be significant differences in the rates of depressive symptoms between minority participants (African American non-Hispanic, Mexican Hispanic, Other Hispanic) and Caucasian participants as measured by the CEST–Psychological Functioning, before and after a court-mandated substance abuse treatment program.

2. After controlling for gender and age, are the rates of depressive symptoms significantly different between minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) before and after a court-mandated substance abuse treatment program?

H_{02}: After controlling for gender and age, there will be no significant differences in rates of depressive symptoms between the three minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic), as measured by the CEST–Psychological Functioning measure, before and after a court-mandated substance abuse treatment program.

H_{a2}: After controlling for gender and age, there will be significant differences in rates of depressive symptoms between the three minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic), as measured by the CEST–Psychological Functioning measure, before and after a court-mandated substance abuse treatment program.

Theoretical Foundation

Cognitive behavior theory (CBT), as it relates to substance abuse, served as the theoretical foundation for the presented study (Finney, Noyes, Coutts, & Moos, 2002). Proponents of CBT assumed that the onset and perpetuation of substance use is influenced by distorted beliefs about the effects of the abused substance and also by dependence on substance abuse as a maladaptive coping behavior (Finney et al., 2002). This theory also suggested that an abuser's primary cognitive proximal outcomes of CBT are an enhanced sense of self-efficacy to remain abstinent in high-risk situations, a decrease in positive anticipated consequences of drinking or using drugs (positive substance use expectancies), and an increase in expectancies regarding the benefits of quitting or reducing drinking behavior or drug use and reduced expectancies regarding the costs of such outcomes (Finney et al., 2002).

In the cognitive theory of substance abuse, there are three main groups of distorted beliefs related to an individual's decision to engage in substance abuse behavior, including anticipatory, relief-oriented, and distorted facilitative or permissive beliefs (NIDA, 2010). Anticipatory beliefs occur prior to substance use and are related to the feelings and beliefs of an individual who anticipates drug use. Relief-oriented beliefs are an individual's presumptions that using drugs will rid him or her of uncomfortable feelings or pain. Facilitative beliefs are reflected in the tendency for users to assume that drug use is appropriate, despite any apparent or potentially negative consequences (NIDA, 2010).

Other theories of addiction in addition to the etiology of addiction have provided additional theoretical basis for CBT and other treatment approaches. The self-medication

hypothesis presented substance abuse as a compensatory mechanism for stressors as well as a method to temporarily ameliorate negative feelings arising from stressors (Suh, Ruffins, Robins, Albanese, & Khantzian, 2008). Specifically, in terms of the minority experience, the concept of minority stress, which arises from experiences of discrimination, economic marginalization, and cultural estrangement, has been identified as a stressor with the potential to lead minorities to self-medicate and become substance users (Voss Horrell, 2008; Wilson & Rocco Cottone, 2013).

Explanations for substance use are posited by the theory of learned helplessness, which states that over time, individuals may perceive themselves as helpless to escape negative stimuli (Peterson, Maier, & Seligman, 1993). Simultaneously, individuals also learn passive nonavoidance of those stimuli over time, even after the stimuli become avoidable (Peterson et al., 1993). This theory is supported by original evidence showing that testing animals who would endure obligatory negative stimulus under restraint and afterwards would endure the same negative stimulus without restraint even after the stimulus became avoidable (Peterson et al., 1993). The theory further suggested that substance abusers form distorted cognitions, which causes them to view substance use and its effects differently from those who are not substance abusers (Shaghaghy, Saffarinia, Iranpoor, & Soltanynejad, 2011). It must be noted that for the purposes of the presented study *substance use* and *substances abuse* are used interchangeably.

Information from the current study may add to the current literature for CBT by demonstrating whether or not there are changes in the rates of depressive symptoms in a minority subgroup population after substance abuse treatment. Since cognitive-behavioral therapy has been effectively used to treat depression, it was expected that rates of

depressive symptoms would improve after participation in a CBT-based substance abuse treatment program (Blaney, 1977; Gregory, 2007; Heslop, 2008).

Nature of the Study

In the current study, I used a quantitative pretest/posttest design to compare pretest and posttest depression rates of participants from three minority subgroups in addition to a Caucasian non-Hispanic comparison group. Participants were evaluated before and after a court-mandated substance abuse treatment program. These individuals began and terminated their treatment at different times. These secondary data were gathered from approximately 317 adults who were referred by the criminal justice system to participate in a residential substance abuse treatment program, which consisted of CBT-based and psycho-educational treatment therapies. Although only data from participants who had completed both pre- and posttests were used, the dataset was de-identified, and the particular program each individual participated in was not named.

The secondary data included information about the both of the study's independent variables—time of depression assessment and minority or Caucasian non-Hispanic subgroup—and the study dependent variable, change in depression score. A comparison was made of depression scores as assessed by the CEST–Psychological Functioning at treatment intake (pretest) and again 30 days later at discharge (posttest). Joe et al. developed the CEST in 2002 (see Appendix B). The CEST–Psychological Functioning was a self-administered test, which consists of a 33-item self-report scale measuring psychological functioning, including depression, self-esteem, and anxiety. Information about the participant's minority or Caucasian subgroup status and gender was available in the secondary dataset. Because this study involved both between- and

within-subject variables, a mixed design factorial ANOVA was used. The between-subjects variable was the independent variable of racial or ethnic subgroup (African American non-Hispanic, Mexican Hispanic, Other Hispanic, or Caucasian non-Hispanic), and the within-subject variable was the time of depression assessment (pretreatment and posttreatment). The dependent variable was the change in depression scores. Gender and age were used as covariates. Secondary data were used. There were two independent variables and one dependent variable. The independent variable of time of depression assessment, both pretreatment and posttreatment, was considered within subjects in nature.

Both pre- and posttest depression assessments were compared to determine if depression scores were lowered (dependent variable) over the course of substance abuse treatment. The independent between-subjects variable had two levels in the first ANOVA test (all minority vs. all Caucasian), and in the second ANOVA test, the minority subgroup provided three levels (African American non-Hispanic, Mexican Hispanic, Other Hispanic). In the first test, a 2 X 2 mixed design ANOVA was used to evaluate the overall change in depression score as a function of time of depression assessment (within factor), and whether or not there were differences in depression change scores among all minorities as compared to the majority group (between factor). In the second test, a 2 X 3 mixed design ANOVA was used to evaluate the overall change in depression score as a function of time of depression assessment (within factor), and whether or not there were differences in depression change scores among the three minority subgroups without comparison to the Caucasian group (between factor). Gender and age were included as covariates in both analyses.

Definition of Key Terms

Alcohol dependence: A more serious disorder than alcohol abuse, involving the maladaptive use of alcohol that leads to tolerance, withdrawal symptoms after cessation, and the inability to stop drinking (APA, 2000; Gruber, Roth, & Daley, 2008).

Alcohol use/abuse: A pattern of alcohol consumption resulting in harmful biological, social, and/or psychological effects for oneself or others (APA, 2000, 2013).

Client Evaluation of Self and Treatment (CEST): A self-administered test consisting of a 33-item self-report scale measuring psychological functioning, including depression, self-esteem and anxiety (Joe et al., 2002; see also Appendix A).

Cognitive behavioral therapy (CBT): A type of therapeutic intervention (talking therapy) based on cognitive theories that are used to treat depression (Gregory, 2007; Heslop, 2008).

Comorbidity: A condition of coexistence of two psychiatric disorders in the same individual (Graham & Massak, 2007).

Depression: A serious medical and psychiatric illness that is more than just a state of feeling down or blue for several days; for individuals with depression, such feelings usually do not disappear, but continue and impair everyday life experiences (APA, 2013; National Institute of Mental Health [NIMH], 2010).

Dual-diagnosis or dual disorder: Dual-diagnostic or dual-disorder-refers to two psychiatric disorders that coexist in the same individual (Dongier, 2005; Havassy et al., 2004).

Somatization: A form of depressive symptoms characterized by physical ailments instead of emotional feeling (Ivbijaro, Kolkiewicz, Palazidou, & Parmentier, 2005).

Triad: The term used in Beck, Rush, Shaw, and Emery's (1979) cognitive theory of depression referring to the three negative thoughts (a pessimistic view of the world, a pessimistic-self-concept, and a pessimistic view of the future) of individuals with depressive disorder.

Assumptions

For the purpose of this study, it was assumed that participants understood the purposes and goals of their therapy programs. It was further assumed that evaluations were given in a controlled environment. Participants' responses to the CEST (Joe et al., 2002) were assumed to have been made accurately, honestly, and to the best of their abilities. It was also assumed that evaluations were accurate measures of depression and treatment. The ability of CBT to be applied to the treatment for substance abuse and depression was further assumed by the present study. Lastly, it was assumed that the data were collected and entered correctly by the treatment program.

Scope and Delimitations

The study was delimited to Texas residents who were referred by the criminal justice system for participation in a substance abuse treatment program. Accordingly, the results of the study might not apply to individuals who voluntarily enter treatment programs. The study was also delimited to certain minority subgroups, as there is a paucity of literature on the impact of treatment in minorities. Information about other mental disorder diagnoses was not obtained, which further limits the generalizability of the findings. Additionally, the gender distribution of participants was not revealed to the researcher before the sample was granted for use. Because the sample is composed of court-mandated participants, it was imbalanced in terms of gender. Thus, gender was

examined as a covariate only, limiting the strength of findings in addressing possible gender differences across racial or ethnic groups.

Limitations

As the study was limited to individuals in one treatment facility in Texas, the presented results may exhibit a sampling bias and not be representative of either the general African American and Hispanic populations of America. The study was also limited in that it only focused on the effects of one CBT-based substance abuse treatment program, and the effects of other types of treatment of depressive symptoms remained unexplored. Further, participation in this substance abuse program was court-mandated, limiting the generalizability of study results to voluntary participants of substance abuse programs, who may exhibit different characteristics or motivations to complete treatment. Another limitation of this study was that complete datasets were collected only for those who completed the substance abuse treatment program. Those participants who completed their assessments may have unique characteristics that differentiate them from those that dropped out.

Yet another limitation of the study was that there was no control group, and thus a strong causational connection between the treatment and changes in depression scores could not be made. Further, participants may have provided the answers they believed others would like to hear, rather than the truth, in the CEST, called social desirability bias. Additional confounding factors complicating assessments of the impact of treatment on depression scores may have included the socioeconomic status, age, gender, and previous histories of SUD and depression in individuals. Age and gender were considered

as covariates in analyses. Complete data on Socioeconomic status(SES), histories of SUD, and depression were not available and could not be used as covariates in analysis.

Significance of the Study

In this study, I examined the impact of a substance abuse treatment program on levels of depression among African American non-Hispanic, Mexican Hispanic, and Other Hispanic participants with substance dependence and compared the results of their depression scores with those of a group of Caucasian non-Hispanic participants in the same program. In a search of the literature, no studies regarding the differential effects of substance abuse treatment on minorities were found. The presented study may reveal differential effects of substance abuse treatment on minority individuals, which were largely underserved and undersampled in the explored literature. Further, the current research might also add to the literature on depression in African Americans and Hispanics, two groups for which the etiology of depression has been poorly understood (Gonzales-Prendes et al., 2011; Salami & Walker, 2013). Information about depression before and after intervention for substance abuse also provided data about the differential experiences of minority individuals in substance abuse treatment programs, which were largely designed for Caucasian populations (Arndt, Acion, & White; 2013; Gallardo & Curry, 2009; Voss Horrell, 2008; Wilson & Rocco Cottone, 2013).

Exploring the experiences of minority individuals in substance abuse programs may provide useful contextual data for designing minority-targeted therapies, which may retain participants at higher rates, since both African Americans and Hispanics are both less likely to use services for depression and substance abuse. Further, African American and Hispanics are also more likely to terminate early when they do utilize substance

abuse services (Gonzales-Prendes et al., 2011; Milligan, Nich, & Carroll, 2004; Perron et al., 2009; Salami & Walker, 2013). Further, exploring pre- and postintervention depression scores may be useful in exploring linked environmental and genetic factors implicated in both substance abuse disorders and depression (Boden & Fergusson, 2011; Kelly, Young-Wolff, Kendler, Sintov, & Prescott, 2009; Nurnberger, Foroud, Flury, Meyer, & Wiegand, 2002). Therefore, designing and implementing interventions for minorities and utilization of the data gathered here may allow other researchers to further study the experiences of minority individuals with depression and substance abuse, potentially filling other literature gaps such as minority differential use of cocaine, minority differential use of heroin, and minority outcomes from CBT interventions targeted at comorbid substance abuse disorders and depression.

Social Change Implications

The results of the study may also impact future practices and treatment approaches regarding the depression outcomes of minority individuals who abuse substances, thereby leading to positive social change. This study provides information about changes in depressive symptoms after participation in a substance abuse treatment program, which may provide insight into how certain minority groups respond to a particular form of treatment compared to Caucasian individuals receiving the same treatment. Currently, relatively little work has been done on the impact of CBT-based treatments for substance abuse and their impact on depression in minorities.

The present study addressed this gap in the literature. In addition, this study provided some useful information for future studies and interventions that target these minority subgroups. In the past, many substance abuse programs were designed with little

or no attention to minorities, resulting in poor retention of patients and disappointing results (Voss Horrell, 2008; Wilson & Rocco Cottone, 2013). The results of this dissertation may contribute to making CBT-based treatments for substance abuse in minority individuals more effective, inclusive, and relevant. Finally, the results of the study may enable mental health professionals to develop the most effective program for minority individuals who present with depression.

Summary

Substance abuse, particularly alcohol abuse, is a major public health concern. In 2013 alone, 17.7 million Americans were found to abuse alcohol (NIDA, 2013; USDHHS, 2014). Depression, another major public health problem, often co-occurs with alcohol abuse. In fact, the lifetime prevalence rate for any mood disorder to occur comorbidly with any alcohol use disorder is 21.8% (Hides et al., 2010; McLaughlin, 2011; NIDA, 2010; Petersen & Zettle, 2009). Being diagnosed with either depression or a substance abuse disorder has also been shown to increase the risk of developing the other (Chou et al., 2012). Researchers have also indicated that individuals with alcohol dependence took longer to recover from depression (Pettinati et al., 2010). Although research has begun to accumulate on the comorbidity of these issues, researchers have yet to agree upon effective treatment strategies when comorbidity is present. It is also indiscernible whether individuals from minority subgroups have experienced treatment differently and whether or not substance abuse treatment might impact depression rates in minority subgroups.

The purpose of the current quantitative study was to examine the impact of a substance abuse treatment program on the levels of depression among participants from

three minority subgroups with substance dependence (e.g., alcoholism and other drugs) in a substance abuse treatment program located in Texas and to compare them with Caucasian non-Hispanic participants. This information was considered requisite, as the demand for treatment will likely continue to increase. The results of the current investigation demonstrate change in rates of depressive symptoms after participation in a substance abuse treatment program, which may impact future clinical practice.

In Chapter 2, I present the literature on the topics of substance abuse and depression. Information on CBT as related to substance abuse is presented as well as information on the nature of alcoholism and other drugs and a discussion of depression is present. A discussion of cultural factors that influence psychological disorders and mental health problems is included, and information on treatment options for substance abuse and depression and treatment disparities across minority subgroups is identified. Finally, the efficacy of cognitive therapy in treating the disorders is discussed.

Chapter 2: Literature Review

The purpose of this quantitative pretest-posttest study was to examine the effects of a substance abuse treatment program on the change in depression scores among participants from three minority subgroups and a comparison group (African American non-Hispanic, Mexican Hispanic, Other Hispanic, and Caucasian non-Hispanic) with substance dependence (e.g., alcoholism or other drugs).

A search of literature on substance abuse and depression since 1980 was conducted via electronic databases and other sources, including Medline, PubMed, PsycARTICLES, PsycINFO, SAGE Premier, Academic Search Premier, Google Scholar, and book chapters. The list of search terms used to conduct the literature search included *alcohol, depression, substance abuse treatment, minority subgroups and substance abuse*, and lastly, *minority subgroups and depression*. The sources of articles obtained for this study were from digital and print peer-reviewed resources. There were multiple books that were also reviewed to provide overviews of early research on substance abuse and depression, and theories associated with these disorders.

This chapter provides a review of CBT as related to substance abuse. Information on alcoholism, other drugs, depression, and the relationship between depression and substance abuse is provided. Information about the cultural factors that influence mental and physical health is provided, as is researched with minority subgroups, and treatment for depression and substance abuse.

Theoretical Framework for the Study

Cognitive Behavior Theory and Substance Abuse

The theory used as the conceptual framework for the presented study is CBT as defined by Finney et al. (2002). Proponents of CBT posited that the onset and perpetuation of substance abuse behaviors are influenced by distorted beliefs about the effects of an abused substance and also by dependence on substance use as a maladaptive coping behavior (Finney et al., 2002). Kadden (1994) proposes that alcohol abuse or dependence is an improper way of coping with social and personal problems or an improper means of meeting particular needs. Further, this theory maintains that alcoholism is a learned behavior and like other learned behaviors could be changed.

According to Kadden (1994), individuals who acquire drinking behavior do so to experience the positive effects of alcohol such as decreasing anxiety level, relieving pain, or improving sociability. CBT further suggests that a user's primary cognitive proximal outcomes of cognitive behavioral treatment are an enhanced sense of self-efficacy to remain abstinent in high-risk situations, decreased positive anticipated consequences of drinking or using drugs (positive substance use expectancies), and increased expectancies regarding the benefits of quitting or reducing alcohol or drug use and reduced expectancies regarding the costs of such outcomes (positive outcome expectancies). The objective of the majority of cognitive behavioral programs is to teach cognitive and behavioral coping skills that clients might use to keep away from drinking excessively or using drugs in situations that they previously had associated with heavy drinking or drug use (Finney et al., 2002).

CBT further asserts that individuals with substance abuse (i.e., alcohol abuse) have established a cognitive susceptibility to drug abuse (Finney et al., 2002). For example, individuals become vulnerable after using drugs since they do not have the cognitive resources to objectively acknowledge or control their substance use. Furthermore, in specific situations, particular beliefs can be triggered and serve to augment the likelihood of substance abuse (NIDA, 2006).

In the cognitive theory of substance abuse, there are three main groups of distorted beliefs related to an individuals' decision to engage in substance use behavior, including anticipatory, relief-oriented, and facilitative or permissive distorted beliefs (NIDA, 2006). Anticipatory beliefs occur prior to and in anticipation of the drug use. Relief-oriented beliefs are beliefs that a person maintains about the presumption that using drugs will rid the person of uncomfortable feelings or pain. Facilitative beliefs reflect the tendency for users to assume that drug use is appropriate, despite its apparent potential consequences (NIDA, 2006). Range and Mathias (2012) further asserted that individuals with substance abuse problems (e.g., alcohol, other drugs) tend to have core and intermediate beliefs concerning lack of love, helplessness, and hopelessness, in addition to a low threshold for frustration and boredom. These intermediate beliefs are referred to as the addictive beliefs that can be divided into other groups, forming a belief scheme (Range & Mathias, 2012).

When individuals start using a substance, anticipatory beliefs emerge. In the beginning, these beliefs take the form of statements such as "consuming alcohol will make me feel better" or "it is okay to use drugs every now and then" (Range & Mathias, 2012). As the individual starts obtaining satisfaction from the drugs, beliefs start

changing into statements of anticipation, such as “smoking relaxes me” or “drinking makes me happy.” The anticipatory beliefs change according to the “anticipation use dysphoria use” cycle into relief-oriented beliefs (e.g., I have to have the substance so I can feel relief), and eventually change into permissive beliefs (e.g., If I don’t get the substance, I will be depressed). When permissive beliefs emerge, control beliefs (e.g., I am in charge of my substance use), which are different from use beliefs (e.g., I can use or not use), develop concomitantly, particularly with regard to illegal drugs. When permissive beliefs and control beliefs are presented at the same time in the individual, using or abstaining from using drugs is a result of the conflict between permissive and control beliefs (Range & Mathias, 2012). Activation of permissive beliefs appear in the existence of particular triggered stimuli, which can trigger the individual’s desire and beliefs regarding use. These circumstances are variable and may differ in degree of risk; per the findings of the study, a situation could be very activating one day, and then not present any risk to the participant at another time (Range & Mathias, 2012).

Substance Abuse Prevalence

The 2013 National Survey on Drug Abuse and Health Survey stated that 9.4% of Americans over the age of 12 used illegal drugs in the last 30 days and that 52.2% of all respondents reported alcohol consumption the same period (as cited in SAMSHA, 2013). The most commonly used illegal drug reported was marijuana, with 7.5% of participants stating that they consumed it within the last 30 days. Further, according to SAMSHA, 2013, 52.5% of respondents consumed alcohol in the 30 days before their interview, with 24.6% and 6.2% of adults being binge drinkers and heavy drinkers respectively. According to Sharma and Kanekar (2008), substance abuse in the form of alcohol and

illegal drug use is related to most of the country's severe problems (e.g., injury, violence, HIV infection).

Alcoholism

According to past research, alcoholism has been considered a form of substance addiction. As a result, the *DSM-5* provided one category of substance abuse disorder related to alcoholism: alcohol use disorder (AUD) that was separated by levels of severity (mild, moderate, and severe; APA, 2013). The *DSM-5* described alcohol abuse as excessive use resulting in failure to perform activities of daily living and/or failure to fulfill major responsibilities at work, school, and at home combined with harmful maintenance behaviors (APA, 2013). Diagnostic criteria for AUD required identification of two or more symptoms related to (a) alcohol interfering with a role obligations, (b) the ingestion of the substance in potentially hazardous situations, (c) inability to reduce consumption of substance, and (d) the substance use interfering with social or interpersonal relationships (APA, 2013). The *DSM-5* criteria of AUD required clinicians to consider physical manifestations of tolerance and withdrawal, increases in usage over time, and the inability to control use. As a result of taking into account these broad symptoms of AUD, alcoholism has been more likely to be diagnosed via behaviors and negative effects on functioning rather than a particular set of medical symptoms (Gruber et al., 2008).

Side Effects of Alcohol

Some side effects associated with alcohol use are serious and may cause psychological damage and problems in cognitive performance. The frontal lobes that coordinate reasoning, judgment, and problem solving have been shown to be the most

damaged by heavy alcohol abuse (Rosenbloom, Sullivan, & Pfefferbaum, 2003). Imaging techniques like magnetic resonance imaging have provided important information regarding the way alcohol affects the brain's anatomy and activity (Rosenbloom et al., 2003). Using this technology, alcohol has been shown to disturb the capacity to establish long-term memories and to cause minor damage to the ability to remember prior developed long-term memories (Rosenbloom et al., 2003). Individuals who drink moderately experience fewer alcohol related problems (Doweiko, 2011). Thus, the more individuals consume alcohol, the more alcohol related damage they experience.

In addition to the physiological side effects of alcohol, alcohol has been shown to cause psychological effects, such as mood instability, that can lead to depression. According to Dongier, alcohol is one of the oldest mood-enhancing drugs that has the propensity to cause depression (p. 98). Dongier further found that 5-Hydroxy tryptamine (5-HT) levels of serotonin and 5-HT metabolites are low in some brain areas of alcohol-preferred rats and in the cerebrospinal fluid of individuals with alcoholism disorder. Increasing 5-HT neurotransmission decreases alcohol consumption in rats, reduces depressive symptoms in humans, and has facilitated alcoholism treatment (Dongier, 2005). Such research further suggested that the two disorders may be inextricably linked.

Etiology of Alcoholism

While it has been reported that there is no known linear cause of alcoholism (Dongier, 2005; Doweiko, 2011), several issues may play a role in its development. Individuals with alcoholic parents were more likely to become an alcoholic themselves (NIMH, 2010). Additionally, researchers have suggested that some genes may actually enhance the risk of alcoholism. In 2009, Saraceno, Munafó, Heron, Nick Craddock, and

van den Bree reported that several genes have been linked to alcohol abuse and mood disorders. These and other researchers maintained that the gamma-aminobutyric acid system has been implicated in alcohol's sedating effects and the development of tolerance in addition to depression-related characteristics (Foroud, Edenberg, & Crabbe, 2010; Saraceno et al., 2009).

Genetic Linkages and Familial Factors' Contribution to Alcoholism

Research demonstrating genetic links between family factors and suffering with alcoholism or alcohol dependence has been established for many years. However, both genetic and environmental influences have been thought to contribute equally, making it difficult to determine direct linkages (NIMH, 2010). Furthermore, genetic risk is also purported to be conditional upon various environmental circumstances, further complicating strategies to estimate any particular individual's specific risk (NIMH, 2010). Boden and Fergusson (2011) maintained that both alcoholism and depression are caused by common underlying genetic and environmental factors that jointly increase the risk of both disorders. Sartor et al. (2009) asserted that early age of the first drink is an indicator for familial liability to alcoholism.

In Boden and Fergusson's investigation, the degree of genetic and environmental influences on the time of first alcohol use and alcohol dependence was calculated on 5,382 twins (2,691 complete pairs) participants aged 24 to 36 years. The twin participants were recruited from the Australian Twin Registry (2011). The results suggested that both male and female individuals who began drinking at an earlier age (14 or younger) were more likely to experience alcohol dependence. In addition to Sartor et al.'s (2009) results demonstrating a positive correlation between alcohol dependence and the early onset of

alcohol use, the authors also noted the commonality was accounted for by genetic risks and suggested their findings provided evidence for the causal nature of the relationship.

Other twin studies clarified the relationship. Agrawal et al. (2009) investigated the connection between age at first drink and alcohol dependence and found that the occurrence of alcohol dependence decreased with increasing age at first drink, and that a twin's first use of alcohol predicted their sibling's alcohol dependence, which was accounted for by a significant degree of common genetic influence. Other researchers who examined the connection between age at first drink and alcohol dependence corroborated these findings; however, after controlling for family history of alcohol-related problems in combination with other joint risk factors, the association was reduced to insignificance (Sartor et al., 2009), suggesting that environmental influences were also salient. Sartor et al. (2009) noted the strong association between age at first drink and alcohol dependence was speculated to be attributed to familial sources of influence; however, the question of whether environment or genetics are causally implicated remains unclear. Moreover, further research on the environmental and genetic influences particular to the etiology of alcoholism in minority individuals has been carried out and is discussed below.

Psychological and Social Factors' Contribution to Alcoholism

The most concrete evidence implicated psychological factors as contributory to alcoholism. Some of the psychological factors that have been shown to contribute to the development of alcoholism were anxiety, conflict in relationships, depression, and low self-esteem (Dongier, 2005). Other influences like social aspects of an individual's environment may also contribute. Some of the social factors contributing to alcoholism

included ease of access to alcohol, peer pressure, social acceptance of alcohol use, and stressful life events (Dongier, 2005; NIMH, 2010).

Alcoholism in Minorities

Racial and ethnic disparities have been documented to exist between alcoholism in minority and Caucasian populations in the United States (Cartier & Caetano, 2010; Grant et al., 2011). Disparities have been explored using combined definitions of alcoholism provided by alcohol abuse, alcohol dependence as described in the *DSM-IV-TR*, and also AUD as described in the *DSM-5* (APA, 2000, 2013; Cartier & Caetano, 2010; Grant et al., 2011). According to the most recent information, AUD onset and persistence were higher in Hispanics over 40 who were born in the United States relative to Caucasians. Onset and persistence were reduced for both African Americans, younger Hispanics born in the United States, and Hispanics of all ages born outside the United States (Grant et al., 2011). Interestingly, when examining criteria for AD separately, onset risk was higher for African American and Hispanic individuals relative to Caucasians (Cartier & Caetano, 2010; Grant et al., 2011).

The causes of disparities in alcoholism between minority populations and Caucasians have remained unclear, and different theories were advanced to explain these differences (Cartier & Caetano, 2010; Grant et al., 2011; Keyes, Hatzenburger, Grant, & Hasin, 2012; Keyes, Hatzenburger, & Hasin, 2011). Cartier and Caentano (2010) and Grant et al. (2011) observed higher rates of alcohol dependence in U.S.-born Hispanic individuals, suggesting that acculturation to U.S. culture and loss of Hispanic identity was one contributing factor to alcohol dependence in this group compared to Caucasians;

this effect was not considered present for non-U.S. born Hispanics as they were less acculturated and considered less likely to lose identity.

Another key cause of alcoholism identified by the literature, is the concept of minority stress (Keyes et al., 2011; Keyes et al., 2012). Minority stress was defined as the stress resulting from prejudice and discrimination, which results in higher levels of alcohol consumption. This theory, conflicts with the observation that African Americans and Hispanics may have lower levels of alcohol consumption than Caucasians, along with a later age of first alcohol consumption (Keyes et al., 2011; Keyes et al., 2012). Nevertheless, in individual cases, especially in African Americans, the minority stress model of psychopathology has been found valid (Keyes et al., 2011; Keyes et al., 2012). Further, since stressors associated with alcoholism were diverse, they were described in terms of severity, occurrence in life course (adult vs. childhood), chronicity, expectedness, physical vs. emotional threat, and consequences to health. In this way, not only the existence of a stressor is identified, but also the way in which it impacts an individual's life. Other explanations for differential trajectories of alcohol use and dependence between minorities and Caucasians include experiences of immigration, instances of experienced discrimination, local environmental factors, and different biological factors in African Americans and Hispanics (Cartier & Caetano, 2010; Grant et al., 2011; Keyes et al., 2011; Keyes et al., 2012).

Other Drugs

Substance abuse disorders are often defined as mixed conditions characterized by persistent maladaptive use of psychoactive substances related to a significant distress and disability. These disorders occur frequently, with lifetime rates of substance abuse or

dependence estimated at more than 30% for alcohol and more than 10% for other drugs, and past year point prevalence rates of 8.5% for alcohol and 2% for other drugs (McHugh, Hearon, & Otto, 2010). According to Inaba et al. (1997) substance abuse could include the abuse of drugs other than alcohol, such as cocaine, cannabis, and heroin. Indeed, in course of the history of drugs, as many as 60 substances have been identified as having the potential for abuse.

According to the 2012 National Survey of Drug Use and Health, the best source of information regarding the substance use in Americans, Blacks (11.3%), Caucasians (9.2%), Hispanics (8.3%), and Asians (3.7%) had differential levels of substance use (SAMHSA, 2013). Excluding alcohol and tobacco, these figures reflected use of marijuana, cocaine, heroin, hallucinogens in addition to a diverse array of other substances. SAMHSA did not collect data on specific uses of these drugs among racial/ethnic groups, however for all races/ethnicities cannabis (marijuana) was the most commonly used illegal drug, with 79.0% of respondents reporting use. Cocaine was used by approximately 1.6 million, and heroin by approximately 300,000 among respondents of all ethnicities/races (cite). The literature further suggested racial and ethnic minorities have been shown to have significantly higher rates of unmet needs for substance use disorders (Perron et al., 2009).

Cannabis

As previously noted, cannabis is among the most common of illegal drugs (Weiten, 2005). Individuals smoke, chew, or eat marijuana to achieve its intoxicating effects (Iversen, 2007). Marijuana produces mild euphoria, relaxation, altered perception, and enhanced awareness. Marijuana withdrawal symptoms include irritability, anxiety

and reduced appetite (Weiten, 2005). It is a continuous debate in the United States whether to legalize marijuana for medical purposes. Many people believe that marijuana combats symptoms associated with certain medical conditions (Iversen, 2007).

Despite the fact that cannabis has generally been perceived to be a fairly harmless drug, concerns about its health effects have grown. Since the beginning of the 1990s, the occurrence of reported cannabis use has greatly increased in most of the Western world (van Laar, van Dorsselaer, Monshouwer, & de Graaf, 2007). In recent years, however, evidence of the etiological role of cannabis in the onset of psychotic symptoms and schizophrenia has added to existing concerns regarding the negative side effects of use. Perhaps caused by the illicit nature of the drug, especially in the United States, less information has been available on the association between cannabis use and other mental health problems, such as mood and anxiety disorders (van Laar et al., 2007). According to Copeland (2006), there has been little evidence on the relationship between cannabis use and depression.

Samples of patients seeking treatment for cannabis and those in outpatient treatment for depression have reported clinically significant comorbidity between cannabis use disorder and depression. However, the direction of the relationship was unclear. Although most researchers supported the postulation that depression did not cause cannabis use, a re-analysis of the ongoing National Longitudinal Survey of Youth of 1979 suggested that cannabis use might indeed cause depression (Copeland, 2006). Accordingly, research on the effects of substance abuse treatment on depression may add to the literature on the nature of the relationship between cannabis and depression. After a

thorough search, no acceptably current information was located regarding differential use of cannabis in minorities.

Cocaine

Stimulant drugs such as cocaine are often abused. According to Weiten (2005), cocaine is a natural substance that comes from the coca shrub. Cocaine is a hydrochloride salt made from the leaf of the coca plant and looks like a white powder. Less frequently, cocaine may also be injected when mixed with heroin. It is a stimulant and its effects include feeling awake, feelings of euphoria, and increased confidence (Fleetwood, 2012). Cocaine produces a brief high, elation, excitement, increased energy, alertness, and reduced fatigue (Weiten, 2005). The side effects include high blood pressure, rapid heart rate, increased talkativeness, restless, irritability, insomnia, reduction in appetite, paranoia, and greater aggressiveness. Cocaine leads to a moderate risk of physical dependence and a high risk of psychological dependence (Weiten, 2005). Health problems of this substance are related to long-term or heavy use (Fleetwood, 2012).

Yang, Han, Kranzler, Farrer, and Gelernter (2011) maintained that cocaine ranks as the third most prevalent illicit drug dependence diagnosis (SAMSHA, 2009). Even though there are no reported statistics for occurrence of comorbid cocaine dependence and depressive disorder, it has been estimated that about 30% of individuals with major depressive disorder have had a lifetime drug use disorder, and the lifetime occurrence of affective disorders was about 35% among cocaine abusers (Yang et al., 2011). Despite this and the fact that shared genetic risk has been affirmed, there have not been any reports of genome-wide linkage scans (GWLSs) surveying the susceptibility regions for comorbid cocaine dependence (CD) and major depressive episode (MDE). This

phenomenon caused Yang et al. to conduct a study with the intent of discovering chromosomal regions and candidate genes vulnerable to CD, MDE, and cocaine-major depressive episode (CD–MDE) in African Americans (AAs) and European Americans (EAs). Overall 1896 participants were recruited from 384 AA and 355 EA families. Each family had at least a sibling-pair with CD and/or opioid dependence. Array-based genotyping of about 6000 single-nucleotide polymorphisms was completed for all participants. Parametric and non-parametric genome wide linkage analyses were performed. The results indicated a significant genetic linkage, and the authors concluded that replication of the linkage findings in other populations was warranted, as was a focused analysis of the genes located in the linkage regions implicated in this study (Yang et al., 2011).

Bohnert and Miech (2010) conducted a study to explore changes in the relationship between cocaine use and depressive disorders in recent decades. Their analysis suggests that an association between depressive disorders and cocaine use surfaced in the 1990s, and did so quite dramatically. In 1981, the association was small and not statistically significant; by 1992–1993 this association had grown, and people with depressive disorders had a three times greater probability of reporting past-year cocaine use than those without depressive disorders (Bohnert & Miech, 2010).

Bohnert and Miech (2010) also demonstrated that the significance of cocaine use went through a dramatic transformation throughout the 1980s. Through the mid-1970s in the United States, both cocaine and marijuana were perceived by many to be relatively gentle, and these two drugs were often compared to each other to help make the case that both substances should be legalized (Bohnert & Miech, 2010). Indeed, by the early 1980s

cocaine had become a “fashionable” drug, and considered to be as harmful as an addiction to peanuts or potato chips. However, during the 1980s, when the most severe effects of cocaine use became evident, public opinion about cocaine changed to reflect a stronger perception of danger. The notion of cocaine use as a means of facilitating an amusing or entertaining drug experience became increasingly inconsistent with a drug that appeared to cause addiction and wreak harmful effects on the body. Afshar et al. (2012) maintained that 30.5% of cocaine abusers who were seeking treatment also met the Diagnostic criteria for lifetime MDD. The authors also suggested that comorbid depression might be a risk factor for relapse in cocaine dependent individuals. The use of antidepressants to treat cocaine dependent individuals with depressive disorders has also been examined in several investigations, as depression is considered a motivating factor for cocaine use.

Based on previous findings concerning the use of mirtazapine in the treatment of a range of substance use disorders and its antagonistic actions at the serotonin 5-HT2A receptor, researchers questioned whether or not mirtazapine was effective in the treatment of cocaine dependence in the presence of a depressive disorder. Accordingly, Afshar et al. (2012) conducted a study to examine the efficacy of mirtazapine on the treatment of depressed cocaine-dependent individuals. In this study, 23 men and women within the age range of 18 to 64 received a target dose of 45 mg mirtazapine daily or a placebo for 12 weeks. Urine concentrations of benzoylecgonine and self-report questionnaires were used to evaluate cocaine consumption. Participants’ depressive symptoms were assessed using the Hamilton Depression Rating Scale (HAM-D). Participants’ sleep quality was assessed using the Pittsburgh Sleep Quality Index. The results indicated that cocaine

consumption during the treatment period did not differ significantly between the mirtazapine (n = 11) and placebo (n = 13) groups in this study. In week 4, sleep latency was significantly lower in the active medication group than in the placebo group. Positive effects of mirtazapine treatment on early insomnia were suggested by an item analysis of the HAM-D. In addition, the results of this study suggested that mirtazapine was superior to the placebo in improving sleep in individuals with comorbid depression and cocaine dependence, but mirtazapine was not more effective than the placebo in reducing cocaine use. Overall, the results of this study did not support the efficacy of mirtazapine in the treatment of cocaine dependence and depressive symptoms (Afshar et al., 2012).

After a thorough search, no acceptably current information was located regarding differential use of cocaine in minorities, thus revealing a gap in the research literature.

Heroin

Maremmani et al. (2007) noted that psychiatric symptoms are common in individuals who are addicted to heroin and that these symptoms may arise from addiction and withdrawal problems. However, there have been doubts expressed about whether heroin-addicted individuals truly had co-morbid psychiatric diagnoses. Maremmani et al. examined the psychiatric status of 1,090 heroin-addicted participants (831 males and 259 females) between the ages of 16 to 51 at the beginning of treatment. The results indicated that 499 (45.8%) of the participants reported depressed mood, and 437 (40.1%) of participants reported preoccupation with somatic functions or spontaneous anxiety. Overall 506 (46.42%) heroin addicted participants demonstrated depressive-anxious symptomatology, 421 (38.62%) had psychomotor excitement, and 163 (14.95%) showed a psychotic condition. Participants with depressive-anxious symptomatology, as a whole,

had a less serious addictive illness compared to those demonstrating excited and psychotic symptoms (Maremmani et al., 2007). The authors concluded that depressive features were the most frequent psychiatric symptoms among heroin addicts looking for treatment, and part of the most highly represented clinical state (depressive-anxious). Nevertheless, the existence of depressive-anxious features did not necessarily result in a dual diagnosis (Maremmani et al., 2007).

After a thorough search, acceptably current information was located regarding differential use of heroin in minorities was difficult to find, indicating another gap in knowledge regarding drug use in minority populations. One of the most recent reports was published in 2005 by Bernstein et al. The study focuses on racial and ethnic differences among 963 self-reported cocaine and heroin users who voluntarily sought treatment. Participants were assessed at time of enrollment by the Addiction Severity Index—a measure of distress in seven different domains: medical, legal, employment, drug, alcohol, family and psychological functions (Bernstein et al., 2005)—and six months later. A biochemical sample was also taken in the form of a hair sample at time of enrollment and again six months later.

The report notes significant racial and ethnic difference in use of heroin among whites, African Americans and Hispanics over the course of six months (Bernstein et al., 2005). Whites had higher rates of heroin and alcohol use while African Americans reported higher levels of cocaine use. Alternately, heroin use was confirmed as the drug of choice for Hispanics (Bernstein et al., 2005). Interestingly, underreporting was a prevalent issue noted by researchers, and race in particular, was a predicator of discordant reporting at follow-up. That is, participants' self-reported use ran counter to the results of

their respective hair tests. This was particularly prevalent with Hispanic and black participants. As the current study also notes, this phenomenon has yet to be sufficiently explored by the literature.

Depression

Depression is more than just a state of being down or feeling blue for several days; it is a serious medical and psychiatric illness that impacts the private and professional lives of millions of Americans. For the estimated 20 million in the United States who suffer from depression, these feelings seldom disappear, but rather persist and hinder everyday life experiences (NIMH, 2010). Some of the symptoms of depression may include sadness; loss of interest in activities that one used to find pleasurable; sleep difficulty; weight gain or loss; sleep problems; fatigue or lethargy; feelings of emptiness or worthlessness; low self-esteem; feelings of hopelessness and in more serious cases, suicidal ideation, or suicide attempts. According to the *DSM-5* (APA, 2013), in order to be diagnosed with a depressive disorder, an individual has to experience five or more of the following symptoms for a period of 2 weeks: loss of interest or pleasurable activity; the depressed mood should be present all day and every; significant weight loss when not dieting; insomnia or hypersomnia almost every day; fatigue or loss of energy almost every day; unable to concentrate; feeling of worthlessness; frequent suicidal ideation; psychomotor agitation(which can be observed by others)and excessive guilt (which may be delusional). It must be noted that not everyone diagnosed with depression experiences all of these symptoms because depressive symptoms manifest differently in men, women, children, and older adults (NIMH, 2010).

Prevalence of Depression

Depression is a debilitating disorder that affects individuals regardless of racial, ethnic, and socioeconomic backgrounds. According to recent studies, it is estimated that up to 16% of the general population experiences a major depressive incident at some point in their lives. In addition to individual suffering, the effect of depression may have significant implications for society at large. For instance, depression is attributed to a productivity loss of more than $44 billion a year in the United States (Wang, Simon, & Kessler, as cited in Sarmiento & Cardemil, 2009). Depression is also related to high rates of suicide, having been associated with over 30,000 deaths in the United States in 2004 by The World Health Organization. According to Sarmiento and Cardemil (2009), depression was the second leading cause of disability among all health problems.

Etiology of Depression

There is no known cause of depression; however, it likely results from a mixture of genetic, environmental, biochemical, and psychological factors. Some researchers also maintain that depressive illnesses are disorders of the brain. According to the NIMH (2010), research using MRI demonstrated that the brains of depressed and non-depressed individuals looked different, especially in the areas of mood, thought, sleep, and appetite regulation. Some depressive disorders were found to run in families, indicating a genetic connection (NIMH). Depression may also occur, however, in an individual without a family history of depression. Genetics research also suggested that the risk for depression results from the influence of numerous genes acting together with environmental and other factors (Dongier, 2005; NIMH).

Differences in Depression Between Genders

Both males and females may develop depression; however, findings have suggested that each sex experiences and expresses depression differently. The NIMH (2009) reported that an estimated 6 million men in the United States suffered from a depressive disorder every year. Further, the NIMH (2010) also noted that men were more likely to acknowledge the presence of fatigue, irritability, loss of interest in work or hobbies, and sleep disturbances compared to the feelings of sadness, worthlessness, and excessive guilt that women were more likely to report. The NIMH's (2010) national research on depression indicated that many men were unaware of the depression's physical symptoms, including headaches, digestive disorders, and chronic pain. In addition, some men expressed concern regarding seeking mental health assistance due to the negative impact this would have in their job, promotion potential, or health insurance benefits, as well as lack of respect from family, friends, and their position in the community.

The American Psychiatric Association, via the *DSM-IV-TR*, reports that research conducted in the United States and Europe indicated that women are at a significantly higher risk than men to experience major depressive episodes at some point in their lives. This high risk was more prominent in adolescents during periods of growth, which might coincide with the onset of puberty, and then might become worse before the onset of menstruation. Female adolescents and adults were more likely to experience MDD than male adolescents and adults. Women were also two to three times more likely to develop dysthymic disorder than men (APA, 2000).

According to Hersen, Turner, and Beidel (2007), other factors that contribute to the increased occurrence of depression in women were sexual abuse; domestic violence, and economical limitations; a lack of personal and public resources also resulted in significant psychological problems. Hersen et al. also maintained that hormonal and biological factors may have contributed to high rates of depression in women. Menopausal symptoms have also been shown to increase depression rates in women and some maintained that, when including vasomotor instability (hot flashes) as part of the diagnosable symptom cluster, rates of depression increase from 39% to 55% (Hersen et al., 2007).

Among the minority groups of African Americans and Hispanics, females exhibited higher levels of depression than males (Arbona & Jimenez, 2014; Roxburgh, 2009). Proposed causes of higher levels of depression in female minority individuals were largely related to differential ways in which those individuals experience social, economic, and cultural influences (Arbona & Jimenez, 2014; Roxburgh, 2009). For example, Arbona and Jimenez found female gender was related to higher levels of cultural identity, which in turn was related to higher levels of depression in a specific context (mixed-race universities). Arbona and Jimenez linked gender and cultural identity to the minority stress model, emphasizing that cultural marginalization caused higher depression rates, not the female gender itself. In the same vein, though Roxburgh stated African American women were more likely to be depressed than African American men were. Social modifiers such as marital status, home ownership, and education provided more mental health benefits to this group than for others, suggesting a powerful influence of socioeconomic modifiers in gender.

Depression Prevalence in Minorities

Although the research is limited, the research that is available associates depression among young adult minorities with stress, lack of social resources, and low socioeconomic status (Brown, Meadows, & Elder, 2007; Stein et al., 2010). Non-Hispanic African American men displayed the highest rates of MDD at 12.2%, followed by Hispanics or Hispanics 12.7%, and then Caucasian non-Hispanics (8.7%; USDHH, 2012). Risk factors for depression for African Americans included economic damage, interpersonal conflicts, and racial discrimination (Brown et al., 2005). Hispanic and African American males also displayed significantly earlier onset of MDD when compared with their Caucasian counterparts. Even though minority males also suffered from depression, they sought mental help from health care professionals less frequently than females, which only further decreased the likelihood of diagnosing their mental health disorders (Buzi & Weinman, 2013). One reason for that is that males frequently felt pressured to stay away from emotional expression, conceal weaknesses and vulnerability, and solve problems without requesting the help of others. The pressure to be "masculine" may explain why men are more likely than women to express anger and irritability when they were depressed (Buzi & Weinman, 2013).

Buzi and Weinman (2013) conducted a study to assess depression among young males attending a family planning clinic and whether depression varied by socio-demographics and service requests. The study consisted of a convenience sample of 535 African American and Hispanic young males, ages ranging from13 to 27, who attended a family planning clinic located in an inner-city neighborhood in a large city in the Southwest United States. The clinic provided low-cost to free comprehensive family

planning and reproductive health services to indigent adolescents and young adults who resided in the inner city. The results indicated that of the 535 young males who participated in the study, 119 (22.2%) met criteria for a depressive disorder. Chi-square analyses were conducted to compare the depressed and non-depressed males based on sociodemographic characteristics. Hispanic males were more depressed at 28.6% than African American males at 19.0%. As a result, males were more likely than non-depressed males to be Hispanic and to request services related to relationships, feelings, financial resources, physical issues, and well-being. The findings indicated that young males who were affected by depression have unmet needs, but when given an opportunity, are able to express those needs. The findings of the study were inconsistent with other studies that found higher rates of depression among African American males than Hispanic males. Identified risk factors for depression among Hispanics included ethnic microaggressions, which is a form of everyday, interpersonal discrimination that may increase feelings of depression and illness (Huynh 2012). Findings indicated depressed males were more likely to express interest in services. These service requests related to relationships, feelings, financial resources, physical issues, and well-being. Interest in physical issues was consistent with interest indicated in previous studies. Overall researchers found that African American individuals focus more on somatic and physical symptoms to express depression.

African Americans. It has been noted that psychological symptoms may be more debilitating for African Americans than for European Americans and that African Americans who experienced depressive symptoms were less likely to succeed in treatment (Salami & Walker, 2013). According to U.S. Census Bureau (2009), since

African Americans were overrepresented among socially and economically stressed subgroups, with approximately 24% of the African American population living below the poverty line, it is possible that African Americans experienced relatively more stressors than European Americans

In 2005, Thema Bryant-Davis and Carlota Ocampo published an article that explored racist incidents as traumatizing forms of victimization with the potential to lease to increased psychiatric and psychophysiological symptoms in targets (Bryant-Davis, 2005). Although the scope of the problem was difficult for researchers to estimate, the prevalence of racist incidents in America is particularly high among people of color and researchers sought to explore the impact of this form of psychosocial distress on African Americans. Ultimately, the study pointed to a need to conceptualize the symptoms of survivors of racist incidents as trauma responses as this may help to inform treatment of these individuals in therapy (Bryant-Davis, 2005).

Hispanics. One population with depression that has remained relatively understudied is Hispanics, a fact that has considerable public health implications given the continuous growth in Hispanic populations in the United States Gonzalez-Prendes, 2011). This lack of racial and ethnic minority research has resulted in a vague understanding of depression among Hispanics. For instance, several early epidemiological studies found that compared with Caucasian non-Hispanics, Hispanics were at increased risk for depression (Gonzalez-Prendes, 2011). The paucity of data related to the stressor experienced by those of Hispanic or Latino heritage was noted in a 2015 study on Discrimination, Acculturation, Acculturative Stress, and Latino Psychological Distress using a moderated mediation model (Torres et al., 2015). Based

on prior research, which has found that perceived discrimination is associated with adverse mental health outcomes among Latinos, the study investigated the role of acculturative stress in the underlying relationship between perceived discrimination and psychological distress as experienced by Latinos.

Based on a sample of 669 Latino adults, their moderated mediation analyses revealed that acculturative stress mediated perceptions revolving around the "discrimination-psychological distress relationship" (Torres et al., 2015, p. 57). Further, these findings established that the link between perceived discrimination and acculturative stress was moderated by Caucasian behavioral orientation but not Latino behavioral orientation (Torres et al., 2015). The findings provided evidence for a moderated mediation model in which perceived discrimination was associated with heightened acculturative stress. This in turn was related to increased psychological distress. Per the results of the study, one-third of Latino participants scored above the clinical cut-off score for psychological distress, suggesting that further research may be needed in order to adequately explore and resolve this phenomenon (Torres et al., 2015).

Depression and Substance Use Disorders

Usually, individuals with depression experience other illnesses along with the depression. At times, those illnesses come first, while at others, depression appears first and comorbid disorders appear secondarily. When depression appears before the other illnesses, the depression is classified as primary depression; when another illness comes first, the depression is classified as secondary depression (NIMH, 2010). While it must be noted that each individual and situation is different, it is essential that comorbid illnesses are addressed through targeted treatment in addition the treatment being received for

depression. Numerous illnesses or disorders can co-occur with depression, including diabetes, Parkinson's disease, HIV/AIDS, anxiety disorders, alcoholism or substance abuse, panic disorder, obsessive-compulsive disorder (OCD), social phobia, generalized anxiety disorder, and posttraumatic stress disorder (NIMH, 2010).

According to Nolen-Hoeksema, Larson, and Grayson (1999) depressed men are more likely to report comorbid alcohol or drug and chemical dependence in their lifetime than depressed women. Bazargan-Hejazi, Ani, Gaines, Ahmadi, and Bazargan (2010) conducted a study to assess the relationship between alcohol misuse and depressive symptoms as it varied among male and female participants. This cross-sectional survey study used 412 randomly selected adult patients who sought care in the hospital emergency room. The major predictor variables of alcohol abuse were created from AUDIT, RAPS4, binge drinking, alcohol abuse, and alcohol dependence measures. The outcome variable of depressive symptoms was measured by the Center for Epidemiological Studies Depression Scale (CES-D; Bazargan-Hejazi et al., 2010). The results indicated that, of the participants who reported greater depression, 34.1% of males in comparison to 9.2% of females who reported alcohol misuse (Bazargan-Hejazi et al., 2010). This differential may be due to men's self-reported feelings of frustration, discouragement, anger, or irritability; all of which are symptoms associated with these disorders. Currently, researchers are debating whether substance abuse can be regarded as part of the symptoms underlying depression in men, or if it is a co-occurring condition that mostly develops in men (Bazargan-Hejazi et al., 2010). Many depressed men abused substances in an attempt to self-medicate their depression, instead of accepting depression as a separate illness that required intervention and treatment. Nolen-

Hoeksema and Girgus (1994) maintained that many depressed men responded to their depression by engaging in reckless or harmful behavior.

When depression is primary to alcoholism, alcoholism often occurs as a result of attempted self-medication. In this case, the individual is seeking a "way to feel better" and to otherwise relieve his depressive symptoms (Dongier, 2005). According to the National Epidemiological Catchment Area Survey, 13.4% of individuals with a lifetime alcohol disorder also reported having an affective disorder such as depression. In addition to these findings, the National Comorbidity Study found 24.3% of men and 48.5% of women with a long-term alcohol disorder or substance abuse disorder also reported a long-term major depressive disorder. Although many individuals with alcohol dependence disorder also experienced depressive disorder, mental health professionals oftentimes had difficulty assessing whether the depressive symptoms are from the alcoholism disorder or independent of the alcoholism disorder (Ramsey, Kahler, Read, Stewart, & Brown, 2004). Other studies also demonstrated that moderate to severe depressive symptoms during the end of alcohol treatment were a significant predictor of returning to substance use about 3 months posttreatment. The exception occurred when the patients were treated with antidepressant medications. If antidepressants were used, participants were less likely to return to substances, including alcohol (Curran, Booth, Kirchner, & Denke, 2007).

Numerous clinical and community studies have demonstrated a significant linkage between substance abuse and psychiatric problems (Brook, Brook, Zhang, Cohen, & Whiteman, 2002). In fact, drug use itself has been found to be significantly related to substance use disorders including nicotine dependence, anxiety, and affective

disturbances. Overall, drug users have been found to have more rigorous levels of psychological problems than do individuals who do not use drugs (Brook et al., 2002).

Cameron Wild et al. (2005) further reported that regarding diagnosis, mood disorders were widespread among all drug users in the general population. The authors noted that 8% of the general U.S. population experienced a mood disorder at some time in their lifetime. Despite this, mood disorders were 4.7 times more likely among those who had struggled with substance dependence (apart from alcohol) when compared with the general population. Among individuals who abuse drugs such as opiates in their lifetime, 31% had a mood disorder at some time during their life. Cameron Wild et al. (2005) further maintained that treated drug abusers in general, were more likely to suffer with affective disorders or depressive disorder, compared with untreated drug users. This was particularly true for users of opiates. Indeed, 42% of individuals seeking treatment for poly substance dependence reported lifetime suffering with a mood disorder, and almost 19% reported a lifetime history of depression. According to Mandell, Kim, Latkin, and Suh (1999), the co-occurrence of depression among illegal drug users clearly has important behavioral and treatment implications as depression was positively correlated with continuous drug use during and after treatment for opiate abuse. Injection drug users and individuals with opiate addiction demonstrated that stopping drug use leads to reduced depressive symptoms. In addition, depressive symptoms were significantly correlated with needle-sharing behavior among injection drug users. Mandell et al. also reported that individuals with high depression had a 1.66 higher likelihood of needle-sharing behavior than injection drug users who suffered from moderate depression (Mandell et al., 1999).

Genetic Linkages Between Substance and Mood Disorders

Alcoholism and depression have appeared comorbidly at greater levels than suggested by chance alone, implying that overlapping genetic and environmental influences were significant in the etiology of substance abuse and mood disorders; this may hold further potential implications for minority individuals from different genetic and environmental backgrounds (Kelly et al., 2009; Nurnberger et al., 2002). With respect to the genetic relationship between alcoholism and depression, Nurnberger et al. (2002) noted a clear and direct connection between alcohol and mood, and maintained alcohol intoxication often generated a strong effect with attendant giddiness and lowering of inhibitions. On the contrary, hangovers and acute withdrawal typically produced dysphoria characterized by anxiety and depression combined with physical malaise. Moreover, psychopathological evidence suggested susceptibility to both alcoholism and depression might run in families (Nurnberger et al., 2002).

Although most researchers agreed on the existence of a relationship between the disorders, there was disagreement about the cause of the association. Kelly et al. (2009) noted that treatment and community-based studies both demonstrated that major depression and alcohol co-occur within individuals at higher rates than expected by chance. Although the relationship between alcohol dependence and major depression had been previously acknowledged colloquially, prior to these findings there had only been limited agreement on the foundation for the relationship between the two disorders. Kelly et al. further argued that one proposed explanation for the relationship between alcohol dependence and major depression among the family and twin studies used to explore possible mechanisms for the connection between alcohol dependence and major

depression was that the disorders have a shared etiology (e.g., overlapping genetic or environmental risk factors).

In a similar study, Kuo et al. (2010) conducted genome-wide linkage analyses to discover loci and to reproduce prior evidence for linkage to major depression, in addition to searching for linkage regions that may present risk to the co-occurrence of depression and alcoholism in a sample of sibling pairs affected with alcohol dependence. A set of 1,020 micro-satellite markers (average marker spacing of 4 cM) were genotyped in 1,289 participants: which consisted of 473 informed families for analysis of depressive traits and 626 sibling pairs for analysis of symptoms of major depression and alcohol dependence (Kuo et al., 2010). The result revealed a fair level of genetic connection between alcoholism and major depression. These authors argued that depressive disorder is more common among individuals with alcoholism and that twin studies revealed a fair level of genetic linkage between alcoholism and depression (Kuo et al., 2010). The authors further proposed that this linkage suggested the presence of loci that make these particular individuals more susceptible to the two disorders (Kuo et al., 2010). In their 2010 twin study, which used a fairly large culturally and ethnically identical sample, they found linkage areas of interest that may imply the existence of carrier genes for developing major depression (Kuo et al., 2010).

Thus, although the genetic influences on the risk of developing major depression and alcohol abuse were well established and several family and adoption studies supported the hypothesis of a common familial liability underlying both disorders (Kelly et al., 2009), the cause(s) of the relationship, and whether one disorder always preceded the other, remained unknown. It has been reported that family members of individuals

who suffered from both alcohol dependence and major depression had a higher prevalence of alcohol dependence than family members of individuals who suffered from alcohol dependence only (Kelly et al., 2009). Moreover, individuals who were diagnosed with major depression without a diagnosis of alcohol dependence were more likely to have alcoholic family members compared with individuals without either disorder. These findings suggested that alcohol and major depression shared an underlying liability (Kelly et al. 2009); however, the question of which disorder contributed to the genesis of the other was not established.

Still other researchers disagree about the nature of the relationship between alcohol and major depression. Nurnberger et al. (2002) suggested that while both alcoholism and affective disorders such as depression may co-occur, they were still completely distinct disorders. Although they were associated, Nurnberger et al. further maintained that one disorder did not cause or contribute to the other disorder. These dissimilar hypotheses about the existence of the association between alcoholism and affective disorders had different implications for family related risk factor estimates of these illnesses. For example, if alcoholism were the primary disorder and depression occurred as a result of it, family members of alcoholic individuals would be expected to have an increased risk of alcoholism with secondary depression, but not of solely depression (Kelly et al., 2009; Nurnberger et al., 2002), and family members of individuals with depression but without alcoholism would be predicted to have an increased risk of depression only. However, if depression were the primary disorder and alcoholism occurred secondarily, relatives of non-depressed alcoholics would be expected to have an increased risk of alcoholism, and only family members of individuals

with depression would be expected to have an increased risk of depression with secondary alcoholism. The research results did not consistently support these predictions Nurnberger et al., 2002).

According to family data on alcoholism and depression, conclusive support for the superiority of one hypothesis over another has not yet been obtained. What *is* currently agreed upon, is that the association between alcoholism and affective disorders, and the understanding that this relationship was at least partly mediated by genetic factors (Nurnberger et al., 2002). The authors also maintained twin studies provided evidence for overlapping genetic and environmental influences observed in the association between major depression and alcohol disorder (Nurnberger et al., 2002).

In the Virginia Adult Twin Study of Psychiatric and Substance Use Disorders sample, Nurnberger et al. (2002) found that 9% to 14% of the variation in liability to alcohol disorder overlapped with major depression, with 50% to 60% of this overlap was caused by genetic factors and the remainder by specific environmental influences. Moreover, in a study of Australian twin pairs, Nurnberger et al. found that a history of major depression was an important genetic correlate of risk for alcoholism; however, the heritability of alcoholism was still significant after adjusting for major depression and other psychiatric and personality measures (Nurnberger et al., 2002).

In a sample of males from the Vietnam Era Veteran Twin Registry, researchers could not distinguish between the overlapping-causes model and a causal model in which major depression leads to alcohol and vice versa (Kelly et al., 2009). In summary, the research suggested that both genetic and environmental factors overlapped in diagnoses of major depression and alcohol disorder, and specific genetic and environmental factors

similarly influenced the liability of major depression or alcohol dependence (Kelly et al., 2009).

Shared Genetic Vulnerability for Other Mood and Substance Disorders

Evidence of shared genetic vulnerability between other nondepressive affective disorders and substance dependence remains ambiguous. As such, making potential differences between minority and nonminority comorbid etiologies due to environment and genetic influences is difficult to discern. Research indicated manic individuals with and without antecedent alcohol abuse and individuals with antecedent abuse had a lower risk of affective illness in first-degree relatives and a later age of onset of affective disorder (Nurnberger et al., 2007). That is, alcohol abuse might precipitate mania in some of the individuals who suffer from bipolar disorder (Nurnberger et al., 2007). In addition, it was reported that individuals with bipolar disorder and with antecedent alcoholism had a similar age of onset to those without alcoholism; in contrast, bipolar individuals with secondary alcoholism had the earliest onset of bipolar disorder and a worse course of affective illness than those with antecedent alcoholism. Furthermore, alcoholic bipolar individuals demonstrated earlier age of onset than nonalcoholic bipolar individuals. Bipolar individuals with subsequent substance abuse showed earlier onset (M = 13.5 years of age) than those without (M = 22.7 years of age), and participants with antecedent substance abuse had a later age of onset of bipolar disorder (M = 27.5 years of age; Nurnberger et al., 2007). Nurnberger et al. also suggested alcohol abuse in bipolar disorder might be associated with depressive symptoms and cannabis use with manic symptoms. The differences between these findings may reflect the presence of different subgroups of patients defined by different temporal courses of illness. Taken together,

findings were consistent in establishing a distinction between primary bipolar disorder and bipolar disorder occurring secondary to substance dependence (Nurnberger et al., 2007); this discovery might help shed light on the relationship between depression and alcoholism.

In order to identify genes contributing to the development of alcoholism and its associated characteristics (i.e., phenotypes) and phenotypes related to the comorbidity of alcoholism and depression, Nurnberger et al. (2002) conducted a collaborative study on the genetics of alcoholism (COGA) at several research centers across the United States. The results indicated that major depression was not more common in alcoholic participants than in nonalcoholic participants for either males or female participants. Despite this, the findings also suggested that depressive syndrome was significantly more common among alcoholics than among nonalcoholics for both males and females (Nurnberger et al., 2002). Ultimately, researchers concluded that the prevalence of alcohol dependence and depression was significantly greater among the first-degree relatives of individuals with alcohol dependence and depression than among relatives with alcoholism alone or relatives of control participants (Nurnberger et al., 2002). Overall, the risk of depression was increased in family members of alcoholics with major depression and, to a lesser extent, in relatives of alcoholics with depressive syndrome. These findings supported the idea that the alcohol dependence and depression phenotype represented a genetically distinct condition (Nurnberger et al., 2002). This notion was further supported by the finding that depression in family members of individuals with alcohol dependence and depression typically did not occur independently but only in combination with alcoholism.

Psychological Linkages Between Substance Abuse and Mood Disorders

Brook et al. (2002) noted that drug use at an early age was associated with and predicted later psychiatric disorders. The authors further suggested that there might be an array of mechanisms underlying the linkage between alcohol use, marijuana, or other psychoactive drugs and later psychiatric disorders that are related to different causes. In line with a psychopharmacological interpretation, it might be that different neurobiological and behavioral changes occurred with numerous exposures to different drugs. Furthermore, unmeasured frequent underlying factors (e.g., family conflict, drug-using peers, or genetic factors) might have had an effect at some time throughout development on the onset of marijuana use which in turn, might be associated with psychiatric disorders (Brook et al., 2002).

Brook et al. (2002) examined the effects of drug use such as tobacco, alcohol, marijuana, and other drugs during childhood, adolescence, and the early 20s on the development of episodes of major depressive disorder, alcohol dependence, and substance abuse disorders in the late 20s. The authors used data from a community-based sample of 736 adults that included a 50% female sample from upstate New York. The participants were interviewed at the mean ages of 14, 16, 22, and 27 years. Participants' psychiatric disorders and drug use were measured by age-appropriate versions of the University of Michigan Composite International Diagnostic Interview. The results indicated that adolescent and young adult tobacco use was significantly related with an increased risk of alcohol dependence and substance use disorders at a mean age of 27 years, but not with new episodes of major depressive disorder (Brook et al., 2002). Early alcohol use significantly predicted later major depressive disorder, alcohol dependence,

and substance use disorders in the late 20s, as did earlier marijuana use and other illicit drug use. With the exception of the effect of tobacco use on major depressive disorder, early drug use was significantly linked to later psychiatric disorders, even after statistically controlling for age, sex, parental educational level, family income, and prior episodes of major depressive disorder and substance use disorders (Brook et al., 2002).

Rubin et al. (2007) maintained that major depressive disorder (MDD) frequently accompanied cocaine dependence (CD) as a comorbid condition, yet this co-occurrence can be difficult to identify because cocaine withdrawal and MDD share symptomatology. Some prior reports had not rigorously accounted for such overlap. Rubin et al. demonstrated that mood effects directly attributable to abstinence from cocaine, even in the setting of comorbid MDD, might be substantially moderated by environmental factors and likely decline during the first days of abstinence. With continued abstinence, a second mood component became evident only in the comorbid group. This more sustained dysphoria was attributable to MDD, and presumably reflected enduring changes in brain function related to chronic cocaine use (Rubin et al., 2007).

Depression and Alcoholism

Comorbid depression and substance abuse complicated the treatment of both conditions (Renner, Baxter, Suzuki, & Ciarulo, 2011). The linkage between abuses of different kinds of substances and depression remained unclear; however, depression is more common among substance abusers (Renner et al., 2011). For example, depressed individuals diagnosed with Major Depressive Disorder (MDD) were more likely to have problems with alcohol (16.5%-21.9%) compared to those who were not depressed (13.5%); depressed individuals were also more likely to have drug abuse problems (18%-

18.9%) when compared to those who were not depressed (6.9%; Renner et al., 2011). Most research regarding the relationship between depression and substance abuse focused specifically on alcoholism (Renner et al., 2011).

Alcoholism has been shown to simultaneously occur with other mental health disorders. According to the Epidemiological Catchment Area studies and the National Comorbidity Survey (Havassy et al., 2004), there was an existing high prevalence rate (30%) of severe mental disorders co-occurring with substance abuse disorders. Dongier (2005) reported that the mental health disorder of depression was likely to co-occur with alcoholism. Indeed, the lifetime prevalence rate for depressive disorders to occur comorbidly with any alcohol dependence was 21.8% (Petersen & Zettle, 2009). Petersen and Zettle reported that being diagnosed with either depression or substance abuse disorder alone has also been shown to increase the risk of developing the other disorder. In their 2010 study, Sjöholm, Kovanen, Schalling, Lavebratt, and Partonen reported approximately 80% of their participants with alcoholism experienced depressive symptoms, and 25% to 40% of the participants with depressive disorders also reported drinking problems. Boden and Fergusson (2011) corroborated earlier research and demonstrated an association between alcoholism and depression. Further, they revealed that having either alcohol abuse disorder or depressive disorder doubled the risk of the second disorder.

Research on the comorbidity of alcoholism and depression also suggests the co-occurrence of disorders influenced treatment outcomes for both disorders. Petinatti et al. (2010) demonstrated that depressed individuals with alcohol dependence or alcoholism took longer to recover from their depression. Similarly, among individuals seeking

treatment for alcohol dependence or other drug use dependence, depressive symptoms were associated with poorer treatment outcomes (Dongier, 2005). Furthermore, Sjöholm et al. (2010) found that the comorbidity of depression and alcohol use problems complicated participants' treatment outcome and might modify their prognosis.

Substance Abuse and Depression Treatment Disparities by Race and Ethnicity

Although African Americans and Caucasians of either Hispanic or Non-Hispanic origin had similar rates of substance use disorders, population-based studies showed that African Americans, either Hispanic or Non-Hispanic, were less likely to use specialty treatment services (e.g., substance abuse programs, drugs prevention program, 12-Steps program; Perron et al., 2009). Given the expectation that the African American population will nearly double its size to 61 million by the year 2050, research about substance abuse treatment in this population subgroup was vital. Hispanics, particularly of the generation, have a collectivist orientation that gives primacy to family cohesiveness over individuality, are more likely to endorse traditional hierarchical relationships characterized by respect and loyalty, and have distinct cultural norms about the father's leadership role in the family and the way family members should be honored (González-Prendes et al., 2011). Within this value system, social stigma about seeking treatment was sharp because as a Hispanic proverb stated "dirty laundry is only washed at home." As a result, seeking help for psychiatric problems could be perceived as a threat to a family's reputation or as a sign of weakness (González-Prendes et al., 2011). Moreover, Gonzalez-Predes et al. (2011) further found that when Hispanic males *did* seek help for their depression they often went to their primary care doctors complaining of somatic symptoms of depression such as chronic pain, headaches and stomach problems.

The comorbidity of alcoholism and depression, its impact on prognosis, the increased rates of both disorders in African American populations, and the higher rates of unmet treatment needs in minority populations made research on this topic essential.

Self-Medication Model

Khantzian (1985) created one of the first self-medication hypotheses from a psychodynamic point of view. The self-medication hypothesis suggested that substance addiction functions as a compensatory means to alleviate or diminish distress and as a means to self-soothe from "unmanageable psychological states" (Suh et al., 2008, p. 43). The authors also asserted that individuals who abused substances experienced dysphoric feelings as "intolerable" and "overwhelming" and further found themselves unable to control these emotional states on their own. As a result, individuals who abused substances may use drugs to battle, both physiological and psychological effects and to control distressful feelings in order to achieve emotional stability (Suh et al., 2008). While focusing primarily on drugs like heroin and cocaine, Khantzian stated that the particular psychotropic effects of both drugs can negatively affect those who suffer from psychiatric disorders, making them more vulnerable to developing an addiction to either substance (Khantzian, 1985). In addition, Khantzian also observed that the subjective experiences of addicts provide helpful indications as to the extent to which they suffer from overwhelming instabilities of affect (e.g., individuals with depression) and how the short-term use of their drug of choice helps to fight these instabilities.

In light of the self-medication hypothesis, the experience of minority individuals may require special therapeutic attention. Minority stress, discrimination, economic marginalization and a host of other factors associated with the unique life experiences of

African Americans and Hispanics have been identified as contributors to alcohol abuse in these groups (Voss Horrell, 2008; Wilson & Rocco Cottone, 2013). As a result of different trajectories of alcoholism and substance addiction in minorities, treatment specifically adjusted for the experience and culture of African Americans and Hispanics has been recommended (Gallardo & Curry, 2009; Mulvaney-Day, Earl, Díaz-Linhart, & Alegría, 2011; Voss Horrell, 2008). Findings regarding the tendency of minority individuals to cease substance abuse treatment early indicated that programs designed primarily for Caucasian individuals might pay insufficient attention to the experiences of minorities (Arndt et al., 2013; Gallardo & Curry, 2009).

Suh et al. (2008) identified alcohol as the most broadly abused substance in the United States. Alcohol was considered a central nervous system depressant, featuring relaxing and sedating effects. According to the self-medication hypothesis, individuals who abused alcohol often manifested rigidly over-contained, constricted emotions. "To avoid distressful effects, emotions are isolated and cut off from abusers' awareness through the use of rigid defenses, leaving the feelings of emptiness and isolation" (Suh et al., 2008, p. 63). Individuals who abused alcohol utilized rigid emotional and psychological defenses to restrict feelings from consciousness, resulting in feeling less or disaffected states. Per the findings of Suh et al., the alcohol alleviated these individuals' rigid defensive formation and allowed them to relieve these constricted feelings (Suh et al., 2008).

Suh et al. (2008) conducted a study to investigate Khantzian's (1997) clinical observation that specific psychological characteristics (e.g., repression, over-controlled hostility, psychomotor acceleration, depression, posttraumatic stress disorder, and

cynicism) were associated with specific drugs of choice (e.g., alcohol, cocaine, or heroin). The authors hypothesized that the individuals in each drug class would share distinctive emotional states (indicating the relationship between subjective affects and drug of choice), and that preference for alcohol could be predicted by high levels of emotional inhibition and repression; that cocaine preference could be predicted by high depressive affect and/or the need for elevated psychological states; and that preference for heroin were predicted by high levels of anger or trauma (Suh et al., 2008). Their findings revealed that repression and depression scales (inversely) significantly predicted alcohol preference. Psychomotor acceleration was the only significant predictor of the cocaine preference, and cynicism significantly predicted heroin preference (Suh et al., 2008).

Learned Helplessness

Learned helplessness is a theory that attempts to explain the human tendency to make choices resulting in the repetition of unpleasant experiences or stimuli (Peterson, Maier, & Seligman, 1993). In 1967, Martin Seligman observed rats and dogs, after being shocked in a harness, would fail to learn behaviors necessary to easily avoid shock while not in a harness. Later this idea was applied to individuals who, either through passivity or inertia, continually experienced negative stimuli and did not avoid those stimuli (Peterson et al., 1993).

Learned helplessness theory consisted of three essential elements necessary to explain human or animal passivity or inertia in the face of negative stimuli:
(a) contingency, defined as the objective result of a person's actions, (b) cognition, defined as the thought process for understanding and predicting contingency, and

(c) behavior, which was the observable contingencies of a behavior and cognitions about it (Peterson et al.,1993). This theory suggested that over time individuals might perceive themselves as helpless to escape negative stimuli and over time simply learn passivity or nonavoidance of those stimuli even after they become modifiable (Petersen et al., 1993). The application of this theory to substance abuse was the concept that some individuals who abuse substances formed specific patterns of cognition that caused them to view the contingency of drug abuse in a way that promoted continued use and was dissimilar to the way that others perceived drug use and its effects (Shaghaghy et al., 2011).

Treatment for Depression and Substance Abuse

Treatment for Depression

Depression has often been treated with antidepressant drug therapy such as antidepressants and psychological therapies such as CBT (Johnson & Preston, 2008). Per the *DSM-5*, the treatment of major depression is divided into three phases. The first, "Acute treatment" phase is directed at the current depressive episode and consisted of the use of antidepressant medications and routine supportive psychotherapy or a combination of both. While cognitive or behavioral therapy has been shown to be more effective only in patients with mild to moderately severe depressive episodes, antidepressants have been shown to be effective regardless of the severity of a patient's episodes. The second, "Combination" phase of treatment is initiated only once "Acute" treatment has effected a symptomatic remission of depressive symptoms and is directed at preventing a relapse into the current episode. "Continuation" treatment is required until the depressive episode itself has gone into a spontaneous remission; in some cases, this may also include a reduction in antidepressant dosage. The *DSM* further noted each depressive episode is

unique and cautioned against cessation of treatment until the patient feels that life has become manageable and feels likely to remain so. Lastly, a "Prophylactic" or "Maintenance" treatment directed at the prevention of future episodes is often recommended given that most of patients have as subsequent episode (APA, 2013).

Psychopharmacological treatments for depression. Currently, in the United States, there are more than 30 antidepressant medications (Schatzberg, Cole, & De Battista, 2010). The current medications for depression may be classified in three ways: heterocyclic antidepressants, monoamine oxidase inhibitors, and selective serotonin re-uptake inhibitors (SSRIs; Goldstein, 2008; Schatzberg et al.). Although these medications have been quite effective in improving the symptoms of depression, their usefulness was limited by their numerous related side-effects. "These side-effects include dry mouth, constipation, weight gain, urinary hesitancy, rapid heartbeat, and dizziness upon arising" (Goldstein, 2008).

Medication choice is typically directed by diagnosis. As such, prior to the beginning treatment, care must be taken to accurately diagnose the medical condition that best describes the presenting symptoms (Goldstein, 2008). Antidepressants may be extremely effective and may significantly change the course of an individual's life. It is important to bear in mind that the choice to take the medication was based on an assessment of the risks and benefits associated with taking medication as opposed to those of not taking the medication (Goldstein, 2008).

Cognitive behavior therapy (CBT) for depression. Accompanied by the increase in depression diagnoses in the 1960s and 1970s, came a growing interest in the psychological theories of the origin and the nature of depression. One of the pioneers of

research on depression was Aaron T. Beck (Beck, Rush, Shaw, & Emery, 1979; Beck et al., 1996), who, in 1972 and 1974 proposed the cognitive theory of depression (Blaney, 1977). In his theory, Beck et al. (1979) described depression as mainly a cognitive disorder that was characterized by negative thoughts he referred to as the *triad*. The triad components included a pessimistic view of the world, a pessimistic self-concept, and a pessimistic view of the future (Blaney, 1977; Gregory, 2007). These three thought processes were believed to be responsible for the development and the maintenance of depression (Moilanen, 1995).

Cognitive behavior therapy is a psychological treatment that is used for many diagnoses, including depression. Based on his 1960 Cognitive Behavior Theory, Beck developed cognitive therapy, now referred to as CBT, which focused on a simple type of cognitive restructuring to help individuals change the thought processes that are associated with depression and to view their problems in other less pessimistic ways (Gregory, 2007). Currently, CBT has been used in the mental health clinics or settings, and also has been implemented in medical settings as patients with chronic diseases or illnesses often developed psychological problems such as anxiety and depression as a response to the illness. In helping medically ill patients cope with chronic medical conditions, cognitive-behavioral therapy has become a mainstay of required treatment (Heslop, 2008). The charge of the CBT therapist is understanding what a patient is going through from their perspective (Olinger, 1989). CBT has also been shown to enhance relationships through assertion training, which enriches individuals' relationships and broadens their quality and capability for these relationships (Olinger, 1989).

Cognitive-behavior therapy (CBT) has consisted of numerous interventions that were effective for the treatment of a large number of psychological disorders and behavioral issues including depression, generalized anxiety disorders, and schizophrenia among others. CBT has been described as a mixture of behavioral interventions and cognitive processing in the form of monitoring, identifying, or challenging problematic thoughts. According to Norcross, CBT was the most frequently used approach in psychotherapy (Norcross, 2007).

It has been recommended that individuals with psychiatric symptoms and behavioral problems (e.g., depression, substance abuse) attend cognitive behavioral therapy to help reduce their psychiatric symptoms and behavioral problems (Weiten, 2005). Cognitive-behavioral therapy, which was based on cognitive-behavior theory, works on each of the belief classes, which are described as anticipatory, permissive, and core (Range & Mathias, 2012). During therapy, the therapist or counselor introduces or reinforces better adaptive beliefs. The cognitive-behavioral therapist/counselor helps the individuals to act based on more rational thoughts regarding their problem. Upon restructuring their thoughts, individuals start to take charge of their problems and situations, which in the past they considered excruciating and caused them to use or abuse substances (Range & Mathias, 2012).

The therapists also have also used the Relapse Prevention (RP) approach. RP has been a well-researched cognitive behavioral treatment approach to drug abuse that emphasizes functional analysis of cues for drug use and the systematic training of alternative responses to these cues. RP is focused on the identification and prevention of high-risk situations, such as favorite bars or being with friends who also use substances,

in which the individual may be more likely to engage in substance use (McHugh et al., 2010). Techniques of RP included challenging the individuals' expectation of apparent positive effects of use and providing psycho-education to help the individual make a more educated choice in the threatening situation. The goal of RP was to prevent or limit the incidence of relapse based on a combination of behavioral abilities and cognitive interventions (Marlatt & Donovan, 2005).

The core strategy in the RP approach was to train an individual to see addictive behaviors as hyper-learned and maladaptive patterns. In many cases, individuals display maladaptive coping mechanisms when experiencing stressful situations such as smoking or drinking to reduce anxiety. It should be noted that the individuals were not responsible for their acquired behaviors, nor can they voluntarily control the behavior. However, individuals may take active responsibility during the process of behavior change (Marlatt & Donovan, 2005). A meta-analysis reviewing the efficacy of RP across 26 studies examining alcohol and drug use disorders as well as smoking, demonstrated a fairly small effect (r = .14) for RP reducing substance use, but a large effect (r = .48) for progress in general psychosocial adjustment (Marlatt & Donovan, 2005).

According to Miranda et al. (2006), it has been reported that CBT provides continuous clinical benefits compared with antidepressant medications that have been withdrawn after clinical response. Based on this report, Miranda et al. conducted a study to explore long-term outcomes of two active treatments compared with community referral for care for impoverished, young minority women. The authors examined the impact of depression care on functioning of disadvantaged young women at 1-year follow-up, and hypothesized that the psychotherapy intervention would result in fewer

depressive symptoms and lower rates of remission at 12-month follow-up than the antidepressant intervention (Miranda et al., 2006). Women who agreed to random assignment were offered antidepressant medications by standard protocol, manual-driven CBT, or referral to community mental health care. Among the 16,286 women screened, 13,975 were deemed eligible for study participation and represented the following ethnic groups: African American, Hispanic, or Caucasian (Miranda et al., 2006). Intent-to-treat, repeated measures analyses showed that medication and CBT interventions were more effective than community referral in reducing depressive symptoms across 1-year follow-up. By Month 12, 50.9% of the participants assigned to the antidepressant group, 56.9% of the participants assigned to CBT group, and 37.1% of the participants assigned to community referral group were no longer experiencing clinical depression (Miranda et al., 2006). These findings implied that both antidepressants and CBT resulted in clinically significant decreases in depression for low-income minority women (Miranda et al., 2006). One limitation of this study was that men were not included in the sample. Cognitive behavioral therapy (CBT) has been used successfully to treat both substance abuse and depression so CBT used to treat substance abuse may also have the side effect of improving depressive symptoms.

One of the benchmarks and most prominent observable measures of client success when using CBT is Beck Depression Inventory (BDI): Hamilton Rating Scale and Social Adjustment Scale for depression treatment. Scogin, Welsh, Hanson, Stump, and Coates, (2005) maintained that CBT for the treatment of depression involves the cognitive theory that depression is caused by negative information processing and dysfunctional beliefs. Beck (1967) described CBT as a structured, problem-focused, and time-limited therapy in

which client are taught how to monitor and record their negative thoughts in order to develop the ability of recognizing the associations between their thoughts, feelings, physiology, and behavior. Behavioral techniques such as activity scheduling, self-monitoring of mastery, pleasure, and graded task assignments may be used early in therapy to help clients overcome apathy and expose themselves to potentially rewarding experiences (Beck, 1967). Many investigators have documented the clinical usefulness of CBT for depression following client success. Dobson (1989) maintained that CBT is regarded as more powerful and possibly more efficient than other psychotherapies. This evidence was based on the results of the Treatment of Depression Collaborative Research Program (TDCRP), which demonstrated CBT's long-term effects were at least as durable as pharmacotherapy or interpersonal psychotherapy.

According to Beck, Rush, Shaw, and Emery (1979), using CBT for depression was related to its solid empirical foundation, its superiority to many other forms of therapy for depression and a relapse prevention effect. According to evidence presented in the literature, in group and bibliotherapy formats, CBT may be used as a control and alternative treatment for individuals with major depressive disorder. Shaw (1977) maintained that a group version of CBT was superior to a group that was given a behavior modification, described as a nondirective group CBT for depression. This included interventions that focus on publicly observable behavioral measures (Shaw, 1977). This intervention was conducted in a progressive way that helped the therapist to focus on overt behavioral change first. It also taught clients how to assess their symptoms and in the necessary time to assess them. The intervention might also be used to correct

situation-specific distortions in thinking before identifying and modifying the more stable depressive schemas and presumed cognitive structures (Shaw, 1977).

While CBT was considered to be the most empirically validated psychological treatment for depression and various other mental disorders, its superiority over other types of psychotherapy has been challenged (Hides et al., 2010). Hides et al. stated that, "While early meta-analyses found CBT for depression [are] superior to waitlist and untreated controls, antidepressants and other therapies, more recent meta-analyses comparing CBT with bona fide therapies for depression have failed to do so" (Hides et al. 2010, p. 91). A recent study found little evidence that CBT or any other type of psychotherapy such as interpersonal psychotherapy, problem-solving therapy, social skills training, nondirective supportive treatment, psychodynamic treatment, were more efficacious at posttreatment. However, it has been suggested that CBT may be more successful in the longer term, because of its focus on an individual's ability to cope with daily life. Verification of this came via follow-up studies indicating CBT was more successful at preventing relapse to depression than antidepressants over a one-year period and that the rates of response to CBT improved over time (Hides et al., 2010).

CBT for Substance Abuse

Although CBT has been mostly used in the treatment of depression (Ness & Oei, 2005), CBT may also help alcoholic individuals identify external and internal cues or factors that can trigger drinking episodes and develop coping mechanisms to deal with the event (Ness & Oei, 2005). The authors conducted a study to investigate the effectiveness of attendance of a short-term, in-patient group CBT program on alcohol use. They recruited 37 male and 34 female participants diagnosed with alcohol

dependence. The participants attended 42 1-hour CBT sessions for over 3 weeks. Ness and Oei's hypothesis, which proposing that problem drinkers who attended a greater number of sessions at the CBT program would show greater improvement than those who attended fewer, was partially supported. The rate of attendance was related to improvement in anxiety and psychopathology scores, but not to alcohol consumption at either the 1- or 3-month follow-up examinations.

In contrast, evidence from many large-scale trials and quantitative reviews supported the effectiveness of cognitive behavior therapy for substance abuse disorders (e.g., alcohol and other drugs disorders). For example, McHugh et al. (2010) conducted a meta-analytic review of cognitive behavior therapy for drug abuse and dependence including 34 randomized controlled trials with 2,340 treated individuals. The authors found a general effect size in the moderate range $d = 0.45$, with effect sizes ranging from small to large (d depending on the substance targeted on treatment efficacy). Larger treatment effect sizes were found for treatment of cannabis, followed by treatments for cocaine and opioids with the smallest effect sizes for poly-substance dependence. Among individual treatment types, there was some evidence for greater effect sizes for contingency management approaches comparative to relapse prevention or other cognitive behavioral treatment approaches. In all reported cases, these advantages were computed comparative to control conditions, most frequently general drug counseling or treatment-as-usual. Magill and Ray (2009) reported similar results for alcohol and illegal drugs in a meta-analytic review of cognitive behavior therapy trials.

Cognitive Behavioral Therapy and Minorities

Many cognitive behavioral theory (CBT) treatments were not developed with consideration of either minorities or differential effects, however over time some exploration regarding CBT therapies for substance abuse and African American or Hispanic patients was undertaken (Voss Horrell, 2008; Wilson & Rocco Cottone, 2013). Further, it was observed that minorities in general and Hispanics in particular, dropped out at high rates from CBT treatment (Burrow-Sanchez & Wrona, 2012; Wilson & Rocco Cottone, 2013). Consideration of how African American and Hispanic individuals viewed, used, and interacted with mental health services was considered important since they were less likely to utilize services at all, with some evidence showing treatments developed for European-Americans might be ineffective in a more diverse setting (Gallardo & Curry, 2009; Mulvaney-Day et al., 2011; Voss Horrell, 2007).

The study of the efficacy of CBT-based treatment for substance abuse in African Americans and Hispanics found these approaches to be more effective when they were specifically tailored to these groups (Wilson & Rocco Cottone, 2013). In an earlier but substantial review of CBT use with African Americans and Hispanic or Hispanic individuals, Voss Horrell (2008) found CBT to be marginally effective in cocaine addiction alcohol abuse desistance in two different reviewed studies; however, both of these studies had a high drop-out rate. In examining the effectiveness of CBT on minority youth, Huey and Polo (2008) found Multidimensional Family Therapy to be the only CBT approach strongly supported by data to be effective for African American youth. Burrow-Sanchez and Wrona (2012) studied the effects of CBT treatment for substance abuse in Hispanic youth. They further found these approaches effective at promoting

desistance from substance abuse. Research supported CBT treatment as a valid evidence-based treatment of substance abuse in minority individuals, with interventions that take into account the unique context of cultural experiences of African American and Hispanic individuals representing the ideal approach, and not one-size-fits-all interventions (Burrow-Sanchez & Wrona, 2012; Gallardo & Currey, 2009; Huey & Polo, 2008; Mulvaney-Day et al., 2011; Wilson & Rocco Cottone, 2010).

Research on Treatment Approaches for Comorbid Alcoholism and Depression

Research has indicated that treatment outcomes for either depression or substance abuse disorders varied as a function of the comorbidity of these disorders (Dongier, 2005). Some studies indicated that among individuals seeking treatment for alcohol dependence or substance use dependence, depressive symptoms were associated with poorer treatment outcomes (Dongier, 2005). Nonetheless, there was limited research on the impact of substance abuse treatment on the expression of depressive symptoms, and additional research needed to be conducted.

In treating individuals with alcohol dependence and depression, some scholars maintained that it was important to determine the relative chronology of alcoholism and depression (Graham & Massak, 2007). It was reported that most individuals with alcoholism who were in treatment maintained high scores on depression rating scales (Graham & Massak, 2007). However, these scores were often reduced after a few weeks of abstinence or when normal consumption was reinstated. Thus, it was important that the diagnoses of alcoholism and depressive disorders were delayed during the 4-week period of abstinence to determine whether depression is secondary to alcohol use disorder.

Research on both psychopharmacological treatments and psychological treatments has been conducted (Graham & Massak, 2007).

Psychopharmacological treatments. Graham and Massak (2007) explored the association between the use of antidepressant treatment and alcohol consumption among both depressed and nondepressed men and women, and found that sex differences exist in treatment efficacy for both disorders. In general, the results of this study demonstrated that depressed participants consumed more alcohol than nondepressed participants; however, this effect was significantly reduced in depressed men medicated with antidepressants. In women however, the significant relationship between alcohol consumption and depression was not mitigated by depressant use. The results of this study also suggested that for women, regardless of the use of antidepressants, there was a significant association between depression and heavier alcohol consumption (Graham & Massak, 2007).

In addition, because alcoholism and depression have had a strong likelihood of co-occurrence, mental health professionals have often used antidepressants as one of the effective ways to treat alcoholism (Pettinati et al., 2010). Graham and Massak (2007) explored the association between the use of antidepressants and alcohol consumption among both depressed and nondepressed men and women. In this study, random-digit dialing and computer-assisted telephone interviewing were used to survey a sample of 14,063 Canadian residents, ages ranging from 18 to 76. In general, the results of this study indicated that depressed participants consumed more alcohol than nondepressed participants. However, depressed men who took antidepressants consumed less alcohol than depressed men who did not use antidepressants and those nondepressed male

participants consumed less alcohol relative to women. This study also demonstrated that women, regardless of the use of antidepressants, showed a significant association between depression and heavier alcohol consumption. The findings of the study suggested that even though depressed participants drank more generally than did nondepressed participants, depressed men and women who used antidepressants drank approximately the same amount as nondepressed men and less than depressed men who did not use antidepressants. This finding was consistent with previous findings from studies that showed antidepressants might reduce both depressive symptoms and desire for alcohol. Alternatively, the effect might be due to the patient being cautioned about alcohol consumption by the physician prescribing the antidepressants.

In Pettinati et al.'s (2010) double-blind, randomized placebo-controlled study, the researchers found that when antidepressants were combined with naltrexone, a medication for alcohol dependence, depressed patients were more likely to achieve abstinence. Specifically, when sertraline was combined with naltrexone, the combination significantly increased the ability of patients to quit drinking, but this combination was shown to be no better than the other interventions at alleviating depression. About half of patients who received the combination of drugs (22 of 41) remained abstinent by the end of the study, compared with roughly one quarter of those in the other three intervention arms: 10 of 47 in the naltrexone alone group, 11 of 40 in the sertraline alone group, and nine of 39 in the double placebo group. However, one of the limitations of this study was that this study followed participants for only a brief period of time (Pettinati et al., 2010). Another limitation of this study was that the investigators did not control for CBT and attendance at support groups might have affected sobriety (Pettinati et al., 2010).

In terms of sex differences, it was reported that depressed men who took antidepressants consumed less alcohol than depressed men who did not use antidepressants (Graham & Massak, 2007). However, for women antidepressants appeared to have less of an impact on alcohol consumption. That is, regardless of the use of antidepressants, several researchers reported significant associations between depression and heavier alcohol consumption in women (Curran et al., 2007; Graham & Massak).

Ramsey et al. (2004) investigated the course and characteristics of depression in individuals with alcoholism receiving treatment for depression and alcohol abuse in a hospital setting. In this study, the participants completed a baseline assessment battery before starting treatment, and then completed follow-up interviews at 3, 6, and 12-months after they were recruited for the study. The Beck Depression Inventory (BDI) was used to assess depressive symptoms (Ramsey et al., 2004). Lifetime and current prevalence of *DSM-IV-TR* (APA, 2000) Axis I psychiatric and substance use disorders were assessed using the instrument of SCID-I/P (First et al., 2002). Ramsey et al. found that during the follow-up, 28 out of 95 participants continued to experience major depressive symptoms after 28 days of abstinence. Thus, the authors concluded that depressive disorders were independent of alcoholism disorders (Ramsey et al., 2004).

Curran et al. (2007) reported that moderate to severe depressive symptoms during the end of treatment were a significant predictor of returning to substance use about 3 months posttreatment. However, individuals with moderate to severe depressive symptoms who are being treated with antidepressant medications were less likely to return to substance use including alcohol (Curran et al., 2007).

Saisan, Smith, and Segal (2010) established that, regardless of whether the depression or the substance abuse problem presents first, successful recovery depended on the treatment of both illnesses. That is, the best chance of recovery was thoroughly integrated treatment for both the substance abuse problem and the mental health problem. This means getting combined mental health and addiction treatment from the same treatment provider or team (Saisan et al., 2010). Research indicated that most individuals who are suffering from co-occurring addiction and mental health problems are able to recover from both conditions if given proper treatment and support. However, there is disagreement on what constituted proper support, and research on the efficacy of combined treatment approaches is lacking (Saisan et al., 2010).

Psychological treatments. Given the fact that depressive disorders are often diagnosed comorbidly with substance abuse disorders, CBT may be used effectively to treat alcohol dependence in addition to depression (Olinger, 1989). A meta-analysis of 34 cognitive-behavioral treatment trials for illicit substance use disorders found CBT had significantly better outcomes (31% abstinent) compared with control conditions (13%), with a cumulative moderate effect size of 0.45 at posttreatment (Hides et al., 2010). Other randomized controlled trials comparing CBT with other psychotherapies including insight-oriented therapy, psycho-education have also supported the efficacy of CBT. However, the significant reductions in substance use typically found are usually small and often there are no significant between group differences reported. Even so, researchers have often found that all participants achieve improved substance use outcomes regardless of treatment type. The effects of CBT for substance use also appear to be long-lasting (Hides et al., 2010). In sum, while there is support for the effectiveness

of CBT over control conditions in the treatment of both depression and substance use disorders, there is little evidence of the power of CBT over other psychotherapies. There is, however, reliable verification that individuals achieve improved depression and substance use outcomes regardless of whether they receive CBT or another type of treatment, and that the effects of CBT were long-lasting and might increase over time (Hides et al., 2010).

Hollon et al. (2005) conducted a study to determine whether cognitive therapy (CT) had an enduring effect and to compare this effect with the effect produced by continued antidepressant medications in individuals presenting with both substance use and depression. Patients who responded to CT in a randomized controlled trial were withdrawn from treatment and they were compared during a 12-month period with medication responders who had been randomly assigned to either continuation medication or placebo withdrawal. Patients who endured the continuation stage with no relapse were withdrawn from all treatment and examined at a later, 12-month "naturalistic" follow-up (Hollon et al., 2005). All of the patients were recruited from outpatient clinics at the University of Pennsylvania and Vanderbilt University. In total, 240 patients met all inclusion and exclusion criteria. The patients were randomly allocated to 16 weeks of acute treatment with either CT (n = 60) or ADM (n = 120); the remaining 60 patients received 8 weeks of a placebo pill. Among the 180 patients who had been allocated to one of the active treatments, 104 (57.8%) met the criteria for response and they were enrolled into the 12-month continuation stage of the study (Hollon et al., 2005). A total of 104 patients (57.8%) responded to treatment and were enrolled in the later continuation phase.

According to Hollon et al. (2005), the results indicated that patients who were withdrawn from cognitive therapy (CT) were significantly less likely to relapse during continuation than patients withdrawn from medications and they were no more likely to relapse than patients who kept taking continuation medication. Finally, the authors concluded that cognitive therapy had a lasting effect that actually *increased* after treatment was over and that it appeared to be as efficient as keeping patients on a medication regime (Hollon et al., 2005).

As alcoholism and depression rates continue to increase across all studied populations, it is particularly important to evaluate the efficacy of different treatment approaches designed to mitigate symptoms of both disorders. Although preliminary research demonstrated that the two disorders are related, there is limited research on how effective substance abuse treatment was in mitigating symptoms of depression (as substance abuse treatment is generally designed to reduce substance abuse). The current research may add to the literature on this topic by describing information about depression outcomes as a function of substance abuse treatment.

After a thorough search of literature, no acceptably current information was found regarding the use of CBT specifically for treating minorities with comorbid SUD and depression, indicating yet another research gap in this area. None of the studies on the use of varied treatments for comorbid depression and alcoholism cited above included race as a variable in analysis.

Treatment Use Disparities in Ethnic and Racial Subgroups

According to research on racial and ethnic treatment differences and disparities, African Americans and Hispanics had similar rates of substance use disorders compared

to Caucasian Non-Hispanics; however, population-based studies showed that African Americans are less likely to use specialty treatment services (Perron et al., 2009). It has been predicted that more African Americans and Hispanics would be added to the population than Caucasian Non-Hispanics after 2016 (Perron et al. 2009). As the substance abuse rates are currently disproportional, with African Americans and Hispanics having a higher prevalence of substance abuse than Caucasian Non-Hispanics (Petersen & Zettle, 2009; Turner, & Wallace, 2003), substance abuse may become a major health threat to an even larger percentage of United States citizens, thereby making research on substance abuse treatment issues in these groups a priority. Similarly, González-Prendes et al. (2011) suggested minority groups might be at a greater risk for depression than their Caucasian counterparts because minorities overall faced greater social and economic stressors. Moreover, minorities with depressive symptoms were more likely to seek care for mental health problems from primary care providers rather than from mental health specialists compared to Caucasian non-Hispanics (González-Prendes et al., 2011).

African Americans

Milligan et al. (2004) conducted a study to evaluate the results of two prior studies that compared African Americans and Caucasians who underwent treatment for cocaine dependence to determine if the groups differed in pretreatment characteristics, treatment retention, compliance, and/or cocaine use outcome. Participants were randomly assigned to groups that used different behavioral treatments (cognitive-behavioral treatment and 12-step facilitation) and pharmaceutical therapies (desipramine and disulfiram). A total of 122 individuals who met criteria for both cocaine and alcohol

abuse and dependence were randomly assigned to one of five treatment conditions (e.g., cognitive behavioral treatment plus disulfiram, 12-step facilitation plus disulfiram, clinical management plus disulfiram, cognitive-behavioral treatment plus no medication, and 12-step facilitation plus no medication).

The results indicated that in general, African Americans and Caucasians shared similar baseline characteristics and treatment expectations. Furthermore, researchers found there were no differences between ethnic groups in cocaine use outcomes. It must be noted that in both studies African Americans were significantly less likely to complete treatment than Caucasians (Milligan et al., 2004). African Americans who received disulfiram remained in treatment significantly longer than African Americans who were not assigned to a medication group. Lastly, there was a significant relation of ethnicity and expectations for treatment; African Americans who expected positive treatment results to take a month or longer dropped out of treatment sooner than Caucasians who held similar expectations (Milligan et al., 2004).

Hispanics

According to population projections from the U.S. Census Bureau (2004), the 2050 Hispanic population in the United States was projected to be 102 million or 24.4% of the total U.S. population. These numbers underscore the strong probability that, as the population increases, there may be more Hispanics with mental health problems in need of effective and accessible therapeutic services. However, available data suggested that Hispanics as a group underutilized mental health services (Gonzalez-Prendes et al., 2011). Even though there are a variety of reasons as to why this might be happening such as language barriers; perceived stigmas; socioeconomic barriers, and other barriers

preventing the acquirement of treatment, researchers have suggested that one of the frequent reasons identified by Hispanics for not seeking traditional psychotherapy is the lack of cultural competency on the part of practitioners (Rios-Elliot, Aguilar-Gaxiola, & Cabassa, 2005). The authors also suggested that, if therapeutic services were more culturally sensitive, rates of use would likely increase. Indeed, about 75% of Hispanics who do experience traditional mental health services have not been likely to return following the first visit.

Although the National Institutes of Health (NIH) Revitalization Act, Subtitle B (NIH, 1993), created guidelines for the inclusion of women and minorities in clinical research, it has not led to an increase in research that focuses specifically on minority groups. Later, the Surgeon General's Report on Mental Health and Culture, Race and Ethnicity: A Report of the Surgeon General (USDHHS, 2001) called for increased intervention research focused on racial and ethnic minorities that would lead to the establishment of evidence-based treatments. During the past 15 years there has been an increase in books that address cultural issues relevant to minority groups overall and Hispanics specifically. However, this advance in publications has not translated into research that focuses specifically on African American non-Hispanic, Mexican Hispanic and Other Hispanic as uniquely identified populations.

Summary

In this study, data regarding the depression of minority individuals before and after a CBT-based substance abuse treatment program were analyzed. The goal of this analysis was to explore the impact of an intervention program for substance abuse on depression scores, operationalized through the CEST. The results of minority participants

were compared to the general Caucasian non-Hispanic population. This goal conformed to the basic premise of a pretest-posttest design, in which "a measure is assessed before administering some treatment, followed by a posttest on the same measure after treatment occurs" (Salkind, 2010). In the case of the present study the treatment was the CBT intervention for the treatment of substance abuse, and the measure was depression scores on the CEST.

The purpose of this study was to examine the impact of a substance abuse treatment program on the levels of depression among participants from three minority subgroups with substance dependence in a substance abuse treatment program located in Texas. Another objective was to determine whether there were differences in the rates of depressive symptoms at intake and at the end of the treatment program between three minority subgroups and a Caucasian non-Hispanic comparison group. The intent of the presented study's design was that the two measures "can be compared, and differences in the measures are assumed to be the result of treatment" (Jackson, 201). The major fault of this research design has been the lack of a comparison group (Jackson, 2010; Salkind, 2010). To remedy this, a comparison group (Caucasian non-Hispanic) from the same program provided data regarding individuals who also completed the same program the minorities completed, with the only difference being race/ethnicity of the participants. In this way, the study sought to provide information regarding relative levels of depressive symptoms in minority participants before and after a substance abuse intervention.

Although some studies suggest that depressive symptoms were associated with poorer treatment outcomes among individuals seeking treatment for alcohol dependence or substance abuse (Dongier, 2005), there has been limited research on the impact of

substance abuse treatment on depressive symptoms among minority groups. An examination of depressive symptoms and the effect of substance abuse treatment on depression in minority subgroups was considered essential, because such groups were the fastest growing in the United States (Perron et al., 2004), and because the comorbidity of such conditions might exacerbate symptoms or may interfere with treatment outcomes (Dongier, 2005). Although information on treatment disparities has been presented, a paucity of empirical evidence on the impact of substance abuse treatments on depression, especially across minority subgroups, remained a problem. This information may be requisite as the demand for treatment for depression in the context of substance abuse has continued to increase, especially in minority populations. As such, the results of the current investigation may inform future clinical practitioners.

Although there is information on the rates of treatment for minority subgroups there is limited research as to whether or not particular substance abuse treatment programs differentially affect depression rates in minority subgroups. Thus there has been gap in the literature on the efficacy of depression treatment among minority subgroups. The current research added to the literature on substance abuse in minority populations as well as to the efficacy of such treatment in mitigating symptoms of depression in these populations. The results of the current investigation added to the literature on the efficacy of substance abuse treatments for depressive symptoms as well as the literature on treatment differences among racial/ethnic categories.

The current review explored research in the area of depression, alcoholism, substance abuse, the comorbidity of these two disorders, and treatments for the disorders. The review of the literature revealed that more research must be conducted on these

topics, especially as the rates of the comorbid occurrence of the disorders have continued to increase. It is also important to review the disorders in a cultural context and information was provided on cultural differences in the expression of health and illness. Although there has been some preliminary research on the efficacy of treatment on individuals with comorbid alcoholism and depression, there has been no research on the efficacy of substance abuse treatment in mitigating symptoms of depression, especially within a minority population. The current research added to the literature on this topic. Further, the design for this study was chosen based upon a careful review of existing psychological literature in the areas of substance abuse treatment efficacy.

Chapter 3 provides information on the methodology, setting, sample, instrumentation, and analysis that was used to investigate the research questions of this study. This chapter discusses the use of analysis of variance as a valid means to examine the effects of substance abuse treatment on depression rates in minority subgroups. The chapter also includes a description of the sample population, procedures, ethical considerations, measures, and analysis of the data.

Chapter 3: Research Method

This chapter includes a description of this study's design, sample, instrumentation, data analysis, and ethical considerations. An overview of the study's design includes a rationale for why this particular research design was selected. The sample characteristics and size are presented as well as a description of the instrumentation. The data collection and analysis process are also described.

Purpose

The purpose of this quantitative pretest-posttest study was to examine the effects of a court-mandated substance abuse treatment program on the changes in depression scores among participants from three minority subgroups and a comparison group (African American non-Hispanic, Mexican Hispanic, Other Hispanic, and Caucasian non-Hispanic) with substance dependence (e.g., alcoholism and other drugs) in a substance abuse treatment program located in Texas.

Research Design and Approach

In this quantitative study, I employed a pretest/posttest design. The quantitative research approach is used when researchers are interested in exploring relationships between specific and measurable variables. Quantitative research is further used to quantify attitudes, behaviors, or measured variables (Stringer, 2013). As the purpose of the current investigation was to quantify depression scores and to determine whether or not they changed over the course of substance abuse treatment, the quantitative research approach was considered the best fit for the current study.

I used a preexperimental approach using secondary data. A preexperimental study is used when the researcher does not have complete control over independent variables or

when an appropriate control group cannot be included. The exploration of differences between the independent variable (race/ethnicity) on depression is another example of a preexperimental design. In ex post facto or causal-comparative designs, the researcher seeks to identify cause-effect relationships by forming groups of individuals into preexisting independent variable levels in order to assess whether the groups differ on the dependent variable (Creswell, 2008). Some of the potential disadvantages of this method include difficulty establishing the experimental and control groups and making sure they are equivalent. This method is observational and does not explore causality. In the first test, the selected variable of race/ethnicity had two levels: (a) minority (including African American Non-Hispanic, Mexican Hispanic, and Other Hispanic) and (d) Caucasian non-Hispanic (a comparison group). In the second test, the selected variable of race/ethnicity had three levels: (a) African American non-Hispanic, (b) Mexican Hispanic, and (c) Other Hispanic. Independent variable level placement was made by participant demographic responses to a race/ethnicity. Secondary archival data were used in the current investigation. Gender and age were included as covariates in both analyses.

Setting and Sample

The population for the study was minority individuals and a comparison group of Caucasian non-Hispanics participating in a court-mandated substance abuse treatment program in Texas. The individuals were referred to the treatment program by the criminal justice system, but specific details about population and sample were unavailable to me until after approval to use the data (following dissertation proposal approval) was granted. Information about the individual participants' treatment program was not made available to me.

The current sample consisted of secondary data from approximately 400 adult individuals who completed a residential substance abuse treatment located in Texas. Two mixed design ANOVA tests were completed. For the first hypothesis, a 2 x 2 ANOVA was completed, and for the second hypothesis, a 2 x 3 ANOVA was completed. For the 2 x 3 ANOVA, a power analysis revealed that a sample of at least 246 participants was needed to detect a small effect size of f =.1, alpha of .05, with a power of .80. As data were available from 400 treatment program participants, complete datasets from all 400 individuals were included in the analysis. This secondary dataset was then de-identified and no particular treatment program was identified.

Instrumentation

Secondary data were used to obtain the participants' depression scores on the CEST-Psychological Functioning (Joe et al., 2002; see Appendix A). The CEST–Psychological Functioning is a self-administered test that consists of a 33-item self-report scale measuring psychological functioning including depressive symptoms, self-esteem, and anxiety; however, only data from the depressive symptom subscale was analyzed in the current investigation. It is also used to monitor client performance and psychosocial changes during treatment (Simpson, 2004). The items are rated on a 5-point scale, ranging from *1 = Strongly Disagree* to *5 = Strongly Agree*. A total depression score from the CEST for each participant was made available to me.

The CEST–Psychological Functioning instrument has been shown to have high reliability and validity (Joe et al., 2002). To evaluate the psychometric properties of the CEST with respect to the internal consistency, Joe et al. (2002) used a national sample of over 1,700 individuals from 87 treatment programs to study reliability and validity of the

CEST. The authors used confirmatory factor analysis to verify the CEST factor structure. The coefficient alpha reliabilities were computed as measures of internal consistency, and relationships of scales with selected client and program functioning indicators document their predictive validities. The program-level coefficient alpha for the CEST–Psychological Functioning Depression scale was found to be .87 (Joe et al., 2002).

Data Collection

Procedure

Following approval of the proposal by the Walden dissertation committee directing this study, I applied for IRB approval. After receipt of IRB approval, data were requested from the provider of secondary data. Before delivering the secondary data, the provider of the secondary data removed participants' personal identification information from the data. In checking for missing data, entries with missing data relating to any of the variables used in the study (depression score and race/ethnicity) were identified and not used in study analyses. A data file was created in Statistical Package for the Social Sciences (SPSS) and consisted of the participant identification number, pre- and posttest CEST scores, and demographic information (e.g., age, gender, race/ethnicity) for each participant.

Data Analysis Plan

Two mixed design analysis of variance ANOVA tests were used to compare mean differences for statistical significance (minimum of $p < .05$) between the pretest and posttest depression scores (within factor), among minorities in comparison to a Caucasian non-Hispanic group (first mixed design analysis of variance 2 x 2 ANOVA), and then among three distinct minority groups, specifically African American non-Hispanic,

Mexican Hispanic, or Other Hispanic (second mixed design analysis of variance, 2 x 3 ANOVA). Gender and age were included as covariates in both analyses. Data were screened to ensure appropriateness for analysis and assumption tests for ANOVA (independence, normality, and homogeneity of variance) were performed. The following research questions and hypotheses were proposed:

1. After controlling for gender and age, are the rates of depressive symptoms after participation in a court-mandated substance abuse treatment program lower than the rates of depressive symptoms at intake in the minority population when compared to the Caucasian non-Hispanic population?

$H0_1$: After controlling for gender and age, there will be no significant differences between minority participants (African American non-Hispanic, Mexican Hispanic, Other Hispanic) and Caucasian non-Hispanic participants in the rates of depressive symptoms, as measured by the Client Evaluation of Self and Treatment (CEST)–Psychological Functioning (Joe et al., 2002), before and after a court-mandated substance abuse treatment program.

$H1_1$: After controlling for gender and age, there will be significant differences between minority participants (African American non-Hispanic, Mexican Hispanic, Other Hispanic) and Caucasian non-Hispanic participants in the rates of depressive symptoms, as measured by the Client Evaluation of Self and Treatment (CEST)–Psychological Functioning, before and after a court-mandated substance abuse treatment program.

2. After controlling for gender and age, are the rates of depressive symptoms significantly different between minority subgroups (African American non-

Hispanic, Mexican Hispanic, Other Hispanic) before and after a court-mandated substance abuse treatment program?

$H0_2$: After controlling for gender and age, there will be no significant differences between the three minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) in rates of depressive symptoms, as measured by the CEST–Psychological Functioning measure, before and after a court-mandated substance abuse treatment program.

$H1_2$: After controlling for gender and age, there will be significant differences between the three minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) in rates of depressive symptoms, as measured by the CEST–Psychological Functioning measure, before and after a court-mandated substance abuse treatment program.

Threats to Validity

There are two types of validity, internal and external (Creswell, 2009). Internal validity refers to the accuracy of the observed effect(s) produced solely by the independent variable and not extraneous ones (Campbell & Stanley, 1966). Threats to internal validity include social desirability bias, which is particularly strong in self-reports where individuals answer, as they perceive the questioner prefer them to answer, rather than answering honestly. In this study, there were two potential confounding variables, namely gender and age of participants, which were addressed by adding them as covariates to analysis. Further, in the secondary data used in current study, participants responded to the same depression instrument two different times, introducing testing reactivity a potential threat to internal validity. It must be noted, however, that this effect

may be minimized because the two assessments were given at an interval of at least 10 weeks between administrations.

The second kind of validity is external validity, which represents the extent to which a study's results can be generalized or applied to other people or settings (Isaac & Michael, 1971). A challenge to external validity in this study may be that, as it was conducted with a specific group of individuals receiving court-ordered substance abuse treatment in the state of Texas, participants may not be widely representative of those who did not undergo substance abuse treatment in the same or similar conditions, nor for the same reasons. In order to maximize the generalizability of the study findings, replication attempts with groups in other locales should be made. Additionally, because I only used data from individuals who completed pre- and posttest portions of the CEST (i.e., individuals who were present for the entirety of the treatment), findings may not apply to individuals who dropped out of treatment before completion.

Ethical Considerations

Following preliminary approval (contingent upon Walden IRB approval and treatment center approval), the dataset was obtained from the provider of the secondary data (see Appendix A). After the Walden University Institutional Review Board (IRB) approved (approval number 08-24-15-0111492) all aspects of the study, a final request was made to access to the secondary data for the study. The provider of the secondary data de-identified the secondary dataset and provided it to me. Further, in the final published dissertation, the treatment program that generated the secondary data for the study was not identified. All electronic data are available to me only and are stored in password-protected files on my personal computer.

Summary

In this chapter, I provided information on the research approach and design, instruments, procedures, and ethical considerations of the study. Secondary data were used to compare pretest and posttest depression assessments made with the CEST–Psychological Functioning Test (Joe et al., 2002) in a sample of 400 adult individuals who participated in court-mandated substance abuse treatment in Texas. Information about the treatment program was made available to me after approval to use the dataset was granted. Two mixed design analysis of variance ANOVA (2 x 2 and 2 x 3) were conducted in order to compare participant-experienced changes in depression as a function of substance abuse treatment between minority and Caucasian non-Hispanics as well as within minority subgroups; in both tests, participant gender and age were used as covariates.

Chapter 4: Results

The purpose of this quantitative pretest-posttest archival study was to examine the effects of a substance abuse treatment program on the changes in the depression scores (dependent variable) among participants from three minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) and a comparison group (Caucasian non-Hispanic). All participants struggled with substance dependence (e.g., alcoholism, cocaine dependence, cannabis dependence, and heroin dependence) and were sentenced to participate in a court-mandated residential substance abuse treatment program located in Texas.

Data were used to explore two research questions. The first research question was as follows: After controlling for gender and age, are the rates of depressive symptoms after participation in a court-mandated substance abuse treatment program lower than the rates of depressive symptoms at intake in the minority population when compared to the Caucasian population? This research question was operationalized in a null hypothesis and hypothesis, which were as follows: (H_{01}) After controlling for gender and age, there will be no significant differences between minority participants (African American non-Hispanic, Mexican Hispanic, Other Hispanic) and Caucasian participants in the rates of depressive symptoms, as measured by the CEST–Psychological Functioning, before and after a court-mandated substance abuse treatment program, and ($H1_1$): After controlling for gender and age, there will be significant differences between minority participants (African American non-Hispanic, Mexican Hispanic, Other Hispanic) and Caucasian participants in the rates of depressive symptoms, as measured by the CEST–

Psychological Functioning, before and after a court-mandated substance abuse treatment program.

The second research question was as follows: After controlling for gender and age, are the rates of depressive symptoms significantly different between minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) before and after a court-mandated substance abuse treatment program? This research question was also operationalized in a null hypothesis and hypothesis, which were as follows: (H_{02}) After controlling for gender and age, there will be no significant differences between the three minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) in rates of depressive symptoms, as measured by the CEST–Psychological Functioning measure, before and after a court-mandated substance abuse treatment program, and ($H1_2$): After controlling for gender and age, there will be significant differences between the three minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) in rates of depressive symptoms, as measured by the CEST–Psychological Functioning measure, before and after a court-mandated substance abuse treatment program.

In this chapter, the secondary data and initial data cleaning processes are described, followed by a description of the sample. After describing the secondary data, hypothesis testing through analysis of variance is described, after which the simple analyses of bivariate statistics are introduced and explained as additional analyses. Further, tables are used to illustrate all analyses of data.

Sample

Initially, I received secondary data from 400 cases from one treatment center in Texas, where participants participated in and completed a residential substance abuse treatment program. These participants subsequently completed the pretest and posttest scores administrations of the CEST–Psychological Functioning, which included questions related to levels of depression. Based on the four desired subgroups, 26 participants from other racial/ethnic groups were dropped from the study ($N = 374$). Forty-nine other participants were removed because they had not completed the program ($N = 325$). The primary reasons for noncompletion were "left against clinical advice" ($n = 18$) and "terminated by facility for chronic noncompliance" ($n = 17$).

Before delivering the secondary data to me, the treatment center removed participants' personal identification information from the data archive. Data from participants were gathered from June 4, 2013, through July 25, 2015. A file was created in SPSS and consisted of the participant identification number, pre- and posttest CEST scores, and demographic information (e.g., age, gender, race/ethnicity) for each participant. In checking for missing data, entries with missing data relating to any of the variables used in the study (depression scores and race/ethnicity) were identified and not used in study analyses.

Box plots revealed eight univariate outliers that were also removed from the study while Mahalanobis distances found no multivariate outliers. These outliers were standard outliers that were defined using the SPSS box plot procedure, with the default setting defined as either 1.5 times the interquartile range below the first quartile or 1.5 times the interquartile range above the third quartile.

As a result, the final number of participants was 317 (79.3% of the original data). These data may be considered representative of individuals referred for participation in residential substance abuse treatment programs in Texas and who completed their treatments according to a CBT model; however, they may or may not be representative of other localities and may not be representative of other treatment approaches in different geographic locations.

Preliminary Analyses

Table 1 displays the frequency counts for selected variables. As stated previously, there were four racial/ethnic subgroups in the study with the largest subgroups being non-Hispanic Caucasian (n = 126, 39.7%) and non-Hispanic Blacks (n = 100, 31.5%). When aggregated together, there were more minority participants (60.3%) than nonminority (39.7%). Seventy-one percent of the sample was male. The ages of the participants ranged from 19 to 62 (M = 35.03, SD = 10.92). Univariate measures of depressive symptoms included self-identification as Other Hispanic, Mexican Hispanic, non-Hispanic Black, and non-Hispanic Caucasian in pretest and posttest assessments. Minority status was determined by self-identification as Other Hispanic, Mexican Hispanic, and non-Hispanic Black. Alternately, nonminority status was determined by self-identification as non-Hispanic Caucasian. As the initial, basic univariate analyses of minority or nonminority status did not indicate statistically significant results, gender and age were included as covariates in both ANOVA tests conducted and further analyzed. However, it should be noted that the majority of the sample were male; thus, the impact of gender was not as easily determinable.

Table 1

Frequency Counts for Selected Variables (N = 317)

Variable	Category	*n*	%
Racial/ethnic grouping			
	Non-Hispanic Blacks	100	31.5
	Mexican Hispanics	48	15.1
	Other Hispanics	43	13.6
	Non-Hispanic Caucasian	126	39.7
Race/ethnicity			
	Nonminority	126	39.7
	Minority	191	60.3
Gender			
	Female	93	29.3
	Male	224	70.7
Age category [a]			
	19 to 24	63	19.9
	25 to 29	64	20.2
	30 to 39	94	29.7
	40 to 49	50	15.8
	50 to 62	46	14.5

Note. a Age: $M = 35.03$, $SD = 10.92$.

Results

Research Question 1

Research Question 1 was as follows: After controlling for gender and age, are the rates of depressive symptoms after participation in a court-mandated substance abuse treatment program lower than the rates of depressive symptoms at intake in the minority population when compared to the Caucasian population? The related null hypothesis was H_{01}: After controlling for gender and age, there will be no significant differences between minority participants and Caucasian participants in the rates of depressive symptoms, as measured by the CEST–Psychological Functioning, before and after a court-mandated substance abuse treatment program.

To answer this question, Table 2 displays the results of the repeated measures ANOVA test for the depression scores based on minority status controlling for age and gender. The within subjects' variable of time was significant (F [1, 313] = 29.15, p = .001) with pretest scores (M = 23.96, SD = 8.26) higher than posttest scores (M = 18.86, SD = 6.67). The covariates of gender (F [1, 313] = 8.33, p = .004) and age (F [1, 313] = 5.33, p = .02) were also significant. This phenomenon may indicate the need for the further exploration of the impact of gender distinctions on treatment efficacy. Minority status was not significant (F [1, 313] = 2.81, p = .09). The interaction for time with gender (F [1, 313] = 7.72, p = .006) was significant, further indicating that men and women respond differently to treatment over time. Alternately, the interactions of time with age (F [1, 313] = 1.58, p = .21) and time with minority status (F [1, 313] = 3.21, p = .07) were not significant (Table 2). This combination of findings provided support to

retain the null hypothesis. It should also be noted that all the partial eta squared coefficients were weak correlations based on the Cohen (1988) criteria (Table 2).

Table 2

Repeated Measures ANOVA for the Depression Scores Based on Minority Status Controlling for Age and Gender (N = 317)

Source	*SS*	*df*	*MS*	*F*	*p*	Partial Eta Squared
Time [a]	730.90	1	730.90	29.15	.001	.085
Gender	687.57	1	687.57	8.33	.004	.026
Age	440.22	1	440.22	5.33	.02	.017
Minority [b]	231.86	1	231.86	2.81	.09	.009
Time X gender	193.49	1	193.49	7.72	.006	.024
Time X age	39.64	1	39.64	1.58	.21	.005
Time X minority	80.61	1	80.61	3.21	.07	.010
Error (between)	25,828.68	313	82.52			
Error (within)	7848.88	313	25.08			

Note. [a] Time: Pretest (M = 23.96, SD = 8.26) versus Posttest (M = 18.86, SD = 6.67). [b] Minority: Nonminority (M = 22.41, SD = 7.30) versus Minority (M = 20.75, SD = 6.00).

Research Question 2

Research Question 2 was as follows: After controlling for gender and age, are the rates of depressive symptoms significantly different between minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) before and after a court-mandated substance abuse treatment program? The related null hypothesis was H_{02}: After controlling for gender and age, there will be no significant differences between the three minority subgroups (African American non-Hispanic, Mexican Hispanic, or Other Hispanic) in rates of depressive symptoms, as measured by the CEST–Psychological Functioning measure, before and after a court-mandated substance abuse treatment program?

Table 3 displays the results of the repeated measures ANOVA test for the depression scores based on minority subgroup controlling for age and gender. The within subjects variable of time was significant (F [1, 186] = 13.35, p = .001) with pretest scores (M = 23.96, SD = 8.26) higher than posttest scores (M = 18.86, SD = 6.67). The gender covariate (F [1, 186] = 6.72, p = .01) was significant, suggesting a need to explore the influence of gender on depressive symptomology and treatment, while the covariate for age (F [1, 186] = 0.94, p = .33) was found to be not significant. No differences were found based on minority subgroup (F [2, 186] = 0.46, p = .63). None of the three, two-way interactions were significant. This combination of findings provided support to retain the null hypothesis. It should also be noted that all of the partial eta squared coefficients were small based on the Cohen (1988) criteria (Table 3).

Table 3

Repeated Measures ANOVA for the Depression Scores Based on Minority Subgroup Controlling for Age and Gender (N = 317)

Source	*SS*	*df*	*MS*	*F*	*p*	Partial Eta Squared
Time [a]	301.53	1	301.53	13.35	.001	.067
Gender	471.93	1	471.93	6.72	.01	.035
Age	66.10	1	66.10	0.94	.33	.005
Minority Subgroup	64.94	2	32.47	0.46	.63	.005
Time X gender	72.16	1	72.16	3.19	.08	.017
Time X age	15.05	1	15.05	0.67	.42	.004
Time X minority	115.09	2	57.54	2.55	.08	.027
Error (between)	13,054.23	186	70.18			
Error (within)	4201.20	186	22.59			

Note. [a] Time: Pretest (M = 23.96, SD = 8.26) versus Posttest (M = 18.86, SD = 6.67).

Additional Findings

Cohen (1988) suggested some guidelines for interpreting the strength of linear correlations. He suggested that a weak correlation typically had an absolute value of r = .10 (r^2 = 1% of the variance explained), a moderate correlation typically had an absolute value of r = .30 (r^2 = 9% of the variance explained) and a strong correlation typically had an absolute value of r = .50 (r^2 = 25% of the variance explained). In the current study, both eta coefficients (equivalent to r) were used in the repeated measures ANOVA tables

(Tables 2 and 3) as well as the partial eta squared statistics (equivalent to r^2) in the one-way ANOVA (Tables 4 through 6. Therefore, for the sake of parsimony, this Results Chapter primarily highlights those correlations that were of at least moderate strength to minimize the potential of numerous Type I errors stemming from interpreting and drawing conclusions based on potentially spurious correlations.

Table 4 displays the one-way ANOVA tests comparing the depression scores based on the four racial/ethnic subgroups. These depression scores included scores for the pretest, posttest, and reduction (pretest minus posttest). Inspection of the table found no significant differences between the four groups for the pretest (F [3, 313] = 2.53, p = .06), and the posttest (F [3, 313] = 1.82, p = .14). However, significant differences were found for the reduction in depression scores (F [3, 313] = 3.71, p = .01). Specifically, non-Hispanic Whites (M = 6.11, SD = 7.61) had significantly greater reductions in their level of depression than did the non-Hispanic Blacks (M = 3.25, SD = 6.29, p = .03). No other pair of means were significantly different from each other at the $p < .05$ level. These results may have been impacted by the low number of Mexican and Other Hispanic participants. Further, it should also be noted that the eta coefficients (r) (η), Pearson correlations between a categorical/nominal variable and a continuous variable) were all considered weak correlations based on the Cohen (1988) criteria (Table 4). These were provided by SPSS in its output as a measure of the strength of a relationship.

Table 4

One-Way ANOVA Tests Comparing Depression Scores Based on Racial/Ethnic Group (N = 317)

Depression score	Racial/ethnic group	*n*	*M*	*SD*	η	*F*	*p*
Pretest [a]					.15	2.53	.06
	1. Non-Hispanic Blacks	100	22.55	7.53			
	2. Mexican Hispanics	48	23.51	8.42			
	3. Other Hispanics	43	23.33	7.28			
	4. Non-Hispanic Whites	126	25.46	8.88			
Posttest [a]					.13	1.82	.14
	1. Non-Hispanic Blacks	100	19.30	6.27			
	2. Mexican Hispanics	48	18.54	5.83			
	3. Other Hispanics	43	16.78	5.42			
	4. Non-Hispanic Whites	126	19.35	7.52			
Reduction [b]					.19	3.71	.01
	1. Non-Hispanic Blacks	100	3.25	6.29			
	2. Mexican Hispanics	48	4.97	6.72			
	3. Other Hispanics	43	6.55	7.76			
	4. Non-Hispanic Whites	126	6.11	7.61			

Note. η = Eta coefficient.
[a] Scheffe Post Hoc Test Results: no pairs were significantly different from each other at the $p < .05$ level.
[b] Scheffe Post Hoc Test Results: 4 > 1 ($p = .03$); no other pairs were significantly different from each other at the $p < .05$ level.

Table 5 displays the one-way ANOVA tests comparing the depression scores based on minority subgroup. Inspection of the table found no significant differences between the three subgroups for the pretest (F [2, 188] = 0.31, p = .73), and the posttest (F [2, 188] = 2.66, p = .07). However, significant differences were found for the reduction in depression scores (F [2, 188] = 3.80, p = .02). Specifically, Other Hispanics (M = 6.55, SD = 7.76) had greater reductions in their level of depression than did the non-Hispanic Blacks (M = 3.25, SD = 6.29, p = .03). That noted, no other pair of means was significantly different from each other at the $p < .05$ level. Moreover, due to the small sample sizes in some of the groups, future studies may look to include a more robust sampling of Mexican and Other Hispanic populations. It should also be noted that the eta coefficients were all weak correlations based on the Cohen (1988) criteria (Table 5).

Table 5

One-Way ANOVA Tests Comparing Depression Scores Based on Minority Subgroup (n = 191)

Depression score	Minority subgroup	*n*	*M*	*SD*	η	*F*	*p*
Pretest [a]					.06	0.31	.73
	1. Non-Hispanic Blacks	100	22.55	7.53			
	2. Mexican Hispanics	48	23.51	8.42			
	3. Other Hispanics	43	23.33	7.28			
Posttest [a]					.17	2.66	.07
	1. Non-Hispanic Blacks	100	19.30	6.27			
	2. Mexican Hispanics	48	18.54	5.83			
	3. Other Hispanics	43	16.78	5.42			
Reduction [b]					.20	3.80	.02
	1. Non-Hispanic Blacks	100	3.25	6.29			
	2. Mexican Hispanics	48	4.97	6.72			
	3. Other Hispanics	43	6.55	7.76			

Note. η = Eta coefficient.
[a] Scheffe Post Hoc Test Results: no pairs were significantly different from each other at the $p < .05$ level.
[b] Scheffe Post Hoc Test Results: 3 > 1 ($p = .03$); no other pairs were significantly different from each other at the $p < .05$ level.

Table 6 displays the one-way ANOVA tests comparing the depression scores based on minority status. Minority status was determined by self-identification of participants as Other Hispanic, Mexican Hispanic and Non-Hispanic Black. Inspection of the table found no significant differences between the two groups for the posttest scores (F [1, 315] = 1.12, p = .29). However, non-minority participants had higher pretest scores (F [1, 315] = 7.07, p = .008) as well as greater reductions in their depression scores (F [1, 315] = 4.21, p = .04). It should also be noted that the eta coefficients were all weak correlations based on the Cohen (1988) criteria (Table 6).

Table 6

One-Way ANOVA Tests Comparing Depression Scores Based on Minority Status (N = 317)

Depression score	Minority status	*n*	*M*	*SD*	η	*F*	*p*
Pretest					.15	7.07	.008
	Non-Minority	126	25.46	8.88			
	Minority	191	22.97	7.68			
Posttest					.06	1.12	.29
	Non-Minority	126	19.35	7.52			
	Minority	191	18.54	6.03			
Reduction					.12	4.21	.04
	Non-Minority	126	6.11	7.61			
	Minority	191	4.42	6.85			

Note. η = Eta coefficient.

Table 7 displays the Pearson correlations for the three depression scores with the respondent's age and gender. For the resulting six correlations, three were significant. Specifically, older participants had higher posttest depression scores (r (315) = .17, p = .003). In addition, female participants had higher pretest depression scores (r (315) = -.21, p = .001) and larger reductions in depression (r (315) = -.17, p = .003). It should also be noted that the correlations were all weak based on the Cohen (1988) criteria (Table 7).

Table 7

Pearson Correlations for the Depression Scores with Age and Gender (N = 317)

Depression score	Age		Gender [a]	
Pretest	.09		-.21	****
Posttest	.17	***	-.09	
Reduction	-.06		-.17	***

Note. * $p < .05$. ** $p < .01$. *** $p < .005$. **** $p < .001$.
[a] Gender: 1 = *Female* 2 = *Male*.

Summary

The present study utilized archival data from 317 participants to examine the effects of a substance abuse treatment program on changes in the depression scores (dependent variable) among participants from three minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) and a comparison group (Caucasian non-Hispanic) with substance dependence (e.g., alcoholism, cocaine dependence, cannabis dependence, and heroin dependence) in a court-mandated residential substance abuse treatment program located in Texas. Research Question 1 (differences based on minority status) was not supported (Table 2), and the null

hypothesis was retained. Also, Research Question 2 (differences based on minority subgroups) was not supported (Table 3), and the null hypothesis was retained. In the final chapter, these findings are compared to the literature, conclusions and implications are drawn, and a series of recommendations are suggested.

Chapter 5: Discussion, Conclusions, and Recommendations

In the present study, I examined the effects of a court-ordered substance abuse treatment program on participants' levels of depression with various types of substance dependence from three minority subgroups (African American non-Hispanic, Mexican Hispanic, and other Hispanic) and a Caucasian non-Hispanic comparison group. During the proposal stage of the present study, the minority groups targeted for analysis were African American non-Hispanic, Caucasian Hispanic, and African American non-Hispanic; however, due to the dataset containing a high quantity of participants identifying as other Hispanic and few identifying as African American Hispanic, the minority groups targeted for study were reorganized according to the self-identification of the participants in the secondary data. I explored potential differences in the depression scores of minority and nonminority participants after completing a residential rehabilitation substance abuse program.

The research aim for this study was to explore differential impacts on levels of depression between all minorities and Caucasians and between the three minority subgroups, both pretest and posttest. Two research questions, along with hypotheses and null hypotheses, were formulated to investigate differential outcomes in depressive symptoms in individuals after participation in a substance abuse treatment program and are reproduced below.

After controlling for gender and age, are the rates of depressive symptoms after participation in a court-mandated substance abuse treatment program lower than the rates of depressive symptoms at intake in the minority population when compared to the Caucasian population?

$H0_1$: After controlling for gender and age, there will be no significant differences between minority participants (African American non-Hispanic, Mexican Hispanic, Other Hispanic) and Caucasian participants in the rates of depressive symptoms, as measured by the Client Evaluation of Self and Treatment (CEST)–Psychological Functioning, before and after a court-mandated substance abuse treatment program.

$H1_1$: After controlling for gender and age, there will be significant differences between minority participants (African American non-Hispanic, Mexican Hispanic, Other Hispanic) and Caucasian participants in the rates of depressive symptoms, as measured by the Client Evaluation of Self and Treatment (CEST)–Psychological Functioning, before and after a court-mandated substance abuse treatment program.

After controlling for gender and age, are the rates of depressive symptoms significantly different between minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) before and after a court-mandated substance abuse treatment program?

$H0_2$: After controlling for gender and age, there will be no significant differences between the three minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) in rates of depressive symptoms, as measured by the CEST–Psychological Functioning measure, before and after a court-mandated substance abuse treatment program.

$H1_2$: After controlling for gender and age, there will be significant differences between the three minority subgroups (African American non-Hispanic, Mexican Hispanic, Other Hispanic) in rates of depressive symptoms, as measured by the CEST–

Psychological Functioning measure, before and after a court-mandated substance abuse treatment program.

Analyses of secondary data from 317 program participants who completed a CEST–Psychological Functioning test before and after attending a court-ordered substance program located in Texas indicated no significant differences in levels of depressive symptoms between minority individuals and Caucasians, and no significant differences between minority groups. With this combination of findings, the null hypotheses were retained for Research Questions 1 and 2. No previous studies on the effect of substance abuse treatment programs on depression were uncovered in a search of literature for either minority or Caucasian individuals, potentially indicating that the results from the present study may provide additional information regarding possible underlying links between substance use disorder and depression, along with the saliency of CBT in simultaneously treating both conditions (Kelley et al., 2009; Nurnberger et al., 2002).

Interpretation of the Findings

No differential reductions in depressive symptoms before and after a CBT-based substance abuse program were found, neither in minority levels of depression compared to that of Caucasians (Research Question 1), nor in the three different groups of minorities when compared (Research Question 2). Further, although it was not a research question, results indicated that participation in the program may have reduced levels of depression amongst all participants. These results indicate that completion of treatment may have a statistically significant impact on all individuals who participate in such rehabilitative programs, regardless of their racial or ethnic background.

The finding of no significant difference in levels of depression may be due to the existence of a generalized link between substance use disorder and depression. That is, less dependence on substance use may be associated with less depression in that treatment for one disorder and seems to be effective for the other (Boden & Fergusson, 2011; Bohnert & Miech, 2010; Cameron Wild et al., 2005; Hides et al., 2010; Kelley et al., 2009; McLaughlin, 2011; NIDA, 2010; Nurnberger et al., 2002; Petersen & Zettle, 2009; Rubin et al., 2007; Schönnesson et al., 2009).

Results from the current study support the conclusion that a CBT-based approach implemented in a residential substance abuse treatment program reduced participant levels of depression, regardless of race, according to measurements taken on the CEST inventory. This finding may support the appropriateness of CBT generally for minority individuals who suffer from comorbid substance use disorder and depression and additionally complete their treatment.

Etiologies of substance use disorder and depression may be multifactorial, with genetic disposition contributing only partially to the development of outcomes with clinical significance (Arbona & Jimenez, 2014; Dunlop et al., 2003; Ornelas & Hong, 2012; Otiniano Verissimo, Grella, Amaro, & Gee, 2014). That said, alcoholism and depression particularly co-occur at a greater frequency than mere chance would indicate, and some research supports the conclusion that biology may link both conditions (Boden & Fergusson, 2011; Kelley et al., 2009; Nurnberger et al., 2002; Nurnberger et al., 2007; Young-Wolff et al., 2009). As such, the finding of the current study that treatment for the condition of substance abuse also had the additional effect of reducing levels of symptoms linked with depression may add additional evidence supporting a link between

the conditions and implies that programs designed to address both conditions are a feasible treatment option. It has been noted that substance abuse disorder and depression may be linked genetically, potentially making individuals with one disorder, regardless of race or ethnicity, more prone to developing the other disorder but also amenable to a similar treatment (Kelley et al., 2009; Nurnberger et al., 2002; Saraceno et al., 2009). Therefore, future studies may seek to explore the potential causality of these relationships.

This conclusion must remain tentative as personal experiences and stress experienced differentially by minority individuals may also play a role in the expression of clinically significant substance use disorder and depressive symptoms (Cartier & Caetano, 2010; Grant et al., 2011; Keyes et al., 2011; Keyes et al., 2012).

CBT interventions with cultural relevance have been successful in achieving programmatic aims; however, disagreement exists as to whether these modified programs are substantially different in their results from standard treatments (Benuto & O'Donohue, 2015). Thus, the present research may lend support to the assertion that when individuals are treated for comorbid substance abuse and depression in a residential setting, one approach may be appropriate for the groups covered in this study. However, care must be taken to recognize minorities have underutilized professional resources for treating substance use disorder and depression, and when they do use treatment resources, they often terminate treatment early (Chartier & Caetano, 2010; Gonzales-Prendes et al., 2011; Guerrero et al., 2013; Milligan et al., 2004; Perron et al., 2009; Salami & Walker, 2013). Of the 49 participants who were removed from the sample due to noncompletion of the program, 18 self-identified as minorities.

Although I did not find significant differences between reductions in depression between groups in pre- and posttest measures, additional analyses indicated that reductions in depression scores among groups were not at all times equal. Caucasian non-Hispanics had a greater reduction in depressions scores than African American non-Hispanics, though the correlation was weak, and these data should not be heavily relied due to the risk of a Type I error. Further, Other Hispanics had a greater depression symptom reduction than African American non-Hispanics; however, the correlation was also weak and therefore should be considered only with judicious caution.

Nevertheless, the implication of these findings is that completion of treatment will have a statistically significant impact on all individuals who participate in such rehabilitative programs regardless of racial or ethnic background. This may be because the CBT-focused treatment was equally effective across all groups. Further, as I was unable to monitor the program, it is impossible to know whether the program attended to minority-specific issues. Future researchers may explore this nuance of therapeutic programs, and treatment of minority-specific issues should be assessed in future research. Although the limitations of the current study make such a conclusion tentative at best, the decrease in symptomology experienced by all patients in the current study does lend itself to the supposition that if therapeutic programs were able to successfully embed themselves in a minority-majority community, they may be able to assess, understand, and ultimately overcome the deterrents that have negatively impacted minority enrollment and completion of rehabilitation programs. In this sense, the findings of the current study can positively influence the shape of future studies to ensure that this phenomenon is explored.

These differences may be a fruitful target of future investigations with superior statistical power, one that is more representative of each minority and gender group, regarding pathways to mental health in African Americans undergoing substance abuse treatment. Even if these weak correlations are not to be relied upon, it is known that African American and Hispanic individuals have some differential experience of substance use treatment, since both groups have been less likely to utilize services and are more likely to terminate treatment early when they do (Gonzales-Prendes et al., 2011; Perron et al., 2009; Salami & Walker, 2013). Nevertheless, the confluence of depression symptoms and substance abuse must be noted, as it is a factor that is both less subject to cultural differentiation and provides a possible explanation for the overall reduction of substance abuse seen across all groups.

The findings of the current study suggest that use of a CBT-oriented rehabilitation program has the potential to significantly improve depression symptoms and ultimately reduce risk of relapsing. However, future researchers may want to explore the impact of CBT-oriented programs in addition to measuring the effect of culturally sensitive treatment. Future researchers also may use the findings to direct their efforts at identifying, understanding, and ameliorating any cultural or structural factors, which may influence the development of SA or depression in minorities. Another factor to be thoughtfully considered and explored by future researchers is the positive impact of reduced substance abuse in the reduction of depression symptoms. This could account not only for the findings of universal improvement but also lead researchers to identify and explore other mechanisms that may have contributed to these phenomena.

Limitations of the Study

Secondary data used in analyses of the present study were obtained from participants who were referred by a court for substance abuse treatment program in Texas, where they completed a CBT-based program that included pretest and posttest measures of the CEST–Psychological Functioning measure. Since secondary data came from participants at one location in Texas (sampling bias), the sample may not be representative of the target population of African American, Hispanic, or Caucasian populations since the local context may be conceivably different than the general context of the United States. The original research questions for the present study included racial and ethnic groups that were not robustly represented in the secondary data once they were received. This may be due to special ethic identifications unique to the Texas area, such as a higher proportion of ethnically Mexican individuals who do not identify with structures of race and ethnicity dominant in American culture, and as a result, this sample may not generalize to other Hispanic populations in other states. Other local variations in identity that are not readily apparent in the secondary data may have also influenced findings, decreasing their generalizability to other areas of the United States.

Further, as a court referred all the participants for the program, the sample may not be reflective of the symptomatology expressed by individuals who autonomously join a program. Only the secondary data from participants who completed the program were used in analyses; it must be noted that participants who completed both pretest and posttest examinations may have exhibited differences in symptomatology than those who dropped out did not; thus, these findings are not generalizable for participants who did not complete the program. The program employed a CBT approach, and as a result, the

study may not represent the results of other modalities for substance use disorder in regard to levels of depression.

No control group was used in this study, making it impossible to compare CBT treatment with the mere passage of time for individuals with depressive symptoms. No data were available regarding the adherence of actual CBT treatments delivered to evidence based practice CBT, and as a result, the study was unable to assess the degree to which the treatment delivered adheres to CBT practices, which may limit generalizability. Further, as the data were curated by a treatment center in Texas, I was not able to ensure that testing sessions were correctly conducted and monitored. In examining levels of depression, the CEST–Psychological Functioning was used; this tool may not describe all aspects of depression and resultantly, may only present a partial picture of depressive symptoms. Moreover, some patients may have answered questions regarding depression according to what they believed the proctor wanted to hear, rather than how they actually felt, which is another potential limitation, called self-reporting or desirability bias. This is of particular note because participants were part of a court-mandated program for men and women whose issues with substance abuse had led to the need for legally imposed rehabilitation. Because data collection occurred over a 2-year time period, potential historical influences on the findings cannot be eliminated. An additional confounding factor includes my inability to ensure that the dataset included a robust sample of minority participants, which limits the impact of the current findings and their application to the study of minority substance abuse and treatment. Further, due to the geographic limitations of the dataset, sample bias may exist in that the data

collected may not accurately reflect the efficacy of treatment or responsiveness of other minority and majority population samples.

Lastly, as the data sample was limited to those recommended by the court to treatment, the sample itself was skewed in such a way that minority groups and females were underrepresented, limiting the inclusiveness of the current study sample and the application of its results. This limitation is further exacerbated by the use of exclusionary criteria, which reduced the sample size to include only participants who completed their program, as noted in the previous section. These limitations further limit the generalizability of the findings.

Recommendations

Future studies may examine the influence of substance abuse treatment on depression with different tools other than the CEST–Psychological Functioning and incorporating more nuanced questions for participants. Other disorders, such as anxiety, bipolar disorder, and others may also be studied in reference to outcomes resulting from substance abuse treatment with these diagnosed populations. Control groups may also be potentially included in future research work, thus demonstrating a causal relationship between particular treatments and particular outcomes. In order to decrease the risk of unique local factors limiting generalizability, these potential participants may be drawn from various population centers across the United States. Future research ought to include not only data from several treatment centers across the nation, but care should be taken to include a more robust and representative sample of both women and minorities. Further, future studies may also include information and analyses of the characteristics of participants who drop out of treatment as opposed to those who complete treatment.

Additionally, analyses may be carried out on the SES characteristics and substance use histories of participants and examined for relevance to outcomes.

In the current study, lower reductions in depression among African American participants compared both to Other Hispanic and Caucasian non-Hispanic participants were observed and found to be statistically significant, although weakly correlated; a future study, seeking to explore the experiences of African American individuals in substance abuse treatment and suffering from depression, may be able to incorporate a greater number of participants under conditions of greater group control and selection in order to observe whether the observed results were simply noise in the data or evidence of some durable difference between groups. Currently, the two findings must be taken with studious caution; a rigorous study however, may be able to elucidate what, if any, differences might exist between African American participants and those of other populations.

In terms of the treatment approach, future studies may ensure the adherence to the CBT method in future studies by directly collecting data and verifying programmatic content and delivery. Other studies may explore the impacts of other treatment approaches on depressive and other symptoms. Work has already been done on integrated approaches combining substance use disorder and depression symptom treatment, and future research including information from the present study may further explore the effectiveness of specialized CBT substance use disorder/depression interventions with a generalized group of participants (Curran et al., 2007; Hides et al., 2010; Petersen & Zettle, 2009).

Implications

Co-occurrence of substance use disorder and depression is very common for individuals in treatment contexts (NIDA, 2010; Nurnberger et al., 2002, 2007; Kelly et al., 2009). This comorbidity has been shown to complicate recovery from either substance or depression (Curran et al., 2007; Renner et al., 2011; Saisan et al., 2010). Further, being diagnosed with one disorder increases the likelihood of being diagnosed with the other (Petersen & Zettle, 2009). As such, individuals who have comorbid substance use mood disorders have been found to exhibit trajectories of recovery that are more extended than those with only one condition (Chou et al., 2012; Dongier, 2005; Doweiko, 2011; Hides et al., 2010; Pettinati et al., 2010; Renner, Baxter, Suzuki, & Ciarulo, 2011).

Although completion of treatment resulted in lowered depression scores, in light of the treatment hurdles presented by comorbidity, the research from the present study may have provided support for implementing interventions such as CBT that may simultaneously address both substance use disorder and depression, which may be linked and mutually malignant disorders that both hinder recovery from the other. This is especially true when seeking to design inclusive rehabilitative programs that address the potentially different treatment needs of minority participants as opposed to non-minorities. When adhered to the application of these new strategies to patients, may help many individuals overcome substance use disorder and depression; especially, *if* it is found that unitary approaches *are* effectual in equally reducing depression scores in various racial and ethnic groups.

Further, if additional research finds that significant differences in depression reduction in African Americans are in fact correlated somehow with treatment, new treatment methods for both depression and substance abuse disorders may help African American patients to recover without culturally insensitive treatment approaches that are imprecisely tailored to their needs. That said, if future research building on the current study can adequately provide data while substantially answering the question of whether different approaches are merited for different groups to generate acceptable outcomes, the door opens to researching the question of minority dropout and non-use of services. Given the paucity of current literature and the categorical under-representation of minorities in these studies, building from the current research may be a crucial societal concern.

As the minority experience in America becomes an increasingly urgent conversation across the country and the world, we have a duty to this growing population to explore and satisfy their treatment needs. Due to the scarcity of research on this population, our understanding of minority substance abuse, depression and treatment still needs to be examined and developed. By exploring the impact of the minority experience on levels of depression and substance abuse, this and future studies may improve the lives of minority individuals suffering from depression and substance abuse by aiding the outreach work of clinics and programs to propel efforts to implement minority-specific treatments. Because of this, future studies may seek to explore the understudied mechanisms of CBT rehabilitative treatment programs, such as the impact of reducing substance abuse on depression symptoms in addition to an exploration of the successful aspects of CBT which make it an effective intervention across all groups. The

development of a more culturally cognizant approach to substance abuse and depression treatment will enable treatment centers to address the needs of their patients and ultimately, achieve effective, long-term rehabilitation for their patients--not only in communities with large minority populations, but in all communities.

Ultimately, answering all of these questions may positively influence the lives of individuals in treatment by ultimately providing them with evidence based programs suited to their needs. As is evidenced by the surprising lack of substantive investigation into the differential experiences of minorities who struggle with substance abuse and depression, the concept of diversity within psychology research is more essential than ever to promote.

In this sense, the limitations of the current study are themselves quite illuminating. The lack of an ethnically diverse sample in a court-mandated program is intriguing for multiple reasons, not the least of which is small number of minority offenders whom the court deemed eligible for treatment in the first place. This is of particular note because research not only indicates that minorities make up the majority of incarcerates in Texas, but there is an endemic overrepresentation of minority drug offenders in prisons nationwide. Although this was not the intent of the study, this reality nevertheless poses an increasingly urgent concern, not just for individuals and families, but for entire communities (Schiraldi et al., 2014). Even states are not exempt. In the state of Texas alone, researchers estimated that, in 2014, more than $1 billion dollars was lost in economic productivity to incarceration in the African American community alone (Schiraldi et al., 2014).

Although this was not the intent of the current study, should future researchers choose to take the torch and continue to delve into the concerning societal contexts that surround minority substance abuse and treatment, they could provide us with data that allows us to better understand our minority population and lawmakers with information that has the potential to bring awareness to systemic injustices that lurk within the criminal justice system. Nevertheless, our ability to effectively reach and treat minorities who struggle with substance abuse is a concern that makes exploration of these phenomena essential. Further, by examining and comparing the aspects of successful treatment, research can provide information about how different treatment mechanisms impact various populations and identify which approaches are the most successful and why, thereby contributing to positive social change at both the individual and societal levels.

Research should not be limited to only African Americans and Hispanics, however. Instead, researchers should seek to incorporate as many different societal groups as samples and targets of inquiry. Methodologically, the results of this study also highlight the need for further investigation into the efforts and enrollment rates of rehabilitation programs that are not sponsored or affiliated with the court. To this end, further investigation of different racial and ethnic groups' responsiveness to treatments in substance use disorder programs will provide further contextual information regarding substance abuse and depression and its treatment in minority populations. These data are even more necessary given the current paucity of samples and studies that explore minority experiences in treatment versus those of largely homogenous Caucasian test groups.

As the nuances of the presented program and treatment were unavailable, future studies should explore the efficacy of CBT programs in comparison to alternative program approaches. As not much was known about the particular treatment used, future researchers should seek to compare different program approaches and their treatment mechanisms in order to identify if there are culturally sensitive aspects to treatment that made the program effective across all groups. That noted, current results suggest that the program studied here was effective in reducing depression across all groups, and thus should be continued in practice. To this end, the impact of culturally competent treatment should also be examined. Future research will be essential to serving the purposes of filling the existing gap of knowledge regarding comorbid substance abuse and depression among *all* populations and highlighting the potential of CBT and culturally oriented therapy mechanisms.

Conclusion

The current study found that after participation in a residential court-referred substance abuse program utilizing CBT, all participants regardless of race or ethnicity experienced a significant decline in symptoms associated with depression. The finding of CBT-related treatment being efficacious in reducing depression may be relevant in future interventions seeking to treat both substance use disorder and depression together, which often co-occur and mutually complicate recovery from the other condition (Curran et al., 2007; Renner et al., 2011; Saisan et al., 2010).

The finding of no difference in levels of depression before and after treatment between Caucasian participants and minorities, and between the minority groups themselves may lend support to theories that posit a common and biological etiology of

substance use disorder and depression in some individuals (Boden and Fergusson, 2011; Kelley et al., 2009; Nurnberger et al., 2002; Nurnberger et al., 2007; Young-Wolff et al., 2009). However, the theory that biology determines the expression of clinically significant substance use disorder or depression must be moderated by consideration of the experiential, personality and lifestyle factors that push individuals towards unhealthy disorders, factors that for minority individuals may involve experiences of structural discrimination, cultural estrangement, health burdens, inability to access care, and other factors attached to the lived experiences of these groups (Arbona & Jimenez, 2014; Brody et al., 2012; Chartier & Caetano, 2010; Dunlop et al., 2003; Keyes et al., 2011, 2012; Otiniano Verissimo et al., 2014).

From the point of view of exploring interventions designed to effectually treat substance use disorder and depression for all populations, the tendency of minority participants to drop out of treatment early or not enter treatment at all was of crucial importance. Although these two outcomes were simply not addressed in this research design, these factors remain highly salient to creating inclusive programs (Guerrero et al., 2013; Perron et al., 2009; Voss Horrell, 2008). Further, the creation of targeted interventions effective in treating comorbid substance use disorder and depressive disorders among a diverse population still faces a great many hurdles, as a significant number of the factors leading to the expression of one or both disorders remain poorly understood.

The current paucity of knowledge and research in both assessing and addressing the needs of a growing minority population is further exacerbated by the limitations of current research regarding the comorbidity of substance abuse and depressive disorders,

not just in minorities but in Caucasians as well. This makes the need for further research even more urgent in the search for effective rehabilitation not just for non-minority citizens, but also for all patients, regardless of race, color, or creed. We must seek to understand more about the minority experience and potential cultural or gender-based deterrents to seeking and completing treatment. As such, it is the responsibility of future research to explore the question of comorbidity along with current methods for attracting and retaining minority individuals. This includes exploring various mechanisms of treatment, particularly those that may be culturally sensitive or responsive. Our goal must be to create inclusive, responsive, and effective treatment approaches that answer the needs of all our citizens, not just the privileged few. To this end, the promising reduction in symptoms experienced by all patients in the presented study not only sheds light on the potential of CBT-oriented therapies to effectively treat comorbid substance abuse and depression, it also provides hope to the many communities that struggle against an ever-increasing cultural endemic.

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Appendices

Appendix A: CEST – Psychological Functioning

TCU PSYFORM

Disagree Strongly (1)	Disagree (2)	Uncertain (3)	Agree (4)	Agree Strongly (5)

Please indicate how much you AGREE or DISAGREE with each statement.

1. You have trouble sleeping.
   ○ ○ ○ ○ ○
2. You have much to be proud of.
   ○ ○ ○ ○ ○
3. You consider how your actions will affect others.
   ○ ○ ○ ○ ○
4. You plan ahead.
   ○ ○ ○ ○ ○
5. You feel interested in life.
   ○ ○ ○ ○ ○
6. You feel like a failure.
   ○ ○ ○ ○ ○
7. You have trouble concentrating or remembering things.
   ○ ○ ○ ○ ○
8. You feel afraid of certain things, like elevators, crowds, or going out alone.
   ○ ○ ○ ○ ○
9. You feel anxious or nervous.
   ○ ○ ○ ○ ○

10. You wish you had more respect for yourself.
    ○ ○ ○ ○ ○

11. You are likely to feel the need to use drugs in the next few months.
    ○ ○ ○ ○ ○

12. You feel sad or depressed.
    ○ ○ ○ ○ ○

13. You think about probable results of your actions.
    ○ ○ ○ ○ ○

14. You feel extra tired or run down.
    ○ ○ ○ ○ ○

15. You have trouble sitting still for long.
    ○ ○ ○ ○ ○

16. You think about what causes your current problems.
    ○ ○ ○ ○ ○

17. You are likely to drink alcohol in the next few months.
    ○ ○ ○ ○ ○

18. You think of several different ways to solve a problem.
    ○ ○ ○ ○ ○

19. You feel you are basically no good.
    ○ ○ ○ ○ ○

20. You worry or brood a lot.
    ○ ○ ○ ○ ○

21. You have trouble making decisions.
    ○ ○ ○ ○ ○

22. You feel hopeless about the future.
    ○ ○ ○ ○ ○

23. You make good decisions.

○ ○ ○ ○ ○

24. You are likely to relapse in the next few months.

○ ○ ○ ○ ○

25. In general, you are satisfied with yourself.

○ ○ ○ ○ ○

26. You make decisions without thinking about consequences.

○ ○ ○ ○ ○

27. Please fill in the “Disagree” box as your response for this question.

○ ○ ○ ○ ○

28. You feel tense or keyed up.

○ ○ ○ ○ ○

29. You feel you are unimportant to others.

○ ○ ○ ○ ○

30. You feel tightness or tension in your muscles.

○ ○ ○ ○ ○

31. You are likely to have problems in quitting drug use.

○ ○ ○ ○ ○

32. You feel lonely.

○ ○ ○ ○ ○

33. You analyze problems by looking at all the choices.

○ ○ ○ ○ ○