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EXAMINING SUBSTANCE-USE TREATMENT UTILIZATION AMONG INCARCERATED WOMEN IN CENTRAL APPALACHIAN JAILS

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EXAMINING SUBSTANCE-USE TREATMENT UTILIZATION AMONG
INCARCERATED WOMEN IN CENTRAL APPALACHIAN JAILS

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Education at the University of Kentucky

By

Rae Lyn Glover

Lexington, Kentucky

Co-Directors: Dr. Danelle Stevens-Watkins, Associate Professor of
Counseling Psychology and Dr. Jeff Reese, Professor of Counseling Psychology

Lexington, KY

2017

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ABSTRACT OF DISSERTATION

EXAMINING SUBSTANCE-USE TREATMENT UTILIZATION AMONG INCARCERATED WOMEN IN CENTRAL APPALACHIAN JAILS

Women in Central Appalachia represent a significant proportion of those engaging in problematic patterns of opioid use, which is concerning given the limited available services in the region and gender specific treatment barriers. This investigation seeks to understand the role of mental health and substance use symptoms among incarcerated Central Appalachian women and build on the conceptual model of substance use treatment utilization purposed by Leukefeld and colleagues (1998). Data for this study was drawn from a larger longitudinal investigation (NIDA 1R01-DA033866) and baseline data collected during initial interviews was analyzed. The sample included 400 women incarcerated at one of three central Appalachian jails. Bivariate analyses determined significant relationships between symptoms of depression, anxiety, trauma and substance use. Binary logistic regression was used to assess the factors influencing treatment utilization. The overall multivariate model of treatment utilization with eight factors (income, overdose history, injection drug use, entered detox, attended self-help groups, substance use problems, number of children, and no way to get to their provider) significantly improved the prediction of treatment utilization. Implications of this study highlight the importance of continued interventions at the individual, community, and policy level.

KEYWORDS: Central Appalachia, treatment utilization, opioid use

Rae Lyn Glover

Student's Name

07/21/2017

Date

EXAMINING FACTORS OF SUBSTANCE-USE AND TREATMENT UTILIZATION
AMONG INCARCERATED WOMEN IN CENTRAL APPALACHIAN JAILS

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DEDICATION

This manuscript is dedicated to the women in my family who taught me how to be a true mountain woman. No matter how far I go, the mountains will always be in my heart.

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Views expressed here are those of the author and may not reflect views of NIH/NIDA.

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Chapter One: Statement of the Problem and Literature Review

The following section outlines the purpose of the current study along with an overview of relevant literature. First, historical factors related to immigration and exploitation of the Appalachian region are presented. Second, the current socioeconomic context of Central Appalachia is outlined. Third, Appalachian culture is explored. Fourth, an integrated review of the literature pertaining to drug misuse in rural Appalachia, pathways to drug use, and differentiated patterns of drug use among women, and women of Eastern Kentucky are outlined. Fifth, factors associated with substance-use treatment utilization among women, rural, and incarcerated individuals are discussed. Sixth, the help-seeking theory of substance-use treatment (e.g., Leukefeld et al., 1998) and relational model (e.g., Miller, 1976) of substance use is applied to the current study and a modified theoretical framework for conceptualizing treatment seeking among Appalachian women is proposed. Seventh, research questions and related hypotheses are outlined.

Statement of the Problem

Substance-use is a major health concern affecting an estimated 20.7 million adults with substance-use disorders (SUDs) in Americans annually (Substance Abuse and Mental Health Service Administration [SAMHSA], 2013). Women represent a growing trend among those with SUDs and display concerning patterns of substance-use regarding nonmedical use of prescription drugs ([NMUPD]; Center for Disease Control and Prevention [CDC], 2013) and often present with more significant clinical profiles that includes co-occurring mood and anxiety disorders with specific concerns related to being a parent (Tuchman, 2010). Despite these complex treatment needs, women are

underrepresented in substance-use treatment programs (Greenfield et al., 2007; Tuchman, 2010). The treatment gap is especially problematic in rural areas with limited access to resources, as substance-using women in these areas access treatment less than urban women and typically report unmet treatment needs and treatment barriers (MacMaster, 2013; Staton-Tindall, Duvall, Leukefeld, & Oser, 2007; Zhang et al., 2008). The underutilization of substance-use services by rural women is particularly troubling given the prescription drug epidemic disproportionately affects the area of rural Central Appalachia (Havens et al., 2007; Zhang et al., 2008). Even though there is a rise in prescription drug use in the Central Appalachian region and gendered specific treatment concerns and barriers to accessing resources, there is a dearth of literature that specifically addresses the unmet treatment need among women in the region.

Understanding substance-use treatment utilization among individuals who are historically underrepresented in substance-use treatment programs is challenging. The current literature of treatment utilization is often confined to convenience samples of those who are actively engaged in treatment (e.g., Jackson & Shannon, 2012; McMahon, Winkel, Suchman, & Luthar, 2002; Troyer, Ferketich, Murray, Paskett, & Wewers, 2011) or dependent on survey data from national epidemiological studies (e.g., Green-Hennessy, 2002; Grella & Stein, 2013) that frequently underrepresent those in the rural Central Appalachian region. Treatment utilization among those engaged in treatment neglects to consider the experience of individuals who are not accessing services, and national survey data often disregards the unique perspective of those in the Central Appalachian region. Therefore, understanding lifetime treatment utilization among women in Central Appalachia who are incarcerated rather than actively seeking treatment

may shed light on the specific barriers one encounters in navigating the healthcare landscape in the region. Furthermore, individuals who are financially disadvantaged and struggle with substance-use represent a growing proportion of those in our nation who are incarcerated in jails and prisons (Glaze & Herberman, 2014; Steele & Masterson, 2013). Kentucky ranks in the top three nationally for the highest rate of incarcerated women (Glaze & Herberman, 2014). Women incarcerated in jails and prisons are some of the most at-risk and underprivileged groups who commonly struggle with substance-use disorders and have complex and severe clinical profiles with limited access to resources (Guerrero et al., 2014; Knight, 2012; Peltan, 2009; Staton-Tindall et al., 2003; Staton-Tindall et al., 2015). Therefore, it is important to fully understand treatment utilization among women involved in the criminal justice system whose lives are, perhaps, among the most impacted by the prescription drug epidemic with limited access to treatment. The sample of women incarcerated in rural Central Appalachian jails in this study captures a unique perspective of prior substance-use treatment utilization that is not currently represented in the literature. Understanding gender-specific factors associated with substance-use and substance-use treatment utilization in the community among rural women involved in the criminal justice system is paramount in order to formulate targeted interventions. The purpose of this study is to contribute to the dearth of empirical studies that specifically address psychosocial and gender-specific needs among a particularly vulnerable population with increased risk of substance use and limited treatment resources. Specifically, the goal of this study was to examine the impact of co-occurring mood and anxiety symptoms among substance-using women and the gender-

specific factors associated with substance-use treatment utilization prior to incarceration among a cohort of women incarcerated in rural Central Appalachian jails.

Review of the Relevant Literature

In order to understand substance-use treatment utilization among Appalachian women incarcerated in Central Appalachian jails, a review of the relevant literature will be outlined. First, the historic and current context of Appalachia is explored. Second, a description of the current socioeconomic conditions of Appalachia is outlined in terms of poverty, education, and women's access to resources. Third, pathways and patterns of drug misuse and use in the Appalachian region are identified. Fourth, substance-use treatment utilization among rural individuals and women who are incarcerated and living in the community are reviewed. Fifth, theoretical perspectives for conceptualizing substance-use and treatment utilization are proposed.

Historical and Current Perspectives of Appalachia

Appalachia is vast geographic region that is distinguished by a unique history and geography (Keefe, 1988). The geographic region of Appalachia is located along the spine of the Appalachian Mountain chain, which extends from New York to Mississippi, covering 13 states and 205,000-square-mile area (Appalachian Regional Commission [ARC], 2009). Appalachia is further divided into three subregions, which include the north, central, and southern regions. This study primarily focuses on the Eastern Kentucky (KY) counties that form the Central Appalachian subregion (ARC, 2009). Central Appalachia is a subregion containing all of the Eastern KY counties as well as counties in Tennessee, Virginia, and West Virginia. Appalachia is defined as a distinct region primarily due to the nation's motivation to address human needs for inhabitants of

this region (Couto, 2002). Human needs in the region were central to struggles with intense poverty, outmigration of people, over-concentration of employment in extraction industries, low education attainment, poor housing, health disparities, and limited access to transportation (ARC, 2015a). In order to fully grasp Appalachians' disparities, one must first consider the historical events that formed the region.

The earlier colonization of Appalachia by Europeans occurred during the seventeenth century, which led to the displacement and massacre of Native Americans (Pudup, 2002). During the post-revolution expansion, English, Irish, and Scottish settlers migrated to Eastern KY. As a result of American chattel slavery, Africans were transported to the region as well (Jackson, 2002). Due to European colonization and chattel slavery, indigenous or Native Americans, Africans, and Europeans inhabited Eastern KY during the eighteenth century (Jackson, 2002; McKinney, 2002).

While ethnically diverse individuals inhabited the land during the early settlement period, there was considerable inequity in the division of land, labor, and basic human rights. Specifically, land grants were given to more individuals than there was available land, which led to disputes and lengthy litigations in the earlier courts (Billings & Blee, 1999). Wealthy white elitists with capitalist intentions generally prevailed over less-wealthy landowners during the litigation process. During the earlier twentieth century, coal and land agents, eager to profit from the natural resources in Eastern KY, purchased mineral rights from the farmers in the region. The acquisition of land and mineral rights by outside interests resulted in corporate control of local politics (McKinney, 2002).

Between 1870 and 1920, the flourishing coal industry led to one of the most ethnically diverse periods of Central Appalachian region history (Jackson, 2002). The

influx of migrant laborers in the coalfields transformed the culture in the region. The coal miners were predominately composed of white Appalachians, who had immigrated from Scotland, Ireland, and England, along with those from Italy, Poland, Hungary and Slavic nations, and African American (Jackson, 2002). Emigration of the Central Appalachian coal region occurred during the Great Depression (1929–1939) until the 1970s (Obermiller & Howe, 2002). Today, Central Appalachia predominately (95.3%) consists of white or non-Hispanic individuals (Pollard & Jacobsen, 2015). The total minority population is less than 5%, as there are less than 2% black or non-Hispanic individuals, 1.3% Hispanic or Latino, and 1.6% classified as not Hispanic (Pollard & Jacobsen, 2015).

Exploitation of Central Appalachia. The coal mining industry has long maintained an interest in Central Appalachian politics. Extensive corruption has been reported between coal companies and regulatory government agencies in the Central Appalachian region (Purdy, 2002). Lax environmental policies directly support the interests of the coal industry. The impact of lax environmental standards continues to erode the environment, which negatively impacts the health of individuals in the Central Appalachian coal-mining region. Although various grassroots organizations formed in Eastern KY combat the devastating effects of the coal industry, there remains a complex sociopolitical impact on the local economy in the region (Sutton, 2002). Coute (2002) maintains the current socioeconomic inequalities among Appalachians are predicated on the historical and current legislative practices that allowed for the exploitation of inhabitants and the extraction of resources from the land of Central Appalachia. Specifically, the outside industrial interests formed legislative policies that benefited the

coal industry and limited the tax base among local residents to maintain basic infrastructure (e.g., healthcare, education). Understanding the political and economic exploitations of the people in Eastern KY offers historical context to understand the present economic and social conditions in the region.

Socioeconomic Context of Central Appalachia. The Central Appalachian region is one of the most economically distressed regions in the nation (ARC, 2015b) and has largely been regarded as a “region apart” (ARC, 2015a, p. 2) from the rest of the United States. The ARC has a socioeconomic classification system that compares three year averages of Appalachian counties with the national averages based on measures of unemployment rates, per capita income, and poverty rates (ARC, 2015b). Based on comparisons with national averages, counties in Appalachia are designated to one of five economic statuses. Central Appalachian KY has the largest number of counties that rank in the lowest 10% in terms of socioeconomic status (Pollard & Jacobsen, 2015). The Central Appalachian region has the highest rates of poverty compared with other Appalachian regions, as almost a quarter (24.0%) of all age groups were living at or below the poverty level (e.g., income less \$23,624 for families of two and two children in 2013).

The Central Appalachian region has the most rural counties compared with other Appalachian subregions and the least number of inhabitants per square mile than the other subregions (ARC, 2015). The rural and isolated nature of the region has implications for access to healthcare services. Limited access to specialized healthcare services and an overall lack of a community-responsive health system has been attributed to the health disparities in the region (Halverson, Friedell, Cantrell, & Behringer, 2012).

Therefore, the rurality and isolation of the Central Appalachians complicated by the lack of financial resources interacts with a fragmented healthcare system that results in poor health outcomes in the region. In the face of economic uncertainty and health disparities, Appalachians have learned ways to cope and overcome such hardships. However, there remains a social need that has yet to be addressed in the region.

Appalachian culture. Perceptions of Appalachia have historically been framed by the works of non-Appalachian professionals of diverse disciplines, including academicians, novelists, and journalists (Coute, 2002). During the earlier twentieth century literary depiction, which unduly characterized Appalachians as distinctly different from non-Appalachians, propagated the “othering” of the Appalachian people (Lewis, 2002). Appalachians were evaluated on a continuum of social evolution, as their traditional ways were viewed as less evolved than the modern cultural elite of non-Appalachians (Anglin, 2004). Earlier fictional writings and research regarding Appalachian people and culture tended to perpetuate negative stereotypes of Appalachians (Lewis, 2002). To date, there remains a tendency to attribute the social inequalities of Appalachians to their own cultural pitfalls (e.g., culture of poverty model; Billings, 1974). Therefore, the purpose of this discussion concerning Appalachian culture is to avoid oversimplifications and offer a foundation for understanding common social characteristics in the context of unequal access to necessary resources.

Appalachian studies scholars have yet to reach a consensus regarding the appropriateness of defining Appalachia as a distinct cultural group. Some scholars regard Appalachians as the invisible minority (Russ, 2010) and encourage the conceptualization of Appalachians from a culturally competent perspective that regards Appalachians as a

distinct cultural and ethnic group (Keefe, 1986). The consolidated research by Keefe (1986, 1988) expands an understanding of Appalachian culture specific to mental health professionals. Familialism is one of the cultural values described by Keefe that is applicable to conceptualizing substance-use treatment utilization among Appalachian women. Familialism is defined as close ties and loyalty to family, including nuclear family members and distant relatives (Keefe, 1988). These Appalachian cultural values influence one's behaviors and are an important consideration when conceptualizing mental health and substance-use in the region.

Expression of Appalachian cultural values in family. The centrality of family is expressed in decision making, social support, and sharing of accumulated wealth (Keefe, 1988). Decisions made by individuals are predominately dependent on the consensus among family members. Appalachians derive support through their family by sharing resources and emotionally supporting one another. Families commonly distribute their land to younger generations as a way to share accumulated wealth within the family. Sharing of land with younger generations has implications for intergenerational poverty and the tendency for families to live in close proximity. It is a common practice for several generations of families to live in close proximity to each other, which allows relational bonds to strengthen among family and kin. Perhaps in part due to these close relational bonds formed near the family home, Appalachians are known for their strong sense of connection to their family home, which has been termed "love of place" (Jones, 1991). Family support is demonstrated through emotional support, as families remain a place of protection from exploitative practices by outside forces (extraction industries) in the region.

The cultural values among Appalachians have been shaped by their economic, social, and geographic realities. The cultural values of family and love of place are adaptive functions. However, some of these cultural adaptations also act as a source of stress and strain among individuals. Family can provide emotional support to individuals struggling, yet given the importance of one's family reputation, seeking outside professional help for stigmatized conditions may be discouraged among Appalachians. The benefit of the family support also is contrasted with the primary identity of Appalachians embedded within the family reputation. Community members commonly judge an individual based on the reputation of the family, which may have positive implications for individuals with desirable family reputations yet suggests individuals belonging to families with unfavorable reputations are at a severe disadvantage (Keefe, 1988). Therefore, familialism can be strengthening to individuals in Appalachia and act as a source of stress and social strain as well.

Education and employment among Appalachian women. Appalachian women have a significant and different familial role and social status in the community, given the commonly held patriarchal views in the region (Fiene, 2002; Keefe, 1988). Gender roles are often more traditional among women with low socioeconomic status (Fiene, 2002). Women from lower socioeconomic status may be expected to adhere to traditional gender roles within the family and larger community, which have implications for educational attainment and employment opportunities.

Appalachia follows the national trend of women obtaining a greater number of college degrees than men (Haaga, 2004), yet there are notable discrepancies in education attainment between women from Eastern KY compared with women in other parts of the

nation. Furthermore, the rate of men earning college degrees in Eastern KY is the lowest of any other Appalachian subregion (Eastern KY men = 10.1%, Northern Alabama = 20.4%) and lags far behind that of U.S. averages (U.S. men = 25.8%), which is based on the aggregated data by Haaga (2004) from the 2000 census among young adults ranging from 25–34 years of age. Haaga (2004) concluded that women from Eastern KY have the highest high school drop-out rate compared with women in all of the other Appalachian subregions and women in the U.S. (Eastern KY = 24.0%, Northern Alabama = 14.5%, U.S. Total = 14.2%; Haaga, 2004). Women from Eastern KY rank in the lowest category of those obtaining college degrees compared with the other subregions and earning fewer than other women in the U.S. (Eastern KY = 11.0%; U.S. women = 29.3%; Haaga, 2004). The lower education attainment among Central Appalachian women has implications for their access to resources, familial caretaking roles, and employment opportunities outside the home.

The Central Appalachian economy has historically been overly reliant on male-dominated jobs in the coal industry, while women worked as caregivers to the family (Miewald & McCann, 2004). Recent evidence suggests a changing economic landscape in Central Appalachia, as employment in the extraction industries is dwindling with increased focus on the service industry jobs that require more education (ARC, 2015a). A study by Meilwald and McCann (2004) found a changing Appalachian economy has allowed women to re-negotiate their traditional roles as caregivers, yet women's efforts to work outside the home and obtain more education are often met with opposition from men through threats of violence and physical harm (Melwald & McCann, 2004). Although there may be more opportunities for women to redefine their roles in the region

given the changing economy, it appears there is significant opposition and severe consequences to women obtaining equal status. Without equal status, Appalachian women's well-being is compromised. The inequalities among Appalachian women may predispose them to poor mental health outcomes and place them at an increased risk of engaging in negative coping strategies such as substance use. Furthermore, considering the intersectionality of social class and gender, women attempting to access treatment for substance-use disorders may encounter additional barriers in rural Central Appalachia.

Pathways and Patterns of Drug Use

Substance use has been an area of increased interest over the last two centuries (White, 1998) and remains a highly debated topic among politicians, academics, and clinicians. There has been considerable research on the study of addiction, yet the cause of addiction remains a highly disputed topic within and between academic fields of study (Levy, 2013). There is no single determining neurobiological, psychological, sociological, or genetic determinant of drug use but rather a culmination of factors that lead to substance use and development of substance-use disorders (Levy, 2013; National Institute on Drug Abuse [NIDA], 2014).

Consistent with the nomenclature of the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5; American Psychiatric Association, 2013), this report utilizes the terminology "substance-use disorders" (SUDs). The changes in the DSM-5 reflect different thresholds for SUD diagnostic criteria. In order to meet the criteria for SUDs in the DSM-5, the threshold of symptom criteria has changed from one or more symptoms for substance abuse and three or more symptoms for substance dependence to two or more symptoms for SUD in the updated DSM-5 (APA, 2013). For

clarity purposes, descriptions of studies using the DSM-IV classifications will be noted as substance abuse or dependence; otherwise, the most recent terminology is maintained. Furthermore, the commonly used term of addiction can be applied to the DSM-5 criteria as referring to severe SUD (APA, 2013, NIDA, 2013). For the purpose of this discussion, “drug misuse” is defined as taking medication inconsistent with medical advice, such as taking more of the drug or for longer periods of time (WHO; World Health Organization, 2004). Conversely, taking prescription medication with the intention to reach euphoric effects or to “get high” is referred to here as nonmedical prescription drug use or nonmedical prescription opioid use. The broad categories of opioids are a class of psychoactive substances derived from the seeds of a poppy plant (WHO, 2004). Opioids include synthetic (e.g., methadone) and semi-synthetic derivatives (e.g., morphine, heroin, oxycodone, hydrocodone). The central focus of this discussion is concerned with the psychosocial aspects of drug use by outlining pathways to drug misuse and use in Eastern KY and patterns of drug use among women and those living in Eastern KY.

Prescription Drug Problem in Eastern Kentucky

Although illicit drug use is more commonly attributed to individuals in urban areas, recent research suggests rural residence represents an increasing proportion of those engaging in nonmedical use of prescription opioids (NMUPO; Havens et al., 2011; Young, Havens, Leukefeld, 2012; Zhang et al., 2008). Specific patterns of drug misuse and nonmedical use of prescription drugs have been noted in the Central Appalachian region that encompasses Eastern KY counties (Leukefeld et al., 2007; Zhang, 2008). Comparisons of drug use among Appalachians and non-Appalachians have identified

prescription drug use, such as opioid use, to be far more prevalent among Appalachians and even more common in the coal mining areas of Central Appalachia (Zhang, 2008). The disproportionate rates of prescription drug use have continued to be supported in samples comparing rural and urban probationers, as Havens (2007) found rural probationers ($N = 1,525$) were almost five times more likely to report prescription drug use compared with urban probationers. The prescription drug problem in the region is further supported in samples ($N = 212$) of drug users in KY by Young and colleagues (2012) who found participants from the rural Eastern KY region to be more likely to report recent use of certain prescription opioids compared with urban participants. Similar findings by Shannon, Havens, Oser, Crosby, and Leukefeld (2011) have been observed among a community sample ($N = 370$) of drug users in the Appalachian KY region, as participants reported polydrug use, with the majority (hydrocodone = 88%, benzodiazepines = 90.1%) engaging in recent prescription drug use. Researchers have illuminated the problem of prescription drugs in the Central Appalachian region and are beginning to uncover the severe health-related consequences.

Prescription drug use is associated with severe individual and societal consequences. A recent exploratory study by Staton-Tindall and colleagues (2015) revealed that injection was the preferred route of drug administration among a sample ($N = 22$) of incarcerated Central Appalachian women. Injection drug use among rural substance users is concerning given the increased rate of acquiring blood-borne pathogens such as human immunodeficiency virus (HIV) and Hepatitis C (HCV) (Hagan & Des Jarlais, 2000). A cross-sectional study by Havens and colleagues (2013) found HCV to be prevalent in more than half (54.6%) of the rural Appalachian injection drug users

and injection of prescription opioids increased the risk of HCV ($AOR = 2.22$, 95% CI = [1.13, 4.35]). To further illustrate the consequences of prescription drugs among Kentuckians is the striking increase of deaths due to overdose in the past 13 years, as the death rate has increased from 247 deaths in 2000 to 1,007 in 2013 (Brown & Ingram, 2013). The risk of death appears to be greater in the rural areas of Eastern KY, as one study by Matthews (2002) found over a two-year period KY had more than 2,600 drug-related deaths and 1,300 of those deaths occurred in Eastern KY. Given the prescription drug problem in Central Appalachia along with the sobering statistics of related consequences, several hypotheses have been generated as to the pathways of drug misuse and use among this vulnerable population.

Pathways to Prescription Drug Use Among Appalachians

Following the initial reports of the prescription drug problem in Eastern KY, Leukefeld, Walker, Havens, Leedham, and Tolbert (2007) undertook one of the first studies to investigate possible pathways to prescription drug misuse and use in the region. The authors interviewed 70 community stakeholders (e.g., community leaders, educators, health care providers, and law officials). The qualitative findings indicated two pathways to prescription drug misuse: managing physical pain and recreational use. The majority (87%) of interviewees cited physical pain as a major pathway, and over two thirds (77%) indicated recreational use as a common pathway. Although these two pathways speak to the specific problem of prescription drug use in the region, it neglects to consider the individual realities of those living in the region that place them at greater risk of engaging in substance use. Prevention literature reviewed by Hawkins and colleagues (1992) identifies several risk factors for substance use; most applicable to those living in Central

Appalachia are the risk of socioeconomic inequality, availability of the drug, and presence of mental health disorders. The two pathways simply offer anchors for the initial intention to use prescription drugs but do not offer an explanation for the underlying etiology of the problem. Therefore, the assertion here is Central Appalachians are at an increased risk of engaging in prescription drug use given the increased availability of the drug in the region, socioeconomic inequalities, and vulnerability to mental health problems. Therefore, the specific risk factors of socioeconomic characteristics, availability of the drug, and presence of mental health disorders are applied to the two pathways of prescription drug use and misuse in Central Appalachia.

The pain pathway to prescription drug use. The issue of drug availability in rural Central Appalachia is a multilayered, as it involves the pharmaceutical industry, medical associations, physicians, and individuals selling prescription drugs in local communities (Jonas et al., 2012; Keyes et al., 2014; Tunnel, 2005). Over two decades ago, the pharmaceutical industry supported the production and marketing campaigns of powerful analgesics (prescription opioids); the industry was later penalized for understating the risks of the drugs and overstating the potential benefits (Tunnel, 2005). Concurrent with marketing of the powerful analgesic drugs, medical institutions encouraged health professionals to assess the fifth vital sign: a novel way to evaluate pain (Mularski et al., 2006). Therefore, at the same time that medical professionals were encouraged to evaluate and treat pain, the pharmaceutical industry was producing and marketing powerful analgesics for the treatment of pain. The efforts of the pharmaceutical industry and medical associations translated into prescribing practices by physicians in Appalachia, as the region has been found to have some of the highest rates

of opioid prescriptions in the nation (McDonald, Carlson, & Izrael, 2012). There are several reasons that might predispose Appalachians for legitimately seeking medical care for the treatment of pain conditions. The available employment opportunities in the region are often confined to physically demanding jobs such as mining, timber, and construction, which may predispose those working laborious jobs to seek relief from chronic pain conditions. Treatment of pain, as a pathway to prescription drug misuse, is further supported given that the areas most affected by the drug problem in Appalachia are the coal mining areas of Central Appalachia (Zhang, 2008) with some of the highest cancer rates in the nation (U.S. Cancer Statistics Working Group, 2014). Therefore, an unintended consequence of legitimately attempting to treat pain conditions may have been an important factor for prescription drug misuse in the region and undoubtedly contributed to the increased availability of the drug.

Another explanation for the pain pathway to drug misuse in the Appalachian region is the common presentation of somatic complaints among Appalachians (Keefe, 1988). Keefe and Curtin (2012) described the manifestation of somatic complaints, often referred to as “nerve” problems to commonly be perceived through the medical model rather than attributing such complaints to a lived experience of dealing with societal inequalities. This cultural mismatch for treating somatic complaints may contribute to the inappropriate treatment of such conditions by medical providers. Therefore, Appalachians may be more inclined to report somatic mental health symptoms (Keefe, 1988) and be prescribed medications (e.g., benzodiazepines or other “nerve pills”) to *treat* their symptoms (Greenlee & Lantz, 1993; Leukefeld et al., 2007; Havens, Walker, & Leukefeld, 2008). The treatment of “nerve” problems through the use of prescription

drugs rather than addressing the potential etiology of such symptoms speaks to the acceptability of taking prescription drugs among Appalachians. Therefore, the treatment of somatic and pain symptoms by medical providers has implications for the overall acceptability and availability of prescription drugs in Appalachia.

Another consideration for the availability of prescription drugs in the region is central to the cultural and contextual factors. Individuals in the region commonly “swap” or share their medications with those in need due to their lack of economic means to afford their medicine (Anglin & White, 1999). Given the close kinship networks of Appalachians, availability of prescription drugs combined with their economic hardships may facilitate the influx of illegal distribution networks (Keyes, Cerda, Brady, Havens, & Galea, 2014). A study by Havens and colleagues (2008) reported that Appalachians who were prescribed opioids for pain management commonly engaged in nonmedical use of opioids and other nonmedical uses of prescription drugs (e.g., benzodiazepines). The divergence from legitimately attempting to control pain to accessing medication through illicit means may speak to the addictive qualities of prescription opioids and, perhaps, lowered perception of harm by those using medicine given the present-day mechanisms of addressing the treatment of pain and related somatic manifestations of mental health problems. It is clear how the pharmaceutical industry and the medical practices of physicians converged with the distinct physical and mental health needs among Appalachians, which laid the foundation for prescription drug misuse in the region.

The second pathway of nonmedical use of prescription drugs. The second pathway to drug misuse diverges from the first pathway in that individuals deliberately engage in recreational nonmedical use of prescription opioids (NMUPO) for the purpose

of reaching euphoric effects (Leukefeld et al., 2007). The assertion by Leukefeld (2007) of the second distinct pathway is supported in studies showing drug users were engaging in the use of substances before initiating NMUPO (Havens et al., 2007; Young, 2012). There are several individual and sociocultural factors that may support this pathway. The specific factors related to substance use that are applicable to Appalachians include socioeconomic disparities and presence of psychological disorders.

The socioeconomic disparities among Central Appalachians have implications for poor mental health outcomes and may partially explain motivations for engaging in illegal means of acquiring economic standing (Jonas, 2012; Keyes, 2014). In Leukefeld's (2007) investigation, a community leader explained that the illegal sale of prescription drugs increased following the aggressive eradication of marijuana crops, which was noted as a way to make profit in an area with limited employment opportunities. Tunnel (2005) described the prior practices of distilling corn whiskey (e.g., moonshine) and growing marijuana as a historically accepted practice among many Appalachians, as the profits may indirectly benefit local economies in the region. Selling prescription drugs acquired through physicians was described as a way for single mothers to provide for their families given the dire economic conditions in Eastern KY (Anglin & White, 1999). Profiting from illegal drug sales is substantiated in more recent studies among Eastern KY opioid users, as Jonas and colleagues (2012) found OxyContin was a form of currency in the economically disadvantaged region. Among Jonas's (2012) sample of rural Appalachians drug users involved specifically with OxyContin appears to have established social networks and relationships, which speaks to the availability of the drugs in the region and potential to gain access to limited resources through criminal activity. The overall

availability of prescription opioids in the region has implications for increased vulnerability of prescription opioid use among those living in the region.

There are several psychosocial and contextual risk factors that may contribute to the understanding of prescription drug use in the region. In order to fully understand the vulnerabilities of those in the Central Appalachian region, psychosocial manifestations of substance-use disorders explored. Additionally, related risk factors for developing substance-use disorders are discussed.

Psychosocial factors of substance-use in Central Appalachia. Economic disparities have consistently been implicated in poorer mental health outcomes and the propensity to engage in drug use and development SUDs (American Pediatric Association, 2013; Martins, Keyes, Storr, Zhu, & Chilcoat, 2009). Theoretical frameworks have been formed based on the concurrence of psychiatric and SUDs. The seminal work of Khantzian (1985) asserts that individuals struggling with mental health difficulties often use substances to alleviate mental health symptoms, which predisposes them to developing SUDs. Khantzian's (1985) theory is often referred to as the "self-medication hypothesis." Given that many Appalachians disproportionately struggle with opioid addiction (Leukefeld et al., 2012; Young et al., 2012), mental health disorders (Zhang, 2008), and economic hardships (ARC, 20015b), the self-medication hypothesis may help to explain the recent opioid epidemic in the region. Disentangling the chronological ordering of economic and mental health struggles from substance-use disorder is challenging and, likely, not unidirectional. Some of the research that investigates the relationship between psychosocial factors and substance use is explored.

In one of the first studies to investigate the temporal ordering of opioid dependence and co-occurring psychiatric disorders, Martins et al. (2009) analyzed results from the National Epidemiological Survey on Alcohol and Related Conditions from 2001–2002 to explore the relationship of psychiatric disorders with opioid use among 43,093 participants. Results from Martins’ (2009) correlational study revealed that lower socioeconomic status as assessed by years of education and annual income was associated with substance dependence. Specifically, participants with more education (high school and college degrees) and those with annual income higher than \$35,000 were less likely to meet the criteria for substance dependence compared with those with less than a high school education and less than \$20,000 annual income.

Results also showed that participants with preexisting psychiatric disorders, such as mood (major depressive disorder, bipolar I and II disorder) and anxiety disorders (generalized anxiety disorder and panic disorder), to have an increased risk of NMPOU. Martins and colleagues found support for the self-medication hypothesis. Implications of this investigation are pertinent to understanding drug use pathways among Appalachians, as there is a higher prevalence of mental health disorders in the region compared with the rest of the nation (Zhang, 2008). More specifically, major depressive disorders and serious psychological distress, without the presence of substance-use disorders, is far more common in the Central Appalachian region compared with Appalachia as a whole (Zhang, 2008). Furthermore, Martins’ (2009) findings suggest that socioeconomic factors such as education and income appear to be significant in conceptualizing substance use, particularly in a region such as Central Appalachia with lower education attainment with higher rates of poverty (ARC, 2015b).

Limitations of Martins' (2009) investigation are central to the overall generalizability to Appalachians, as future studies could examine these relationships among samples of Appalachians who struggle with substance use. There are further limitations in the lack of assessing levels of severity of substance use with specific psychiatric disorders and the accuracy of participants recalling the occurrence of psychiatric disorders. Some studies have investigated the relationship of mental health symptoms among Appalachians who struggle with substance use.

A cross-sectional study conducted by Leukefeld and colleagues in 2005 among probated Appalachians ($N = 295$), 67.8% of who were men. Leukefeld found that Appalachian participants who used OxyContin were significantly more likely to endure symptoms of depression (users = 70.3%; nonusers = 53.6%, $p < .05$) and anxiety (users = 69.3%; nonusers = 51.5%, $p < .05$) compared with nonusers. Additional evidence of the self-medication hypothesis is found in recent qualitative reports among 36 rural Appalachian community members in a study by Hall and Skinner (2012), as participants reported depression as a causal factor for substance use. Although investigations by Hall and Skinner (2012) and Leukefeld and colleagues (2005) shed light on the link between psychological conditions and substance use, these studies have limitations in the lack of using psychometrically sound instruments to capture diagnostically relevant psychological conditions. Furthermore, Leukefeld's (2005) investigation is an over-representation of the male perspective given the participants were predominantly men.

One cross-sectional study by Post and colleagues (2013) investigated the impact of socioeconomic inequalities on depression among samples of Appalachian women ($N = 570$). Results suggest that one third of the women were depressed, and women with

lower SES (income, education, insurance, perceived financial situation) were significantly associated (OR 8.0; 95% CI [2.6, 24.6]) with risk of having depression. Moderation analysis indicated that depression and SES was moderated by smoking status, as women who smoked and had lower socioeconomic statuses were almost eight times more likely to suffer from depression (Post et al., 2013). Post and colleague's (2013) investigation shows the importance of considering an association between socioeconomic inequalities and psychological conditions such as depression among Appalachians and, most importantly, that engaging in a form of substance use such as smoking moderated the relationship between lower SES and depression. The implication of this study to understanding substance use among Appalachians suggests those who are economically disadvantaged tend to be at a greater risk for mental health concerns such as depression.

Support for the central role of socioeconomic status in the lives of individuals struggling with addiction is noted in the recent longitudinal investigation from 2008–2013 estimating study by Harp and Havens, (2015) as higher SES was found to be a protective factor among rural Appalachians initiating heroin use in a cohort of 503 prescription opioid users (Harp & Havens, 2015). Results from the logistic regression analysis revealed more years of education and higher income to be significant protective factor, and risk factors were associated with chronicity of using other illicit substances such as OxyContin, cocaine, methamphetamines (Harp & Havens, 2015). Implications of Harp and Havens' (2015) findings are central to conceptualizing the role of lower economic status and drug use. Limitations of the study are seen in the lack of evaluating other potential contributing risks such as psychological conditions and neglecting to address potential gender differences. The role of socioeconomic status and related

psychological disorders appears to be a meaningful consideration in conceptualizing substance-use Appalachians.

Considering the reviewed literature concerning the significant role of socioeconomic inequality, vulnerabilities to mental health disorders, and the availability of prescription opioids in Central Appalachia sheds light on the region's prescription drug problem. Some of the research that seeks to explain the problem of prescription drug use in the region includes samples that may not represent Appalachians' experience with opioid use. Furthermore, the studies are often atheoretical, conceptual, lack statistically conclusive results, and neglect to consider gender differences. Continued research efforts could contribute to the existing literature, thus suggesting the importance of psychosocial factors by using clearly defined constructs that are grounded in theory and pertinent to the larger social context of Central Appalachia.

Differences in Patterns of Drug Use Among Women

Addiction was historically viewed as a problem only among men, as women were disregarded from the study of addiction until approximately three decades ago (Straussner & Brown, 2002). The past three decades have uncovered gender differences in the health consequences of drug use, physiological responses to drug use, clinical correlates of substance-use disorder, and patterns of drug use (Straussner & Brown, 2002; Tuchman, 2010). Gender differences have been reported in the types of substances used and patterns of drug use over one's lifespan (SAMHSA, 2013). National survey data (SAMHSA, 2013) shows that illicit drug use (e.g., marijuana, cocaine, psychotherapeutics) among individuals over the age of 12 was more common among men (11.5%) compared with women (7.3%) and that men were more likely to report alcohol

use (57.1%) than women (47.5%). Similarly, men had a higher rate of substance dependence and abuse among individuals 12 and older compared with women, yet youth (ages 12–17) had similar rates of abuse and dependence. Drug use patterns were different for specific age groups between both genders. Specifically, among youth from ages 12 to 17, girls were more likely than boys to report alcohol use (11.9% girls; 11.2% boys) and NMUPD (2.4% girls; 2.0% boys). Whereas, marijuana use in young girls (6.2%) was less than use in boys (7.9%). Men over the age of 26 were more likely (62.2%) than women (50.1%) to report current drinking. Initiation of illicit drug use under the age of 18 was more frequently reported among women (58.3%) compared with men (SAMHSA, 2013). There are clear gender differences in the patterns of illicit and licit drugs used by men and women at different periods in their lives. A striking illustration of the recent rise in prescription opioid use among women is evident in the 400% increase in deaths related to prescription opioid overdoses, relative to the 265% increase in deaths among men, even though men continue to have higher rate of prescription opioid deaths (Center for Disease Control & Prevention [CDC], 2013). Given the rise in NMUPO in the past decade, researchers have begun to identify trajectories of drug use.

In recent investigations of NMUPO, researchers have identified gender differences related to specific mental health concerns, reasons for use, and patterns and progression of drug use behaviors. Specifically, women reporting past year NMUPO were significantly and positively associated serious mental health symptoms of mood and anxiety disorders (Tetrault, 2008). Other investigations by Green, Serrano, Licari, Budman, and Butler (2009) identified gender-specific correlates of NMUPO in a sample

($N = 3,821$) of treatment seeking, as women were more likely to use other licit and illicit substances. Additionally, clinical trials conducted by McHugh and colleagues (2013) found gender differences among men and women with SUDS ($N = 653$), as women were more likely to report using for reasons related to pain ($t[651] = 4.31, p < .001$) and negative emotions ($t[651] = 5.11, p < .001$), showed greater severity of psychiatric symptoms ($t[636] = 3.99, p < .001$) and significantly ($p < .001$) more likely to access opioids for the first time through legitimate prescriptions from their physicians compared with men. In smaller samples ($N = 24$) prescription opioid dependent individuals, women showed an accelerated progression of addiction compared with men and reported different reasons for engaging in NMUPO, as women were more likely to report using to cope with interpersonal stress compared with men (Back, Lawson, Singleton, & Brady, 2011).

Back and colleagues' (2011) findings of accelerated progression of opioid addiction among women is termed telescoping. Telescoping effects have been attributed to the physiological differences (metabolic rate, gastric dehydrogenase, hormonal fluctuations) and sociological (adverse social consequences) as the phenomenon is well documented in other SUD (e.g., alcohol and marijuana) and place women at increased risk of experiencing negative health consequences as a result of their addiction (Greenfield, 2010). The empirical findings of gender-specific correlates of NMUPO are consistent with previous consolidated research concerning other drugs of abuse (Straussner & Brown, 2002; Tuchman, 2010; Greenfield, 2010), as women appear to have different reasons for engaging in drug use, accelerated progression of addiction, and complex health and mental health-related concerns (McHuegh et al., 2013; Tetrault,

2008). Therefore, women presenting to substance-use treatment may have more severe and specific clinical health and psychiatric concerns.

Considering the gender-specific patterns and trajectories of drug use and the more severe clinical profile of substance-using women, investigating the specific needs among Central Appalachian women is warranted given the disproportionate rates of prescription drug use in the region, along with several risk factors specific to the social inequalities in the region and limited treatment resources (Zhang et al., 2008).

Patterns of Drug Use Among Central Appalachian Women

There are unique gendered, sociocultural, and contextual concerns related to the most recent patterns of drug use among women in the rural Eastern KY region of Central Appalachia (Havens et al., 2011; Shannon, Havens, Mateyoke-Scriver, & Walker, 2009; Shannon, Havens, & Hays, 2010; Staton-Tindall et al., 2015). The substance-use patterns of women in the region are particularly troubling and have implications for individual and public health in the region.

Recent empirical findings suggest distinctive patterns of substance-use among women in the region. A cross-sectional correlational study by Shannon and colleagues (2009) compared substance-use among non-Appalachian and Appalachian women ($N = 2,786$) presenting to treatment facilities in KY and found Appalachian women to have disproportionately high rates of opiate and sedative/tranquilizers use compared with non-Appalachian women. Similarly, in a cross-sectional correlational study by Shannon and colleagues (2010) among pregnant substance dependent women seeking treatment in KY ($N = 114$), rural Appalachian women showed notable variations in substance-use patterns compared with their urban counterparts. The rural and urban participants reported

lifetime use of alcohol (98%), tobacco (96%), and illicit drug use (99%); however, rural KY women were 8.4 times more likely to report use of illicit opiates, 3.3 times illicit sedative/benzodiazepine use, and 5.9 times more likely to report injection drug use compared with urban women (Shannon et al., 2010). Injection drug use among individuals in Appalachia has been found to be significantly associated with non-fatal drug overdose (Havens et al., 2011) and increased risk of blood-borne infections such as Hepatitis C Virus (HCV), which is prevalent (54.6%) in the region among prescription opioid injection users (Havens et al., 2013). In an exploratory study by Staton-Tindal and colleagues (2015), the authors uncover the perceptions of drug use among rural incarcerated women in Eastern KY. Staton-Tindal's (2015) recent investigation found prescription drugs (e.g., opioids & benzodiazepines) were the most commonly reported drug of choice and the preferred route of administration was injection.

Additional correlational investigations by Young, Larian, and Havens (2014) highlighted the gendered power structures at play in women engaging in substance use and the route of administration. Young's (2014) comparative study of Appalachian women and men ($N = 394$) uncovered that women were more likely to report the central role of their male partners to directly impact their initial injection experience, as bivariate analysis reveals that women were more likely than men to be injected by their sexual partners (female = 30.1%; male = 3.5%, $p < 0.001$) and more likely to be given drugs as a gift compared with men (female = 44.8%; male = 26.4%, $p < 0.005$). The gender differences illustrated in the patterns of drug use among Appalachian women may speak to the larger societal gender norms.

To further illustration that substance use is a gendered experience, the comparative study by Shannon, Havens, Oser, Crosby, & Leukefeld, (2011) found gender differences among 400 rural Appalachian KY drug users living in the community. Specifically, Shannon and colleagues (2011) uncovered that men initiated drug use at a statistically significant younger age than women for all drug categories (alcohol, marijuana, cocaine, hallucinogens) except for initiation of prescription drugs, as there was no statistical significant difference. Perhaps traditional gender norms in the region act as a protective factor for engaging in alcohol and illicit drug use, whereas cultural norms specific to women using prescription drugs may be normalized in the region (Fiene, 2002). The normalization of prescription drug use among women in the region may be attributed to the somatic presentations combined with gender-specific prescribing practices by physicians, as women are more likely to be prescribed opioids and benzodiazepines compared with men (McHugh et al., 2013; Olfson, King, & Schoenbaum, 2015).

Somatic complaints of women in the region may be related to their experience of chronic pain, intimate partner violence, sexual assault, and mental health symptoms, all of which are associated with NMUPD among women in Eastern KY (Shannon et al., 2009; Shannon, Nash, & Jackson, 2015; Staton, Leukefeld, & Logan, 2001). Shannon and colleagues' (2009) comparative study among Appalachian and non-Appalachian pregnant women entering detox treatment in KY ($N = 2,786$) found that Appalachian women reported experiencing chronic pain at a greater rate than non-Appalachian women ($X^2(1, N = 2,786) = 16.07, p < .001$). A more recent pilot investigation by Shannon, Nash, and Jackson (2015) examined the occurrence of intimate partner violence among

77 rural Appalachian KY women entering detox treatment primarily for opiate dependence. Shannon's (2015) investigation revealed that more than half of the Appalachian women had experienced intimate partner physical (64.9%) and psychological (89.6%) violence and reported significant histories of sexual (26.0%) and physical (23.4%) victimization before the age of 14. Similar results were observed in an exploratory study among 153 drug-using women in rural Appalachia, as half of the women reported their initial sexual experiences to be nonconsensual (MacMaster, 2013). Consistent with substance-use being a gendered experience, Staton-Tindal and colleagues' (2015) qualitative investigation of substance-using women incarcerated in Central Appalachian jails ($N = 22$) reported the reasons for drug use to differ by gender, as one woman explained, "I think some use to cope to things they've been through...like rape or abuse." The qualitative and quantitative findings suggest experiences of trauma and related mental health symptoms are important considerations in understanding substance-use among this population. The lived experiences of women in Eastern KY appear to suggest their patterns of substance-use have contextual and gender specific foundations.

Collectively, the substance-use literature specific to women in Central Appalachia suggests complex and severe clinical profiles that require consideration of co-occurring mental health disorders along with an understanding of how their intersecting identity of gender and social class may have an impact on substance use and access to treatment. Addressing the patterns of substance use among women in the region demands culturally relevant and gender-sensitive approaches, as women's struggles with addiction cannot be

divorced from their lived realities of social inequality. Given the complex needs of women in the Eastern KY region, an investigation of treatment utilization warranted.

Substance-Use Treatment Utilization

Considering that the recent prescription drug problem disproportionately affects Central Appalachians, uncovering treatment utilization patterns is paramount (Havens et al., 2008; Zhang et al., 2008). Recent investigations highlight the underrepresentation of rural substance users in treatment programs (Falck, Wang, Carlson, Krishnan, Leukefeld, & Booth, et al., 2007; Oser et al., 2011) and the multiple barriers to accessing services in rural areas (MacMaster, 2013; Sexton, Carlson, Leukefeld, & Booth, 2008; Staton-Tindall et al., 2015). The treatment gap with substance users is apparent among rural women, which is particularly problematic among those involved in the criminal justice system who have complex treatment needs (Grella & Rodriguez, 2011; Oser et al., 2011; Peltan & Cellucci, 2011; Small, Curran, & Booth, 2010; Staton-Tindall et al., 2001; Staton-Tinall et al., 2007).

The fastest-growing correction population is that of women in jails (Bureau of Justice Statistics, 2013), who are more likely to be incarcerated for drug-related offenses (Carson & Golinelli, 2014). Women involved with the criminal justice have consistently indicated specialized needs that include concerns about their children, trauma histories, co-occurring mental health difficulties, and substance-use disorders (Guerrero et al., 2014; Knight, 2012; Peltan, 2009; Staton-Tindall et al., 2003; Staton-Tindall et al., 2015). Incarcerated women appear to have complex treatment needs yet remain underrepresented in treatment programs, particularly among rural incarcerated women (Mahmood et al., 2013; Staton-Tindall et al., 2003; Staton-Tindall et al., 2007).

Considering the complex and often unmet treatment needs among incarcerated substance-using women in rural areas, an investigation of the factors impacting treatment utilization is necessary.

The following section will review substance-use treatment utilization among community samples and those involved in the criminal justice system. In order to understand the factors that enable and impede treatment entry, the studies reviewed include factors that have an impact on treatment utilization among rural individuals and women who live in the community and who are incarcerated.

Treatment Utilization Among Non-Incarcerated Individuals

In a community sample of 672 young adults (ages 18–23) living in the urban area of Miami, Florida, with substance-use disorders, Gayman, Cuddeback, and Morrissey (2011) examined factors associated with lifetime treatment utilization. Treatment utilization was assessed as a dichotomous measure of lifetime use of informal and formal mental health and substance-use services (e.g., told a mental health specialist or other professionals about their substance-use problem). Results indicated that 68% of the sample had never received substance-use treatment.

The authors found young adults with co-occurring mental health symptoms of depression ($X^2(1) = 8.70, p \leq 0.003$), and almost half of those with co-occurring substance-use disorder and posttraumatic stress disorder (47.9%) utilized services compared with one-third of those with no such history of posttraumatic stress disorder ($X^2(1) = 12.17, p \leq 0.001$). Criminal histories were positively associated with treatment utilization ($X^2(1) = 18.27, p \leq 0.001$) compared with those with no criminal history. In the multivariate model of treatment utilization, those who had criminal histories ($OR =$

2.04) and co-occurring posttraumatic stress disorder ($OR = 1.78$) were more likely to enter treatment. Similar results showing the predictive qualities of co-occurring psychological disorders for substance-abuse treatment was found in the investigation by Blanco, Iza, Schwartz, Rafful, Wang, and Olfson (2013) who examined the lifetime probability of treatment utilization among those with diagnosis of prescription drug use disorders ($N = 623$) based on data from a national epidemiology study. The authors identified treatment seeking as speaking to a health care provider about addiction at any point in their lives. Among the sample of prescription drug users living in the community, the authors calculated a cumulative probability of treatment utilization for substance-use was approximately 43%. The authors found several co-occurring psychological factors that increased the probability of the individuals seeking treatment. Specifically, having a history of major depressive disorder ($HR: 2.24; CI = 1.29-3.90$), bipolar disorder ($HR: 2.59; CI = 1.44-4.67$), specific phobic disorder ($HR: 1.84; CI = 1.84-3.20$), and cluster B personality disorder ($HR: 1.76; CI = 1.04-3.00$) was found to be predictive of entering substance-use treatment at some point in their lives. The increased likelihood of those with co-occurring psychiatric disorders receiving substance-use treatment suggests those with increased need for services may be more motivated to engage in help-seeking.

A more in-depth correlational study by Chen, Strain, Crum, and Mojtabai (2013) examined the impact of co-occurring major depression and SUDs with substance-use treatment. The authors examined the differences between individuals with a substance-use disorder (SUD) and co-occurring major depressive disorder ($n = 5,557$) compared with those with a SUD without co-occurring major depressive disorder ($n = 27,359$). This sample ($N = 32,916$) was drawn from the 2005–2010 National Survey on Drug Use

and Health (NSDUH) and included individuals over the age of 18 with substance-use disorders. The majority of study participants met the criteria for alcohol abuse (15,152) and dependence (11,942) compared with those who met the criteria for drug abuse (3,227) and dependence (7,932). The most commonly abused drug was marijuana (7,331) and second was pain relievers (2,613). The authors used a multivariable binary logistic regression model with participants with SUD without MDD as the reference group and controlled for sociodemographic characteristics. Results indicate that men and women with co-occurring MDD were more likely to utilize substance-use services compared with those without MDD (male $aOR = 1.99, p < 0.001$; female $aOR = 1.64, p < 0.001$). Similarly, individuals with SUD and MDD were more likely to perceive an unmet treatment need among both men ($aOR = 2.75, p < 0.001$) and women ($aOR = 2.15, p < 0.001$) compared with those without co-occurring MDD. These findings suggest that co-occurring psychological symptoms may be an important indication for entering substance-use treatment.

Treatment utilization among rural substance-users. Oser and colleagues' (2011) correlational investigation examined treatment utilization among 620 individuals with substance dependence (DSM-IV; American Psychiatric Association, 2002). The sample was comprised of predominantly white (68%) males (62%) who ranged in age from 18–61 with the mean age of approximately 32 years. Results revealed that over one-third (41%) received mental health treatment, less than half (49%) entered substance-use treatment, and over half (52%) attended a self-help group in their lifetime. Results from the negative binomial regression model produced several predictive factors for a number of substance-use treatment episodes. Specifically, being male was associated

with a 36% increase in treatment episodes, and having received mental health treatment was associated with a 53% increase in treatment episodes. Other significant predictors of treatment episodes were seen in those who were court mandated to treatment, which increased the odds of the number of treatment episodes by 2.77 ($\beta = 1.02, p < .001$), and those who had better communication with their medical doctors were more likely to enter substance-use treatment ($\beta = 0.07, p < .001$). Considering the underutilization of substance-use services by rural substance users, other studies have investigated potential barriers faced by rural substance users.

In an ethnographic study by Sexton, Carlson, Leukefeld, and Booth (2008), the authors examined barriers to treatment among 86 stimulant users in rural Arkansas and Kentucky. Over half (69.0%) of the individuals had never entered treatment. Based on the qualitative interviews, the authors concluded that geographic location was a significant barrier in accessing treatment, as the rural counties were limited in services offered, which was further complicated by the limited access to transportation among study participants. One participant noted, “They accepted me. I just couldn’t get a ride.” Organizational barriers were also reported as a barrier to treatment as the bureaucratic processes often prevented individuals from entering treatment. The individuals explained the appropriate services are not available and that the services offered do not match their individual needs, as they cited too few inpatient facilities, long wait times, and difficulties navigating the bureaucracy of the programs. Participants explained that they were afraid of the consequences to entering treatment, as one woman explained, “I wanted help before, but the reason I didn’t go, ’cause [if] Department of Health Services says I’m on drugs, and I’m going to the drug program, they gonna [might] take my baby.” Additional

barriers were central to financial burdens for the cost of treatment and overall lack of perceived need or motivation for treatment.

In more recent investigations of treatment utilization among rural stimulant users, Carlson and colleagues (2010) studied treatment entry over a two-year period among male and female stimulant users living in rural areas of Ohio, Arkansas, and Kentucky. The authors conceptualized treatment utilization under three of the major contributing factors based on the Anderson–Newman model (1973), which included predisposing (sociodemographic characteristics, prior treatment, frequency of substance), current illness (health and mental health), and enabling/mediating factors (perceived need for treatment and social/family problems). Over the duration of two years, only 133 of the 710 stimulant users had entered treatment.

The only significant difference found in the predisposing characteristics was geographic location, as individuals living in the rural areas of Arkansas were the least likely to utilize services (Wilcoxon $X^2 = 28.65, p < .0001$). Furthermore, perceived need for treatment (HR: 2.1), increased legal problems (HR: 1.0), and previous substance-use treatment (HR: 1.7) were significant effects of treatment utilization in the two-year period. These results suggest geographic status is an important indication of treatment utilization. It is important to note that the participants in this study from Kentucky resided in the western region and were not from the rural Central Appalachian region of the state. Therefore, it is unknown if similar results would have been found among those from the rural and underprivileged areas of Central Appalachia.

Other investigations by Small, Curran, and Booth (2010) have addressed treatment utilization among those residing in rural geographic regions, including that of

KY. The authors addressed gender differences of treatment utilization among rural and urban problem drinkers ($N = 733$) living in one of six southern states, including KY. The authors conceptualized treatment utilization based on the Aday and Andersen model (1974; Andersen, 1995) by including measures predisposing characteristics (demographics), enabling characteristics (subjective appraisal of resources), and need characteristics (perceived need and objective measures of severity of addiction). There were significant differences in men and women's perception of the cost of talking to a mental health professional about their drinking ($p = .0272$). Specifically, a greater proportion of men (40.50% vs. 31.11%) perceived the cost of treatment to be about what one could afford. Women reported higher expected wait times to see a physician compared with men (6.15 [SD = 7.02] vs. 4.15 [SD = 4.80], $p < .0001$). There were gender differences in lifetime diagnosis of major depressive disorder, as women were more likely to meet the DSM-III criteria than men (20.38% vs. 10.89%, $p < .0001$).

The results comparing rural and urban women revealed significant results related to predisposing characteristics, enabling characteristics, and need characteristics. Specifically, rural women were more likely to have lower annual income (~\$20,000 vs. \$30,000, $p = .0009$), experienced one or more negative financial event within the last 6 months (15.04% vs. 7.94%, $p = .0091$), and report that it was "very hard" to pay for basic necessities (9.52% vs. 20.35%, $p = .0421$) compared with urban women. The significant differences between rural and urban problematic drinkers also were observed in the category of enabling characteristics, as rural women anticipated less wait time to see a doctor for their drinking problems (5.02 [SD = 6.22] vs. 7.12 [SD = 7.56], $p = .0224$), fewer days to enter residential drug treatment (5.46 [SD = 7.74] vs. 8.63 [SD = 10.26], p

= .0166). However, rural women anticipated more barriers in terms of travel time compared with urban women. Specifically, rural women expected to travel longer to reach mental health services (31.64 [SD = 22.53] vs. 18.90 [SD = 12.51], $p < .0001$) and self-help groups (23.71 [SD = 17.25] vs. 19.04 [SD = 10.94], $p = .0197$) compared with urban women. Regarding the treatment-need characteristics, rural women consumed more alcohol daily in the past 6 months compared with urban women (4.26 [SD = 3.52] vs. 3.45 [SD = 2.80], $p = .0481$), and rural women reported poorer physical health than urban women (77.81 [SD = 18.35] vs. 83.14 [SD = 15.61], $p = .0161$).

This study illuminates the gender and geographic differences of treatment utilization and highlights the importance of examining significant factors impacting treatment utilization among rural women. The theoretically derived constructs of predisposing, enabling/mediating, and need characteristics produced findings that can be tested further among understudied and at-risk populations such as women in rural Central Appalachia. Limitations of this study are the lack of predictability observed in these factors on treatment utilization. Additionally, the rural areas included in the study may include those from the rural Central Appalachian region or other regions of Appalachia, but it is not clear about the generalizability of these findings to those from Central Appalachian region. This investigation sheds light on the need for additional studies to address gender specific treatment barriers among rural women.

Treatment utilization among rural substance-using women. To date, MacMaster (2013) conducted one of the only quantitative and descriptive investigations of substance-use treatment utilization among a community sample (153) of women in Appalachian. The exploratory investigation aimed to describe the perception of need for

substance-use services and barriers to accessing services among a community sample of rural Appalachian methamphetamine using women ($N = 153$). Even though the women in the study reported active methamphetamine use, the majority (33.8%) explained their drug of choice was opiates (Dilaudid, OxyContin, and Lortab), and opiates were the most frequently abused substance in the last 30 days. The sample included women from Central and South-Central Appalachian regions of East Tennessee. The majority of women (75%) were born in the area; believed in God (92%); were single, divorced, or widowed (84.0%); and mothers (82.6%). Among the participants who were mothers, less than one-tenth (7.1%) had ever received child support from the father or state or federal government, and less than a quarter (21.4%) of the mother's children were in state custody. Descriptive results showed that the majority of women (84.9%) believed they had a drug problem, which corresponded to the majority of women (99.3%) who met criteria for substance dependence (DSM-IV; APA, 2000). Over half of the women (51.4%) indicated an immediate desire to enter treatment (MacMaster, 2013).

Although the majority of women perceived a need for services and met the DSM-IV criteria for dependence (APA, 2000), only 27% had ever accessed treatment. The most commonly (9.2%) reported barrier to accessing substance-use services was "not enough money," followed by approximately 8% of the women who reported "not enough room in the program." Other barriers to women accessing services were central to family and child concerns, as three women stated the "program doesn't take women with children," three women explained they "couldn't find childcare," three women were "afraid children would be taken away," and one participant explained the "program didn't take women." These results suggest many women living in rural Appalachia have a

desire to enter treatment, yet they were left to manage their addictions without formal treatment. Considering the reported barriers among these women suggests there are gender specific concerns about being a mother and a woman that may interfere with accessing treatment in the Central and South-Central Appalachia. Limitations of this study are the peer-driven sampling methods used, the cross-sectional research design, the lack of exploring potential relationships among variables, and the atheoretical nature of the study. The peer-driven sampling method is vulnerable to homogeneity of sample characteristics, which has implications for overall generalizability. Furthermore, the relationship between need for treatment and services utilized is left undetermined as well as the relationship between barriers and treatment utilization. In order to explore the implied relationships, there must be an analysis of the relationship in future study, and even more refined statistical analysis could shed light on predictors of treatment entry.

Treatment Utilization Among Incarcerated Individuals

Warner and Leukefeld's (2001) investigation examined the differences in rural and urban substance-use treatment utilization based on a sample of 377 (rural = 34%, very rural = 8%; urban = 58%) incarcerated men in one of three KY prisons. Results indicated that rurality was a significant predictor of substance-use treatment prior to incarceration. Specifically, rural participants reported statistically significant higher percentages of drug use in terms of lifetime use for various drugs including opiates (rural = 53.08%; very rural = 60.00%; urban = 36.57%; $F = 6.30$; $p = .02$), and rural participants used multiple drugs for a longer duration in the 30 days prior to incarceration compared with urban participants (rural = 21.87%; very rural = 25.46%; urban = 20.38%; $F = 3.09$; $p = .047$). The frequency and chronicity of drug use among rural participants

suggests that there is an increased need for treatment among these individuals; however, results indicated that rural participants were less likely to receive substance-use treatment compared with their urban counterparts (urban = 49%; rural = 48%; very rural = 23%; $F = 3.55$; $p < .05$). Considering these findings concerning rurality as a major indicator of underutilization of substance-use services, with increased chronicity and frequency of substance-use, warrants further study in regards to the specific factors impacting treatment utilization among rural individuals. Although this investigation highlights critical empirical inquiry into the problem with unmet substance-use treatment needs among rural incarcerated Kentuckians, the extent to which this sample represents the experience of those in Central Appalachia is unknown, and this study of male participants neglects to capture the experience of women.

Treatment utilization among incarcerated women. In a cross-sectional investigation of service use among rural and urban incarcerated women ($N=100$) in the state of Kentucky, Staton-Tindall and colleagues (2007) highlighted the differences in treatment utilization among rural and urban. Specifically, descriptive results showed few differences in patterns of substance use, other than urban women reporting the use of crack-cocaine more than rural women. However, there were significant variations in substance-use treatment utilization, as rural women were significantly less likely to receive substance-use services throughout their lifetime (38.0%) compared with urban women (64.6%); among the rural women who received services, the rural women who did receive treatment had significantly less treatment episodes compared with those of urban women. Additionally, rural women reported fewer hospitalizations for mental health problems compared with urban women. This study contributes to the limited

investigations of treatment utilization among rural women involved in the criminal justice system and sheds light on the problem of rural women. This study has implications for the purposed investigation of treatment utilization among rural women in Eastern Kentucky. Specifically, the role of mental health problems and the relationship to severity of substance-use could be further explored with measures that correspond with the diagnostic criteria of psychiatric disorders, and the larger sample size among rural women will allow for a more in-depth analysis of factors that may be associated with substance-use treatment utilization.

Additional support for investigating gender-specific factors of treatment utilization are seen in the results of the cross-sectional study by Staton-Tindall et al. (2009). The investigation sought to describe the individual factors associated with substance-use treatment in the community prior to incarceration among 545 male and 169 female inmates. Bivariate associations indicated women with prior psychiatric hospitalizations to be significantly positively correlated with SA treatment use in the community. Although psychiatric hospitalization was not found to be a significant indication of treatment utilization at the multivariate level, independent correlates of prior hospitalization for health problems and living in a home that was not their own were significantly associated with treatment use in the multivariate model.

Other investigations by Staton, Leukefeld, and Webster (2003) addressed common mental and physical health symptoms and lifetime service utilization among 60 rural and urban women incarcerated in a Kentucky prison. The majority of the participants reported lifetime health problems as 90% having drug problems. Mental health symptoms were assessed with the psychiatric status module of the Addiction

Severity Index (ASI). Results from the ASI indicated depression as being the most commonly experienced lifetime mental health problem (62%), second was anxiety reported by over half of the women (53%), and cognitive problems were experienced by 43% of the women. Lifetime treatment utilization was assessed in three domains of emergent care, substance-use treatment, and mental health treatment. Results of lifetime treatment utilization revealed that women were treated in the emergency room 13.7 times on average, 80% participated in drug or alcohol treatment, and 53.3% received mental health treatment.

One of the most interesting findings from the bivariate analysis between health problems and treatment utilization was in the relationship of lifetime mental health symptoms and emergency room use. Specifically, there was a significant and positive relationship between emergency room use and the experience of anxiety ($r = .332, p < .01$), thoughts of suicide ($r = .368, p < .01$), and suicide attempts ($r = .424, p < .01$). Additional bivariate results showed a positive correlation between mental health treatment utilization and the experience of lifetime depression ($r = .380, p < .01$) and anxiety ($r = .425, p < .01$). Substance-use treatment utilization was significantly correlated with sexually transmitted disease ($r = .332, p < .01$) and years of alcohol use ($r = .432, p < .01$). These results suggest women entering the criminal justice system present with complex health and mental health needs. Among this sample of incarcerated women, the need for treatment as indicated by mental health symptoms and chronicity of drug use appears to be an important indication for entering treatment.

Perceived treatment availability among women incarcerated in rural Central Appalachian jails. In the only investigation, to date, exploring the lived experiences of

substance-use and treatment availability from the perspective of some of the most at-risk and understudied individuals is the recent investigation by Staton-Tindall and colleagues (2015). The authors specifically addressed the perspectives of drug use, Hepatitis C, and service availability among 22 women incarcerated in Central Appalachian jails. The women were divided into four focus groups comprised of three to seven women per group. The prominent themes that emerged as a result of these focus groups were central to the idea that prescription opiates were the drug of choice in the region and the most common route of administration was injection. Additionally, the women reported that substance-use services and/or HCV services were lacking in the community and the services that were available had lengthy waiting lists and were too costly. This recent qualitative investigation sheds light on the prescription opiate epidemic in the region and the complication of accessing needed services. The perceived barriers to treatment noted among these women suggest that further investigation could deepen the understanding of the potential relationship between perceived barriers and treatment utilization. Furthermore, this investigation speaks to the advantages of capturing the unique and often unheard perspectives of those that are understudied.

Parental barriers to treatment among clinical samples of substance-using women. Evidence from studies specific to rural women and women entering treatment in Kentucky found being a mother was a motivating factor for discontinuing substance-use (Hall & Skinner, 2012; Jackson & Shannon, 2012; Jackson & Shannon, 2013). In the reviewed literature by Hines and colleagues (2011), the authors concluded drug using women that desire custody of their children to be motivated to enter treatment due to concerns for their children. Additionally, the role of being a mother was found to be the

most frequently reported motivation for treatment among samples of drug-using-pregnant Kentucky women (Jackson & Shannon, 2012; Jackson & Shannon, 2012). Qualitative findings also support the notion of women's roles as mothers to motivate recovery, as rural women explained the birth of their children as a primary factor in reducing or discontinuing use of drugs (Hall & Skinner, 2012). Furthermore, women often enter treatment due to social service involvement and longitudinal studies conclude social service contact is predictive of treatment entry among women (Hansen et al., 2004; SAMHSA, 2001).

Although women's parental responsibilities may present barriers to treatment entry, women appear to report motivation for recovery due to their roles as mothers and accessing services may be easier for women with children given social service involvement (Hall & Skinner, 2012; Hansen et al., 2004; Jackson & Shannon, 2012; SAMHSA, 2001). The role of being a mother appears to be a major consideration in accessing substance-use services among women with children. The role of being a mother may be particularly important among women from eastern Kentucky considering the traditional gender roles as primary care giver that may be compounded by the limited access to services. Therefore, the purposed study may contribute to the existing literature by investigating the role of being a mother on substance-using women's treatment utilization.

Summary of Treatment Utilization

The collection of studies emphasizes the unmet treatment needs among substance-using women living in Central Appalachia. The studies have contributed to the growing body of research highlighting the gendered and geographic factors that impact treatment

utilization. The reviewed empirical evidence of treatment utilization among incarcerated and community samples suggest several factors might be important indications of treatment utilization for substance-using women in Central Appalachia. Several studies replicated findings concerning sociodemographic characteristics (income, perceived financial hardship, rurality), need characteristics (substance-use chronicity and frequency), psychological problems (major depressive disorder, post-traumatic stress disorder), use of emergent services, perceived barriers to accessing treatment (the right services unavailable, too far to drive, lack of transportation) and gendered concerns (fear of children being taken away, being a mother) as important factors that impact treatment utilization.

The studies reviewed have several limitations, as many were atheoretical, lack rigorous statistical analysis, and may be compromised in the generalizability to the population of interest. Many of the studies pertaining to community samples, were limited to urban areas or relied on national survey data that often neglects to capture individuals in rural areas. Other studies that included rural participants often didn't specify the specific rural region or provide additional information concerning the economic landscape of the region and their proximity to urban areas. Additionally, there is a lack of research that specifically addresses substance-use treatment utilization among women in Central Appalachia. The two studies (MacMaster, 2013; Staton-Tindall et al., 2015) focused on the unmet treatment needs among women in the Appalachian region, which provide support for further the empirical inquiry. Specifically, the exploratory and qualitative studies suggest continued research efforts may deepen the understanding of factors that impact treatment utilization.

Therefore, the impetus for this investigation is to contribute to the limited empirical investigations of treatment utilization in the community prior to incarceration for an understudied, underserved, and vulnerable group of substance-using women incarcerated in Central Appalachian jails.

Theoretical Perspectives

The following section critically evaluates a leading theoretical framework, which seeks to explain help-seeking behaviors specific to substance-using offenders (Leukefeld et al., 1998) and the Relational Model (Covington & Surrey, 1997) that explains substance-use among women. To date, a dearth of theoretical perspectives has incorporated substance-use treatment seeking behaviors of incarcerated Appalachian women. This report seeks to formulate an understanding of treatment utilization among substance-using women from Eastern KY. Therefore, an integrated model derived from the Relational Model of substance-use (Covington & Surrey, 1997) and help-seeking framework of substance-use treatment (Leukefeld et al., 1998) is applied to the complex needs of substance-using incarcerated women in Eastern KY.

Relational Model of Substance-Use Among Women

Over the past three decades, a growing body of research has increased the understanding of best practices for treating substance-use among women (Covington, 2008; Hines, 2011; Kissin, Tang, Campbell, Claus, & Orwin, 2014) as well as the complex needs of women involved in the criminal justice system (Covington, 1998; Guerrero et al., 2014; Knight, 2012; Peltan, 2009; Staton-Tindall et al., 2003; Staton-Tindall et al., 2015). Among the more applicable theories to conceptualize substance-use among women is the pioneering work by Miller (1976), which challenged the traditional

male perspectives of human development that prevailed during that time. The Relational Model was created in contrast to the traditional psychological theories (e.g., Erikson, 1963, Mahler, 1975) that strongly emphasized independence and self-sufficiency. The Relational Model stresses the importance of connectedness through relationships, which is held as a path toward and goal of healthy psychological development (Covington & Surrey, 1997). The Relational Model posits that healthy connections with others are vital for the psychological development of women and problems (e.g., pathologies) arise from disconnections or violations within relationships at the personal, familial, and sociocultural levels (Covington & Surrey, 1997).

Substance-use is explained from the relational perspective to be, in part, due to the misplaced yearnings for connectedness (Covington & Surrey, 1997). The Relational Model further recognizes the additive influences of physiology, genetics, availability, and chance on substance-use but places a greater emphasis on disrupted connectedness. The Relational Model focuses on the cultural and relational explanation for the development of addiction, which have implications for psychotherapy. The Relational Model asserts that women often engage in substance-use as a way to build and maintain connections or a way to deal with the loss of connection. The loss of connections can arise from the disrupted connectedness in personal, familial, and sociocultural interactions. The Relational Model considers the interaction of the individual within the sociocultural context, which is pertinent to the discussion of substance-use among women in Appalachia.

Relational model applied to substance-using Central Appalachian Women.

Although existent research is limited concerning substance-use among women in Eastern

KY, concentrated efforts by investigators (e.g., MacMaster, 2013; Shannon et al., 2009; Staton-Tindall et al., 2015) have been instrumental in highlighting the specific treatment needs of this marginalized population. The Relational Model provides a comprehensive theoretical basis to understand the treatment needs of substance abusing women of rural Appalachia. Given the cultural and geographic distinctions of rural Appalachia, the Relational Model provides a broader sociocultural lens to conceptualized substance-use among women in the region. Therefore, the specific sociocultural environment of women in Central Appalachia will be explored using the Relational Model. Specifically, the Relational Model constructs of mutuality, centrality of relationships, and coping with negative emotions are applied to the conceptualization of substance-use among Central Appalachian women.

Mutuality and the Sociocultural Context of Women in Central Appalachia. The Relational Model identifies mutuality as a central component of fostering healthy connections. Mutuality is defined as a dynamic interaction of each individual being able to reveal true thoughts, feelings, and perceptions (Covington & Surrey, 1997). The Relational Model holds that non-mutual and abusive relationships can lead women to turning to substances as a way of filling the void resulting from loss of connectedness. The descriptions of non-mutual relationships are palpable in the lives of many women in Eastern KY.

Patriarchy in Appalachian families is seen in the subordinate status of women and has implications for the healthy psychological development of the relational construct of mutuality (Helton & Keller, 2010; Gagne, 1992; Covington & Surrey, 1997). Logan, Stevenson, Evans, and Leukefeld's (2004) qualitative investigation of access to victim's

services among Appalachian women found themes regarding a subordinate status of women in Appalachia. Notable themes regarded the accepted role of women indicating that women should be “seen not heard,” and women “believing they were less than men (Logan et al., 2004).” Other researchers have compared the stereotypes of Appalachian women to be similar to that of developing countries with limited gender equality (Smith & Reed, 2009). Investigations of women’s roles in Appalachian society revealed devaluing relationships formed by the objectification and unequal status of women, which Gagne argued as being grounded in patriarchal values of the society (Gagne, 1992). Recent investigations have shown the objectification of Appalachian women in the stereotypes of the hyper-sexualized Appalachian women and the deviant Appalachian man (Massey, 2007), which may have implications for the maltreatment of women.

Intimate partner violence has been found to be common in the lives of a cohort of rural Appalachian pregnant women entering drug treatment (Shannon et al., 2015). Further supporting the significance for considering intimate partner violence among substance-using incarcerated women is seen in the qualitative investigation by Staton and colleagues (2001) outlining one of the participant’s statement of “I believe I was put on this earth to be abused. It’s been a pattern throughout my life.” It is clear that the Relational Model offers a conceptualization of substance-use pertinent to the lived experiences among women in rural Appalachia. Given the unequal status of women in the region, the Relational Model frames the discussion of the social underpinnings of substance-use and provides explanations for the barriers to accessing services.

Relationships among women in Central Appalachia. Another factor that supports the relevance and appropriateness of the Relational Model centers on the

emphasis on the important role of relationships in the lives of addicted women. The Relational Model holds that relationships are fundamental in women's healthy development. Based on the Relational Model the role of children and family members is considered an important consideration in the development and maintenance of substance-use. Jackson & Shannon's (2012) study of pregnant mothers seeking treatment for drug addiction in KY found that the expected birth of a child was the primary reason for many participants to enter treatment. Other research has supported the role of relationships with their children to be the primary motivation to discontinue substance-use among women in the rural south and Appalachian region (Hall & Skinner, 2012). Relationships with family and intimate partners also have been found to contribute to the initiation and maintenance of substance-use among incarcerated women in Eastern KY (Staton-Tindall, 2015). The influence of relationships within the sociocultural context of Appalachia appears to be paramount in the conceptualization of substance-use among women from the region.

Coping with negative emotions among women from Central Appalachia.

Further support for the relational model applied to Appalachian women is the assertion that women often use substances as a way of dealing with unwanted negative emotions (Covington & Surrey, 1997). Staton-Tindall (2015) found that Appalachian women incarcerated in Eastern Kentucky jails report using drugs as a means to cope with feelings of grief and trauma. In a longitudinal investigation of drug use among women in rural North Carolina, Hall and Skinner (2012) found women often engage in substance use in order to self-medicate and deal with troubled childhoods. Consideration of the role of trauma and co-occurring disorders is a notable strength of the relational model. Attention

to these factors is relevant to the study of substance use among women from Central Appalachia, as co-occurring and trauma-related disorders are commonly reported among substance-using women incarcerated in the Appalachian state of KY (Staton-Tindall, 2001; Staton-Tindall et al., 2003; Staton-Tindall et al., 2007). Given the specific needs of substance-abusing women in Appalachia, the relational model appears to offer a foundation to address the complexities often present in the lives of women battling addiction.

Summary of strengths and weaknesses of the relational model. Several strengths of the relational model are applied to rural substance-using Appalachian women. The primary strength of the relational model is the view of women as separate, equal, and different, which is in contrast to the historical conceptualization of addiction from the male experience (Straussner & Brown, 2002). The relational model has promoted an understanding of women's addiction that was previously missing and encourages continued research toward equitable treatment services for women with addiction (Covington, 2002). Another strength of the relational model is the consideration of the sociocultural context, as theories of addiction often stress the importance of physiological and psychological conditions without consideration of the larger sociocultural impacts on the individual.

Given the distinct sociocultural aspects of Appalachia, incorporating the relational model will enhance conceptualization of substance-use treatment among women in Central Appalachia. Specifically, the purpose study will assess the socioeconomic status (education attainment and annual income) of the women and their severity of substance use. Grounded in the relational model, the occurrence of co-occurring psychological

disorders (major depressive disorder, generalized anxiety disorder, and post-traumatic stress disorder) will be analyzed regarding the relationship of mental health symptoms and substance-use problems. Furthermore, the impact of relationships on treatment utilization is principal to the relational model and pertinent to this investigation. Specifically, women's roles as caregivers to their children may play a significant role in their overall motivation to enter substance-use treatment. Therefore, the number of children will be assessed as it relates to treatment.

The modified model to investigate treatment seeking will be enhanced by the theoretical underpinnings of the relational model. However, the relational model, as applied to the study of substance-use treatment utilization among incarcerated women of Central Appalachia, is not without limitations. The weakness of the relational model is the applicability specific to this study of treatment utilization. The relational model addresses the manifestation of substance use and the needs of women in treatment but does not account for the diverse range of factors that impact treatment-seeking behaviors. Therefore, the health service use framework specific to substance-use treatment utilization among offenders is explained along with modifications to the model in order to incorporate the cultural and contextual realities of women in Central Appalachia.

Health Service Use Framework for Drug Using Offenders

The health service use framework for drug-abusing offenders (HSF) proposed by Leukefeld and colleagues (1998) incorporates individual determinants of health service use within the context of the social and structural system. The HSF is grounded in the behavioral underpinnings of the original Anderson and Newman (1973) model, which asserted health service use is largely determined by societal and individual factors. The

individual factors include one's predisposition to seek services, need for services, and factors that enable and impede treatment use (Andersen, 1995). Leukefeld and colleagues (1998) modified the Anderson and Newman model (1973) to specifically address determinants of treatment use among substance-using offenders.

Leukefeld and colleagues' (1998) modified model has three major components of health service use that includes: (a) *societal determinants* norms in response to illness; (b) *characteristics of the health care system* available resources; (c) *individual determinants*, predisposing, enabling, and illness-level factors. This study is concerned with the *individual determinants* of service use, which are further divided into four overarching dimensions: (a) *predisposing factors* sociodemographics; (b) *historic health factors* past experiences with illness and treatment; (c) *current illness factors* objective and subjective measures of illness; (d) *enabling and mediating factors* perceived need for services, perceived barriers in accessing services, and income. The model conceptualizes perceived need for services and illness-level factors as two separate constructs, as an individual's perception of his or her health and need for treatment is thought to mediate health utilization.

The model specific to this study has several strengths. The model was modified to address the specific factors relevant to substance-use treatment among substance-using individuals involved in the criminal justice system (Leukefeld et al., 1998). One of the strengths of the model is the division of perceived need for services and illness-level factors, as researchers often assume need based on illness-level factors such as severity of addiction without consideration of the individual's experience of perceived need for treatment. The HSF has been shown to be an effective framework in the investigation of

treatment utilization among incarcerated individuals (Webster, Mateyoke-Scrivner, Rosen, & Staton-Tindall, 2006) and specifically, rural drug users (Oser et al., 2011) and incarcerated women (Staton et al., 2003). The intention of the model to assess substance-use treatment utilization is vital to the framework of this study.

Further support for the HSF is the consideration of perceived barriers in accessing services, which is a crucial consideration for those living in Central Appalachia given the difficulties accessing care in the region (Staton-Tindall et al., 2007; Staton-Tindall et al., 2015; Zhang, 2008). Researchers have identified difficulties with transportation (Zhang, 2008), limited availability of substance-use services, (Staton-Tindall, et al., 2007; Staton-Tindall et al., 2015; Zhang, 2008), and lack affordable services (MacMaster, 2013; Staton-Tindall et al., 2015) as barriers to treatment utilization among substance-using Appalachians.

Accessibility is a construct defined by Penchansky and Thomas (1981) to the relative “fit” of the services with the individual. The construct of accessibility proposed by Penchansky and Thomas (1981) includes five dimensions: (a) *availability* or adequate supply of services; (b) *accessibility* or location of supply in relation to the location of client; (c) *accommodation* or the relationship of how resources are organized and perceived by client as appropriate; (d) *affordability* or the cost of services relative to the client’s ability to pay for the service; and (e) *acceptability* or the fit between the client’s attitudes about the provider and the providers’ attitudes about the client. The accessibility construct has empirical support and is recommended by researchers as an enabling and mediating factor specific to investigations of health disparities among Appalachians (Logan et al., 2004; Staton-Tindal et al., 2015; Small et al., 2010; Thorton

& Deitz-Allyn, 2010). Incorporating the access dimension proposed by Penchansky and Thomas (1981) provides an understanding of the interaction between enabling factors of the HSF with the sociocultural context of accessing services in Eastern KY.

Summary of the health service framework. Although the HSF provides a firm theoretical framework for the conceptualization of substance-use utilization, there are weaknesses of the model specific to Appalachian women's help-seeking behaviors. Specifically, the HSF does not account for the role of children in the women's lives when deciding to enter treatment. Considering the sociocultural context of women's ascribed gender role as primary caretaker along with literature suggesting children are significant factors of women seeking treatment (Helton & Keller, 2010; Jackson & Shannon, 2012; Staton et al., 2001; Tuchman, 2010), the relative influence of children will be taken into consideration in the modified model by calculating the participant's number of children. The number of children the women have is considered an enabling and mediating factor. Although the HSF includes stigma as an inhibiting factor of seeking SA services, the role of stigma cannot be assessed in the current data set.

An additional limitation of the HSF applied to this study is the use of cross-sectional data. Although longitudinal data would provide temporal explanations for factors influencing future treatment use, the authors of the model (Leukefeld et al., 1998) also note the HSF can be applied to cross-section data as well. Therefore, the proposed model considers the limitations of the HSF and provides accommodations to the model.

Proposed Model of Treatment Utilization

The proposed model incorporates the strengths of the relational model (Covington & Surrey, 1997), access dimensions (Penchansky & Thomas, 1981), and health service

use framework (Leukefeld et al., 1998). The modified model considers individual factors and the interaction within the sociocultural context. The proposed model is based on empirical findings of determinants of substance-use treatment utilization relevant to this investigation.

Figure 1 represents the adapted health service use framework by Leukefeld and colleagues (1998) and includes factors examined in this study. Within this model, predisposing factors are composed of sociodemographic characteristics, including education and income. Historical health factors include history of overdose, history of detox, ever attended self-help groups, history of intravenous drug use. Current illness-level factors include measures of substance-use severity based on measures from the substance problem scale on the global appraisal of individual needs (GAIN) (Dennis, 1998) and measures from the GAIN specific to the DSM-IV criteria of major depressive disorder, generalized anxiety disorder, and post-traumatic stress disorder. Enabling and mediating factors include barriers to accessing needed treatment (Penchansky & Thomas, 1981) and number of children.

Research Questions and Study Hypothesis

Considering the reviewed literature concerning the complex treatment needs among women in Appalachia and the underutilization of substance-use services, an investigation of the specific factors influencing treatment-seeking behaviors is paramount. This investigation may contribute to the limited empirical inquiry that may have implications for clinical and systemic interventions. The following research questions are addressed:

1. What is the relationship between symptoms of anxiety, trauma, and depression with substance-use problems, while controlling for annual income and education attainment among incarcerated women in Central Appalachia?
 - a. What is the proportion of women that report difficulties with depression, anxiety, and trauma-related symptoms among incarcerated women in Central Appalachia?
 - b. What is the average score of substance-use problems among this sample of women as indicated by the substance-use problem score among incarcerated women in Central Appalachia?
 - c. What is the average education attainment and annual income of incarcerated women in Central Appalachia?
2. Do *predisposing factors* (education attainment, income), *historical health factors* (history of overdose, history of detox, ever attended self-help groups, history of intravenous drug use), *current illness level factors* (substance dependence score, symptoms of anxiety, symptoms of depression, and symptoms of trauma), and *enabling and inhibiting factors* (number of children and perceived barriers to treatment) significantly influence treatment utilization based on entry into a substance-use treatment program among incarcerated women in Central Appalachia?
 - a. What are the perceived barriers to accessing treatment as indicated on the four dimensions by Penchansky and Thomas (1981) among incarcerated women in Central Appalachia?

- b. What is the relationship among *predisposing characteristics* (education, income), *historical health factors* (history of overdose, history of detox, ever attended self-help groups, history of intravenous drug use), *current illness level factors* (substance dependence score, symptoms of anxiety, symptoms of depression, and symptoms of trauma), and *enabling and inhibiting factors* (number of children and perceived barriers to treatment) and substance-use treatment utilization among incarcerated women in Central Appalachia?

Study Hypothesis One

Ha1: There is a positive relationship among symptoms of anxiety, trauma, and depression on substance-use problems, while annual income and education attainment are held constant.

Ho1: There is no relationship among symptoms of anxiety, trauma, and depression on substance-use problems, while annual income and education attainment are held constant.

The investigations by Harp and Havens (2013), Martin and colleagues (2009), and Post and colleagues (2013) inform the hypothesis that education and income influence substance-use severity and, therefore, used as control variables in hypothesis one. The hypothesized positive relationship between reported mental health symptoms (depressive symptoms, symptoms of trauma, symptoms of anxiety) and substance-use problems considered the extensive literature concerning co-occurring psychological conditions (e.g., major depressive disorder, post-traumatic stress disorder) and substance-use disorders (Back et al., 2011; Green et al., 2009; Hall & Skinner, 2012; Martin et al.,

2009; McHugh et al., 2013; Shannon et al., 2009; Tetrault et al, 2008). The hypothesized positive relationship between psychological symptoms (depression, trauma, anxiety) is grounded in the relational model of substance-use proposed by Covington and Surrey (1997).

Study Hypothesis Two

Ha2a: The model of substance-use treatment utilization is a good fitting model, which includes the following predictors: education attainment, income, overdose, detox, ever attended self-help groups, history of intravenous drug use, substance dependence score, symptoms of anxiety, symptoms of depression, and symptoms of trauma, number of children, and perceived barriers to treatment.

Ho2a: The model of substance-use treatment utilization is not a good fitting model, which includes the following predictors: education attainment, income, overdose, detox, ever attended self-help groups, history of intravenous drug use, substance dependence score, symptoms of anxiety, symptoms of depression, and symptoms of trauma, number of children, and perceived barriers to treatment.

Ha2b: There is a positive relationship among education attainment, annual income, overdose, detox, attending self-help groups, substance dependence score, history of intravenous drug use, psychological symptoms (depression, anxiety, and trauma) with substance-use treatment utilization.

Ho2b: There is no relationship among education attainment, annual income, overdose, detox, attending self-help groups, substance dependence score, history of intravenous drug use, psychological symptoms (depression, anxiety, and trauma) with substance-use treatment utilization.

Ha2c: There is an inverse relationship between number of children and perceived barriers with substance-use treatment utilization.

Ho2c: There is no relationship between number of children and perceived barriers with substance-use treatment utilization.

The second research hypothesis was informed by the reviewed literature concerning treatment utilization and grounded in the theoretical foundations of the health service use framework (Leukefeld et al., 1998) and access dimensions (Penchansky & Thomas, 1981). The study hypothesis two is based on research that addresses each of the factors (predisposing, historical health, illness level, enabling and mediating) in the purposed model of treatment utilization and outlined below. The predisposing factors of income (Green-Hennessy, 2002) and education attainment (Green-Hennessy, 2002; Staton-Tindall et al., 2009) have been found to have a positive association with treatment utilization. Historical health factors such as prior hospital service use have been found to be positively associated with to substance-use treatment utilization (Staton-Tindall et al., 2009). Therefore, entering the hospital/emergency department for detox is considered as a positive correlate of treatment utilization.

History of substance treatment also has been found to be positively associated with accessing other forms of treatment (Carlson et al., 2010), therefore attending self-help groups is a supported independent variable of treatment utilization in the current model. Illness-level factors are considered in this investigation based on previous research using the HSF (Leukefeld et al., 1998), which indicate lifetime service use was best predicted by illness-level factors (Webster et al., 2005). Specifically, Webster and colleagues (2006) concluded substance-use problems were predictive of substance-use

treatment utilization among male offender populations. The number of lifetime substance-use treatment episodes has been found to be positively associated with regular drug use among female rural offenders (Staton-Tindall et al., 2007). In this investigation, the substance-use problem score is considered an illness-level factor as the measure serves as a clinical indicator of problematic substance-use based on diagnostic criteria for substance abuse and dependence as defined by the DSM-IV (APA, 2000). The decision to include history of overdose and intravenous drug use as predictors of treatment utilization is grounded in the theoretical model proposed by Leukefeld (1998) who proposed that historical health factors are indicators of treatment utilization. There are several investigations of the positive relationship between co-occurring psychological disorders and substance-use treatment utilization (Blanco et al., 2013; Chen et al., 2013; Gayman et al., 2013) that inform the hypothesis that increased psychological symptoms are predictive of treatment utilization. Potential barriers in accessing treatment services are included as enabling and mediating factors.

The decision to incorporate dimensions of access described by Penchansky and Thomas (1981) is based on the existing literature suggesting that treatment gaps among rural women may be attributed to the specific barriers of affordability, availability, and accessibility (MacMaster, 2013; Sexton et al., 2008; Small, 2010; Staton-Tindall et al., 2015). The decision to include number of children as a variable was based on the literature that suggests children and parental roles as a commonly reported concern among drug-using women (Hall & Skinner, 2012; Hines et al., 2012; Jackson & Shannon, 2012; MacMaster, 2013; Sexton, 2008).

Chapter Two: Design and Methodology

This chapter describes the research design and methodological plan for this investigation. The source of the data and sample is outlined in this section. Detailed descriptions of the variables selected for the study are offered, followed by the research questions and corresponding data analytic plans to address each question.

Data Source

Data for this study were drawn from a larger longitudinal investigation (National Institute on Drug Abuse, [NIDA] 1R01-DA033866) seeking to reduce risky drug use and sexual behavior among a vulnerable population of incarcerated female offenders in Appalachian jails. The University of Kentucky Institutional Review Board approved the larger longitudinal study. Given the sensitive nature of the study, a federal certificate of confidentiality was obtained to further ensure privacy of the vulnerable population. The larger longitudinal study (NIDA 1R01-DA033866) collected baseline data before randomizing the subjects into different intervention groups for further analysis. For the purpose of this study, only data collected during the baseline interviews were analyzed.

Participants were recruited from three Central Appalachian jails and met the following criteria for inclusion in the study: (a) National Institute on Drug Abuse (NIDA)-modified Alcohol, Smoking and Substance Involvement Screening Test (NM-ASSIST) score of 4+ for any drug, suggesting a minimum of moderate risk for substance abuse (NIDA, 2012); (b) self-report of at least one risky sexual behavior in the past three months; and (c) consent to participate. Participants were randomly selected from the roster of the three jails in Central Appalachia. The data coordinator used the Research Randomizer computer-based program (www.randomizer.org) to randomly select women

from the jail roster to be screened. The screening process took place in the three jails where participants were incarcerated. Trained interviewers conducted the screenings in the jails. The screening questions included items from the NM-ASSIST (NIDA, 2012) and self-reported measures of risky sexual behavior in the past three months. During the brief screenings of approximately 20 minutes, the professionals informed study participants of their confidentiality, informed consent, and offered opportunities to ask questions about the study. Participants who met the screening criteria were included in the baseline interviews, which is the focus of the current investigation. The baseline interviews were conducted face-to-face by trained interviewers in a private room in the jails. The interviews used Computer Assisted Personal Interview software. All participants were reimbursed \$25 for their time.

Sample

The sample of women in this study is from baseline data from the larger longitudinal study (NIDA 1R01-DA033866). The current study includes data on 400 women from three jails in the target area of Appalachian KY counties (ARC, 2013). The entire sample of women participating in baseline interviews agreed to participate in the study and met the study inclusion criteria of self-reported substance abuse and risky sexual behavior.

Measures

This study used a quantitative research design to investigate factors associated with treatment utilization based on the Leukefeld (1998) model in order to build on the applicability of the model for incarcerated women in Appalachia. Treatment utilization factors include predisposing factors (income, housing, education), current illness-level

factors (severity of substance-use, mental health symptoms, injection drug use), and enabling and mediating factors (perceived barriers to treatment, number of children) as represented in Figure 1.

Sociodemographics

The sociodemographic variables of interest in the current study are age, partner status, housing, and education attainment. Age was calculated by asking participants their date of birth in years. Household income was calculated in dollars by asking, “During the six months before incarceration, what was your total income from all sources including work, family/friends, government support, etc.?” Partner status was assessed by asking the women if they were currently with a partner, and responses were coded 0 for no partner and 1 for being with a partner. Education was coded as a continuous variable as highest grade of education completed.

History of Detox

Historical health factors described in the HSF (Leukefeld et al., 1998) include history of detox by asking participants, “How many times in your life have you been admitted to a detoxification program for your alcohol or other drug use?” The variable was recoded to represent a dichotomous variable as 0 = 0 and 1 = 1 or more times.

History of Overdose

The historical health factors described in the HSF (Leukefeld et al., 1998) include history of overdose by asking participants, “Have you ever overdosed?” The variable was coded dichotomously (0 = “No” and 1 = “Yes.”).

Ever Attended Self-Help Groups

Included as one of the historical health factors described in the HSF (Leukefeld et al., 1998), participants were asked about lifetime attendance at self-help groups by asking participants, “Have you ever attended Alcoholics Anonymous, Cocaine Anonymous, Narcotics Anonymous, Social Recovery, or another self-help group for your alcohol or other drug use?” The variable was dichotomously coded (0 = “No” and 1 = “Yes.”).

History of Intravenous Drug Use

The historical health factors described in the HSF (Leukefeld et al., 1998) include history of intravenous drug use by asking participants if they had ever engaged in intravenous drug use in their lifetime. Endorsement of ever injecting was coded 0 = “No” and 1 = “Yes.”

Substance-Use Problem Scale

The substance problem scale (SPS) is a measure of alcohol and drug problem severity based on the DSM-IV-TR (APA, 1952) and contained within the global appraisal of individual needs (GAIN), which is a comprehensive biopsychosocial assessment and screening tool used in treatment planning, diagnosis, and treatment evaluation (GAIN; Dennis, White, Titus, & Unsicker, 2008). The SPS has been widely used with incarcerated individuals, injection drug users, and women (Ives, Funk, Ihnes, Feeney, & Dennis, 2012). The SPS is intended to measure symptoms related to problematic use of alcohol and other drugs based on the DSM-IV-TR criteria ranging from lower severity items to more severe symptoms. Seven items are based on DSM-IV criteria for substance dependence: tolerance, withdrawal, loss of control, inability to quit, time consuming, reduced activity, continued use in spite of medical/mental problems. An example of a higher severity items is, “Did you have withdrawal problems from alcohol or other drugs

like shaky hands, throwing up, having trouble sitting still or sleeping, or you used any alcohol or other drugs to stop being sick or avoid withdrawal problems?” There are four items for substance abuse (role failure, hazardous use, continued use in spite of legal problems, continued use in spite of family/social problems). One example of the four lower-severity items include, “Did you keep using alcohol or other drugs even though you knew it was keeping you from meeting your responsibilities at work, school, or home?” There are two items for substance-induced disorders (health and psychological) and three items for lower-severity symptoms commonly used in screeners (hiding use, people complaining about use, weekly use). All items on the scale were dichotomously coded (0 = “No” and 1 = “Yes”). The endorsement of three or more questions among the higher-severity items indicated past year substance dependence. Endorsement of one of the lower severity items indicates substance abuse, if dependence criteria were not met.

Recent psychometric investigations concluded the overall model fit was good with unidimensionality of a single underlying construct of substance problem severity (Kenaszchuk, Wild, Rush, & Urbanoski, 2013). Additionally, strong test-retest reliability ($r = .81$) has been reported among mixed gender adult samples (Dennis, Scott, & Funk, 2003). Indicators of the internal consistency of the SPS from this investigation produced a Cronbach’s alpha score of .95, which is above the recommended value of $\alpha = .70$ (Nunally, 1978). Assessment of normality within the scale in this study revealed the distribution was negatively skewed (-2.2) and kurtotic (3.8). The negatively skewed distribution among this sample of incarcerated women who self-reported substance-use in order to participate in the study is somewhat expected. However, the non-normal distributions may present difficulties in the data analyses that assume normality.

Psychological Symptoms

In order to assess for symptoms of major depressive disorder, generalized anxiety disorder, and post-traumatic stress disorder, the GAIN (Dennis et al., 2008) was used for thresholds that correspond with those of the diagnostic criteria in the DSM-IV (APA, 1994). Although the symptoms on each scale correspond with diagnostic criteria, trained psychological clinicians did not conduct the interviews with the women in order to make a formal diagnosis. Therefore, high scores should not be considered as a diagnosis of the psychological condition and low scores an absence of the psychological condition.

As discussed earlier, the GAIN has been used with a variety of samples, including women, incarcerated individuals, and injection drug users (Ives et al., 2012). The psychological symptoms included in the GAIN were found to match that of psychiatrist diagnoses (Shane et al., 2003). In this investigation, the internal consistency of each psychological symptom scale (major depressive disorder, generalized anxiety disorder, and post-traumatic stress disorder) was calculated using Cronbach's alpha. The reliability analysis revealed coefficients above the suggested cut-off ($\alpha = .70$; Nunally, 1978) in all three of the scales. Specifically, the scale for symptoms of major depressive disorder produced $\alpha = .90$, the scale for symptoms of generalized anxiety disorder ($\alpha = .86$), and the scale of post-traumatic stress symptoms generated Cronbach's alpha coefficient of .81.

Number of Children

Number of children was calculated as a continuous variable and determined by asking, "How many children do you have under the age of 21 years of age?"

Barriers to Treatment

Four of the treatment accessibility barriers proposed by Penchansky and Thomas (1981) correspond with the following barriers the participants might encounter in accessing needed services: (a) *availability*, adequate supply of services, “could not get an appointment,” which was calculated on a dichotomous scale (0 = “No” and 1 = “Yes”) and the rating (1 = “not at all available” and 10 = “extremely available”) of available healthcare in their community; (b) *accessibility*, location of supply in relation to the location of client, “didn’t have a way to get there” and “too far to go” were both calculated on a dichotomous scale (0 = “No” and 1 = “Yes”) and the questions of the average miles to provider and average minutes to provider were both assessed on a continuous scale (0–996 in the respective units of measurement); (c) *accommodation*, the relationship of how resources are organized and perceived by the client as appropriate “right kind of services not available,” which was measured on a dichotomous scale (0 = “No” and 1 = “Yes”), and number of facilities providing drug/alcohol treatment in their community measured on a continuous scale; (d) *affordability*, the cost of services relative to the client’s ability to pay for the service, “can’t afford medical care” and “no insurance” were both measured on a dichotomous scale (0 = “No” and 1 = “Yes”). Due to data constraints, the construct of acceptability was not assessed. There are 10 total access barrier questions that correspond with four (availability, accessibility, accommodation, and affordability) of the access dimensions (Penchansky & Thomas, 1981).

Treatment Utilization

Substance-use treatment utilization is defined as a dichotomous variable as enrollment in a substance-use treatment program in the community prior to incarceration.

The participants were asked, “Have you ever been in substance abuse treatment program?” The responses were dichotomously coded 0 = “No” and 1 = “Yes.”

Data Analytic Plan for the Corresponding Research Questions

The data analytic plans are discussed separately for each research question. The data analytic plans are grounded in theoretical conceptualizations of treatment-seeking behavior based on the modified HSF by Leukefeld (1998), including access dimensions from Pechansky and Thomas (1981). Analyses for all research questions were conducted using Statistical Package for Social Sciences 23 software.

Research question one. The aim of the first research question was to examine the relationship among symptoms of anxiety, trauma, and depression on substance-use problems, while controlling for annual income and education attainment. The first research question was addressed by using the statistical analysis of multiple linear regression. Multiple linear regression is the appropriate statistical analysis, considering the independent variables of symptoms of depression, trauma, and anxiety are continuous, the dependent variable of substance-use severity is continuous, and the control variables are continuous. Furthermore, the aim of the first research question requires the statistical analysis to control for income and education attainment, which can be exerted in multiple linear regression.

In order to test the assumptions of multiple linear regression, several preliminary analyses were conducted. The assumption testing for multiple linear regression yielded problems with normality, homoscedasticity, linearity, and outliers. Outliers that were identified based on the Mahalanobis distance, Cook’s distance, and leverage values in the multiple linear regression model were eliminated, which improved some of the negative

skewness and kurtosis among the variables. After eliminations were made, there remained problems with normality, homoscedasticity, and linearity. Viewing the plotted values from the regression model in the histogram with imposed normal curve and the normal P-Plot revealed non-normal curves, the assumption of linearity was not met, as seen in the partial regression plots. Further violations in assumptions homoscedasticity are evidenced by the scatterplots of independent variables on the dependent variable. Transformations were conducted in order to address some of the difficulties with the data meeting the assumptions of multiple linear regression. Although the log transformations ameliorated some of the problems with skewness and kurtosis, violations with normality and linearity remained.

Therefore, a multiple linear regression was not performed. Modifications were made to research question one. The revised research question one is, thus, “What is the relationship between income, education, anxiety symptoms, depression symptoms, and trauma symptoms with substance-use problems among incarcerated women in Central Appalachia?” Bivariate analysis was conducted to address the relationship among substance-use problems, income, education attainment, anxiety symptoms, trauma symptoms, and depressive symptoms. Although the bivariate analysis does not address the independent influence of each independent variable or control for the influence of income and education attainment, the analysis does produce useful information concerning the relationship among the variables.

Revised study hypothesis one. The following study hypothesis is revised in order to address the failed assumption testing for the statistical analysis to test the original

study hypothesis. The revised study hypotheses below replace the original study hypothesis one.

Ho1a: There is a positive relationship among symptoms of anxiety, trauma, and depression with substance-use problems.

Ho1a: There is no relationship among symptoms of anxiety, trauma, and depression with substance-use problems.

Ho1b: There is an inverse relationship between education attainment and income with substance-use problems.

Ho1b: There is no relationship between education attainment and income with substance-use problems.

Research question two. The second research question speaks to the overarching purpose of this study. Specifically, the question addresses the predisposing factors, historical health factors, current illness-level factors, and enabling and mediating factors associated with substance-use treatment based on the modified framework (Figure 1). Additionally, empirical evidence specific to the needs and barriers of drug-using women in rural Appalachia informs the independent variables included in the modified model.

In order to address the predictive qualities of the independent variables (education attainment, housing, income, prior emergent service use, severity of substance-use, mental health symptoms, injection drug use, number of children and perceived barriers to treatment) and the dependent variable (treatment utilization), binomial logistic regression was used. Binomial logistic regression is the appropriate statistical procedure given the dichotomous dependent variable of treatment utilization and the independent variables

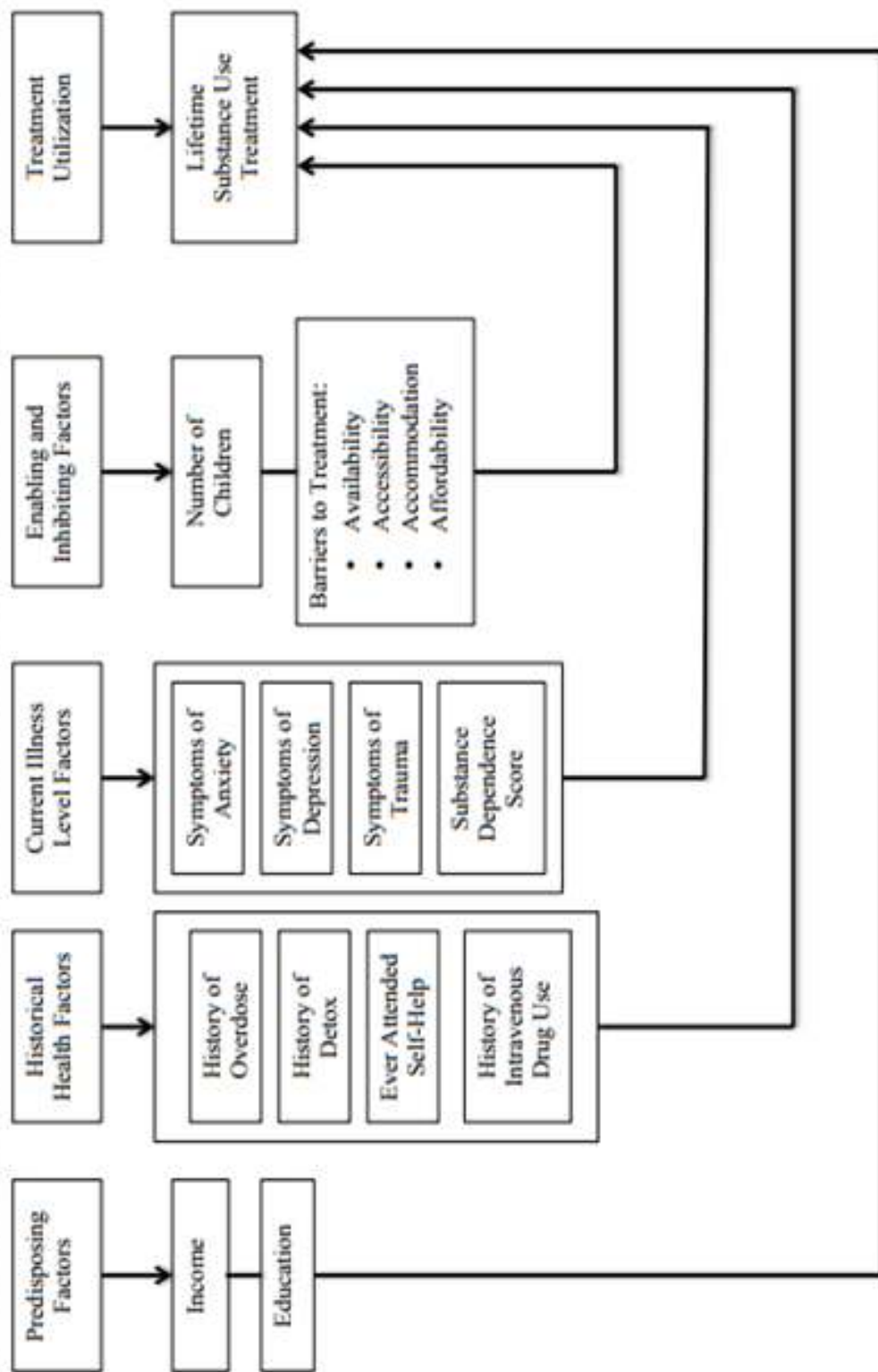
measured on categorical (perceived barriers, education, housing) and continuous scales (number of children, income, and severity of substance-use).

In order to address the potential multicollinearity among the covariates the tolerance and inflation tolerance factors were assessed and deemed appropriate based on the recommendations by Abu-Bader (2010), as all the tolerance values were above .10 and all variance inflation factor (VIF) values are smaller than 10. However, bivariate relationships among variables of interest were assessed for multicollinearity as well. There was one correlation beyond the threshold of .80 in the perceived barriers to accessing treatment. Specifically, the *accessibility* barriers of “too far to go” and “didn’t have a way to get there” were found to be significantly correlated ($r = 0.81, p < 0.05$). Considering this problem with multicollinearity, the treatment barrier of “too far to go” was eliminated. In order to assess proper sample size for logistic regression, the rule of 10 was applied, as there should be 10 cases for each independent variable (Agresti, 2007).

There are 16 independent variables remaining in the analysis and a sample size of 400, which is beyond the recommendation of 160 cases. After assumption testing, the Pearson correlation coefficients were assessed to determine the significant relationship ($p \leq 0.05$) between independent variables (predisposing factors, mental health treatment, severity of drug use, perceived need for treatment, and perceived access to treatment) and the dependent variable (substance-use treatment utilization). The results from the bivariate associations addressed the research hypothesis 2b-2c. Based on the results from the bivariate relationships, variables that were significantly correlated with substance-use treatment utilization (dependent variable) were entered into the hierarchical logistic

regression analysis. Specifically, the factors that were found to be significant at the bivariate level and entered into the hierarchical logistic regression model to predict substance-use treatment utilization were income, substance-use problems score, ever experiencing an overdose, ever injecting drugs, number of times entered detox, ever entering self-help groups, not having a way to get to healthcare provider, and number of children.

Figure 1. Substance Use Treatment Utilization Model for Women in Central Appalachian Jails adapted from Leukefeld et al. (1998).



Chapter Three: Results

The goals of this study were to: a) examine psychosocial factors that are associated with substance-use problems among women incarcerated in Central Appalachian jails; and b) determine which of the predisposing (income and education), historical health (history of overdose, history of detox, ever attended self-help groups, history of intravenous drug use), current illness level (substance-use problem score, symptoms of anxiety, depression, and trauma), enabling and mediating factors (number of children and perceived barriers to treatment) based on the Leukefeld model (Figure 1) predict substance-use treatment utilization among women incarcerated in Central Appalachian jails (Figure 2). This chapter outlines sample characteristics and results from testing each research hypotheses. All results were calculated based on the level of significance at the alpha level of .05.

Sample Characteristics

The sample consisted of 400 women from three jails in the target area of Central Appalachian KY counties (ARC, 2013) who self-reported substance abuse and risky sexual behavior. Sociodemographic characteristics are presented in Table 1. The racial identity makeup of participants was 99% Caucasian. The average annual household income six month prior to incarceration was \$8,467.15 with the lowest reported income of zero and the highest \$210,000 and standard deviation of \$18,558. The average years of education were 11. The average number of children in the women's lifetime was 2.2. The majority (97.75%) of the participants reported nonmedical opioid use in their lifetime. A complete summary of sample characteristics is presented in Table 2. The majority of women reported substance-use problems, as indicated on the SPS by the

mean score of 13.37 with a range of 0–16 and *SD* of 4.15. The psychological symptom scores are presented in Table 3. A complete summary of treatment barriers is also shown in Table 3. The most commonly reported treatment barrier was in the *affordability* dimension as 54.8% of participants indicated “can’t afford medical care,” and 57% stated “no insurance” was a barrier to accessing treatment. The second most commonly reported treatment barrier was in the *accessibility* dimension, as over half (44.8%) reported that they “didn’t have a way to get there.”

Research Question One

Descriptive statistics of psychological symptoms and substance-use problems are displayed in Table 3. Results from the bivariate analysis are represented in Table 5. A significant negative relationship ($r = -.09, p < .05$) between substance-use problems and education. Substance-use problems were based on the GAIN SPS scale as higher scores indicate greater substance dependence symptoms and the scale range was 0-16. Education attainment was measured by highest grade of education attained in years. Specifically, women who obtained more years of education had lower substance-use problems. It is important to note that although there was a significant relationship detected between years of education and substance-use problems the relationship was weak. There was not a significant bivariate relationship between substance-use problems and income ($r = .07, p < .17$). Income options were based on participants’ report of annual household income in dollar amounts six months prior to incarceration. Positive bivariate relationships were found between substance-use problems and symptoms of major depression ($r = .31, p < .01$). Symptoms of depression were based on the endorsement of the *DSM-IV-TR* criteria for major depressive disorder and responses on

the scale could range from 0-12. Substance-use problems and symptoms of generalized anxiety were positively associated ($r = .31, p < .01$). Symptoms of anxiety could range from 0-9 and the items were based on the *DSM-IV-TR* criteria of generalized anxiety disorder. Symptoms of posttraumatic stress were positively correlated with substance-use problems ($r = .24, p < .01$). The posttraumatic stress symptom scores range was from 0-12. In summary, participants who reported more symptoms of depression, anxiety, and posttraumatic stress had elevated scores of substance-use problems.

Research Question Two

Results from the hierarchical binary logistic regression are presented in Table 7 and revealed the overall model with all eight factors was accurate and differed significantly from zero ($X^2 = 114.14, df (8), p < .01$). This model had a good fit (-2 log likelihood = 436.22, Hosmer and Lemeshow, $X^2 = 4.07, df (8), p = .85$) as the lack of statistical significance indicated the observed model and the predicted model were not statistically significantly different. The overall model with all eight factors correctly predicted 78.9% of those who had utilized substance-use treatment and 61% of those who had not utilized substance abuse treatment. The accuracy of the overall model has a success rate of 70%. The results of the Cox and Snell and the Nagelkerke R^2 show that income entered in the first block accounted for 1.2% and 1.6%, respectively, of the variance in treatment utilization. The second block including: income (0 – 210,000.00), ever experiencing an overdose, ever injecting drugs, ever entered detox, and ever entered a self-help group accounted for 24.5% to 32.6% of the variance. The addition of substance problems scores (0-16) entered in the third block and all the previously entered predictors (income, ever experiencing an overdose, ever injecting drugs, number of times entered detox, and

ever entering a self-help group) accounted for 24.5% to 32.7% of the variance. The fourth block added the predictors of number of children (0-7) and “not having a way” and included the previously entered predictors in the third block (income, ever experiencing an overdose, ever injecting drugs, number of times entered detox, ever entering a self-help group, and substance problems score). Therefore, the fourth block included all eight predictors that accounted for 25% to 33.3% of the variance in treatment utilization. The percentage of variance accounted for in model increased with the addition of the historical health factors (overdosed, injected drugs, entered detox, entered self-help groups). The same three factors emerged as uniquely contributing to treatment utilization in the context of the other eight variables. Specifically, women who injected drugs were 1.9 times more likely to utilize treatment (Wald $X^2 [1] = 4.77, p < .05$), those who had ever attended a self-help group (Wald $X^2 [1] = 38.42, p < .01$) were 6.3 times more likely to utilize treatment, and women who had entered detox (Wald $X^2 [1] = 10.85, p < .01$) were 1.8 times more likely to utilize substance-use treatment. The remaining odds ratios are represented in Table 7.

Factors that were not found to be statistically significant predictors of treatment utilization in the multivariate model included: annual income, number of children, substance-use dependence, ever overdosing, and the perceived barrier to treatment of not having a way to get to their healthcare provider.

Results from the bivariate correlations are represented in the correlation matrix in Table 6. The significant bivariate relationships that were entered into the multivariate analysis are detailed in Figure 2. The null hypothesis that no relationship exists between income, substance-use problems, overdose, injection history, entered detox, attended self-help, not

having a way to get to their provider, and children was rejected. However, the directionality of these relationships differed from the hypothesis related to number of children ($r = .12, p < .05$) and not having a way to their provider ($r = .10, p < .05$) as these were positive relationships. The null hypothesis was rejected for the relationship between education attainment, psychological symptoms (depression, anxiety, and trauma) with treatment utilization. Substance-use treatment utilization was significantly correlated with income ($r = .10, p < .05$), substance-use problems ($r = .14, p < .01$), ever experiencing an overdose ($r = .13, p < .01$), ever injecting drugs ($r = .21, p < .01$), entered detox ($r = .26, p < .05$), and ever entering self-help groups such as AA/NA ($r = .42, p < .01$). All significant predictors were then entered into the binary logistic regression model in a hierarchical fashion based on the modified model of treatment utilization as represented in Figure 2. Specifically, income was entered in the first block. The second block included the following variables: ever experiencing an overdose, ever injecting drugs, number of times entered detox, and ever entering a self-help group. The third block included the substance problems score. The fourth and final block included the barrier of not having a way to get to healthcare provider and number of children. No significant relationships were detected in the education, symptoms of anxiety, symptoms of depression, symptoms of trauma, and perceived barriers of availability, accommodation or affordability and therefore excluded from the logistic regression analysis.

Table 1. *Sociodemographic Characteristics (N = 400)*

	<i>Mean</i>	<i>SD</i>	<i>Range</i>	<i>Percentage</i>
Annual Household Income ^a	8,467.15	18,558.99	0–210,000.00	
Education ^b	11.10	2.28	0-19	
Race (White)				99.00
Number of Children ^c	2.20	1.52	0-7	

^aAnnual household income six months prior to incarceration represented in dollars.

^bHighest grade of education attained. ^cTotal number of children in lifetime.

	<i>Percentage</i>	<i>Mean</i>	<i>SD</i>	<i>Range</i>
Substance Use Problem Score ^a		5.9	2.2	0-7
Lifetime Injection Drug Use	75.5			
Ever Overdose	35.5			
Ever attended self-help group ^b	72.0			
Ever entered detox	45.5			
Ever been in substance abuse program	49.8			

^aSubstance Use Problem Score (SPS) refers to the number of items endorsed on the GAIN substance dependence scale based on the DSM-IV criteria as a score of three or greater indicates dependence ; the higher the score the more substance dependence symptoms. ^bAttendance in Alcoholics Anonymous, Cocaine Anonymous, Narcotics Anonymous, Social Recovery, or another self-help group for alcohol or other drug use.

Table 3. *Treatment Barriers (N = 400)*

	<i>Percentage (n)</i>
Availability	
“Couldn’t get an appointment”	23.3 (93)
Accessibility	
“Didn’t have a way to get there”	44.8 (179)
Accommodation	
“Right kind of service unavailable”	27.0 (108)
Affordability	
“Can’t afford medical care”	54.8 (219)
“No insurance”	57.0 (228)

Table 4. *Descriptive Statistics of Substance Use and Psychological Symptoms*

	<i>M</i>	<i>SD</i>	<i>α</i>	<i>Range</i>
Substance Use Problems Score ^a	13.37	4.15	.95	0-16
Depression Symptoms	7.87	3.42	.90	0-12
Trauma Symptoms	10.25	2.85	.81	0-12
Anxiety Symptoms	6.39	2.96	.86	0-9

Note. All reported symptoms of depression, trauma, and anxiety are endorsement of items on the GAIN that are based on the DSM-IV criteria. ^aSubstance Use Problem Score (SPS) refers to the number of items endorsed on the GAIN substance dependence scale based on the DSM-IV criteria as a score of three or greater indicates dependence; the higher the score the more substance dependence symptoms.

Table 5. *Correlations of Matrix for Substance Use Problems (N = 400)*

	Income	Education	Depressive Symptoms	Anxiety Symptoms	Trauma Symptoms	Substance Use Problems
1. Income	-					
2. Education	.09	-				
3. Depressive Symptoms	.08	-.07	-			
3. Anxiety Symptoms	.08	-.09	.92**	-		
4. Trauma Symptoms	-.01	-.13*	.29*	.34**	-	
5. Substance Use Problems	.08	-.09	.31**	.31**	.24**	-

Note. * $p < .05$, ** $< .01$.

Table 6. Correlation Matrix for Substance Use Treatment Utilization (N = 400)

	1	2	3	4	5	6	7	8	9	10	12	14	15	16	17	18	19	20	21	
1.Treatment	.																			
2.Income	.10*	.																		
3.Education	.05	.09	.																	
4.Children	.12*	-.02	-.10*	.																
6.SPS ^a	.16**	.07	-.10*	.03	.11*	.														
7.Depression	.04	.04	-.10	.06	.15**	.25**	.													
8.Anxiety	.06	.12*	-.02	.08	.10	.21**	.55**	.												
9.Trauma	.03	-.00	-.10	.06	.06	.18**	.40**	.32**	.											
10.Overdose	.13**	.04	-.03	.09	.11*	.16**	.26**	.17**	.13**	.										
11.Injected	.21**	.07	.02	-.05*	.04	.29**	.08	.02	.03	.16**	.									
12.Detox	.26**	.04	-.03	.05	.04	.14**	.09	.03	.08	.24**	.14**	.								
13.Self-help	.42**	.08	.06	.13*	.09	.13*	.11*	.04	.03	.07	.18**	.2**	.							
14.Barrier A	.02	.02	.05	.05	.06	.07	.15**	.26**	.03	.09	.02	.07	.02	.						
15.Barrier B	-.00	.00	.03	.08	.06	.08	.14**	.23**	.03	.06	.03	.09	.02	.81**	.					
16.Barrier C	.10*	-.03	-.06	.14**	.09	.18*	.26**	.24**	.13**	.05	.08	.12*	.05	.43**	.43**	.				
17.Barrier D	.03	-.08	-.12*	.15**	.13**	.14**	.22**	.23**	.12*	.05	.02	.07	.03	.36**	.36**	.63**	.			
18.Barrier E	.08	.07	-.06	.11*	-.02	.10	.18**	.20**	.04	.04	.04	.07	.05	.25**	.25**	.42**	.46**	.		
19.Barrier F	.07	-.01	-.08	.06	-.04	.08	.22**	.17**	.06	.10*	.06	.20*	.03	.32**	.32**	.42**	.42**	.48*	.	

Note. SPS^a is the Substance Problem Score. Barrier A: "Can't afford medical care." Barrier B: "no insurance." Barrier C: "didn't have a way to get there." Barrier D: "too far to go."

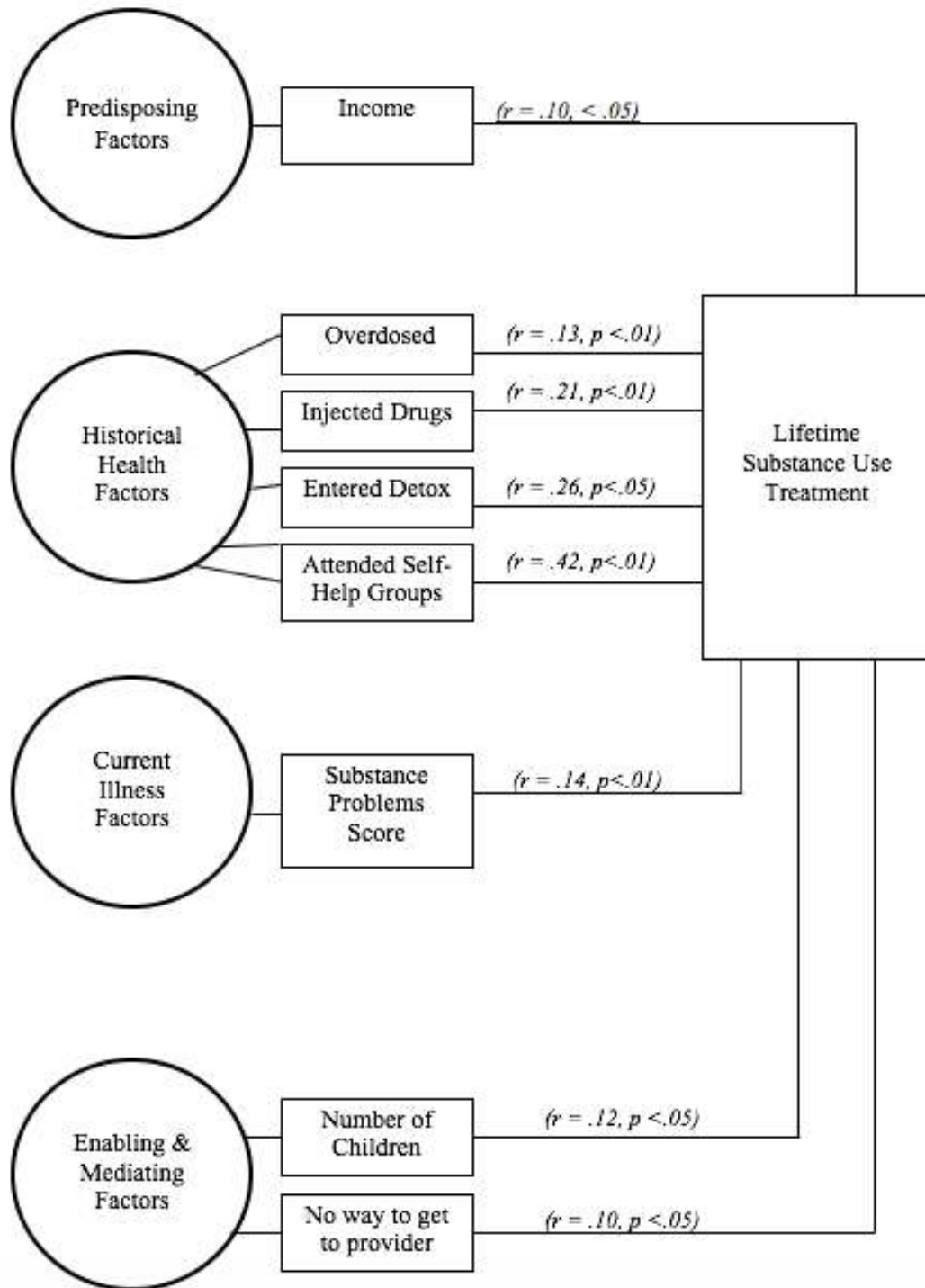
Barrier E: "couldn't get an appointment." Barrier F: "the right kind of service not being available."

Table 7. Hierarchical Logistic Regression – Substance Treatment Utilization Among Substance-Using Women Incarcerated in Central Appalachian Jails (N = 400)

	Model 1	Model 2	Model 3	Model 4
Income	Wald(1) = 3.4, OR = 1.0	Wald(1) = 3.4, OR = 1.0	Wald(1) = 1.1, OR = 1.0	Wald(1) = 1.6, OR = 1.0
Overdosed		Wald(1) = 1.1, OR = 1.3	Wald(1) = 1.0, OR = 1.3	Wald(1) = 0.8, OR = 1.3
Injected Drugs		Wald(1) = 5.3, OR = 1.9*	Wald(1) = 4.5, OR = 1.8**	Wald(1) = 4.8, OR = 1.9*
Entered Detox		Wald(1) = 11.4, OR = 1.8**	Wald(1) = 11.2, OR = 1.8**	Wald(1) = 10.8, OR = 1.8**
Self-help Groups ^a		Wald(1) = 40.4, OR = 6.5**	Wald(1) = 40.0, OR = 6.5**	Wald(1) = 38.4, OR = 6.3**
SPS ^b			Wald(1) = 0.3, OR = 1.0	Wald(1) = 0.1, OR = 1.0
Children ^c				Wald(1) = 1.5, OR = 1.1
Access Barriers ^d				Wald(1) = 0.8, OR = 1.2
Model X ² (df)	X ² (1) = 4.72**	X ² (5) = 111.32**	X ² (6) = 111.57**	X ² (8) = 114.14**
Nagelkerke R	0.06	0.33	0.33	0.33
Cox & Snell R	0.01	0.25	0.25	0.25
-2 LL	545.64	439.04	438.80	436.22

Note. ^aRepresents ever attending self-help groups, ^b indicates Substance Problem Score; ^c indicates the number of children, * $p < .05$, ** $p < .01$.

Figure 2. Significant Bivariate Associations Entered in the Logistic Regression Model to Predict Treatment Utilization Among Substance Using Women in Central Appalachian Jails.



Chapter Four: Discussion

This study examined factors influencing substance treatment utilization among incarcerated women in Central Appalachia and explored the relationship between the women's substance-use problems and their reported symptoms of trauma, depression, and anxiety. The relational model proposed by Covington and Surrey (1997) informed the conceptualization of substance-use among the women in the study. Expected relationships concerning treatment utilization are grounded in the Leukefeld (1998) model of treatment utilization and the accessibility constructs presented by Penchansky and Thomas (1981). The findings from the current study provided partial support for the study hypotheses. First, explanations for the findings are presented. Second, implications and recommendations are outlined from a counseling psychology perspective. Third, limitations and areas for future research are offered. Fourth, conclusions of the study are provided.

The sociodemographic characteristics of the women in this study revealed a striking picture of their lived experiences as their earnings were substantially below the poverty level. The income disparities among the women in this study are consistent with other findings (ARC, 2015b) that found nearly a quarter of Central Appalachians live below the poverty level. The majority of the women had approximately two children and obtained less than an eleventh-grade education. Financial inequalities among the women in this study were similar to most incarcerated individuals, as evidenced by Rabuy and Kopf's (2015) study that compared inmates' incomes prior to incarceration to non-incarcerated individuals based on the Bureau of Justice Statistics survey data from 2004. It is important to note that the incomes among the women in this study represented two

intersecting identities: incarcerated individuals and Central Appalachians. Both intersecting identities revealed the socioeconomic struggles faced by Appalachian women with criminal justice involvement. Considering the intersecting identities as an incarcerated Appalachian woman with limited education attainment and serious economic disadvantages provides an understanding of the predisposing factors of substance-use and the impediments to accessing substance-use treatment.

Relationships Between Psychological Symptomatology, Substance-Use, and Socioeconomics

The modified research question concerning the relationship among income, education, anxiety symptoms, depression symptoms, and trauma symptoms produced findings pertinent to understanding specific needs among substance-using women in Central Appalachia with criminal justice involvement. The positive relationships uncovered among symptoms of anxiety, depression, and trauma are discussed as this relationship suggested women in the region had increased treatment needs that warrant a system designed to address these co-occurring needs. Explanations for the negative relationship between education attainment and trauma symptoms revealed in this study are explored.

Psychological symptoms and substance-use problems. This study's finding that women who have increased substance-use problems also reported more psychological symptoms of mood and anxiety was consistent throughout the broad literature of substance-use patterns among women (Back et al., 2011; McHugh et al., 2013; Tetrault, 2008; Tuchman, 2010). This finding was substantiated in research among community samples of Appalachians (Hall & Skinner, 2012) and incarcerated

Appalachians (Leukefeld et al., 2005). The positive relationship in this study between substance-use problems and symptoms of anxiety, depression, and trauma was consistent with the qualitative work of Staton-Tindall and colleagues (2015), who investigated drug use among incarcerated women in Central Appalachia. The women in Staton-Tindall's (2015) study reported using substances as a way to cope with negative emotions and traumatic experiences. This study quantifies the association of major depressive disorder symptoms, post-traumatic stress disorder symptoms, and generalized anxiety disorder symptoms with substance-use problems among incarcerated women in Central Appalachia. The reviewed literature, discussed earlier, suggested the social inequality of the women in Central Appalachia predisposed them to develop mental health and substance-use disorders (e.g., Khantzian, 1995; Martin et al., 2009). Theoretical models proposed model by Covington and Surrey (1997) explain how the contextual realities of the women in this study may predispose them to develop mental health and substance-use disorders. The relational model (Covington & Surrey, 1997) suggested disconnection in relationships can lead to unwanted negative emotions, and women often use substances to cope with such negative emotions. However, it is important to note that the results from this investigation could not determine directionality of the associations between psychological symptomatology and substance-use disorders. Regardless of the direction of the relationships between psychological symptomatology and substance-use, there exists a complex clinical profile among the women in this study who struggle with co-occurring mental health and substance-use concerns. Considering the co-occurring symptomatology among the women in this study, this finding has implications for interventions by healthcare providers.

An alternative explanation for the positive association among symptoms of trauma, depression, anxiety, and substance use is explained by the harsh realities of substance-using women that may predispose them to developing mental health disorders (Greenfield et al., 2010). Specifically, the lives of substance-using women place them at greater risk of experiencing negative life events and lead to brain changes that contribute to the development of mental health conditions (Greenfield et al., 2010). Therefore, careful examination of the onset of symptoms and periods of remission will assist the healthcare providers to disentangle co-occurring or independent substance-use and mental health disorders.

Although proper diagnosis should guide healthcare providers in the treatment of co-occurring or independent substance-use and mental health disorders, recent evidence suggests mixed recommendations for the most efficacious approach. Specifically, the recommendation by SAMHSA (2009) encouraged integrated treatment models that address the symptom severity and interaction between the co-occurring disorders. Conversely, the reviewed literature by Greenfield and colleagues (2010) uncovered the lack a unified understanding of the best practice regarding the treatment of co-occurring substance-use and mental health disorders among women. However, based on the Greenfield's (2010) review, there was some support for addressing trauma-related symptoms initially as these symptoms (e.g., sleep impairment, flashbacks, nightmares, avoidance of trauma reminders, hyperarousal) often activated a response to engage in substance use. Therefore, treatment of co-occurring disorders among women may require careful consideration of specific symptoms and symptom severity, while assessing progress with recovery and making informed decisions concerning treatment

interventions based on individual needs. Principally, availability of integrated treatment models addressing co-occurring disorders and those that consider the individual and gendered needs among women is imperative.

The relationship found between mental health symptoms and substance-use problems highlights the complexities of the clinical profiles among women in Central Appalachia with criminal justice involvement. These complex clinical profiles suggest that services in the region fit the need and preventative measures be employed on a systemic and individual level to address these struggles. Implications from a counseling psychology perspective are explored later in this document.

Education attainment and trauma symptoms. One of the more interesting findings is the negative relationship between education and symptoms of trauma. This finding that women who earned less years of education have more symptoms of trauma is consistent with larger national samples conducted by Porche, Fortuna, Lin, and Alegria (2011), who linked the experience of childhood trauma to increased rates of dropping out of high school. Considering most of the women in this study earned less than a high school education, the impact of traumatic life experiences likely had bearing on their life trajectory. There have been significant strides in understanding the impact of trauma on overall well-being as recent developmental biology literature suggests traumatic experiences have substantial impacts on the brain structures that are responsible for memory, learning, and emotion regulation (Shonokoff, Boyce, & McEwen, 2009). Therefore, trauma may explain the disruption of social and academic functioning necessary for education attainment.

Another explanation for the negative relationship between education attainment and trauma symptoms may be found in the protective qualities of education, particularly among the economically disadvantaged. Based on this explanation, the trauma experienced may have occurred later in life and education attainment acted as a buffer from their harsh contextual realities. Considering the cultural value of familialism (Jones, 1991) and the prevalence of sexism in the Central Appalachian region, women who earned more years of education may have avoided support from family and partners, which is important if those relationships were abusive. Therefore, the opportunities afforded to the women who earned more years of education may have allowed them to leave abusive family and partner relationships. Although the direct relationships among education, trauma, and substance use could not be assessed in this investigation, the broader literature suggests education is often a protective factor for substance use (Hawkins et al., 1992), and substance-use disorders resulted in a mediation effect on the relationship between school drop-out rate and traumatic experiences (Porche et al., 2011). Interventions in the Central Appalachian region targeted at promoting healthy development may focus on the role of trauma and education on the individual and systemic levels. Implications and recommendations are discussed later in this section.

Factors Impacting Treatment Utilization

This study supported the use of the modified Leukefeld model (1998) to predict treatment utilization among substance-using women incarcerated in Central Appalachian jails (Table 7). Therefore, the results of this study provided support for study hypothesis two (Ha2a). Specifically, individual determinants of treatment utilization were observed in all of the four categories (*predisposing factors*: income; *historical health factors*:

overdosed, injected, detox, self-help; *current illness factors*: substance-use problems; *enabling and mediating factors*: children, accessibility). Bivariate associations (Table 5) yielded partial support for study hypothesis two (Ha2b, Ha2c). The significant bivariate relationships between treatment utilization, income, overdose, injection, detox, self-help, substance-use problems, number of children, and no way to get to provider are discussed in relation to the current literature. Implications for healthcare providers, Central Appalachian community stakeholders, and the criminal justice system are explained based on the results of this investigation among substance-using women incarcerated in Central Appalachian jails.

Predisposing factors of treatment utilization. In the predisposing category, income was positively associated with treatment utilization; meaning that women who earned more money tended to enter treatment more often than women who earned less money. This finding was consistent with the exploratory work of Sexton and colleagues (2008), Staton-Tindall and colleagues (2015), and MacMasters (2013), who showed that substance users reported financial constraints were among the major burdens to accessing services. Another study by Green-Hennessy and colleagues (2002) used national community sampling methods that revealed similar relationships among treatment entry and income. Green-Hennessy and colleagues (2002) found that those who had higher annual incomes were more likely to enter substance-use treatment compared with those whose earnings were less than that of the poverty level. The inverse relationship of income and treatment entry also has been found to impede treatment utilization as Sexton and colleagues' (2008) investigation of stimulant users in rural areas of Arkansas and Kentucky identified financial burdens and cost of treatment interfered with treatment

utilization. Therefore, income appears to be an important consideration in navigating substance-use services in the community. This finding is particularly critical to understanding the mitigating circumstances of women considering treatment prior to incarceration. Women in this study who could offset the financial burden of entering treatment were more likely to seek services, whereas those who may not have been able to leverage financial resources to take time away from work or household responsibilities did not seek services. Furthermore, the cultural expectation for women to maintain the home and assume the role as primary caregiver for children has been found to be even more rigid among women from lower socioeconomic status (Fiene, 2002). Therefore, women with less financial security may be confined to more traditional gender roles that interfere with treatment entry.

This study's finding that increased income predicted treatment entry may speak to the role of income acting as a buffer to the stigma of seeking substance-use treatment, particularly in Appalachia (Sexton, Carlson, Leukefeld, & Booth, 2008; Zhang et al., 2008). Those who earn more may be less reliant on family and friends to help in the treatment seeking process (e.g., managing household responsibilities and childcare) than those with less financial security, who may require the support of family and friends who hold negative views of substance-use treatment and less likely to assist in the treatment seeking process. This assertion is supported by the recent study by Kobau and Zack (2013) who found that individuals who have higher incomes tended to hold more positive views about the effectiveness of mental health treatment for chronic conditions, whereas those with lower incomes held more stigmatizing views.

Another consideration of income and treatment utilization is that women who had more available income may be at a greater advantage of overcoming some of the barriers to accessing services. Specifically, women in this study reported various barriers to accessing services, as over half reported that treatment was unaffordable and over a quarter reported that the right kind of service was not available. Considering that the investigation by Zhang (2008), who uncovered a lack of inpatient substance-use services in Appalachian compared with non-Appalachian regions, suggests that women in this study who had greater incomes were advantaged in the ability to leverage their funds to offset the mismatch of service availability. Specifically, the women with higher incomes could seek services elsewhere or pay for higher-cost services. In summary, income appeared to be an important consideration on an individual and societal level in mitigating barriers to substance-use services. Implications of these findings are discussed later in this document.

Historical health factors and current illness factors. Findings from this investigation revealed the historical health factors (overdosed, injected drugs, entered detox, and attended self-help) and the substance-use specific illness-level factors (substance-use problems) positively impacted treatment utilization, which fit with the existing theoretical and empirical literature. Indicators of symptom severity, whether captured in the conceptual model of historical health factors or illness-level factors, were often indicators of treatment entry. In this investigation, history of overdose, injection drug use, and substance-use problems could be considered indicators of substance-use symptom severity. Indicators of symptom severity were substantiated as a positive predictor of substance-use treatment. An investigation by Webster and colleagues (2006)

uncovered self-perceived substance-use problems defined as an illness-level factor based on the Leukefeld (1998) model was a significant predictor of substance-use treatment utilization among incarcerated substance-using men. Other investigations captured severity of the problem using chronicity measures, as Staton-Tindal (2003) revealed long-term alcohol use was positively correlated with treatment utilization among a group of rural and urban women incarcerated in a Kentucky prison.

The link between substance-use treatment utilization and seeking other forms of treatment (e.g., detox and self-help groups) were similar to other investigations such as those by Carlson, (2010). In Carlson's investigation of substance-use treatment entry over the course of two years among rural substance users showed those who had previously successfully entered substance-use treatment had a greater chance of utilizing future services. Previous use of other forms of treatment predicting future substance-use treatment were consistent in other investigations as well. Staton-Tindall and colleagues' (2009) study of inmates showed that substance-use treatment was significantly different based on previous hospitalizations for health reasons among the women in the study, as women who had been hospitalized were three and a half times more likely to receive substance-use services than women with no hospitalization history. Although the idea that previous utilization of health services to predict future use of other services is not a novel concept, understanding the specific utilization patterns of substance users in the community can better prepare the healthcare stakeholders in providing appropriate services.

Given the evidence of significant substance-use patterns among the women who sought treatment in this study speaks to the chronicity of addiction and the need for

intensive services that match these profiles. Those battling opioid addiction have increased rates of relapse (Smyth, Barry, Keenan, & Ducray, 2010), communicable diseases (e.g., HCV, HIV; Hagan & Des Jarlais, 2000), drug overdose (CDC, 2013), and overall increased mortality rates (Evans et al., 2015). Specific to the needs among the women who entered treatment in this investigation, it is important to note that recent evidence suggests opioid users have a significantly increased risk of overdose directly following inpatient care (Smyth, 2010), decreased rates of mortality among those in detox or methadone maintenance treatment (Evans, 2015). Furthermore, there have been strides to uncover sex differences in the patterns and treatment of substance-using women that are pertinent to the discussion of treatment seeking women in Central Appalachia. Studies have shown that women were significantly influenced by their partners' injection drug risk behaviors (Bryant & Treload, 2007) and reported less opioid use with fewer positive urine samples while undergoing treatment with buprenorphine compared with methadone maintenance therapies (Greenfield, 2010). Therefore, it is imperative that treatment providers in the region gain an awareness of the specific risks associated with problematic patterns of drug use revealed in the substance-using profiles of the women in this study and familiarize themselves with the latest evidence based treatment in order to mitigate the devastating effects of the opioid epidemic. Furthermore, the substance-use severity among this sample of women in Central Appalachia who had utilized treatment sheds light on the chronicity of addiction and the ways in which policy and community level interventions are warranted.

Psychological symptoms and treatment utilization. The nonsignificant relationship among psychological symptoms of generalized anxiety, post-traumatic stress,

and depression and treatment utilization is contrary to the body of evidence that suggested depressive and anxiety symptoms are positively linked to entering treatment (Blanco et al., 2013; Chen et al., 2014; Gayman et al., 2013). This discrepancy might be attributed to the added barrier in seeking services with compounding burdens. Although the Health Service Framework (HSF) theoretical model posits that increased symptom severity promotes treatment entry; psychological symptomatology among the women in this study may speak to the added difficulties in accessing appropriate services. The study by Green–Hennessy (2002) noted the lack of appropriate service allocation among those with co-occurring disorders. They found that nearly a third of those with substance dependence were receiving mental health services that do not specifically address addiction. It is important to note that the studies reviewed concerning treatment entry and co-occurring disorders rely on self-report of the type of service received and the outcome measures range in specificity of types of services. The study by Gayman and colleagues (2013) used a report of speaking to a health care provider about their addiction as an indication of treatment, which was vastly different from the outcome measure used in this study, which asks if participants have ever entered a substance-use treatment program. Furthermore, even if the participants indicated utilizing substance-use treatment programs, it does not necessarily mean they were not accessing mental health services.

Enabling and Mediating Factors. The lack of statistically significant relationships in the accessibility dimensions proposed by Penchansky and Thomas (1981) and conceptualized as enabling and mediating factors based on the Leukefeld (1998) model may be explained by the temporal order of variables. Specifically, barriers to

treatment utilization may have changed overtime, which would affect the direct association with the outcome variable of lifetime treatment utilization. The nonsignificant correlations between most of the access dimensions and treatment utilization highlighted the importance of assessing perceptual barriers on actual service entry. Various investigations have uncovered perceived barriers to accessing services among rural substance users (MacMasters, 2013; Sexton et al., 2008; Small, 2010; Staton-Tindall et al., 2015), yet this investigation showed perceived barriers to have no interfering effect on treatment utilization among this sample of substance-using women incarcerated in Central Appalachian jails.

Healthcare service availability has served as an explanation for understanding health disparities in the region. However, based on this investigation there appeared to be more operating on the behavior of actually seeking treatment than perceived barriers to accessing resources. The most commonly cited barrier to accessing treatment was observed in the affordability dimension, as over half reported no insurance and inability to afford medical care (Penchansky & Thomas, 1981); yet the recent initiatives of the Affordable Care Act (ACA; Patient Protection and Affordable Care Act, 42 U.S.C. § 18001, 2010) may have mitigated the negative impact of accessing treatment. Kentucky received national recognition by improving healthcare accessibility to more than a half million Kentuckians who were previously uninsured (Alcalde, 2016). Therefore, the systemic changes of making healthcare more affordable likely will have positive consequences, particularly in the economically disadvantaged region of Central Appalachia.

The inverse relationship found between treatment utilization and the access dimension of not having a way to the provider may be due to the familiarity with navigating this particular type of barrier among the rural women. Furthermore, perceiving transportation as a barrier and overcoming that barrier by entering treatment may speak to the women's ability to rely on family and friends for transportation given the cultural values of familialism. This finding uncovered the importance of assessing the relationship between perceived barriers and treatment utilization.

Number of children and treatment utilization. The positive correlation between number of children and treatment utilization suggests this variable is a notable contribution to the Leukefeld (1998) model. The directionality of the relationship is contrary to the study hypothesis, as there was a positive relationship between number of children and treatment utilization. This finding may be explained by the way in which women are referred to treatment, as women involved with social services are more likely to enter treatment (Hansen et al., 2004; SAMHSA, 2001). Furthermore, the women with more children may be more motivated to enter treatment, as there was a substantial amount of evidence that uncovered women's motivation for recovery is connected to their role as a mother (Hall & Skinner, 2012; Jackson & Shannon, 2012; Jackson & Shannon, 2013). Considering the traditional gender roles among Central Appalachian women as the primary caretaker for children (Keefe, 1988), their desire for connection to their children may have promoted help seeking (Covington, 2002). Among the women who did not enter substance-use treatment, societal expectations of women in the region to be motherly directly conflicted with the negative ideas of drug addicts, which would have interfered with those women seeking help on their own without social service

involvement. Given that women in this study reported having approximately two children with the highest number of children reaching seven, there may have been additional burdens of parental responsibility with the number of children. Therefore, traditional gender roles may have operated in both directions by influencing women with more children to seek or accept treatment and those who did not seek treatment may have been discouraged from admitting they had a problem as a parenting mother. In summary, the additional number of children likely increased the chances for child protective service involvement, and, once their stigmatized addiction was revealed, cultural expectations may have encouraged them to accept treatment. Implications for healthcare providers and community stakeholders to address the gender-sensitive and cultural-driven needs are explored in the later sections in this document.

Study Implications from a Counseling Psychology Perspective

The field of counseling psychology offers a lens to view the complexities of substance use among the disadvantaged and at-risk group of women in Central Appalachia. Counseling psychologists have long been involved in addressing problems from a strength-based and social justice perspective that stresses the importance of prevention and advocacy (Packard, 2009). The distinct field of counseling psychology has woven the practice and study of prevention into its work for over a century (Romano, Koch, & Wong, 2012). Recent changes in the addition of the Special Interest Group of Prevention was incorporated into the American Psychological Association (APA) Division 17 Society of Counseling Psychologists (Romano et al., 2012). The inclusion of the Special Interest Group to the APA speaks to the field of counseling psychology upholding the longstanding core values of prevention, strength-based approaches, and

social justice (Packard, 2009). These core values were solidified into applied practice and research in counseling psychology following the practice guidelines on prevention purposed by Hage et al. (2007). The prevention guidelines by Romano and Hage (2000) provide a framework to conceptualize and address the findings of this investigation. Specifically, the following tenets of prevention will be addressed in the discussion of implications and recommendations from a counseling psychology perspective: preventing problems from ever occurring, particularly among at-risk groups while reducing the impact of existing problems, and promoting public policy and legislative action to enhance wellbeing (Romano & Hage, 2000).

Drug Use Prevention. As discussed earlier in this document, the economic inequality and cultural adaptations among Central Appalachians placed them at greater risk for the development of mental health and substance-use disorders. The prescription drug epidemic was ignited by the intersection of the healthcare system's approach to treating pain and the longstanding social inequalities in the region that predisposed them to mental health and substance-use disorders. Therefore, the root of the problem of unequal access to resources appeared well before the availability of opioids. This is not to suggest that individual factors were not at play in creating the opioid epidemic in the region; as discussed earlier in this document, there were likely two pathways to opioid use in the Central Appalachian region. This interplay between systemic and individual-based determinants of the opioid problem is consistent with the reviewed literature concerning patterns and pathways to substance use along with the relational model (Covington & Surrey, 1997) of substance use and fits within the counseling psychology values of prevention and social justice (Packard, 2009). Therefore, the prescription drug

problem in the Central Appalachian region from a counseling psychology framework is a symptom of the larger underlying problem of social inequality rather than some moral failing or inherent flaw of the people.

Social inequality in the Central Appalachian region has historic roots with the extraction industry that persist still today (Coute, 2002; House, 2017). The disenfranchisement of Appalachians contributes to current socioeconomic inequalities. In the midst of these social inequalities, women often struggle disproportionately to access necessary resources (e.g., education, jobs, healthcare) in a culture that values patriarchy (Fiene, 2002). Becker's (1999) definition of patriarchy holds that men fear loss of power and control, which enables the oppression of others through masculine valued ways of gaining power (e.g., aggression, control, emotionlessness). Based on this definition, it is clear how patriarchy is particularly toxic to oppressed groups, like Appalachians, whose existence has been threatened by powerful industries and social structures that further oppress the people in the region.

Some of the more harmful aspects of patriarchy specific to women in the Central Appalachian region was revealed in a study by Melwald and McCann (2004) who found that women who earned higher educations and worked outside the home were physically abused and threatened by their male partners for attempting to challenge their traditional gender roles. Women being disbarred and discouraged from attaining an education comes at an extreme cost given that education is a known protective factor against the development of substance-use disorders (Hawkins, 1992). Furthermore, the overall structure of patriarchy disarms some of the strengths and assets often attributed to the feminine role (emotional connectedness), which is a central role of healthy development

and one of the main tenants of how substance-use disorders manifest (Covington & Surrey, 1997). The increased substance-use and mental health symptoms of depression, anxiety, and trauma among the women in this study may be explained by the emotional disconnections that are ramped in societies that value patriarchy. Therefore, in order to address the problem of substance use among women in Central Appalachia, the people must overcome the harmful effects of patriarchy and begin to regard women as equally human and valuable.

In summary, prevention strategies that combat economic inequality and health disparities among Central Appalachians would assist in ameliorating the substance-use problem in the region. Prevention is key in addressing the opioid epidemic in the region, but there remains an undeniable substance-use problem among individuals in Central Appalachian that demands the attention and interventions on a community, individual, and policy level.

Reduce the impact of the existing problem. Reducing the impact of opioid use among women in Central Appalachia necessitates systemic interventions in order to improve the lives of those struggling with addiction and ameliorates the negative effects of the epidemic to community members. Considering many counseling psychologists base their work from a scientist practitioner model and adhere to the core values of social justice, the opioid epidemic among central Appalachian women demands counseling psychologists to be at the forefront of increasing access to treatment and deepening the fields understanding of the most effective forms of treatment.

To enact systemic changes, there must be a cultural shift in the way that drug addiction is understood and treated among substance-using women in Central Appalachia. Drug addiction remains a highly stigmatized and rarely understood condition. In order to address the opioid problem in the region, there must be an understanding of addiction as a chronic condition (Dennis & Scott, 2007). The shift away from viewing substance-use disorders as moral failings or a “curable” condition allows for the adaptation of the treatment models in place in the region to better address the serious needs among those struggling with opioid addiction. The harm-reduction model of addressing substance use is outlined as it pertains to the opioid epidemic in the region. Last, gender and culturally sensitive substance-use treatments are discussed to improve the lives of women struggling with opioid addiction in the region.

The harm-reduction model offers an alternative view to addressing the problems associated with substance use, as it seeks to reduce problematic effects of substance-use behaviors (Logan & Marlatt, 2010). Harm-reduction interventions specific to the opioid epidemic include needle-exchange programs, motivational interviewing techniques, acute naltrexone to prevent overdose, safe injection sites, and medication-assisted therapies (MAT) including methadone and buprenorphine, and law enforcement and prosecutor diversion programs (Logan & Marlatt, 2010; White & Kunkel, 2017). Recent evidence reviewed by Logan and Marlatt (2010) revealed the efficacy of harm-reduction initiatives based on individual outcomes and societal impacts. Although discussing the benefits and drawbacks to the specific forms of MAT is beyond the scope of this discussion, a recent reviewed evidence by Volkow and colleagues (2014) revealed the importance of MAT in the treatment of opioid addiction to decrease overdose death rates. Additionally, the

reviewed randomized controlled trials by Connock and colleagues (2007) revealed that MAT were more cost-effective compared with no pharmaceutical intervention and effective at reducing opioid use, HIV risk behaviors, criminal activity, and opioid-related death. However, a complication of treating opioid addiction with MAT in Central Appalachia is the availability of trained providers, insurance coverage, and the negatively held views of treating addiction with replacement drugs (Kosten, 2005).

Perhaps a testament to the changing perceptions from an abstinence-only model to a harm-reduction approach is evidenced by the recent addition of needle exchange programs in the Central Appalachian region with many more county health departments in the area awaiting approval (Estep, 2016). Although Central Appalachia has made some improvements in addressing the opioid epidemic by implementing needle exchanges, there remain ideological conflicts both regionally and nationally (Kosten, 2005) in addressing the opioid epidemic. These ideological conflicts that inform substance-use recovery have implications for the women in the Central Appalachian region with opioid addiction.

This study revealed that prior attendance at a self-help group increased the likelihood of entering substance-use treatment. Self-help groups such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) have long-standing histories in offering support to those struggling with addiction and have shown to be helpful in the lives of Appalachians struggling with addiction (Grant, 2007). However, the AA and NA model of addiction is grounded in gender-biased assumptions (Covington, 2000) and the tenants of recovery conflicts with harm-reduction based models that promote medically assisted therapies (Narcotics Anonymous, 2016). The unintended consequences of

community stakeholders and healthcare professionals referring to AA and NA programs should be a major consideration, particularly in a region where there may not be access to other self-help groups. Informing the community members and women with substance-use disorders about alternatives to the traditional therapies that privilege the male perspective. Specifically, an integrated approach to recovery among women proposed by Covington (2002) recommended the development of all female groups in early stages of recovery.

Lemanski (2000) highlighted the need for self-help alternatives considering the identified bias of AA and NA models. Perhaps adopting a broader range of alternatives to AA and NA groups in the Central Appalachian region would be better suited in addressing the gender-specific needs in the region. Central Appalachia and community stakeholders can get involved with establishing self-help programs in the area that are not grounded in male privileged agendas (e.g., Discovery Empowerment Groups, 1992; Self Management and Recovery Training, 1992). Furthermore, community members and healthcare professionals should fully understand the potential conflicting models of recovery in abstinence-only programs and medically assisted therapies. The NA pamphlet outlined the organization's formal position on medically assisted therapies (2016), as the organization clearly stated that addiction is treated by abstinence, which is contrary to treating addiction through medication-assisted therapy. The pamphlet continued to explain that members seeking help through NA who are participating in MAT will not be excused from the meeting but recognized some meetings required those on MAT to be denied opportunity to share. Undoubtedly, the abstinence-only model of NA has implications on the recovery process among women in the Appalachian region.

Therefore, healthcare professionals and community stakeholders referring women in the region to self-help groups should be aware of the possible conflict of attendance at local NA meetings.

Consistent with the harm-reduction model are initiatives that divert substance users who commit criminal acts from imprisonment and criminal charges in order to assist in their recovery process (White & Kunkel, 2017). Based on the recommendations by Covington (2002), women who are not deemed a security risk should be considered for community-based sanctions that have shown economic benefits to the larger society and individual gains in the lives of the women. Gender-specific considerations are necessary in the treatment of substance-using women involved with the criminal justice system. Gender-specific programs focus on the multidimensionality of women with addiction, thus providing attention to parenting, economic survival, trauma counseling, and safety (Covington, 2000). Interventions at the time of entry into the jail, targeted therapies during time of incarceration, and transition to aftercare programs in the community are essential at combating the devastating effects of opioid addiction in the Central Appalachian region.

Reviewed literature by Chandler (2009) outlines two decades of research that point to the benefits of offering substance-use treatment within the criminal justice system. These interventions include therapeutic alternatives to incarceration, drug courts, prison-and jail-based treatments, and reentry programs that seek to assist with the transition of offenders into the community. Longitudinal studies point to the need for correction-based interventions and community aftercare, as the interventions show reduction in recidivism (Grella & Rodriguez, 2011). The criminal justice system,

including jails, could act as a conduit to substance-use treatment services within the correctional system as well as community aftercare programs. Furthermore, assessing the individual needs of criminal offenders in order to tailor treatment plans would be consistent with the *Principles of Drug Abuse Treatment for Criminal Justice Populations* published by NIDA (Fletcher & Chandler, 2006).

Considering the increased treatment needs among the women in this study, along with the lack of accessing necessary treatment in the community, mandated treatment at the time of sentencing may offer the women an opportunity to engage in a service that was previously inaccessible. Other studies by Staton-Tindall and colleagues (2001) showed women involved in the criminal justice system reported that mandated treatment was more accessible than seeking treatment on their own. Furthermore, investigations by Burke and Gregoire (2007) have revealed mandated treatment by the criminal justice system have better outcomes than those who were not mandated to treatment. Specifically, the authors found individuals who were mandated to treatment by the criminal justice system were more likely to abstain from substance-use six months after their initial treatment episode. The jail setting offers a unique point of intervention in the lives of substance-using women who have complex treatment needs. Unlike prisons, jails have high turnover rates with individuals serving short sentences. Incarceration among Central Appalachian women may provide an opportunity for them to engage in treatment in a way that may not be possible in the community. Considering the prevailing knowledge that relationships with family members, sexual partners, and children are central concerns to recovery in women; jails are a place where women may be more removed from those relationships that could negatively impact recovery. Specifically,

being in jail may limit the contact with drug using partners or family members. An investigation by Riehm, Hser, and Zeller (2000) concluded that women's motivation to engage in substance-use treatment was contingent on the substance-using status of their partner, as those with partners who did not use drugs had higher motivation for treatment and those whose partners used drugs had lower motivation. Furthermore, at a time where outside motivation to stop using drugs may be high, motivational interviewing has shown increased substance-use treatment entry and improved retention rates and decreased rates of recidivism (McMurran, 2009). These factors make the jail setting an ideal point of treatment intervention.

In addition to implementing harm-reduction strategies that promote congruent treatment recovery, there are specific gender and culturally sensitive substance-use treatments that are essential to address the opioid problem among women in the Central Appalachian region. Considering the women in this investigation had significant substance-use profiles with increased mental health needs, and below poverty incomes, there must be a treatment infrastructure that addresses these needs. Gender responsive treatments were outlined by Bloom, Owen, and Covington (2003) as the following: (a) acknowledge that one's gender makes a difference; (b) creates a safe, respectful, and dignified environment; (c) produce policies and practices based on relationships and promote healthy connections to children, family, significant others, and the community; (d) address substance use, trauma, and mental health concerns through comprehensive, integrated, and culturally relevant services; (e) provide women with opportunities to improve their socioeconomic status; (f) establish a system of comprehensive and collaborative community services.

Existent literature provides support for incorporating these gender responsive aspects into substance-use treatment models (Greenfield et al., 2007; Grella & Rodriguez, 2011; Kissen, Tang, Campbell, Claus, & Orwin, 2014; Prendergast et al., 2011). In a study that compared gender responsive treatments to programs that were deemed less gender responsive found that women in gender responsive programs had lower drug-related arrests than women in less gender responsive programs, and overall reduction in arrests were observed for two years following gender responsive treatment, regardless if the arrest was related to drugs or not (Kissen et al., 2014). Reviewed evidence by Greenfield and colleagues (2007) investigated substance-use treatment entry, retention, and outcomes of women and concluded services that address the gender specific concerns such as financial problems and childcare to improved treatment outcomes. A recent investigation by Prendergast and colleagues (2011) compared mixed gender responsive substance-use programs to women-only programs, which revealed women-only programs are significantly more effective at improving substance-use outcomes and reducing criminal activity compared with mixed gender programs, yet there was no difference in the programs at offsetting arrests or increasing employment.

Although there appears to be substantial individual and societal gains for adopting gender responsive services, there are few gender responsive programs that incorporate all the aspects of GR services and even fewer programs that address parenting-related concerns (Grella, 2008). Specific investigations by Brown, Vartivarian, and Alderks (2011), who assessed childcare services, found that less than 8% of outpatient substance-abuse treatment facilities nationwide offered childcare. Given that the women in this investigation were more likely to have sought services if they had more children, the lack

of childcare within outpatient treatment facilities likely impedes a woman's ability to adequately consume services. Additionally, incorporating gender-responsive treatment into the models that serve women from the Central Appalachian region seems most suitable to the needs expressed in this investigation (e.g., symptoms of depression, trauma, low income, children), as gender responsive treatment would address the contextual realities of women and their distinct ways of presenting and progressing through substance-use recovery.

Promote public policy to enhance well-being. In order to address the opioid epidemic in the region of Central Appalachia, there must be public policy initiatives that acknowledge and address the problem in a thoughtful way. Public policy initiatives to decrease the stigma of substance use and treatment have shown promise. Furthermore, legislative action is imperative given the current changes to the healthcare landscape in the region. Public policy and legislative action may assist in ameliorating the problem with opioid addiction in the Central Appalachian region.

The negative representation of the opioid epidemic by local and national media propagates the pejorative views of Appalachians, which is harmful to the overall wellness of the people in the region. Various media releases over the past decade often displayed negative portrayals of those who struggle with opioid addiction in Central Appalachia, as seen in the article by Lowrey (2014) entitled "What's the matter with Eastern Kentucky" or the commonly referenced headline of "hillbilly heroin," as seen in the article by Borger (2001). This negative representation of Appalachians who struggle with addiction likely contributes to internalized stereotypes among Appalachians and fuels pejorative

views of Appalachians among non-Appalachians. These internalized stereotypes may have a detrimental impact on substance-using Appalachians seeking treatment.

Highlighting the epidemic in the region is necessary to promote action, yet investigations concerning the reduction of stigma clearly suggest specific ways of representing the substance-use problem. Reviewed literature by Livingston, Milne, Fang, and Amari (2011) discussed promising outcomes at reducing the social stigma of addiction by communicating positive stories of people with substance-use disorders and changing social stigma at the structural level by intervening with education campaigns targeting health professions (McGinty, Goldman, Pescosolido, & Barry, 2015). Representing those further along in the addiction recovery process as a way to combat negative stereotypes was effective with individuals battling heroin addiction in a randomized national sample conducted by McGinty, Goldman, Pescosolido, and Barry, (2015). Campaigns that address individual self-stigma and social stigma would be key in breaking down barriers to seeking treatment among women in the region. Furthermore, stigma-reducing campaigns also may assist in garnering support for legislative action to address the problem in the region in order to fund prevention and treatment strategies in the region.

Intervention strategies on a policy level have shown promise in addressing health disparities among Appalachians. The Affordable Care Act increased the coverage of mental health and substance-use disorders, as insurance plans must offer the same level of benefits provided for general medical conditions (Volkow et al., 2014). Considering that over half of the women in the study reported affordability as a major detriment to seeking services, the changing healthcare landscape has significant effects on the lives of

those in the region. The recent political threats of dismantling the healthcare benefits would disproportionately threaten needed healthcare coverage among Central Appalachians struggling with addiction. Systemic-level changes in the allocation of specific treatment resources may be necessary. Over a quarter of the women in this study reported the right kind of service was unavailable as a barrier to seeking treatment. The need for increased allocation of specific treatment resources in the region is evidenced by previous studies by Zhang and colleagues (2008) who showed that the Central Appalachian region lacks inpatient substance-use facilities compared with non-Appalachian areas.

There are additional considerations of treatment matching the individual needs of women in the region. First, there must be allocation of funds at the federal and state level for gender-sensitive and culturally appropriate programs that adhere to these treatment considerations. Second, funding specific programs that address opioid addiction from evidenced-based approaches and those that adhere to the harm reduction model, which may augment negative consequences of the opioid epidemic (e.g., needle exchange, use of naltrexone, diversion programs). Third, educational institutions should incorporate competencies for treating pain (medical schools), providing culturally appropriate care to Appalachians (medical schools, mental health programs), and deliver proper education concerning prescription drugs (pharmacy schools).

Limitations

This study has notable limitations, including the cross-sectional design, as causal inferences cannot be extrapolated from the current data. Another limitation is self-reporting on sensitive questions concerning risky sexual behaviors and drug use. Given

the sensitive nature of the questions being asked within a correctional setting, the self-reported responses may be influenced by social desirability and response bias. The responses may be influenced by a perceived threat to confidentiality given the setting of the interview in the local jails where the women were housed. Furthermore, the definition of substance-use treatment utilization confined to a dichotomous measure suggested the results may lack construct validity, as there was no confirmation from the programs about the specific services offered or the quality of the programs. Further limitations were the potential temporal effects in the data, as the time women entered treatment relative to their incarceration date may have influenced the lack of significant correlations (access dimensions and psychological symptoms on treatment utilization) and the strength of the associations (income, number of children). Another limitation of this study was the use of the Relational Model (Covington & Surrey, 1997) as a conceptual construct only rather than assess the variables that test the mechanism of disruptive relationships on substance use among women from central Appalachia.

Other notable limitation were the small effect sizes, lack of variability observed in the measures of substance use problems and the measures of mental health symptoms, and the intercorrelations between generalized anxiety disorder symptoms and major depressive symptoms. The small effect sizes may be explained by the complications with the lack of normality, negative skew, and kurtosis of the substance problem scores, major depressive symptoms, generalized anxiety disorder symptoms, and the posttraumatic stress symptoms may have weakened the detectability of differences among the sample. However, it is important to note that the diagnosis of generalized anxiety disorder and major depressive disorder have known overlapping symptom criteria. Generalized

anxiety disorder and major depressive disorder are generally viewed as overlapping disorders and some suggest the disorders are almost indistinguishable (Seltzer, 210). To further highlight the continued complications with disentangling depressive symptoms from anxiety symptoms field studies that informed the most recent version of the DSM-5 found a single diagnosis of one disorder to be the rare as most commonly diagnosed psychiatric conditions showed comorbidity and the test-retest reliability for generalized anxiety disorder and major depressive disorder were questionable (Regier et al., 2013). The comorbidity of anxiety and depression has been a longstanding problem among those on the forefront of scale development. Specifically, Dohrenwend (1990) reflected on his difficulties creating discriminating subscales for anxiety and depression and he suggested the existence of one underlying nonspecific distress termed demoralization. Although discussing the potential underlying factor is beyond the scope of this study, it is important to note the difficulties with intercorrelation between anxiety and depression is not specific to this study alone. Therefore, the longstanding debate of categorical measurements of major depressive disorder and generalized anxiety disorder necessitates further study among those who create the diagnostic criteria for psychiatric disorders and those are tasked with developing and testing measures that discriminate between the two disorders.

Although a limitation of the study is the lack of generalizing the results to dissimilar population, the purpose of the study was to understand treatment needs and treatment utilization among an underserved and at-risk group of substance-using women involved in the criminal justice system in Central Appalachia. Therefore, caution is

advised in generalizing the results from this investigation to men, those with no criminal justice involvement, or those who are from outside of the central Appalachian region.

Despite the study limitations, the value of the results offers a unique contribution to the existing literature. This investigation adds to the dearth of literature that seeks to illuminate treatment needs and determinants of treatment utilization among an at-risk group of Central Appalachian women who are involved with the criminal justice system. To date, this study is the only quantitative investigation of substance use treatment utilization among central Appalachian women who are not actively engaged in treatment. Additionally, this study deepens the understanding of the treatment needs among women with criminal justice involvement in the region, particularly in the wake of the opioid epidemic and the increasingly devastating health consequences.

Future Directions

Replication studies with community samples of central Appalachians would further contribute to the lack of empirical inquiry into the ways that individuals from the region utilize substance use services in the wake of the opioid epidemic and the recent healthcare changes that both disproportionately effect central Appalachians. Existent literature suggests that those incarcerated in jails have the highest rate of mental health symptoms compared to state and federal prisons (James & Glaze, 2006). Additionally, co-occurring mental health and substance use disorders have been found to increase the likelihood of treatment utilization among community samples (Blanco et al., 2013; Gayman et al., 2011). Therefore, future research using community samples may find less severe clinical profiles, which may negatively impact treatment seeking.

Future studies could build on this investigation of treatment utilization among women from the central Appalachian region by using a theoretical model of treatment utilization that may be better suited to addressing the contextual realities of the women from the region. Specifically, future research could use the Behavioral Model for Vulnerable Populations (BMVP) to conceptualize treatment utilization among central Appalachian women with criminal justice involvement, which is an extension of the original Behavioral Model by Anderson and Newman (1973) that informed the adapted Leukfeld (1998) model for this investigation. The Behavioral Model for Vulnerable Populations has been found to be particularly useful in predicting treatment entry among marginalized groups with increased risks (Oser, Bunting, Pullen, & Stevens-Watkins, 2006). Future studies could incorporate aspects of the Behavioral Model for Vulnerable Populations to understand the impact of cultural and societal factors on treatment entry by examining the role of societal support, public benefits, coping skills, victimization, religiosity, and social stigma. Social stigma has been found to negatively impact treatment-seeking behaviors among women (Ramlow, White, Watson, & Leukefeld, 1997), particularly those involved in the criminal justice system (Olphen, Eliason, Freudenberg, & Barnes, 2009; Staton et al., 2001). Furthermore, cultural components of stigmatization may be more significant for Appalachians, as stigma often extends to family members of the substance user (Sexton et al., 2008). Given that many Appalachians find positive ways of coping through family, the fear of disclosing drug use carries severe negative consequences beyond that of personal shame (Hall & Skinner, 2012). Therefore, the social stigma of drug addicted rural Appalachian women with criminal histories likely contributes to the reluctance of substance-use service utilization.

Future research may explain the directionality of the relationships found in this study regarding substance use and psychological symptoms. To date, there are limited studies that investigate the temporal order of psychological disorders and co-occurring substance-use disorders. However, the accumulated evidence (Greenfield, 2010; Tuchman, 2010) suggested that the utility of proper diagnosis and onset of symptomatology are essential to provide proper interventions. Additionally, future empirical inquiry could specifically incorporate relational measures to assess the impact of substance use behavior and treatment seeking, particularly among women from central Appalachia. Although this investigation used the Relational Model (Covington & Surrey, 1997) as a theoretical foundation for explaining substance among women from central Appalachia, future studies could test the impact of traumatic life events, disruptive relationships, and parenting relationships on substance use problems and treatment utilization. Specific measures that could be incorporated into future research may be drawn from the Relational Model to assess disruptive relationships (e.g., Experiences in Close Relationships-Revised (ECR-R) Questionnaire: Fraley, Waller, and Brennan 2000; Relationship Event Scale (RES): King & Christensen, 1983; The PTSD Checklist (PCL-C): Weathers, Litz, Herman, Huska, & Keane, 1993) and the status of the parenting relationship (e.g., Parenting Relationship Questionnaire (PRQ): Kamphaus & Reynolds, 2006).

Conclusion

This study revealed substance-use severity, mental health symptoms, and factors impacting treatment utilization among a group of disadvantaged women in Central Appalachia, which has historically been underrepresented in the literature and

underserved in terms of health services. These findings contribute to the existing exploratory findings that suggested substance use among women in Central Appalachia is a growing epidemic (Havens et al., 2007; Zhang et al., 2008) and particularly concerning given barriers to accessing effective resources. The study provided a unique perspective for understanding substance-use treatment utilization among disadvantaged women given the grounding theoretical framework of the relational model of substance use (Covington & Surrey, 1997), the treatment utilization framework by Leukefeld (1998), and access dimensions of treatment utilization by Pechansky and Thomas (1981). This study made a contribution to the existing literature concerning substance use among women in Central Appalachia by investigating their needs and individual determinants of treatment utilization.

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PROFESSION PUBLICATIONS AND PRESENTATIONS

- Glover, R. L.**, Stevens-Watkins, D., Staton-Tindall, M. (2015, October). *Substance Abuse Treatment Utilization among Women in Appalachian Jails*. Addiction Health Services Research Conference, Marina del Rey, CA.

Rosenkrantz, D., Abreu, R., Vasilj, I., Farook, M., Jordan, C., & **Glover, R. L.** (2015, August). *Social Justice Training in the Literature: Moving Forward*. Poster presented at the American Psychological Association Convention, Toronto, Canada.

Reese, R., Cunningham, L., Flora, K., & **Glover, R.L.** (2011, August). *Technology-Based Assessment in Sport Psychology-Ethical and Practice Considerations*. Symposium Speaker at the American Psychological Association Convention, Washington, DC