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Justice Involvement and Stress in U.S. Adult Women

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JUSTICE INVOLVEMENT AND STRESS IN U.S. ADULT WOMEN

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Background: The number of women in the justice system has risen at nearly double the rate of men in the last 40 years. The purpose of the current study is to better understand the stress of women involved in the criminal justice system, and how stress relates to the types of justice involvement.

Aims: This study examined the National Survey on Drug Use and Health data from years 2014-2016 and the impact of justice involvement on the primary outcome of stress, defined as psychological distress and functional impairment, for women (N = 68,567) engaged in various types of justice involvement (no current involvement, lifetime arrest, arrested in the past 12 months, and community supervision).

Methods: Using weighted, cross-sectional data, multiple regression analyses were conducted to estimate the effect of type of justice involvement on psychological distress and functional impairment scores for U.S. adult women. Predictor variables (major depression, alcohol abuse, overall health, and insured status) and control variables (age, race, education, family income, and marital status) were included in the regression models. Thirty-two separate regressions were run.

Results: Results show differences in psychological distress (PD) and functional impairment scores (FIS) among non-justice involved women and justice involved women; PD and FIS are greatest among women who are currently involved in the justice system. The greatest predictors of PD and FIS are past 12-month depression and poor overall health.

Conclusion: Results from this study support the conclusion that justice involvement is a stressor for women in the U.S. Findings from this study can be used to support the implementation of interventions for women who have current contact with the justice system to reduce stressors and improve health outcomes.

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INTRODUCTION

In the United States, at the end of 2016, over 6.6 million people were under criminal justice system supervision including incarceration, probation, and parole (Kaeble & Cowhig, 2018). This number of over 6.6 million people does not include people who were arrested, booked into jail, and released, or who entered/exited justice supervision throughout the year. The number of women involved in the criminal justice system has risen dramatically since 1990 from approximately 600,000 (Bloom, 2003), to over 1.3 million at the end of 2017 (The Sentencing Project, 2019), increasing at nearly double the rate of men since 1980 (Kajstura, 2018).

Not only are their numbers of justice involvement growing at a greater rate than that of men, but women's criminal justice experience is different from that of men (Rivera & Veysey, 2015). Similar to men in the justice system, women in the justice system are more likely to be minority (Wildeman & Wang, 2017), impoverished (Lorvick, Comfort, Krebs, & Kral, 2015), of lower educational and occupational attainment (Tyler & Brockmann, 2017), victims of childhood abuse (P. J. Kelly, Cheng, Spencer-Carver, & Ramaswamy, 2014), report drug and alcohol abuse (Lynch & Heath, 2017), and have untreated mental illness (Ponce, Lawless, & Rowe, 2014). However, unlike men, women are more likely the head of household for minor children (Fletcher, 2014), and have reproductive health needs that the justice system struggles to meet (Laufer, 2019). In 2017, there were 8,500 women in federal prison, 27,500 women in state prison, and 27,000 women in local jails on drug charges (63% of whom have not been convicted) (Kajstura, 2018). As of 2018, there were over one million women on probation or parole (Kajstura, 2018).

Even though women involved with the justice system has substantially increased, there is little research examining the differences between how men and women may process this type of stress. However, longstanding research about differences in stress according to sex suggest that men more commonly use problem-focused coping strategies, which are positively correlated with higher levels of self-esteem and mastery that reduce the impact of stress (Street & Dardis, 2018). Women, however, more frequently use emotion-focused problem-solving strategies which are positively correlated with higher distress (Street & Dardis, 2018). Additionally, women who are involved in the justice system experience feelings of stigma and shame (Tyler & Brockmann, 2017), which are intensified due to gender norms (Street & Dardis, 2018), often amplifying stress associated with justice involvement. Further, women are more likely to be victims of intimate partner violence, sexual assault, and childhood sexual abuse which are linked to posttraumatic stress disorder (PTSD) and other mental health symptomatology (Street & Dardis, 2018). The purpose of the current study is to better understand the stress of women who are involved in the criminal justice system. Additionally, the current study seeks to understand whether psychological distress and functional impairment vary as a function of type of involvement in the criminal justice system.

Like men, women can be engaged in various types of involvement in the criminal justice system. These types of involvement in the criminal justice system range from not being involved to arrest, to jail, to spending time in prison and returning to the community under probation or parole (Potter, 2018). Differential involvement in the justice system may have several possible associations with indicators of stress, psychological distress, and daily functioning. For example, persons with existing mental health problems are more likely to recidivate (Barnett & Fitzalan Howard, 2018), or reoffend. Prior research reveals that individuals on probation were more likely

to reoffend if they had a preexisting mental health condition (Castillo & Alarid, 2011), especially if they reported having a problem with alcohol use. Additionally, individuals with high scores for impaired daily functioning have elevated risks for recidivism (Maurer, 2018). Alternatively, with justice involvement come opportunities for treatment that could mitigate mental health conditions, especially for persons on community supervision (probation) who may have the assistance of a probation officer which may alleviate mental health problems (Epperson, Thompson, Lurigio, & Kim, 2017).

Justice involvement may dramatically increase stress, and the risk for poor mental health outcomes. According to the Stress Process Model and stress proliferation, exposure to stressors such as justice involvement may lead to additional stressors (Pearlin, 2010). For example, an arrest and detention for a misdemeanor may disrupt daily life, but a conviction on a felony can create more stress because it creates the likelihood of a prison sentence. This stress has far-reaching effects; criminal justice involvement may relate to chronic stress in women through a process known as stress proliferation where exposure to one stressor creates additional stressors (Leonard, Carol, & Allen, 1997).

In previous research, it has been shown that women who have experienced arrest report higher psychological distress (4.61 times) than those who have never been arrested (Nowotny, Kuptsevych-Timmer, & Oser, 2019). However, beyond arrest, the other types of involvement in the justice system have not been examined. In one study, psychological distress has been linked to elevated substance use in probationers (Golder, Engstrom, Hall, Higgins, & Logan, 2015). It is still unclear how justice system involvement as a stressor is associated with psychological distress and functional impairment among women.

The emergence and presentation of stress may look different with different types of criminal justice involvement. Upon arrest, women may lack childcare and temporarily lose custody of their children, even without any filed charges. Women who plead guilty to a felony may be barred from receiving public assistance and employment opportunities may diminish (Uggen & Celrath, 2014). During probation, women face the stigma associated with having a criminal record or may risk losing custody of their children as a result (Uggen & Stewart, 2015), even if the charges are unrelated to their ability to parent. During parole, women face unique stressors rejoining the community and regaining their identity since incarceration is not consistent with femininity (Tyler & Brockmann, 2017). Additionally, women tend to rely heavily on social services when they return to the community and yet they are under elevated scrutiny and surveillance (Fedock et al., 2018). Over 85% of women under community supervision earn less than $10,000 annually (Fedock et al., 2018).

Justice involvement may be a stressor that becomes chronic. That is, extended involvement with the criminal justice system is hypothesized to be related to chronic stress (Patnaik, 2014). According to the American Psychological Association, chronic stress is stress that is constant and persists over a period of time (Alvord, 2019). Women who suffer from chronic stress have elevated risks of chronic illness (Raposa, Hammen, Brennan, O'Callaghan, & Najman, 2014). Chronic stress can ultimately increase psychological distress, or unpleasant feelings or emotions, and difficulty in daily functioning due to excessive burdens being placed on an individual’s adaptive capacity. It is, thus, imperative to identify and better understand what can exacerbate chronic stress for justice-involved women to reduce long-term negative outcomes for this population.

This study aims to examine the relationship between involvement in the criminal justice system and stress in women, as measured by psychological distress and daily functioning. Further, the current study aims to examine whether psychological distress and functional impairment vary as a function of type of involvement in the criminal justice system. Through cross-sectional data obtained from the National Survey of Drug Use and Health (NSDUH), for years 2014 – 2016, mental health and functional outcomes can be compared across four categories (no justice involvement, ever arrested, arrested current, and community supervision), of women representing differential types of involvement with the justice system. Results from this study may be used to inform intervention programs in support of women involved in the criminal justice system and in re-entry programs to reduce health disparities and improve mental health outcomes. Specifically, this study aims to answer the following:

1. Using the NSDUH (2014 through 2016), among women 18 and over in the U.S., does the prevalence of psychological distress (as measured by the Kessler Psychological Distress Scale (K6)) differ by type of criminal justice involvement categorized by type as no CJI, ever arrested, arrested current, and community supervision?
2. Using the NSDUH (2014 through 2016), among women 18 and over in the U.S., does the functional impairment score (as measured by the World Health Organization Disability Assessment Schedule (WHODAS)) differ by type of criminal justice involvement categorized by stage as no CJI, ever arrested, arrested current, and community supervision?

Statement of Purpose

The purpose of this research is to examine whether psychological distress and functional impairment vary as a function of type of involvement in the criminal justice system among adult women in the United States using the Stress Process Model. Specifically, this study will examine the National Survey on Drug Use and Health data from years 2014-2016 and the impact of justice involvement on mental health for women in the justice system to include no involvement, lifetime arrest, arrested in the past 12 months, and community supervision. Results from this research may serve as guidance and support for policy makers and advocates who seek to reduce health disparities for women in the justice system.

Literature Review

Definition of Stress

Stress is an individual's perceived inability to meet the demands of a given situation. It is accompanied by cognitive, biochemical, physiological, and behavioral changes directed at either changing or adapting to the given situation (Patnaik, 2014). Stress is a difficult concept to measure but there are multiple ways to accomplish this task (Figueroa-Fankhanel, 2014). Stress as an outcome variable has most commonly been assessed through self-report scales, though more recently biomarkers, such as cortisol, have been increasingly used as a benchmark.

Stress can be considered either acute or chronic, depending on the duration of the stressor. Chronic stress has been shown to negatively impact both mental and physical health. Chronic stress is related to generalized anxiety disorder (Michelle & Sanjay, 2017), major depressive disorder (Agius & Goh, 2010), psychosis (van Winkel, Stefanis, & Myin-Germeys, 2008), and addiction (Sinha et al., 2011). Chronic stress is also related to cardiovascular disease, elevated blood pressure and biological dysregulation or allostatic load (Sgoifo et al., 2017). Though there is no precise, predetermined length of time for a stressor, or a process in which "the environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place persons at risk for disease (Gordon, Kessler, & Cohen, 1997)" to be considered chronic;, A single event in far less than a month could induce chronic stress. (Gordon et al., 1997).

Chronic stress negatively impacts the individual. For example, chronic stress negatively impacts executive functioning (Girotti et al., 2017). This impact on executive functioning

ultimately compromises adaptive behaviors (Girotti et al., 2017). In a study that tested the direct and indirect effects of ongoing health, chronic stress, health-related chronic stress, and depressive symptoms at age 20 on the link between health problems in childhood and young adulthood, results showed significant specific indirect effects of health-related chronic stress and depressive symptoms in maintaining health problems from childhood into young adulthood (Dalton, Hammen, Brennan, & Najman, 2016). Chronic stress negatively impacts adaptive behaviors that relate to physical and mental health outcomes for life.

In accordance with the Stress Process Model, life circumstances are associated with chronic stress. Poverty is a well-established environmental stressor that contributes to chronic stress (Oliveira et al., 2016). Financially disadvantaged individuals are more severely impacted and significantly distressed when they experience life stressors, according to the existing body of research (Chen & Matthews, 2001; Cohen, Doyle, & Baum, 2006). Additionally, single, (Horwitz, White, & Howell-White, 1996), minority, women (Collins et al., 1998; Kessler & McRae, 1981) experience life stressors and the distress that follows more significantly than wealthy, white, males do. Environmental and social stressors may compound to contribute to chronic stress.

Further research has demonstrated there may be protective factors in the stress process. In a longitudinal study that examined the combined effects of task persistence and negative emotionality on allostatic load (a physiological indicator of chronic stress), persistence protected against high allostatic load in the context of having a high negative emotionality. However, having a low negative emotionality, high persistence was associated to high stress (Doan, Dich, & Evans, 2016).

Risk Factors of Stress

There are various risk factors associated to stress. Specifically, for women who are involved in the justice system, this includes additional health concerns due to lack of gender responsive healthcare (Andrea Knittel, Angeline Ti, Sarah Schear, & Megan Comfort, 2017). Research has shown that women in the justice system encounter barriers to reproductive healthcare due to a lack of access to services, include routine screening, menstruation-related concerns, prenatal and postpartum care, contraception and abortion, and sexually transmitted infections (Knittel et al., 2017). This is vital to address given that majority of women involved in the criminal justice system are at their peak reproductive age (between 18-44) and are at high risk of unintended pregnancy (Laufer, 2019), with over 80% of incarcerated women reporting an unplanned pregnancy in their lifetime (Walsh, 2016), and approximately 1400 infants born in custody every year (Laufer, 2019). As such, leaving these risk factors unaddressed could lead to worsened outcomes due to increased stress.

An additional risk factor for women in the justice system that may increase stress is the barrier to public assistance. Women who are convicted of a felony can become ineligible for public assistance such as TANF, housing and employment aid. Currently, six states including Wyoming, Mississippi, West Virginia, Alaska, South Carolina, and Georgia have a ban on allowing food stamps for convicted felons with drug related charges. There are 13 states that still have a full ban on drug felons receiving Temporary Assistance to Needy Families (TANF), more popularly known as welfare, while twenty-three states still have a partial ban on these benefits. This may hinder women's ability to support themselves and find stable housing, causing preventative care and routine screenings to remain low on their list of priorities (Sheely & Kneipp, 2015). These challenges may contribute to increasing stress in their lives.

When basic needs are not met, stress is likely to increase. To illustrate this, according to a recent study of probationers in Rhode Island, the most reported needs in order or importance were substance use recovery, employment, housing, and food intake while the participants ranked healthcare last, citing lack of insurance as the primary barrier to accessing care (Kimberly, Aviva, Alice, Curt, & Thomas, 2018). This research highlights the potential impact of justice involvement on stress for women as they are under community supervision. The focus appears to be on meeting daily needs such as housing, food and employment, and medical needs go unmet. This daily struggle may lead to poor health outcomes which is likely to increase stress.

Women involved in the criminal justice system report higher than average rates of serious mental illness. Research has also shown that women on probation report higher than average levels of trauma and unmet mental health needs. According to a study of probationers and parolees and health seeking behaviors, the major complaints were depression, anxiety and substance use and the barriers to seeking help were not having health insurance and being unable to afford treatment (Owens, Rogers, & Whitesell, 2011). A study examining brain serum concentration among incarcerated women found early trauma and mental disorders are highly prevalent among female inmates (Dotta-Panichi et al., 2015). In another comprehensive review of 62 surveys across twelve countries, it was determined that roughly one in five female inmates suffer from antisocial personality disorder and 12% of female inmates suffer from major depressive disorder (Fazel & Danesh, 2002). This body of literature underscores the need for mental health services for both incarcerated and probated women. This is vital to address given that heightened levels of mental illness are also linked to functional impairment, impacting quality of life (Calderón-Larrañaga et al., 2019; McCaslin et al., 2016).

Due to histories of trauma, substance abuse and intimate partner violence, incarcerated women have higher incidences of HIV, cervical cancer, hepatitis and diabetes (Laufer, 2019). These medical conditions create medical complications so pregnancies are often considered high risk for incarcerated women (Parker, 2004). Due to the impoverished community in women's prisons, during a period of incarceration may be the first and only opportunity an incarcerated women has to receive gynecological treatment and education about reproductive healthcare (Walsh, 2016).

An additional health concern for women in the justice system is the lack of follow-up with routine screenings and care for abnormal pap smears. The rate of cervical cancer, the result of a sexually transmitted infection (Human Papillomavirus or HPV), is four-five times greater among justice involved women in the U.S. than non-justice involved women (P. k. u. e. Kelly, Hunter, Daily, & Ramaswamy, 2017). HPV is a prerequisite for nearly all cases of cervical cancer causing 530,000 cases worldwide, and 275,000 mortalities every year (Pourmohsen, Simbar, Nahidi, Fakor, & Majd, 2018). In studies that examine the follow-up for abnormal pap tests among women in jails and prisons, it was discovered that less than half of the women who receive abnormal results gain follow-up appointments (Kelly et al., 2017). Some of the reasons cited for lack of follow-up included unstable lives, competing demands, and lack of money needed for survival (P. k. u. e. Kelly et al., 2017). Poor overall physical health may reduce the ability to manage stress. This is an additional concern for women involved in the justice system and their health outcomes, as well as levels of stress. This body of literature further outlines the risk factors related to stress among women involved in the justice system.

Indicators of Stress: Psychological Distress and Functional Impairment

There are various indicators of stress found in present literature. Among these, common indicators of stress are psychological distress and functional impairment (Castillo & Alarid, 2011). Research has shown that 33% of individuals in the United States report experiencing extreme stress resulting in impairment in daily functioning (physical), and distress symptoms (psychological) (Vechiu & O'Donohue, 2018). These factors are vital to explore further given that individuals with elevated levels of psychological distress and functional impairment may be at higher risks for stress related illness such as depression.

Psychological Distress (PD)

Psychological distress is a term used to describe the general feelings of anxiety, distress, depressive symptoms, perceived stress, and worthlessness (Yamada & Ohayashi, 2012). An individual with psychological distress is often distraught with feelings of sadness and hopelessness (Gebre & Taylor, 2017 (Kessler et al., 2003). Psychological distress is important to address given that it has been associated with many negative health conditions and habits including elevated tobacco use (Hobkirk, Krebs, & Muscat, 2018; Hrywna, Manderski, & Delnevo, 2014; Marko, Linder, Tullar, Reynolds, & Estes, 2015; Weinberger et al., 2019), increased alcohol and/or substance use (Lee & Hines, 2014; Nordfjærn, Hole, & Rundmo, 2010; Weinberger et al., 2019), depression and anxiety (Glasheen, Colpe, Hoffman, & Warren, 2015; Lee & Hines, 2014). These findings further suggest the need to mitigate psychological distress among vulnerable populations.

Research indicates that the Kessler Psychological Distress Scale is a valid psychometric measure for assessing distress. The Kessler Psychological Distress Scale is a self-report measure of depression and anxiety frequently used as a proxy measure for stress. A multitude of studies

have used the Kessler-developed measure for psychological distress, noting similar results regarding differences of psychological distress levels among women and men. These studies reported that psychological distress is higher among women than men, even when considering potential gender differences in expressing distress (Bhattacharyya et al., 2014; Jabbour et al., 2018; Masood, Masud, & Mazahir, 2016; St-Pierre, Sinclair, Elgbeili, Bernard, & Dancause, 2019; Zhang, Zhang, Zhang, Zhang, & Feng, 2018). A study of the K6, an abbreviated version of the full Kessler scale, demonstrated construct validity of psychological distress across gender across the lifespan over a 12-year period suggesting higher mean levels of distress expressed by women are true differences by gender (Drapeau et al., 2010). Women report elevated psychological distress, or negative stress, in other areas as reported by the literature. For example, in a study of gender differences and psychological distress among burn victims in Pakistan, women report higher levels of psychological distress when they suffer severe burns (Masood et al., 2016). This study suggested men and women experience stress differently when under extreme distress. The reasons for this psychological distress, in part, were due to stigma and shame. The K6 is shown to assess psychological distress (PD) in women and is used by the NSDUH as the measure for PD in this study.

According to a recent analysis of the K6, an abbreviated version of the full Kessler Psychological Distress Scale, researchers can confidently use the K6 to screen for psychological distress symptoms within the emerging adult population (Bessaha, 2017), as it demonstrated good fit, with significant loadings on each factor for one-factor, two-factor depression and anxiety and second-order two-factor psychological distress by depression and anxiety (Bessaha, 2017). Distress is the negative form of stress.

Importantly, The K6 has been validated to use with women in a criminal justice setting. In a study of 515 women in a large Midwestern jail, the concurrent validity of the K6 was assessed. The K6 found 36% of the women had a serious mental illness, which was in concordance with the other measures used which included the Referral Decision Scale (RDS) most commonly used with men, and the Brief Jail Mental Health Screen (BJMHS) (Kubiak, Beeble, & Bybee, 2009). The K6 is used to measure psychological distress in this study.

Though psychological distress may be higher among women, there is research to support potential moderators in the relation of psychological distress and negative health outcomes for women. In a study that examined gender differences in intimate partner violence, help-seeking behaviors and psychological distress, results showed that for women, seeking help from a greater number of confidants moderated the association between violence and psychological distress (Fortin, Guay, Lavoie, Boisvert, & Beaudry, 2012). This merits the need to further explore the ways in which psychological distress could be mitigated and decreased among women, especially those who are involved in the criminal justice system.

Functional Impairment

Another significant indicator of stress is functional impairment. Functional impairment refers to the physical or biological challenges faced by the individual, which includes limitations in mobility and strength or cognition that may eventually hinder a person's ability to perform everyday tasks (Calderón-Larrañaga et al., 2019). It is important to evaluate and measure functional impairment as an indicator of stress given that one's quality of life is significantly impacted (Calderón-Larrañaga et al., 2019). Several authors have noted how toxic stress impairs functioning as evidenced by Kleiman et al. (2020) and McCaslin, Maguen, Metzler, Bosch, Neylan, and Marmar (2016). McCaslin et al. (2016), for example, aimed to explore posttraumatic

stress disorder (PTSD) as related to functional impairment and well-being. The authors found that individuals with higher levels of PTSD symptoms were associated with poorer functioning and quality of life (McCaslin et al., 2016). Kleiman et al. (2020) concurred, examining psychometric properties of stress–related impairment. The authors of the study found significant correlations of PTSD symptoms and measures of psychosocial functional impairment. These findings suggest the association between toxic stress, which is also indicated by PTSD symptoms, and functional impairment.

There are various researchers indicating how impaired daily functioning is related to stress-related disorders, noting how functional impairment needs to be measured (Rodriguez, Holowka, & Marx, 2012). In general, an assessment for functional impairment measures difficulty with daily functioning (Forman-Hoffman et al., 2019). Specifically, an assessment for functional impairment measures include attendance in work or school functions, ability to effectively deal with emotions, effective management of relationships, and effective management of household responsibilities (Forman-Hoffman et al., 2019).

Another way to measure functional impairment is through traumatic experiences and mental health issues. For example, the WHODAS, as used in the NSDUH, may be used as a predictor for serious mental illness in combination with functional impairment as described above (Aldworth et al., 2010). Additionally, Bovin et al. (2018) developed another measure of psychosocial functional impairment, considering factors of PTSD symptoms. The authors of the study aimed to develop and validate a scale called The Inventory of Psychosocial Functioning (Bovin et al., 2018). Some of the domains of psychosocial impairment found in their study include mental health-related impairment, PTSD associations, psychiatric comorbidity, and other disorders associated with the anxious-misery factor (Bovin et al., 2018).

Similarly, Forman-Hoffman et al. (2019) used the measures of PTSD and mental health disorders as key measures in examining functional impairment. In their recent study, the authors examined exposure to potentially traumatic experiences and mental health outcomes wherein findings showed that exposure to trauma was significantly related to functional impairment scores that averaged 1.33 points (95% CI [0.92, 1.73]) higher as measured by the WHODAS (Forman-Hoffman et al., 2019). This study also found the relationship was stronger in females than in males (Forman-Hoffman et al., 2019). This body of literature suggests using the measure of functional impairment as an indicator of stress among women involved in different types of criminal justice.

Stress and Health

Stress has been established as an important factor in health outcomes. A significant body of research exists that indicate stressful life events contribute to chronic health conditions. Chronic diseases including heart disease (Abdalla Salem & Lamis Ali, 2018), depression (Benoit et al., 2016), Alzheimer disease (Sutton, 2011) and many others. For example, in a longitudinal study of adults in Australia stressful life events are positively associated with diabetes and obesity related illness (Renzaho et al., 2014). In an additional study of African American women, it was discovered that multiple stressful life events such as detention in a correctional facility combined with living in an impoverished neighborhood increased the likelihood of reporting the onset of depression in participants (Cutrona et al., 2005). Stress has a major impact on both physical and mental health outcomes.

Women as a Vulnerable Population

Women experience unique challenges that differ from men. Poverty, inequality, and discrimination endanger women's well-being (Belle & Doucet, 2003a). As of 2017, women earn

an average of 80% compared to men, with middle-skill occupations (not requiring a bachelor's degree) reporting a mere 66% wage in comparison ("Pay Equity & Discrimination," 2019). Women are sole or co-wage earners in half of all homes with children ("Pay Equity & Discrimination," 2019). These higher rates of poverty contribute to chronic stress in women. Women are also frequently head of the household and responsible for working and raising children, however their "worth" does not represent this responsibility. In an analysis of U.S. household socioeconomic profiles based on marital status and gender, female head of households have less net worth than male head of households (Mohan-Neill, Hoch, & Li, 2013). Single female head of households have the lowest net worth of all groups, according to the same analysis (Mohan-Neill et al., 2013). These disparities make women more vulnerable than men to life stressors.

Women are still considered the primary custodians in most households in the United States. According to the U.S. Census Bureau, 5 of every 6 custodial parents are mothers (Grall, 2016). This means that most children under the age of 18 are being raised by their mothers. This child rearing responsibility, emotionally, physically, and financially, can create stressors that tax the available adaptive systems of women and cause chronic stress. In a recent study of stress and single mothers, results showed psychosocial risk factors for stress, such as inadequate social support, correspond to those for depression and anxiety (Liang, Berger, & Brand, 2019). Lacking social support can add to the already existing stressor of parenthood and compound to become chronic stress in mothers, making them more vulnerable to poor mental health outcomes.

Women in the Justice System

The number of women in the justice system is substantially lower than the number of men. One explanation for this discrepancy may be the different way women respond to strain or

stress. According to the revised General Strain Theory (GST), men and women adapt differently to social-psychological sources of strain such as the failure to achieve positively valued goals. In a study by Sharp et al. (2005) examining GST among college students, it was discovered that, while both men and women respond to strain by getting angry, women are more likely to respond with additional, more internalized negative emotions which may mediate their subsequent delinquent behaviors (Belknap & Holsinger, 2006). The overall numbers are lower; however, the number of women involved in the criminal justice system continues to grow at twice the rate of men (Kajstura, 2018).

Factors that contribute to women's involvement in the justice system include a multitude of lifetime adversities in addition to committing crime. Similar to men, adversities faced by women in the criminal justice system include poverty, substandard housing and lack or employment (Lorvick et al., 2015). Like men, women frequently commit crimes to feed their addictions and cope with poverty (Hannaher, 2007). Additional adversities facing women may include childhood abuse (both sexual and physical) (P. J. Kelly et al., 2014), involvement in the child welfare system as children (Jung & LaLonde, 2016), intimate partner violence victimization during adulthood (P. J. Kelly et al., 2014), and involvement with the child welfare system as mothers (Fedock et al., 2018). Risky behaviors found among women in the criminal justice system that impact health outcomes and incarceration include drug and alcohol use and unprotected sex which increase the odds of sexually transmitted infections as well as reincarceration due to drug charges (Lorvick et al., 2015). These adverse factors impact women and their pathway into the criminal justice system.

Women in the justice system are more frequently minority, impoverished and of lower educational attainment that those women not involved with the justice system (Wildeman &

Wang, 2017). Black women are not only more likely to be imprisoned than white women, but they are also more likely to have a family member imprisoned as well, thus interrupting the family dynamic and creating more stress (Wildeman & Wang, 2017). While only 1 in 111 white women will spend time in prison, that number is 1 in 18 for black women (Tyler & Brockmann, 2017). According to the Bureau of Justice Statistics, the imprisonment rate of black females is twice more than that of white females as of the end of 2016 (Carson, 2018) . This racial disparity is believed to be due to harsher sentencing policies and public policies that disproportionately affect minority populations such as the war on drugs (Tyler & Brockmann, 2017). Justice involved women are also economically disadvantaged reporting the majority of women incarcerated qualified for public assistance prior to their incarceration (Prentice, 2010). Finally, the majority of women in the justice system have low educational and vocational attainment, limiting their economic mobility (Tyler & Brockmann, 2017).

Prior to being incarcerated, young women may become involved with the justice system for low level offenses and untreated mental health issues. Most mental health problems peak between the ages of 18-25, during the transition to adulthood (Zajac, Sheidow, & Davis, 2015). This is the time when many young women become involved with the justice system. Though a greater percentage of youth incarcerated are male, a large percentage of youth incarcerated for lower level offenses such as truancy, curfew violations and running away from home are females ("FACT SHEET: INCARCERATED WOMEN AND GIRLS, 1980-2017," 2019). Mental health problems often go untreated due to barriers to treatment such as homelessness, lack of childcare, fear and anxiety, stigma, underemployment, lack of transportation and scheduling problems (Ponce et al., 2014). Untreated health issues create greater risk of justice involvement for vulnerable women.

The relationship between criminal justice system contact and health remains unclear. Justice involvement may provide much needed access to medical care for highly vulnerable populations (Binswanger, Redmond, Steiner, & Hicks, 2012). Justice involvement may temporarily alleviate immediate health needs for women that create stress. Women in the justice system represent a vulnerable population due to structural risk factors such as higher levels of psychiatric disorders, substance use, intimate partner violence, childhood trauma, chronic pain and sexually transmitted infections (Nowotny et al., 2019). Additional contributors to stress and poor health in women in the justice system include stigma (Tyler & Brockmann, 2017), and collateral consequences (Sheely & Kneipp, 2015), even when other factors such as race and poverty are controlled.

Types of Criminal Justice Involvement

The American criminal justice system can be viewed as a response system for people accused of violating the law ("U.S. Prison System Timeline: Chronology of Major Events," 2019). From a public health framework, the criminal justice system may be viewed as different types of involvement that begin with law enforcement, proceed to the courts and processing, followed by jails and prisons and end with community reentry and supervision (N. Freudenberg & D. Heller, 2016). These types of involvement with the system represent opportunities for public health intervention (Nicholas Freudenberg & Daliah Heller, 2016). These justice system interactions also create stress for the women involved. These opportunities for intervention are called the sequential intercept model, which is designed to reduce incarceration of those with mental health and substance use disorders and increase diversion to other systems. Interventions for women who suffer from mental health or substance use disorders may reduce stress for those women involved in the criminal justice system. This following section outlines the different

types of involvement in the criminal justice systems (arrest, participation in courts and processing, sentencing, and community reentry and supervision). This section also includes a discussion of the impact of stress on women who are involved in each type of criminal justice contact, as well as the need to explore the challenges experienced these groups:

Law Enforcement (Arrested Ever)

Arrests pose a highly stressful experience for most women. In a study examining the link between socioeconomic status and mental health, being arrested, or having trouble with the police was listed as a stressor. It was determined that the number of stressors experienced in the past 12 months mediated the relation of SES to mental health three years later (Businelle et al., 2014). Additionally, the same study demonstrated disadvantaged individuals experienced a greater number of life stressors (such as arrest and trouble with police), which led to a decline in mental health ratings when they conducted a follow-up three years later (Businelle et al., 2014).

Research shows women who have been arrested report more negative mental health outcomes than women who have never been arrested. In a study of young adult women, it was discovered that those with an arrest history had significantly higher likelihood of committing suicide (2.57 times) than those who have never been arrested (Fedock & Sarantakos, 2017). Additionally, this study determined women with an arrest history had higher rates of depression, anxiety and serious mental illness than women without an arrest history (Fedock & Sarantakos, 2017). According to these studies, arrest is a stressor that affects the mental health of women. Women who are involved in the justice system may experience elevated stress which leads to worsened mental health outcomes such as depression, as seen in these studies.

The act of being arrested involves physical restraint, property search and non-negotiable coercive force (Nowotny et al., 2019). This experience creates stress for women who are

arrested. In a study of the NSDUH data years 2010 – 2014 examining women who reported recent arrest and their use of emergency room usage, it was found that women who experienced recent arrest had over 4 times the odds of psychological distress (4.61) (Nowotny et al., 2019). Further, this research supported previous research studies that of which underscored how stress, powerlessness, feelings of anxiety, and apprehension are common among people who have been arrested (Nowotny et al., 2019). This study further suggests that arrest is a primary stressor among women who are involved in the criminal justice system. This is important to address given that arrest as a primary stressor directly influences mental health and may indirectly influence mental health by leading to secondary stressors (Sugie & Turney, 2017).

Once arrested, the details of the arrest remain on the accused person's background record, even if the initial charges are dropped, therefore creating secondary stressors. Digital records can be found on the internet which may cause problems for the accused both personally and professionally (Sugie & Turney, 2017). The stigma associated with an arrest record frequently interferes with future employment, school, housing and family relationships (Lageson, 2016; Westrope, 2018). In a study to examine how a 3-year old disorderly conduct charge would affect callbacks for a job application, it was discovered those applicants who reported the old arrest on their application received fewer callbacks than those who did not, suggesting employers perceive the arrest as stigmatizing (Uggen & Stewart, 2015). The ability to secure employment can, in turn, affect mental health among women who are involved in the justice system by creating secondary stressors.

Another example of a secondary stressor that arrest may cause is the impact it has on the family. According to the existing body of literature, the arrest of a family member, especially a parent, is considered an Adverse Childhood Experience, which is an event that is stressful or

traumatic and has a lifelong effect on the child (Kolko et al., 2010; S. D. Phillips, Burns, Wagner, & Barth, 2004; Susan D. Phillips & Zhao, 2010). After a mother is arrested and released, she returns home to a traumatized child which may increase her own levels of stress. This is potentially a secondary stressor for the women who experiences arrest.

Further, women who are arrested and separated from their children may not have the ability to secure childcare, such as with a family member. After an arrest there are usually court appearances and procedural requirements that require the women to miss work or make arrangements for childcare or other obligations which may cause additional stressors (Kohler-Hausmann, 2013). The Department of Family and Children's Services may step in and take custody of their minor children. For example, in a recent study about parental incarceration, it was cited that less than half of police officers reported asking children's services about minors present during the arrest of the parent (Trotter, Flynn, & Baidawi, 2017), and there was a lack of formal procedures to follow when children are present during an arrest. Separation from their children or temporary loss of custody could be a secondary stressor for women who experience arrest. The dual roles of the justice system remain to both punish those who break the law and protect those who are victims. However, arrest appears to be a stressor for women that may create secondary stressors.

Participation in Courts and Processing (Current Arrest)

Adjudication and Arraignment

Another type of involvement in the justice system is participation in courts and processing, which includes experiences in adjudication and arraignment. Arraignment is the initial appearance in court during which charges are read and a plea of guilty or not guilty is entered by the accused. The arraignment is the response to the indictment which is the accusation

or formal charge of a crime. In 2016, as many as 13.2 million misdemeanor cases were filed in the United States (Baughman, 2018). Women are more likely to be charged with property crimes, public order offenses or charges related to substance abuse that may result in temporary incarceration (Kubiak et al., 2009).

A judge has the option of granting release of the accused with conditions of bail. If the accused is granted bail, the individual has an opportunity to pay a fee to be released from jail with the promise to return later to appear for a hearing. This may create a financial burden as well as an interruption in work and potential loss of employment (Baughman, 2018). As of 2017, of the 630,000 people in local jails, the vast majority (443,000) were unconvicted people who could not afford bail (Baughman, 2018). Unfortunately, the inability to pay legal costs inadvertently affects disadvantaged populations at a higher rate which may have a greater effect on their stress levels due to greater time spent incarcerated (Gunasekera, 2017). Women are at a disadvantage in this type of involvement within the justice system, which contributes to elevated levels of stress.

As jail serves dual roles of temporary detention for those arrested awaiting trial and as detention for those sentenced, detainment while awaiting trial can be immensely stressful. The separation from family, loss of work, lack of comprehensive physical and mental healthcare, and temporary loss of freedom are all stressors. Jails are ill equipped to manage the mental and physical health needs of women due to a variety of factors including the high volume, high rate of turnover and often brief duration of stay of inmates (Amy L. Solomon, 2008).

Diversion

In the courts and processing type of involvement in the justice system, there are diversion programs that funnel people into other systems while maintaining supervision. Alternatively,

these programs include community courts, therapeutic courts and treatment centers (N. Freudenberg & D. Heller, 2016). As the courts use diversion programs and other alternatives, such as accountability courts to provide treatment to defendants, the pretrial process may lead to access to services which could reduce stress for women involved in the criminal justice system. One example of such a program is the Women's Initiative for Success with Early Intervention (WISE) program in Fulton County Georgia. WISE is a pilot program that is designed to funnel women with mental health problems out of jail and into treatment. Research has shown that after the WISE program, women participants who were involved in courts and processing spent significantly fewer days incarcerated and received mental health services as needed. This is an example of women receiving services through the justice system for mental health needs that potentially reduce stress, specifically as they are involved in courts and processing within the justice system.

Drug Court

Another example of potential stress reduction is in the use of drug court which may improve mental health outcomes for women in the justice system. In a recent study of 212 female participants in a Kentucky drug court, 4 variables were significantly associated with program completion for women: employment at program assessment, intravenous opiate use, number of times hospitalized for psychological or emotional problems, and conviction of a misdemeanor-eligible violent crime before drug court (Shannon, Jackson Jones, Perkins, Newell, & Payne, 2018). Women in the drug court who successfully completed the diversion program reported significantly fewer rearrests (Rezansoff, Moniruzzaman, Clark, & Somers, 2015). These types of intervention programs have shown to be highly successful with women. Drug intervention may reduce stress for women with substance use problems.

In another study of 94 female participants of gender responsive drug court treatment versus services as usual, results showed that gender responsive participants had better in-treatment performance, more positive perceptions related to their treatment experience, and trends indicating reductions in posttraumatic stress disorder (PTSD) symptomology. Both groups improved in their self-reported psychological well-being and reported reductions in drug use ($p < .06$) and arrest (a diagnosis of PTSD was the primary predictor of reduction in rearrests, $p < .04$) (Messina, Calhoun, & Warda, 2012). This is another example of women in the justice system who may have had a relief of stress due to interventions they received during this stage of the justice system.

Sentencing (Community Supervision)

Women involved in the justice system may receive a sentence of probation, a term of incarceration followed by probation or parole, a split sentence of both, or some combination of the above community supervision. This may cause stress to the women involved. In a study of the 2009 NSDUH data, probationers and parolees are far more likely than the general population to report mental health outpatient treatment (AOR 3.25, 95% CI 2.33 – 4.54), anxiety (AOR 1.89, 95% CI 1.39 – 2.57) or depression (AOR 2.44, 95% CI 1.72 – 3.45) (Vaughn, DeLisi, Beaver, Perron, & Abdon, 2012), even when demographic variables such as age, race, education, gender, and income were controlled. The relation of marital status to psychological distress and functional impairment was not analyzed in this study. Gender and other types of justice involvement were not examined in this study which suggests a gendered pathway approach would have been helpful in examining these outcome measures.

Further studies support probated adults suffer from multiple poor health outcomes. In a systematic review, it was reported that probated adults experience psychiatric issues at elevated

rates as compared to those who are not on probation (Sirdifield, 2012). This review only included one study on women wherein it was reported that female probationers had significantly higher prevalence rates for all current psychiatric disorders compared to their male probationer counterparts, except for hypomania and psychotic disorder (Sirdifield, 2012). Probated adults who suffer from mental illness are more likely to reoffend, have their probation revoked, or be arrested again (Balyakina et al., 2014). There is a lack of gender specific research on probated women and mental health outcomes, specifically based on type of involvement in the criminal justice system.

According to a recent study examining gender specific experiences in the criminal justice system, women have more negative outcomes following a stay in jail than men do including family stress, emotional instability and mental deficiency (Caudy, Tillyer, & Tillyer, 2018). According to a systematic review of mental health and probated adults, women experience higher rates of psychiatric disorders than men, with the most significant illnesses being affective disorders including mania and major depression (Sirdifield, 2012). This suggests further research is needed to examine mental health needs of women involved in the justice system.

A 2014 study of probation in England revealed 39% of their probationers suffered from a mental illness with the highest category being anxiety disorders (panic disorder, agoraphobia, social anxiety, generalized anxiety, obsessive compulsive disorder and post-traumatic stress disorder), compared to 27% of the general population (Brooker & Ramsbotham, 2014). Probationers who suffer from mental illness are twice as likely to have their probation revoked as those who do not suffer from mental illness (Prins, 2009). Research also supports a significant number of adults on probation who suffer from a mental illness also suffer from a co-occurring

substance use disorder (as many as 52% - 55%) (Prins, 2009). These studies did not take a gendered pathway to examine women separately from men.

Alternatively, probation offers a multitude of opportunities for support to the offender and their family that may reduce stress. For example, according to the Department of Community Supervision for Georgia, probationers may receive assistance with housing, counseling, substance use, and many other services as needed to successfully complete probation. Women on probation may receive services that alleviate stress. A gendered pathway approach to research on probated women would allow an examination of mental health outcomes in women who experience probation.

Research has already examined the stress relationship among justice involved adults who have experienced incarceration. Incarcerated adults are more likely to suffer from stress related illness such as psychiatric disorders, physical morbidity, and mortality, than those who have never experienced incarceration (Cox, 2018; Massoglia, 2008). Based on a cumulative body of research (Clarkson, 2015; Wildeman, 2012), the keys that link incarceration and health are experiential stressors that overload the body's physiological system. This overload strains the immune system causing the body to be susceptible to physical illness (Massoglia, 2008). Very similarly, this overload caused by experiential stressors may overload the person's mental ability to cope, creating susceptibility to psychiatric illness (Massoglia, 2008).

Incarceration may provide a multitude of opportunities to provide support and referral for services to those who are detained. However, it also causes a great deal of stress to both the detainee and their family members. According to the Social Readjustment Rating Scale (SRRS) a stay in jail is equal to 63 points which is the same rating as the death of a close family member . A minor violation of the law is equal to 11 stress points. The scale indicates a scale score of 150-

299 is equal to roughly a 50% chance of developing a stress related illness with a score of over 300 or more indicating a high level of stress suggesting an estimated 80% or higher chance of developing a stress related illness. These stress points are combined to total a life stress scale score (Nicholas Freudenberg & Daliah Heller, 2016; Hart, 1997).

Reentry (Community Supervision)

Another type of community supervision occurs during reentry after incarceration. This too is community supervision. During this type of involvement in the criminal justice system following detention women are now resuming their place among society (N. Freudenberg & D. Heller, 2016). As the length of detention differs, so does the stress of reentry and supervision. Some people will reach probation following only a brief stay in jail (as little as a few hours) while others may serve many years in prison followed by parole. Though the goals of the justice system at this stage are to provide public safety and reduce recidivism through supervision (Bloom, Owen, & Covington, 2004), parole may be a highly stressful time for women or it may be a time during which immediate needs are met and chronic stress is relieved. Once again, the dualism of the justice system is pungent during this type of involvement.

A study of formerly incarcerated women measured psychological distress and determined high distress was related to elevated risk behaviors such as alcohol or drug use (Golder et al., 2015). One potential benefit for women appears to be social support. Women who lack family connections suffer more from the effects of chronic stress than those who have supportive family and community members (Coker et al., 2002; Fortin et al., 2012; Sherman, Skrzypek, Bell, Tatum, & Paskett, 2011). These studies suggest further examining the relation of psychological distress and functional impairment to poor health outcomes among women who have been formerly incarcerated.

A significant decline in mental health following incarceration may be seen due to barriers in accessing mental health services (Mowbray, McBeath, Bank, & Newell, 2016; Owens et al., 2011). There is a well-researched relationship between mental health care services and reduced recidivism (Aalsma et al., 2015; Fisher et al., 2014; Hoke, 2015; Ray, 2014). Barriers to mental health care for probationers include a lack of insurance coverage and lack of financial means to pay for desired services (Owens et al., 2011). According to the 2011 study by Owens, et al, 75% of the probated and paroled participants reported needing mental health services in the past year. In this study, 29% of the participants reported needing mental health services but not seeking services due to lack of money, no insurance, and lack of transportation (Owens et al., 2011).

Adults under community supervision face the threat of incarceration during their time of surveillance. This threat may create environmental stressors that may induce chronic stress. In an environmental audit it was discovered that parolees frequently avoid institutions with elevated surveillance such as banks and hospitals, which may impair mental health (Sugie & Turney, 2017). In addition, probationers and parolees suffer from elevated rates of self-injurious behavior as well as depression and anxiety. According to a recent study, Gunter, Chibnall, Antoniak, Philibert, and Hollenback (2011) found that individuals on probation and parole reported significantly higher rates of suicidal ideation, depressive disorder, anxiety disorder, suicide attempts, and reports of hurting themselves without intending to commit suicide as compared to the general population.

Though studies have shown an association between criminal justice involvement and mental health outcomes during community reentry and supervision, it remains unknown how criminal justice contact as a stressor is associated with mental health outcomes in women with each type of involvement in the justice system. Women who experience arrest have four times

more elevated psychological distress than that of women who have not experienced arrest (Nowotny et al., 2019). However, it is unclear if women at the other types of justice involvement also experience this level of psychological distress or if distress and functional impairment is relieved through support provided by the justice system. Research has shown that probation and parole are associated with anxiety and depression (Vaughn et al., 2012), however a gendered approach was not utilized in this research. A closer examination of women's experience with stress at each type of involvement of the justice system will provide additional information.

Theoretical Approach

According to the Stress Process Model, developed by Leonard Pearlin and colleagues, there are conceptual components related to the status placement of people in society and how stress impacts health (Pearlin, 2010). The first concept is one of stressors, which are conditions or experiences that can either be disruptive events or persistent hardships that challenge the adaptive capacities of people (Pearlin, 2010). Stressors are stressful events that can lead to additional stressors with what could be considered a "spill-over" effect. This is called stress proliferation and is a tendency for exposure to stressors to create additional stressors. Justice involvement may be a stressor that creates additional stressors for adult women according to stress proliferation. For example, women with criminal records are unable to obtain professional licenses which limits their employment opportunities (Schnittker, Uggen, Shannon, & McElrath, 2015).

The second concept is that of transitions or changes in life that cause disruptions forcing strain on the adaptive systems of individuals (Pearlin, 2010), once again creating stress. Further, an alternative to this may be a lack of transition or a "nonevent" or unrealized goal such as underemployment which is referred to as "role captivity" (Pearlin, 2010). The transition into the

justice system for women creates a stigma or new identity as a convict or criminal while simultaneously limiting social status opportunities. Additionally, the transition through various types of involvement in the justice system potentially elevates stress as it depletes the adaptive systems of the individual and the available support systems.

The third concept in this model is termed "timing and sequencing" by Pearlin which addresses the normative or expected life transitions, such as graduations and childbirth, and the stress and hardships that occur if these transitions are blocked or occur out of order (Pearlin, 2010). For example, if a woman transitions to motherhood during adolescence, this may create stress and hardship for her if she has not completed her education or transitioned to employment first. Since most women involved in the justice system are mothers to minor children, involvement with the justice system may exacerbate this strain on her adaptive system creating stress. The social and environmental stressors of motherhood, reduced education, and reduced employment compound if justice involvement prevents transitioning through the expected sequencing of life events. However, stress may be relieved if services are provided, such as a reentry program following a stay in prison that focuses on social support and empowerment, both female-based needs to deal with chronic stress (Barringer et al., 2017). These services may reduce the barriers to success and improve the adaptive systems for the woman involved. (Barringer et al., 2017).

The fourth concept in the Stress Process Model is deemed "agency and mastery." Both agency and mastery assume people are not passively experiencing life, but rather have some ability to exert control over their reaction to stressors. Agency is a belief in control over your own future. Mastery is a belief in control over your own present circumstances (Pearlin, 2010). Women have more emotion-focused coping strategies which limit their mastery and tend to

lower their self-esteem. Women view stressful events as threats (as opposed to challenges) which is associated with increased stress levels (Street & Dardis, 2018).

Finally, the last concept is called "role set" because disruptive events or stressors that occur within important institutional domains such as family, education, occupation or economy are experienced as more stressful as they are important to a person's welfare (Pearlin, 2010). Justice involvement impacts all these important institutional domains. Over 85 percent of women under community based supervision report making less than $10,000 annually and face poverty at the most extreme levels (Fedock et al., 2018). Women report dual involvement in both the justice system and the child welfare system, especially women of color (Roberts, 2012). Probationers and parolees are significantly more likely to have less than a high school education (Vaughn et al., 2012). Women involved in the justice system may experience disruptions in the most important domains of their lives.

Limitations in Current Literature

The effect of justice involvement on chronic stress and the mental health and daily functioning of women across the different types of justice involvement has not been examined in the literature. It is unclear if justice involvement is a stressor that creates additional stressors through stress proliferation. Or if justice involvement creates opportunities for stress relief through supportive services which may bolster the adaptive systems of women involved. Though health outcomes related to poverty and stress (Blair & Raver, 2016), underemployment and stress (Sidorchuk, Engström, Johnson, Kayser Leeoza, & Möller, 2017), and incarceration and stress (Michael, 2008) have been examined in the literature, mental health outcomes related to

stress and women in each type of justice involvement remain unanswered. It is unclear if justice involvement exacerbates or mitigates stress related health problems for adult women.

Contributions to the Literature

First, this study examines a highly vulnerable and understudied population, women in the justice system, whose numbers have grown exponentially. This study will examine the relationship among types of justice involvement and mental health for adult women in the United States.

Second, this study examines the stressors justice involved women face as challenges unique to them instead of treating gender as a variable to be controlled in analyses of justice involvement and mental health. Taking a gendered approach to this study creates a unique look at the woman's experience in the justice system and how stress impacts women's health.

Finally, results from this study can be used to inform and support policy makers and intervention strategists who wish to create and implement programs and policies to support women in the justice system.

Study Aims

It is the central hypothesis of this study that based on the Stress Process Model, with involvement in the criminal justice system psychological distress (PD) and functional impairment score (FIS) in US adult women increase.

AIMS:

1. To determine if the prevalence of Psychological Distress in adult women over the age of 18 in the US differs by type of criminal justice involvement as determined by the Kessler Psychological Distress Scale (K6).
2. To determine if the functional impairment score of adult women over the age of 18 in the US differs by type of criminal justice involvement as measured by the World Health Organization Disability Assessment Schedule (WHODAS).

Research Questions:

1. Are non-justice involved women less vulnerable to functional impairment and psychological distress than women in different types of justice involvement?
2. According to the Stress Process Model, how does depression, alcohol abuse, insured status and overall health predict functional impairment in types of justice involvement in adult women in the US?
3. According to the Stress Process Model, how does depression, alcohol abuse, insured status and overall health predict psychological distress in types of justice involvement in adult women in the US?

CHAPTER TWO

METHODS

This study utilizes cross sectional data from the National Survey on Drug Use and Health (NSDUH) for years 2014, 2015 and 2016. This survey provides a large sample and captures both health data and justice involvement and is the primary source for drug use and mental illness estimates of noninstitutionalized civilians in the United States (National Survey on Drug Use and Health Public Use File Codebook, 2016).

Survey

Participant Selection

Since 1991, the National Survey on Drug Use and Health (NSDUH) is a national, multi-stage, area probability sample survey of noninstitutionalized civilians ages twelve and over in the United States. It currently includes all 50 states, as well as the District of Columbia. Since 1999, the surveys are conducted using computer-assisted interviewing (CAI) methods and use a combination of computer-assisted personal interviewing (CAPI) conducted by an interviewer and audio computer-assisted self-interviewing (ACASI) and provide improved state estimates based on minimum sample sizes per state. Within each state, state sampling regions (SSRs) were formed. A total of 750 SSR's were formed across the United States based on population (*National Survey on Drug Use and Health Public Use File Codebook*, 2016)

The first stage of sampling began by selecting census tracts with 48 tracts sequentially selected per state sampling region (SSR) across the country (some adjustments had to be made for socio-economic status and the percentage of population that was non-Hispanic white to reduce sampling error). For the second stage of selection , adjacent census block groups were aggregated to meet the minimum dwelling unit (DU) requirements (150 or 250 DUs in urban

areas and 100 or 200 DUs in rural areas according to state). During this stage, for the survey in years 2014 – 2017, the NSDUH moved to an address-based sample (ABS) design which reduces the chance of selecting neighboring and possibly similar areas within tracts and block groups. During the third stage of selection, each selected census block group was partitioned into compact clusters of DUs by aggregating adjacent census blocks. For the fourth stage of sample selection a group of households listers visited the areas and obtained complete and accurate lists of all eligible DUs within the sample segment boundaries. Individuals selected in previous years are not expected to be chosen in future years unless they move. Existing DU's are not sampled more than once. During the fifth and final stage of selection, an electronic screening device is used with participants (*National Survey on Drug Use and Health Public Use File Codebook*, 2016).

Survey Participants

The NSDUH survey includes both men and women, but only females were included in this study by selecting only those participants who checked female for gender. During years 2014 through 2016, this survey over sampled youth and young adults with 25% of the participants under 18. In our sample, 31.6% of the participants are 18-25 (n = 21702) years old. Twenty-one percent of participants are ages 26 to 34 years (n = 14225). Twenty-seven percent are adults ages 35 to 49 (n = 18300) and the remaining 21% of are adults ages 50 and over (n = 14537). This oversampling was done for the purpose of increasing the accuracy of drug use and related mental health measures among the aging drug use population (*National Survey on Drug Use and Health Public Use File Codebook*, 2016). For the purpose of this study, only participants who indicated they were 18 and over (adults) were included for analyses (n = 68764). This study uses secondary data that are available for public use, therefore, Institutional

Review Board (IRB) clearance is not needed for this study. According to Georgia State University's policy regarding use of publicly available datasets, the NSDUH does not require IRB approval for its use.

Weights

The NSDUH oversampled younger persons who are more likely to use drugs and more likely to be justice involved. This also increases the likelihood they will report health issues. Only weighted data will be used in these analyses. Weighting the data will allow generalizing the results to the population based on the sample that was drawn in the NSDUH survey.

The following weights will be used in this statistical plan:

VESTR - strata level weight (variance estimation stratum). The 2014 - 2017 public use file variance estimation stratum variable "VESTR" was aggregated into 50 pseudo-strata. These stratum and replicate identifiers were treated by coarsening, substitution, and scrambling. The purpose of these treatments is to mask identifying information (Substance & Mental Health Services, 2016).

VEREP - cluster level weight (variance estimation replicates within stratum).

ANALWT_C - person-level weight (*National Survey on Drug Use and Health Public Use File Codebook*, 2016).

Data are weighted when running regressions to account for the NSDUH survey design to obtain unbiased estimates of survey outcomes. However, estimation of the annual average number of individuals who have engaged in a behavior based upon pooled data from multiple years requires adjustment to the analysis weights. These adjusted weights would be created as the final weight divided by the number of years of combined data. For this study it will be the final weight divided by three.

Measures

The two primary stress outcome variables of interest are psychological distress and functional impairment. The key predictor or independent variable is type of criminal justice involvement. Psychological distress is having unpleasant feelings or emotions that impact your daily functioning. Functional impairment is difficulty with daily functioning such as school, work, or managing household duties, along with emotions that may interfere with accomplishing daily goals. Type of criminal justice involvement is characterized by both the recency of justice involvement and the severity of sanctions the participant faced for criminal activity and is grouped as non-justice involved, ever arrested, arrested in the past 12 months, probated, or paroled.

Survey participants answered questions of a sensitive nature such as topics regarding drug use and mental health using an electronic device (ACASI) that read prerecorded questions to participants through headphones and allowed participants to answer the questions using a computer, without the interviewer knowing the respondent's answers. This method is believed to increase response accuracy.

Psychological Distress

The variable "psychological distress" is measured using the variables (K6SCYR) and (K6SCMAX). K6SCYR is a score with values ranging from 0 to 24 indicating the level of psychological distress during the worst month of the past year that was not the past 30 days. This variable is only defined for respondents who reported that there was a month in the past 12 months she was more depressed, anxious, or emotionally stressed than during the past 30 days. This score is based on a series of six questions asking respondents how frequently she experienced symptoms of psychological distress during her worst month in the past year (only if

the worst month was not the past 30 days). These questions are from the Kessler Psychological Distress Scale (K6) and include the following symptoms of distress:

1	feeling nervous	(NERVE30)
2	feeling hopeless	(HOPE30)
3	feeling restless or fidgety	(FIDG30)
4	feeling so sad or depressed that nothing could cheer you up	(NOCHR30)
5	feeling that everything was an effort	(EFFORT 30)
6	feeling down on yourself, no good, or worthless	(DOWN30)

(National Survey on Drug Use and Health Public Use File Codebook, 2016).

The Kessler Psychological Distress Scale (K6), developed by Kessler et al in 2002, is a 6-item survey that assesses psychological distress within a certain time period (Prochaska, Sung, Max, Shi, & Ong, 2012). The K6 is an abbreviated version of the original K10. Serious psychological distress is categorized by a score of 13 or above. The K6 has a range of 0-24 with about 6% of US adults reporting a K6 score ≥ 13. This measure takes less than 2 minutes to complete and screens for possible severe mental illness (*National Survey on Drug Use and Health Public Use File Codebook*, 2016). The K6 has demonstrated excellent internal consistency and reliability (Cronbach's alpha=0.89) (Prochaska et al., 2012). Additionally, the K6 is a reliable screening tool in population based health surveys (Cornelius, Groothoff, van der Klink, & Brouwer, 2013; Prochaska et al., 2012; Veldhuizen, Cairney, Kurdyak, & L Streiner, 2007).

For each of the six items listed above, responses of "all of the time" were coded 4, "most of the time" were coded 3, "some of the time" were coded 2, "a little of the time" were coded 1, and "none of the time" and all other responses were coded 0. A total score for K6SCYR was

calculated by summing these assigned values across the six items. K6SCYR was set to missing for respondents who indicated they did not have a month in the past year worse than the past 30 days (*National Survey on Drug Use and Health Public Use File Codebook*, 2016). A cut-off score of >13 is used to determine psychological distress (Kessler et al., 2003). Psychological distress has been coded (distress) in the data, 0 = no, 1 = yes, a dichotomous variable.

Functional Impairment

Functional impairment is measured by The World Health Organization Disability Assessment Schedule (WHODAS) which is a scale that assesses disturbances in social adjustment and behavior. A reduced set of 13 WHODAS items (Novak, Colpe, Barker, & Gfroerer, 2010; Rehm et al., 1999) are included in the NSDUH (*National Survey on Drug Use and Health Public Use File Codebook*, 2016). The thirteen questions were scored from 1 No difficulty, 2 Mild difficulty, 3 Moderate difficulty, 4 Severe difficulty, DK/REF. Participants were instructed to think about the one month in the past 12 when their emotions, nerves or mental health interfered most with their daily activities.

During that one month when your emotions, nerves or mental health interfered most with your daily activities . . .

1. How much difficulty did you have remembering to do things you needed to do?
2. How much difficulty did you have concentrating on doing something important when other things were going on around you?
3. How much difficulty did you have going out of the house and getting around on your own? (Additional option “5” was given for “You didn’t leave the house on your own”)

If question #3 was answered as “5,”

4. Did problems with your emotions, nerves, or mental health keep you from leaving the house on your own? Answer options for this question were 1 Yes, 2 No, DK/REF
5. How much difficulty did you have dealing with people you did not know well? (Additional answer option “5” was given for “You didn't deal with people you did not know well.”)

   If question #5 was answered as “5,”
6. Did problems with your emotions, nerves, or mental health keep you from dealing with people you did not know well? Answer options for this question were 1 Yes, 2 No, DK/REF
7. How much difficulty did you have participating in social activities, like visiting friends or going to parties? (Additional option “5” was given for “You didn’t participate in social activities”) If question #7 was answered as “5,”
8. Did problems with your emotions, nerves, or mental health keep you from participating in social activities? Answer options for this question were 1 Yes, 2 No, DK/REF
9. How much difficulty did you have taking care of household responsibilities? (Additional answer option “5” was given for “You didn't take care of household responsibilities.”)

   If question #9 was answered as “5,”
10. Did problems with your emotions, nerves, or mental health keep you from taking care of household responsibilities? Answer options for this question were 1 Yes, 2 No, DK/REF
11. How much difficulty did you have taking care of your daily responsibilities at work or school? (Additional answer option “5” was given for “You didn't work or go to school.”)

    If question #11 was answered as “5,”

12. Did problems with your emotions, nerves, or mental health keep you from working or going to school? Answer options for this question were 1 Yes, 2 No, DK/REF
13. How much difficulty did you have getting your daily work done as quickly as needed?

1	remembering to do things you needed to do	(IMPREMEM)
2	concentrating on doing something	(IMPCONCN)
3	going out of the house	(IMPGOUT)
4	keep you from leaving the house on your own	(IMPGOUTM)
5	dealing with people you did not know	(IMPPEOP)
6	keep you from dealing with people you did not know well	(IMPPEOPM)
7	participating in social activities	(IMPSOC)
8	keep you from participating in social activities	(IMPSOCM)
9	taking care of household responsibilities	(IMPHHLD)
10	keep you from taking care of household responsibilities	(IMPHHLDM)
11	taking care of your daily responsibilities at work or school	(IMPRESP)
12	keep you from working or going to school	(IMPRESPM)
13	How much difficulty did you have getting your daily work done	(IMPWORK)

From the 13 questions in the WHODAS measurement that is asked in the NSDUH, eight variables were created and scored 0-3 depending on the level of difficulty the respondent reports from 0 = No difficulty to 3 = Severe Difficulty with a total possible score of 24. Each of the eight variables created from the WHODAS items was transformed into values of 0 to 3 so that a response of "Severe difficulty" was coded 3, "Moderate difficulty" was coded 2, and "Mild difficulty" was coded 1. If respondents answered “1” to the follow up questions stating the problem prevented them from engaging in life activities, the participant was coded a “3.” “The eight variables are totaled with a score of 0 - 24 providing a functional impairment score

(*National Survey on Drug Use and Health Public Use File Codebook*, 2016).These eight variables are labeled the WHODASC2.

1	remembering to do things you needed to do	(IMPREMEM)
2	concentrating on doing something	(IMPCONCN)
3	going out of the house	(IMPGOUT)
4	dealing with people you did not know	(IMPPEOP)
5	participating in social activities	(IMPSOC)
6	taking care of household responsibilities	(IMPHHLD)
7	taking care of your daily responsibilities at work or school	(IMPRESP)
8	keep you from working or going to school	(IMPWORK)

Types of criminal justice involvement:

Due to the inability to randomly assign women to each group, a quasi-experimental design will be implemented to test differences among women in the following groups defining involvement with the criminal justice system (type of criminal justice involvement). According to the flowchart created by the Bureau of Justice Statistics, the following types of justice involvement follow the flow of adults through the justice system ("Bureau Of Justice Statistics: What is the sequence of events in the criminal justice system?,"). Incarcerated women are not included in these data as this survey only includes noninstitutionalized individuals.

Though cross-sectional data are being used, the composition of the four groups of women represent types of involvement with the justice system:

No Criminal Justice System Involvement: Women in this group answered “No” to the following question: “Not counting minor traffic violations, have you ever been arrested and booked for breaking the law?” (n = 60730). These women have never reported any criminal justice involvement.

Ever Arrested: During this stage, women report an arrest at some time in their life but not in the past year. This stage of the criminal justice system is derived from the following three questions: “Not counting minor traffic violations, have you ever been arrested and booked for breaking the law?” = “YES” AND “Were you on probation at any time during the past 12 months?” = “NO.” AND “Were you on parole at any time during the past 12 months?” = “NO” AND “Not counting minor traffic violations, how many times during the past 12 months have you been arrested and booked for breaking the law” = “0 times.” (n = 5901). This group of women represent the least interaction with the justice system as they have had criminal justice interaction before, but none within the past year.

Arrested Current: Women in this stage of the criminal justice system have been arrested in the past 12 months but have not yet received a sentence of probation or parole and are not currently incarcerated. They answered “No” to the following questions: “Were you on probation at any time during the past 12 months?” AND “Were you on parole at any time during the past 12 months?” However, they answered “Yes” to the following question: “Not counting minor traffic violations, how many times during the past 12 months have you been arrested and booked for breaking the law” = “1, 2 or 3 or more times.” (n = 874).

Community Supervision: (Probated or Paroled) Women who answer “Yes” to the following questions will be in the community supervision group: “Were you on probation at any time during the past 12 months?” = “Yes.” OR “Were you on parole at any time during the past 12 months?” This group represents women who have been on probation or parole in the past 12 months. These women have been convicted of a crime and received a sentence of probation. Or “Were you on parole or supervised release from prison at any time during the past 12 months?”

"Were you on parole or supervised release from prison at any time during the past 12 months?" The total for this group is (n = 1189).

Predictor Variables

Depression Lifetime – (AMDELT) Participants who answered "Yes" to at least five out of the nine criteria used to define an adult as having had major depressive episode in their lifetime, where at least one of the criteria is a depressed mood or loss of interest or pleasure in daily activities (ASMMDEA = 1) were classified as "1" for AMDELT or Depression Lifetime. If they marked fewer than five of the nine criteria below for having a major depressive episode (MDE) than they were classified as "0" for AMDELT. The criteria are as follows:

1	EVER HAVE OTH PRBLMS DURING 2 WKS OR LONGER	ADDPPROB
2	TIME WHEN [FEELFILL] LSTD EVRYDY 2 WKS OR LNGR	ADDPR2WK
3	SEVERAL DAYS OR LNGR WHEN FELT SAD/EMPTY/DPRSD	ADDPREV
4	SEVERAL DAYS OR LNGR FELT DISCOURAGED ABT LIFE	ADDSCEV
5	EVER HAD PER OF TIME LST INTRST IN ENJOYABLE THGS	ADLOSEV
6	PERIOD OF TIME LASTED EVERY DAY FOR 2 WKS /LNGR	ADLSI2WK
7	EMOT DISTRSS SO SEVERE NOTHING COULD CHEER YOU UP	ADWRCHR
8	HOW SEVERE WAS EMOTIONAL DISTRESS DURING 2 WKS	ADWRDST
9	TIME THAT MOST SEVERE/FREQUENT MOOD LASTED	ADWRHRS
10	EMOT DISTRSS SO SEVERE COULD NT DO DLY ACTIVITIES	ADWRIMP

Respondents were classified as NOT having a major depressive episode (MDE) in their lifetime, AMDELT=2, if they met either of these conditions:

1. Reported experiencing fewer than five out of the nine criteria used to define an adult as having had MDE in their lifetime.

2. If the number of criteria used to define an adult as having had MDE in their lifetime is unknown (ADSMMDEA=98) and the respondent reported at least one of the following:

i. Never having had a period of time lasting several days or longer when felt sad, empty, or depressed (ADDPREV=2), discouraged about how things were going in life (ADDSCEV=2), and lost interest in most things usually enjoyable (ADLOSEV=2).

ii. Experienced the feelings in (i), but they did not last most of the day, nearly every day for two weeks or longer (ADLSI2WK=2) or (ADDPR2WK=2).

iii. Experienced the feelings in (i) most of the day, nearly every day for two weeks or longer, but the feelings lasted less than an hour when mood was most severe and frequent (ADWRHRS=1).

iv. Experienced the feelings in (i) most of the day, nearly every day for two weeks or longer for at least an hour during those times when mood was most severe and frequent, but emotional distress was mild (ADWRDST=1), there was never a time when emotional distress was so severe that you could not be cheered up (ADWRCHR=4), and there was never a time when your emotional distress was so severe that you could not carry out your daily activities (ADWRIMP=4).

v. Experienced the feelings in (i) most of the day, nearly every day for two weeks or longer for at least an hour and the severe distress were more than mild or at some point could not be cheered up or could not carry out daily activities, but never had any other problems during those weeks, such as changes in sleep, appetite, energy, the ability to concentrate and remember, or feelings of low self-worth (ADDPPROB=2) (*National Survey on Drug Use and Health Public Use File Codebook*, 2016).

Depression Past 12 months – This construct represents past year major depressive episode (MDE) and was recoded into a single variable (AMDEYR). The following variables comprised past year depression:

1	FELT THIS 2 WKS+ W/OTH PRBS DURING PAST 12 MOS	ADPB2WK
	Think about the time in the past 12 months when [NUMPROBS] with your mood [WASWERE] most severe.	
2	HOW MUCH DID FEELINGS INTERFERE WITH HOME MNGMT	ADPSHMGT
3	HOW MUCH DID FEELING INTERFERE WITH ABLTY TO WORK	ADPSWORK
4	HOW MUCH DID FEELING INTERFERE WITH RELATIONSHIPS	ADPSRELS
5	HOW MUCH DID FEELINGS INTERFERE WITH SOCIAL LIFE	ADPSSOC
	About how many days out of 365 in the past 12 months were you totally unable to work or carry out your normal activities because of your [FEELNOUN]?	
6	# DYS UNABLE TO WORK/CARRY OUT DLY ACT PST 12 MOS	ADPSDAYS

Alcohol Abuse – This construct is defined as a person who is already determined to be dependent on alcohol and qualifies as abusing alcohol according to a series of questions which include the following:

1	DRNK ALC CAUSE PRBS W/FAMILY/FRIENDS PST 12 MOS	ALCFMFPB
2	CONTD TO DRINK ALC DESPITE PRBS W/ FAM/FRNDS	ALCFMCTD
3	DRNK ALC AND DO DANGEROUS ACTIVITIES PST 12 MOS	ALCPDANG
4	DRNK ALC CAUSE PRBS WITH LAW PAST 12 MOS	ALCLAWTR
5	ALC CAUSE SERS PRBS AT HOME/WORK/SCH PST 12 MOS	ALCSERPB
6	RC-ALCOHOL DEPENDENCE - PAST YEAR	DEPNDALC

Insured Status – This variable represents the overall health insurance status of each participant and is a recoded variable (IRINSUR4) comprised of several questions as follows:

1	Covered by Champus, ChampVA, VA, or Military	IRCHMPUS
2	Covered by Medicaid/CHIPCOV	IRMCDCHP
3	Covered by Medicare	IRMEDICR
4	Covered by other health insurance	IROTHHLT
5	Covered by private insurance	IRPRVHLT

Overall Health Status – This construct is aimed at measuring the participants own self-reported health status. The survey question is, "This question is about your overall health. Would you say your health in general is excellent, very good, good, fair, or poor? " This variable is later recoded into only four options: Fair/Poor, Good, Very Good and Excellent.

Control Variables

Age – Age is self-reported and recoded into levels (CATAG5). Individual participants' birthdates are not provided in this survey. The age ranges for this study are 18-25, 26 – 34, 35 – 49, 50 and over.

Race – Race is self- reported and recoded in this survey (NEWRACE2). Originally race is divided into seven separate categories but for the purpose of this study, Non-Hispanic Native Am/AK Native. Non-Hispanic Native HI/Other Pacific Islander, Non-Hispanic Asian, and Non-Hispanic more than one race was collapsed into a single category and titled "Non-Hispanic other" due to an insufficiency of survey sample size required to complete analyses.

Education – Educational levels were self-reported and recoded in this survey (EDUHIGHCAT) into four categories to include those with less than a high school diploma, high

school graduates, those with some college education or an Associate's degree, and college graduates.

Family Income – Family income is a single variable (INCOME) that is self-reported and has four categories listed as follows: Less than $20,000, $20,000 - $49,999, $50,000 - $74,999, and $75,000 or more.

Employment Status – Employment status is a single variable (IRWRKSTAT) that is self-reported and has four categories listed as follows: employed full-time, employed part-time, unemployed, and other (including not in the labor force).

Marital Status – This self-report variable (IRMARITSTAT) indicates the participants marital status and the survey options were as follows: married, widowed, divorced/separated, or never been married. However, for the purpose of this study the categories of widowed and divorced/separated were combined for a total of only three categories: married, widowed/divorced/separated, and never been married.

Statistical Analysis

First, bivariate analyses were conducted with type of justice involvement and the dependent variables psychological distress (PD) and functional impairment score (FIS). Descriptive statistics include sample characteristics age, race, education, family income, employment, and marital status. Predictors include overall health, insured status, alcohol abuse past 12 months as defined by the American Psychological Association by type of justice involvement and two indicators of depression (past 12 months and lifetime depressive episodes). The results are reported in Table 3.

Next, logistic regressions were run for psychological distress and each type of justice involvement (No CJI, EA, CA, CS): $Y(PD) = \beta 0 + \beta_1 X(\text{CJ status}) + e$. Logistic regression was used because PD is a binary variable with "0" representing "No" and "1" representing "Yes." Then, bivariate analyses were replicated for each type of justice involvement, but depression was added to the model. The third model for each type of justice involvement included depression and the other predictor variables, insured status, alcohol abuse and overall health. The final model is the full model with the control variables (a set of dummy variables for each category of age, race, education, family income, employment, marital status, overall health, alcohol abuse, past 12 month depressive episode and lifetime depressive episode as well as insured status) to estimate the effects of justice involvement on psychological distress with person level characteristics included. Therefore, for each female participant in the study, the following equation was estimated:

$Y(PD) = \beta 0 + \beta_1 X_1$ (CJ status) $+B_2 X_2$ (age group) + $B_3 X_3$ (race group) + $B_4 X_4$ (education group) + $B_5 X_5$ (health group) + $B_6 X_6$ (alcohol abuse) + $B_7 X_7$ (depression group) + $B_8 X_8$(income group) + $B_9 X_9$(insured status) + e[1]

Next, linear regressions were run for functional impairment score and each type of justice involvement: $Y(FIS) = \beta 0 + \beta_1 X(\text{CJ status}) + e$. Linear regression was used because FIS is a linear continuous variable (Aldworth et al., 2010). This analysis was replicated for each type of justice involvement (No CJI, EA, CA, CS) without controlling for other factors. Next, a linear regression for FIS and each justice type was run with depression added to the model. The third model for each type of justice involvement included depression and the other predictor variables,

[1] The following reference categories were dropped from each regression of PD to prevent multicollinearity: DEP 12MO = no, DEP LT = no, 50+, Excellent Health, non-Hispanic White, College, $75K+, Unemployed, Widowed, Alcohol = no, Insured = no

insured status, alcohol abuse and overall health. The final model is the full model which includes the predictors of FIS as well as the sample characteristics as seen below:

$Y(FIS) = \beta 0 + \beta_1 X_1$ (CJ status) $+B_2X_2$ (age group) + B_3X_3 (race group) + B_4X_4 (education group) + B_5X_5 (health group) + B_6X_6 (alcohol abuse) + B_7X_7 (depression group) + B_8X_8(income group) + B_9X_9(insured status) + e[2]

Finally, regressions were deconstructed to examine the proportion of the difference in groups due to means and due to treatment. All analyses were conducted using SAS 9.3. (SAS Institute, Cary, NC). A discussion of the results follows in Chapter 3.

[2] The following reference categories were dropped from each regression of FIS to prevent multicollinearity: DEP 12MO = no, DEP LT = no, 50+, Excellent Health, non-Hispanic White, College, $75K+, Unemployed, Widowed, Alcohol = no, Insured = no

CHAPTER THREE

RESULTS

Results

This study consists of adult women who are older, (46% are over the age of 50) and the majority are Caucasian (64%). Most have either attended (31%) or graduated (31%) from college. Half the women in this survey make over $50,000 annually and nearly 42% work full-time. Half of the sample (50.2%) are married while 25% report never being married and another 25% are either widowed, divorced, or separated. Table 1 illustrates the sample characteristics of the current survey (weighted)*. Unweighted values are available in the appendix.

First, the dependent variables were examined including psychological distress (*M Percent* = 17%, *SD* = 0.001) and functional impairment score (*M* = 4.70, *SE* = 0.022) among type of justice involvement for adult women in the United States. The types of justice involvement examined in this study include no justice involvement (n = 60730, 88.57%), ever arrested (n = 5901, 8.33%), current arrest (n = 874, 1.49%), and community supervision (n = 1189, 1.73%). Due to missing data (n = 197), only those participants who responded to both justice involvement and outcome variables in this study were included for analysis, reducing the total number of participants to (n = 68,567). The results of this examination are found in Table 2 and Table 3.

No significant differences emerged in the proportion of (PD) among women in the current arrest and community supervision groups. However, there is a large difference in the proportion of women with PD among those with no criminal justice involvement and a smaller difference in the proportion of PD among women in the lifetime arrest group.

Table 1

Descriptive Statistics for Adult Women in the National Survey of Drug Use and Health 2014 - 2016

Variable	NO CJI %	EA %	CA %	CS %
Age (years)				
18-25	13.96	8.95	30.35	25.83
26 – 34	14.65	21.37	26.24	30.80
35 – 49	23.82	32.66	23.91	28.83
50 plus	47.58	37.02	19.50	14.54
Race				
White	64.39	66.69	54.17	56.40
Black	11.92	16.57	23.22	18.25
Non-Hispanic Other	8.31	5.61	7.56	6.73
Hispanic	15.38	11.13	15.05	18.62
Education				
< High School	12.12	13.79	22.06	22.26
High School	25.12	26.66	33.92	33.11
Some College	30.71	38.52	36.08	37.47
College Graduate	32.06	21.03	7.93	7.15
Income				
< 20K	18.52	27.81	46.43	42.46
20-49K	30.84	33.79	30.94	35.28
50-74K	16.69	13.59	8.35	12.07
75K+	33.95	24.81	14.29	10.20
Work				
Unemployed	3.76	6.25	15.66	12.43
Other	38.41	33.29	37.83	35.76
Part-Time	16.27	15.50	13.84	15.50
Full-Time	41.56	44.96	32.67	36.31
Marital Status				
Never	24.42	30.19	53.66	50.05
Widowed/Divorced/Separated	23.70	33.43	28.73	28.67
Married	51.88	36.38	17.61	21.27
Depression (Past Year)				
No	92.31	84.70	80.21	81.50
Yes	7.69	15.30	19.79	18.50
Depression Lifetime				
No	84.86	73.61	70.19	73.37
Yes	15.14	26.39	29.81	26.63
Alcohol Abuse				
No	98.34	96.34	90.00	92.76
Yes	1.66	3.66	10.00	7.24
Insured				
No	8.39	13.34	22.98	20.56
Yes	91.61	86.66	77.02	79.44
Overall Health				
Fair/Poor	13.94	20.70	26.12	19.00
Good	27.82	32.35	30.31	35.20
Very Good	36.01	32.01	27.51	31.60
Excellent	22.24	14.94	16.06	14.19
Psychological Distress				
No	88.46	78.59	61.46	66.22
Yes	11.54	21.41	38.54	33.78

NSDUH - National Survey of Drug Use and Health.
No CJI – Never Arrest; EA – Ever Arrest; CA – Current Arrest; CS – Community Supervision

The following table illustrates the proportions and standard errors of the dependent variable psychological distress (PD) among the differential types of criminal justice involvement. As seen in Table 2, there is 10% difference between the proportion of adult women with PD in the ever arrested group (21%) as compared to the non-justice involved women (11%) and an even larger difference among women who report an arrest in the past 12 months (39%). After comparing the proportion of PD among women in each group, the difference was found significant F (4, 50) = 1651.78, $p < .0001$.

Table 2

Percentages, Standard Errors, and ANOVA results for Psychological Distress by Type of Justice Involvement for adult women in the NSDUH 2014-2016.

	Percentage	SE	*F*-Test
No Justice Involvement	11.54%	0.002	F (4, 50) = 1651.78, $p < .0001$
Lifetime Arrest	21.30%	0.006	
Current Arrest	38.51%	0.029	
Community Supervision	33.78%	0.019	

An examination of FIS by type of justice involvement revealed the similarity among justice involved groups for (FIS). However, the mean FIS for non-justice involved women and justice involved populations differed as shown in Table 3. After running an ANOVA, a significant between-group difference was found F (4, 50) = 4219.42, $p < .0001$, which suggested further investigation was warranted.

Table 3

Means, Standard Errors, and ANOVA results for Functional Impairment Scores by Type of Justice Involvement for adult women in the NSDUH 2014-2016.

	Mean Score	SE	*F*-Test
No Justice Involvement	3.84	0.032	F (4, 50) = 4219.42, $p < .0001$
Lifetime Arrest	6.18	0.114	
Current Arrest	7.65	0.361	
Community Supervision	7.22	0.258	

Aim 1: The impact of Justice Involvement on Psychological Distress (PD).

Four logistic regressions to predict PD for each of four types of criminal justice involvement were run: No justice involvement, lifetime arrest but not current involvement, current arrest only during the past year and community supervision during the past year. Predictors of PD include depression (both past 12 months and lifetime), alcohol abuse, insured status, and overall health. To control for other factors that might also predict PD, socio-demographic variables including age, race, education, income, employment, and marital status were added. The four regression models may be seen below in Table 4. Full models may be found in the appendix.* Each of the final regressions was significant; the chi-squared values are shown below in Table 5.

Table 4

Psychological Distress and Type of Justice Involvement Logistic Regression Models for adult women in the NSDUH survey 2014 - 2016.

No Justice Involvement and Psychological Distress Logistic Regression

	Model 1			Model 2			Model 3			Model 4*		
PD	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*
NOCJI	-0.89	0.031	0.41	-0.67	0.048	0.51	-0.56	0.048	0.57	-0.42	0.049	0.66
DEP12MO				2.04	0.055	7.67	1.93	0.055	6.92	1.87	0.057	6.46
DEPLT				1.45	0.045	4.26	1.46	0.046	4.29	1.46	0.049	4.31
Alcohol							0.84	0.076	2.31	0.48	0.080	1.62
Insured							-0.38	0.051	0.68	-0.06	0.056	0.95
Health												
Poor							0.91	0.054	2.49	1.21	0.064	3.36
Good							0.46	0.051	1.58	0.57	0.054	1.77
Very Good							0.22	0.047	1.25	0.24	0.050	1.28

Ever Arrested and Psychological Distress Logistic Regression

	Model 1			Model 2			Model 3			Model 4*		
PD	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*
EA	-0.76	0.088	0.47	-0.90	0.100	0.41	-0.89	0.103	0.41	-0.55	0.118	0.58
DEP12MO				1.78	0.146	5.94	1.69	0.149	5.42	1.66	0.153	5.24
DEPLT				1.20	0.133	3.32	1.16	0.133	3.20	1.22	0.142	3.40
Alcohol							0.15	0.151	1.16	0.03	0.165	1.03
Insured							-0.14	0.109	0.87	0.04	0.106	1.04
Health												
Poor							1.14	0.167	3.12	1.18	0.178	3.27
Good							0.45	0.131	1.57	0.39	0.127	1.48
Very Good							0.27	0.142	1.31	0.24	0.145	1.28

Arrested Current and Psychological Distress Logistic Regression

	Model 1			Model 2			Model 3			Model 4*		
PD	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*
AC	0.80	0.130	2.22	0.93	0.141	2.54	0.88	0.146	2.42	0.57	0.162	1.77
DEP12MO				1.78	0.144	5.95	1.68	0.147	5.34	1.65	0.152	5.18
DEPLT				1.21	0.132	3.34	1.18	0.131	3.25	1.25	0.141	3.51
Alcohol							0.03	0.175	1.03	-0.12	0.184	0.89
Insured							-0.22	0.115	0.81	0.01	0.114	1.01
Health												
Poor							1.14	0.168	3.11	1.17	0.178	3.22
Good							0.48	0.144	1.61	0.39	0.137	1.47
Very Good							0.26	0.149	1.30	0.23	0.150	1.25

Community Supervision and Psychological Distress Logistic Regression

	Model 1			Model 2			Model 3			Model 4*		
PD	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*	*B*	*SE*	*OR*
CS	0.54	0.094	1.72	0.69	0.110	2.00	0.70	0.109	2.01	0.35	0.118	1.42
DEP12MO				1.78	0.147	5.94	1.69	0.151	5.40	1.65	0.156	5.23
DEPLT				1.19	0.137	3.28	1.16	0.137	3.18	1.23	0.143	3.42
Alcohol							0.25	0.141	1.29	0.08	0.162	1.09
Insured							-0.21	0.107	0.81	0.02	0.106	1.02
Health												
Poor							1.13	0.166	3.09	1.18	0.177	3.26
Good							0.44	0.130	1.56	0.39	0.126	1.47
Very Good							0.25	0.141	1.29	0.24	0.145	1.27

The following reference categories were dropped from each regression: DEP 12MO = no, DEP LT = no, 50+, Excellent Health, non-Hispanic White, College Graduate, $75K+, Unemployed, Widowed/Divorced/Separated, Alcohol = no, insured = no. *Model 4 includes all controls and can be found in the appendix in detail. OR = Odds Ratio. DEP12MO - Depression past 12 months; DEPLT - Depression Lifetime; *B* = Beta, *SE* = Standard Error;

In Model 1, only the outcome variable psychological distress (PD) and the type of justice involvement was run. Without any other predictors or controls in the model, non-justice involved women had lower odds of PD than justice involved women. Model 2 demonstrates the effect of depression on PD when added to the model. According to the regression analyses, the effects of depression are robust but differ in magnitude across groups. As seen in Table 4, the odds of PD among non-justice involved women with depression in the past year is 7.67 times women without depression in the same group. Among women who were arrested in the past year with depression the odds of PD are 5.94 those without depression in the same group. The effects of lifetime depression on PD are robust and does not appear to differ in magnitude across groups in this model.

Model 3 illustrates the effect of justice involvement on PD with depression, alcohol abuse, insured status and overall health added to the model. Once again, there are strong estimates of these covariates. Past 12-month depression and poor health are the strongest predictors of PD across all groups. The magnitude of the effect of past-year depression appears to differ by non-justice and justice-involved groups. Non-justice involved women with depression (6.92) have greater odds of PD as compared to current arrested women with depression (5.34) in Model 3.

Model 4. demonstrates the effect of type of justice involvement on PD with all predictors and control variables included. Depression appears to be highly linked to psychological distress. For example, after adjusting for all other variables, non-justice involved women who report having a depressive episode in the past year have 6.46 times the odds of PD relative to non-justice involved women who do not report a past 12 month depressive episode. Similar results exist for all other justice types. The odds for justice involved women who report a past year

depressive episode are similarly raised for psychological distress. Women who have ever been arrested who have experienced past year depression, adjusting for all other variables, have 5.94 the odds of PD as women with lifetime arrest who do not report past year depression. The odds ratios for the current arrest group are *OR*= 5.95, (95% CI: 4.49, 7.90) and for the community supervision group *OR* = 5.94, (95% CI: 4.45, 7.93).

The odds ratios for lifetime depression across the groups demonstrate a smaller effect on PD for women involved with criminal justice. For non-criminal justice involved women, the odds of having psychological distress are 4.26 times the odds of women in the same group who have never suffered from depression. The effect for the other groups is similar to each other, but lower. The odds of having PD for women who have ever been arrested and reported lifetime depression are 3.32 times women who have ever been arrested and never suffered from depression. Similarly, the odds for current arrest are 3.34 times and the odds for community supervision are 3.28 times, respectively.

Table 5
Logistic Regression results of Psychological Distress by type of justice involvement for adult women in the NSDUH survey 2014-2016.

		Wald Test		LR Test	
Criminal Justice Status	*d.f.*	χ^2	*p*-value	*Likelihood Ratio*	*p*-value
Never Arrested	24	7825.25	*p* <.0001	72737340.7	*p* <.0001
Ever Arrested	25	1415.48	*p* <.0001	11015544.5	*p* <.0001
Current arrest	25	1809.33	*p* <.0001	10247365.9	*p* <.0001
Community supervision	25	1364.99	*p* <.0001	10908057.2	*p* <.0001

df – degrees of freedom, *x2* – chi squared; *p* – probability; LR – likelihood Ratio.

The Likelihood Ratio test can be used to test the null hypothesis that the regressions specified for each type of justice involvement do not provide significantly more explained variance than no model at all. For each regression, the Likelihood Ratio is significant at the p <

.01 level, which rejects the null hypothesis. This implies that adding controls improves the explanatory power of each of the four regressions.

The odds ratios are then compared to determine the effects of the variables on the odds of having PD for each group of women. The benefit of using odds ratios is that they can be used to compare the change in odds for predicted PD. Overall, comparing women in the non-criminal justice involved group against those in the three criminal justice involved groups show that health effects, age group trends, and race are similar across all four groups. On the other hand, having depression is a stronger predictor for PD in non-justice involved women. The magnitude of the effect of income on PD is larger for criminal justice involved groups than for non-justice involved women.

Health, Justice Involvement and PD

Overall, the effect of poor health on PD as compared to excellent health is strong; however, the health effects across the four groups of women do not vary greatly. To demonstrate this, the odds ratios for fair/poor health responses are show in Table 6.

Table 6
Logistic Regression results for Psychological Distress and type of justice involvement for adult women in the NSDUH survey 2014-2016: Full Model, Overall Health Score (Excellent Health REF)

		Fair/poor Health	
Criminal Justice Status	*OR*	*OR CI*	p- value
No Justice Involvement	2.49	2.24 – 2.76	*p* <.0001
Ever Arrested	3.12	2.25 – 4.32	*p* <.0001
Current arrest	3.11	2.24 – 4.33	*P* <.0001
Community supervision	3.09	2.23 – 4.27	*p* <.0001

OR – *Odds Ratio*; *CI* – Confidence Interval; *p* – probability.

In both health categories, the odds of having PD do not change greatly within the three criminal justice involved groups. The odds are slightly higher for women in the non-justice involved group. For example, for non-justice involved women who have fair/poor health the odds of having PD are 2.49 times those in the reference category of excellent health. For women who are in the current arrest group and poor health, holding all other factors constant, the odds of having PD are 3.11 times those in excellent health.

The coefficients for other health levels, good and very good, between the four groups of women are not statistically significant at the $p < .01$ level. These results are further elaborated upon in Table 7 (PD Decomposition Table).

Table 7

Decomposition Table Psychological Distress: No Justice Involvement Compared to Justice Involved Groups for the adult women in the NSDUH survey 2014-2016.

	NO CJI vs EA		No CJI vs CA		No CJI vs CS	
	% Difference Due to		% Difference Due to		% Difference Due to	
	Means	Treatment	Means	Treatment	Means	Treatment
	0.00%	-23.20%	0.00%	45.73%	0.00%	39.58%
Age (years)						
18 – 25	-10.75%	-6.46%	9.90%	-1.37%	8.25%	-1.18%
26 – 34	11.01%	-4.02%	5.35%	-0.77%	8.32%	-0.82%
35 – 49	11.19%	2.21%	0.04%	1.26%	1.95%	0.90%
Race						
NH Black	-1.99%	-2.83%	2.67%	-2.66%	1.99%	-0.32%
NH Other	-0.48%	3.25%	-0.16%	1.04%	-0.15%	1.06%
Hispanic	0.85%	2.89%	0.10%	0.36%	0.14%	0.92%
Education						
< HS	0.93%	2.12%	2.00%	1.20%	1.84%	0.83%
High School	0.51%	2.92%	0.89%	1.10%	0.92%	1.30%
Some College	4.31%	9.46%	0.89%	3.08%	1.19%	3.19%
Income						
< 20,000	7.66%	6.15%	6.27%	1.71%	5.93%	1.86%
20– 49,000	2.19%	17.72%	0.02%	4.75%	0.97%	5.20%
50 – 74,000	-2.52%	10.43%	-1.82%	2.80%	-1.07%	2.95%
Work						
Full Time	-1.76%	-0.01%	-2.70%	-0.14%	-2.12%	-0.13%
Part Time	3.59%	0.68%	0.14%	-1.54%	0.64%	-1.04%
Other	0.26%	6.91%	0.30%	1.33%	0.09%	1.71%
Marriage						
Never Married	-0.87%	-2.41%	-0.96%	-0.46%	-1.14%	-0.70%
Married	-6.01%	0.33%	-0.87%	-0.05%	-0.97%	-0.15%
Depression Past Year	21.66%	-2.77%	9.21%	-0.78%	9.18%	-0.83%
Depression Lifetime	23.65%	-6.14%	8.50%	-1.44%	7.26%	-1.79%
Alcohol Abuse	0.11%	-1.29%	-0.47%	-0.46%	0.24%	-0.34%
Insured	-0.33%	15.05%	-0.08%	2.88%	-0.10%	3.42%
Overall Health						
Fair/Poor	13.76%	-0.64%	6.59%	-0.26%	3.07%	-0.21%
Good	3.03%	-8.81%	0.44%	-2.40%	1.46%	-2.67%
Very Good	-1.69%	0.14%	-0.89%	-0.27%	-0.54%	-0.10%
Difference in PD	78.33%	21.67%	45.38%	54.62%	47.36%	52.64%

NO CJI - No Justice Involvement; EA - Ever Arrested; CA - Current Arrest; CS - Community Supervision
HS - High School; Sep- Separated. Unemployed, Widowed/Divorced/Separated, Alcohol = no, Insured = no
The following reference categories were dropped from each regression of PD:
DEP 12MO = no, DEP LT = no, 50+, Excellent Health, non-Hispanic White, College Graduate, $75K+,

Further Examination of Control Factors and PD

Age, Justice Involvement and PD

Table 8 displays the odds ratios for the three age category variables, all of which are significant at the p < .01 significance level across the four types of justice involvement. In general, the effect of age on predicted PD is strongest across all justice involvement groups for the youngest category, 18 – 25. To demonstrate this, the odds of having PD for women who have no criminal justice involvement for those who are 18 – 25 are 4.56 times those in the reference category of 50+, holding all else constant. Women in the 26 – 34 group have 3.05 times the odds of having PD as compared to women 50+. In contrast, non-justice involved women who are 35 – 49 have 1.98 times the odds of having PD as compared to women over the age of 50. This declining effect of age on predicted PD is also observed in the three justice involved groups, EA, CA, and CS. All these results are statistically significant at the p < .01 significance level.

Table 8

Logistic Regression for Psychological Distress for Age by type of justice involvement for adult women in the NSDUH survey 2014-2016. Full Model: Age (50+ as REF)

	18 - 25			26 - 34			35 - 49		
CJ Status	*OR*	*OR CI*	*p*- value	*OR*	*OR CI*	*p*- value	*OR*	*OR CI*	*p*- value
Never Arrested	4.56	3.97 – 5.24	*p* <.0001	3.05	2.66 - 3.48	*p* <.0001	1.98	1.76 - 2.23	*p* <.0001
Ever Arrested	3.49	2.52 - 4.82	*p* <.0001	2.60	1.89 – 3.56	*p* <.0001	2.09	1.58 – 2.77	*p* <.0001
Current arrest	3.69	2.66 - 5.12	*P* <.0001	2.72	2.00 - 3.70	*p* <.0001	2.22	1.68 – 2.92	*p* <.0001
Community supervision	3.87	2.83 - 5.30	*p* <.0001	2.73	2.00 - 3.73	*p* <.0001	2.13	1.61 – 2.83	*p* <.0001

OR – Odds Ratio; *CI* – Confidence Interval; *p* – probability.

Race, Justice Involvement and PD

Table 7 (PD Decomposition Table) displays the effects of race on the likelihood of having PD. Of the three race categories, non-Hispanic Black, non-Hispanic Other, and Hispanic, the coefficients for non-Hispanic Black are statistically significant at the p < .01 level across all

four regressions. Across the four groups of women, the predicted effect of being non-Hispanic Black is similar. For example, holding all else equal, women who have no involvement with the justice system and are non-Hispanic Black have 0.62 times the odds of having PD compared to white women; similarly, the odds of having PD are 0.62 that of white women for the non-Hispanic Black women in the CS group. Black women have lower odds than white women of reporting psychological distress across all justice types.

Income, Justice Involvement and PD

Of the three income categories, <$20,000 is a significant determinant of PD in all four regressions. In general, the likelihood of having PD is higher for women involved with the criminal justice system. This is demonstrated by the odds ratios of the non-criminal justice involved women *OR* = 1.33, (95% CI: 1.19, 1.49), the lifetime arrest group *OR* = 1.62, (95% CI 1.22, 2.14,), the current arrest group *OR* = 1.63, (95% CI :1.21, 2.18), and the community supervision group *OR* = 1.62, (95% CI: 1.22, 2.15). Upon closer examination, it appears an equal amount of difference in likelihood of psychological distress between justice involved and non-justice involved groups is due to group composition and treatment . Far more women among the justice involved groups are in the lowest income category (<20,0000) and the mean score for PD among women who make less than $20,000 per year is higher than all other income levels. The full regressions are available in the Appendix.

Table 14

Regression Analyses Psychological Distress by Type of Justice Involvement for Adult Women in the NSDUH survey 2014-2016

	NO CJI			EA			CA			CS		
Variable	B	SE	p	B	SE	p	B	SE	p	B	SE	p
Intercept	-0.42	0.05	<.0001	-0.55	0.12	<.0001	0.57	0.16	0.0004	0.35	0.12	0.0027
Age (years)												
18 – 25	1.52	0.07	<.0001	1.25	0.16	<.0001	1.31	0.17	<.0001	1.35	0.16	<.0001
26 – 34	1.11	0.07	<.0001	0.95	0.16	<.0001	1.00	0.16	<.0001	1.00	0.16	<.0001
35 – 49	0.68	0.06	<.0001	0.74	0.14	<.0001	0.80	0.14	<.0001	0.76	0.14	<.0001
Race												
NH Black	-0.48	0.05	<.0001	-0.50	0.10	<.0001	-0.57	0.11	<.0001	-0.49	0.10	<.0001
NH Other	-0.22	0.08	0.0032	-0.06	0.22	0.7883	-0.03	0.23	0.8975	-0.05	0.22	0.8368
Hispanic	-0.39	0.06	<.0001	-0.18	0.14	0.1892	-0.29	0.16	0.0710	-0.17	0.14	0.2248
Education												
< HS	0.22	0.08	0.0106	0.32	0.17	0.0591	0.44	0.18	0.0181	0.35	0.17	0.0347
HS	0.12	0.06	0.0643	0.19	0.14	0.1808	0.22	0.15	0.1510	0.23	0.14	0.1137
Some Coll	0.14	0.04	0.0039	0.32	0.15	0.0271	0.36	0.15	0.0180	0.34	0.14	0.0170
Income												
< 20,000	0.29	0.06	<.0001	0.48	0.14	0.0008	0.49	0.15	0.0011	0.48	0.14	0.0008
20– 49,000	0.10	0.05	0.3984	0.43	0.14	0.0020	0.43	0.14	0.0016	0.43	0.14	0.0025
50 – 74,000	0.11	0.07	0.3982	0.47	0.18	0.0075	0.47	0.18	0.0085	0.45	0.18	0.0100
Work												
Full Time	-0.41	0.06	<.0001	-0.41	0.12	0.0006	-0.49	0.11	<.0001	-0.48	0.12	<.0001
Part Time	-0.42	0.07	<.0001	-0.41	0.12	0.0010	-0.50	0.12	<.0001	-0.47	0.12	<.0001
Other	-0.45	0.07	<.0001	-0.20	0.15	0.1940	-0.27	0.15	0.0822	-0.24	0.15	0.1016
Marriage												
Never Married	-0.03	0.07	0.6654	-0.09	0.12	0.4659	-0.07	0.13	0.5857	-0.09	0.12	0.4768
Married	-0.37	0.07	<.0001	-0.36	0.17	0.0295	-0.37	0.18	0.0340	-0.38	0.17	0.0217
DEP 12 MO	1.87	0.06	<.0001	1.66	0.15	<.0001	1.65	0.15	<.0001	1.65	0.16	<.0001
DEP LT	1.46	0.05	<.0001	1.22	0.14	<.0001	1.25	0.14	<.0001	1.23	0.14	<.0001
Alcohol Abuse	0.48	0.08	<.0001	0.03	0.17	0.8506	-0.12	0.18	0.5079	0.08	0.16	0.6112
Insured	-0.06	0.06	0.3132	0.04	0.11	0.7116	0.01	0.11	0.9184	0.02	0.11	0.8768
Overall Health												
Fair/Poor	1.21	0.06	<.0001	1.18	0.18	<.0001	1.17	0.18	<.0001	1.18	0.18	<.0001
Good	0.57	0.05	<.0001	0.39	0.13	0.0023	0.39	0.14	0.0048	0.39	0.13	0.0022
Very Good	0.24	0.05	<.0001	0.24	0.15	0.0919	0.23	0.15	0.1317	0.24	0.15	0.1013
DF	24			25			25			25		
CHISQ	7825.25			1415.48			1809.33			1364.99		
N	60151			7659			6985			7690		

N missing	579	125	799	94

The following reference categories were dropped from each regression of FIS: Unemployed, Widowed/Divorced/Separated, Alcohol = no, Insured = no, DEP 12MO = no, DEP LT = no, 50+, Excellent Health, non-Hispanic White, College Graduate, $75K+, *Model 4 includes all controls and can be found in the appendix in detail.
DEP12MO - Depression past 12 months; DEPLT - Depression Lifetime; *B* = Beta, *SE* = Standard Error; *t* = t score.
BOLD are significant at p < .01, * significant at p < .05

AIM 2: The impact of Justice Involvement on Functional Impairment (FIS).

Separate regressions to predict FIS for each of four groups of women with different types of involvement in the criminal justice system were run: No justice involvement, lifetime arrest but not current involvement, current arrest only during the past year and community supervision during the past year. In each, the effects on FIS of past 12 months depressive episode, lifetime depressive episodes, alcohol abuse, insured status, overall health status, and socio-demographic control variables including age, race, education, income, employment, and marital status were examined. Each of the final regressions was significant; the F-statistics and R^2 are shown below.

Table 9
Linear Regression Results for Functional Impairment Score, Full Model for adult women in the NSDUH survey 2014-2016

Criminal Justice Status	*d.f.*	*F*-statistic	*p*-value	R^2
No Justice Involvement	25, 67867	1686.65	$p < .0001$	.38
Lifetime arrest	25, 7633	191.84	$p < .0001$	.39
Current arrest	25, 6959	175.68	$p < .0001$	.39
Community supervision	25, 7664	190.39	$p < .0001$	.38

d.f = degrees of freedom, *p* = probability

Table 9 summarizes the results of all four linear regression models for functional impairment by type of justice involvement. First, the R-squared value describes how close the data is to the fitted line of the regressions. Second, the F-statistic for each type of criminal justice involvement can be examined to determine the overall significance of the model specified. In combination, these two results describe both the overall variation explained by, and the overall significance of the regressions specified. The respective R-squared values of each regression demonstrate that the models explain 38% (for No CJI and CS) or 39% (for EA and CA) of the total variation. For all four criminal justice type regressions, a statistically significant F-statistic at the $p < .01$ level rejects the null hypothesis that the coefficients are zero, or that the regressions specified have no predictive capability. In other words, the significant F-statistics in Table 9 can be used to

determine that the four regressions specified are better than having no models at all. In summary, the results of Table 9 show that each of the four regressions specified are significant.

The detailed tables may be found in the appendix (Model 4 includes all controls). As seen in Table 9. the estimates for the predictors of functional impairment are robust. In Model 1, it is only the outcome variable (FIS) and type of justice involvement. In this model there is a difference between non-justice involved FIS and justice involved FIS. Model 2 demonstrates the effect of depression on FIS when added to the model. According to the regression analyses, the effects of depression are robust and are on about the same magnitude across all groups.

Model 3 illustrates the effect of justice involvement on FIS with depression, alcohol abuse, insured status and overall health added to the model. Once again, there are strong estimates of these covariates. First, the effect of alcohol abuse increases FIS among non-justice involved women by 2.09 but only has a small effect on the current arrest group of 0.30 in this model. The effects of alcohol abuse on FIS among the ever arrest (0.21) and community supervision (0.41) groups do not largely differ. The effect of insured status differs only marginally between the groups. The effect of poor health on FIS (as compared to excellent health) is greatest among those in the current arrest group with an increase of 3.77 in FIS as compared to an increase of only 2.19 in FIS for those in poor health in the non-justice involved group.

Model 4 is the full model that includes all controls and predictors. Results for model 4 can be seen below in Table 10 and the full results may be seen in the Appendix. Adding the controls to the model did not change the relationship of the predictors. The effect of depression on FIS remains robust and the magnitude is consistent across all groups. The effect of poor

health remained a strong predictor of FIS across groups. The strongest predictors of FIS are depression and poor overall health.

Table 10

Functional Impairment Score and Justice Involvement Regression For adult women in the NSDUH survey 2014 - 2016.

No Justice Involvement and Functional Impairment Score Linear Regressions

	Model 1			Model 2			Model 3			Model 4*		
FIS	*B*	*SE*	*t*	*B*	*SE*	*t*	*B*	*SE*	*t*	*B*	*SE*	*t*
NOCJI	-2.58	0.104	**-24.85**	-1.51	0.094	**-16.07**	-1.33	0.092	**-14.50**	-1.16	0.092	**-12.64**
DEP12MO				6.37	0.167	**38.13**	6.04	0.167	**36.10**	5.80	0.161	**36.10**
DEPLT				4.45	0.110	**40.31**	4.40	0.108	**40.72**	4.08	0.105	**38.85**
Alcohol							2.09	0.168	**12.40**	1.53	0.165	**9.25**
Insured							0.16	0.102	1.54	0.25	0.098	2.59*
Health												
Poor							2.19	0.109	**20.13**	2.96	0.112	**26.51**
Good							0.96	0.069	**13.96**	1.38	0.072	**19.29**
Very Good							0.64	0.050	**12.68**	0.75	0.052	**14.43**

Ever Arrested and Functional Impairment Score Linear Regressions

	Model 1			Model 2			Model 3			Model 4*		
FIS	*B*	*SE*	*t*	*B*	*SE*	*t*	*B*	*SE*	*t*	*B*	*SE*	*t*
EA	-1.44	0.248	**-5.81**	-1.05	0.177	**-5.93**	-1.04	0.169	**-6.16**	-0.84	0.204	**-4.11**
DEP12MO				6.30	0.478	**13.20**	5.84	0.458	**12.77**	5.67	0.439	**12.92**
DEPLT				4.22	0.378	**11.17**	4.04	0.362	**11.17**	3.79	0.331	**11.46**
Alcohol							0.30	0.412	0.72	0.15	0.392	0.38
Insured							0.07	0.281	0.23	0.21	0.278	0.75
Health												
Poor							3.68	0.373	**9.88**	3.83	0.355	**10.78**
Good							1.84	0.255	**7.20**	1.84	0.240	**7.69**
Very Good							1.34	0.219	**6.10**	1.34	0.210	**6.39**

Arrested Current and Functional Impairment Score Linear Regressions

	Model 1			Model 2			Model 3			Model 4*		
FIS	*B*	*SE*	*t*	*B*	*SE*	*t*	*B*	*SE*	*t*	*B*	*SE*	*t*
CA	1.37	0.376	**3.63**	0.95	0.277	**3.43**	0.85	0.286	2.97*	0.70	0.308	2.28*
DEP12MO				6.31	0.504	**12.51**	5.80	0.477	**12.17**	5.61	0.455	**12.32**
DEPLT				4.22	0.386	**10.93**	4.05	0.365	**11.10**	3.80	0.331	**11.48**
Alcohol							0.21	0.456	0.47	0.03	0.430	0.06
Insured							0.05	0.276	0.19	0.27	0.280	0.96
Health												
Poor							3.77	0.392	**9.62**	3.93	0.374	**10.49**
Good							1.91	0.263	**7.24**	1.91	0.247	**7.73**
Very Good							1.35	0.234	**5.78**	1.36	0.223	**6.11**

Community Supervision and Functional Impairment Score Linear Regressions

	Model 1			Model 2			Model 3			Model 4*		
FIS	*B*	*SE*	*t*	*B*	*SE*	*t*	*B*	*SE*	*t*	*B*	*SE*	*t*
CS	0.88	0.251	**3.50**	0.80	0.250	**3.19**	0.82	0.238	3.44*	0.55	0.270	2.05*
DEP12MO				6.33	0.478	**13.25**	5.87	0.460	**12.76**	5.68	0.442	**12.83**
DEPLT				4.22	0.380	**11.13**	4.05	0.363	**11.15**	3.81	0.331	**11.51**
Alcohol							0.41	0.411	1.00	0.22	0.394	0.56
Insured							0.02	0.278	0.06	0.19	0.275	0.68
Health												
Poor							3.69	0.377	**9.81**	3.84	0.357	**10.75**
Good							1.85	0.258	**7.18**	1.86	0.241	**7.73**
Very Good							1.32	0.221	**5.97**	1.33	0.211	**6.29**

The following reference categories were dropped from each regression of FIS: Unemployed, Widowed/Divorced/Separated, Alcohol = no, Insured = no, DEP 12MO = no, DEP LT = no, 50+, Excellent Health, non-Hispanic White, College Graduate, $75K+, *Model 4 includes all controls and can be found in the appendix in detail.
DEP12MO - Depression past 12 months; DEPLT - Depression Lifetime; *B* = Beta, *SE* = Standard Error; *t* = t score.
BOLD are significant at p < .01, * significant at p < .05

Averages were run by type of justice involvement to examine group composition. As seen in Table 1, group composition differs on multiple demographic variables as suspected. The first regression examines the relation of type of justice involvement to the outcome variable. The second regression includes the depression variables DEP (Depressive Episode Past 12 months) and DEPLT (Depressive Episode Lifetime), which appear significant in every group as a predictor of FIS. However, there does not appear to be significant differences between groups in the effect of depression on FIS. In fact, women without criminal justice involvement appear to have greater functional impairment when reporting a history of depression than women who have experienced justice involvement. This required closer evaluation of both individual variable contribution and group composition. Table 11 is a decomposition of the FIS and the difference between groups due to means and the difference due to treatment.

Table 11

Decomposition Table Functional Impairment Scores: No Justice Involvement Compared to Justice Involved Groups for the adult women in the NSDUH survey 2014-2016.

	NO CJI vs EA		No CJI vs CA		No CJI vs CS	
	% Difference Due to		% Difference Due to		% Difference Due to	
	Means	Treatment	Means	Treatment	Means	Treatment
Age (years)						
18 – 25	-2.90%	-6.29%	4.64%	-2.54%	3.83%	-2.65%
26 – 34	4.08%	-1.98%	3.25%	-0.80%	5.11%	-0.78%
35 – 49	5.09%	1.21%	0.03%	1.25%	1.49%	0.86%
Race						
NH Black	-1.88%	-12.11%	3.99%	-6.87%	3.19%	-5.62%
NH Other	0.68%	4.72%	0.97%	2.37%	0.48%	2.38%
Hispanic	0.64%	2.15%	0.09%	0.82%	0.18%	1.09%
Education						
< HS	-0.69%	0.63%	-1.75%	0.42%	-1.97%	0.45%
High School	-0.48%	0.39%	-1.36%	-0.12%	-1.17%	0.46%
Some College	1.03%	5.95%	0.32%	2.69%	0.51%	3.27%
Income						
< 20,000	2.68%	3.51%	4.85%	2.39%	4.14%	2.29%
20– 49,000	0.35%	3.81%	0.01%	2.10%	0.29%	2.11%
50 – 74,000	0.12%	-0.93%	-0.01%	-0.11%	-0.04%	0.02%
Work						
Full Time	-0.30%	-0.04%	-1.23%	-0.20%	-0.71%	-0.10%
Part Time	-1.03%	5.89%	-0.03%	0.98%	-0.20%	2.03%
Other	-0.16%	3.03%	-0.11%	0.59%	-0.06%	1.21%
Marriage						
Never Married	-0.75%	-1.49%	-1.55%	-0.52%	-1.75%	-0.82%
Married	-2.59%	-0.72%	-0.61%	-0.33%	-0.72%	-0.66%
Depression Past Year	21.17%	-0.48%	15.04%	-0.32%	14.98%	-0.23%
Depression Lifetime	20.89%	-2.18%	15.04%	-0.32%	10.67%	-1.03%
Alcohol Abuse	0.15%	-1.12%	0.05%	-0.55%	0.30%	-0.53%
Insured	-0.50%	-2.11%	-0.87%	0.29%	-0.55%	-1.52%
Overall Health						
Fair/Poor	12.70%	5.91%	10.59%	2.96%	4.75%	2.99%
Good	4.10%	6.34%	1.05%	3.24%	3.35%	3.25%
Very Good	-2.64%	10.45%	-2.57%	4.88%	-1.43%	5.07%
Difference in FIS	59.75%	40.25%	47.15%	52.85%	44.68%	55.32%

NO CJI - No Justice Involvement; EA - Ever Arrested; CA - Current Arrest; CS - Community Supervision

HS - High School; Sep- Separated.

The following reference categories were dropped from each regression of FIS to prevent multicollinearity: DEP 12MO = no, DEP LT = no, 50+, Excellent Health, non-Hispanic White, College Graduate, $75K+, Unemployed, Widowed/Divorced/Separated, Alcohol = no, Insured = no

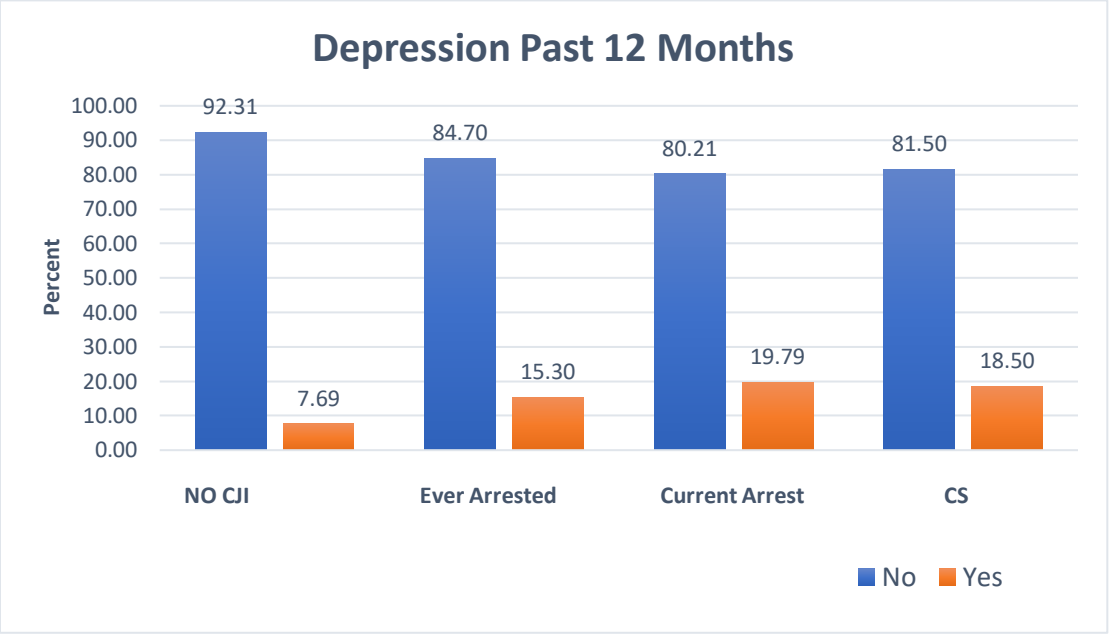
In general, the significance of the variables predicting FIS varied across all four regressions. However, common significant determinants were age, race, depression (both past year and lifetime), and overall health status. The estimated magnitude of the effects of race and depression on FIS did not differ between the non-criminal justice-involved and criminal justice-involved equations. In other words, holding all else constant, having a depressive episode in the past year or lifetime depression significantly predicts FIS scores across all types of justice involvement. In all groups, depression is associated with an increase in FIS score. For both non-criminal justice involved and criminal justice-involved groups, non-Hispanic black women were significantly linked with a decreased predicted FIS.

Further comparisons between the significance of the other person level variables for the non-criminal justice involved group and the justice-involved women are detailed below.

Depression, Justice Involvement, and FIS

Upon taking a closer look at group composition, we see that more women who are justice involved report depression than women who are not. See Figure 1. for the distribution of past year depression and group composition.

Figure 1



Depression by Type of Justice Involvement for adult women in the NSDUH survey 2014-2016.
No CJI – No justice involvement; CS – Community Supervision

Past 12-month depression for never arrested women is lower at 7.7% as compared to justice involved women; 19.8% of women who were arrested in the past year report a depressive episode during the same time frame. Ever arrested women have twice the percentage (15.3%) of past year depressive episode as compared to never arrested women (7.7%). A higher percentage of women under community supervision also report past year depressive episodes (18.5%) as compared to women who have never been arrested. Group composition is affecting differences in depression and functional impairment.

The regressions were further broken down to examine the proportion of the difference in FIS scores that can be explained by group composition and the proportion of difference in scores that can be explained by the coefficients as seen in Table 11. Results of the analyses suggest

depressive episode past year and lifetime are significant contributors to the difference in FIS scores between non-justice and justice involved groups due to group composition.

As seen in Figure 1, twice the percent of women in justice involved groups reported lifetime depression as compared to non-justice involved women (no CJI – 15.14%, ever arrested 26.39%, current arrested 29.81%, community supervision 26.63%). By combining past year and lifetime depression, 41% of the difference in predicted FIS score between non-justice involved and justice involved women can be explained by the effect of depression as twice the number of women who have experienced justice involvement report depressive episodes.

Overall Health, Justice Involvement and FIS

Table 12 displays the results of the impact of health status on FIS for the four regressions.

Table 12
Functional Impairment Linear Regression results for adult women in the NSDUH, 2014-2016: Overall Health Status (Excellent Health as REF).

	Fair/Poor				Very Good			
Criminal Justice Status	*B*	*SE*	*95% CI*	p- value	*B*	*SE*	*95% CI*	*p*- value
No Justice Involvement	2.96	0.11	2.74 – 3.18	*p* <.0001	0.75	0.05	0.65 – 0.89	*p* <.0001
Lifetime arrest	3.83	0.36	3.13 – 4.53	*p* <.0001	1.34	0.21	0.93 – 1.76	*p* <.0001
Current arrest	3.93	0.37	3.18 – 4.67	*P* <.0001	1.36	0.22	0.93 – 1.81	*p* <.0001
Community supervision	3.84	0.36	3.13 – 4.55	*p* <.0001	1.33	0.21	0.91 – 1.75	*p* <.0001

B- Beta; *SE* – Standard Error; *CI* – Confidence Interval; *p* – probability.

Poor health status predicted functional impairment score across all groups and the size of the effects of poor health differed with the greatest effect in the current arrest population. The magnitude of the effect of poor health on FIS was greater among women who reported poor health across all justice involved groups as compared to women who reported poor health in the non-justice involved group. For example, fair/poor health in the non-justice involved group increases predicted FIS score by 2.96, relative to those that report excellent health. In the current

arrest group, fair/poor health increases predicted FIS by 3.93, relative to those in the same group with excellent health.

Within the three justice involved groups (EA, CA, and CS), the effect of poor health on FIS does not appear to differ. There is a difference in the effect of overall health status on FIS among women who report very good health (as compared to excellent health) among women with no justice involvement as opposed to women with any reported justice involvement. However, there does not appear to be a significant difference in the effect of overall health status on FIS among women already involved in the criminal justice system. Poor health status contributes a significant portion of the difference in FIS scores between the non-justice group and the justice involved groups due to the effect of poor health on FIS; however, there is also a compositional difference in poor health status among the groups. There are 10% more women in the community supervision group (26.12%) who report being in poor health as there are in the never arrested group (14.7%). Justice involved women have a much higher concentration of poor health.

Further Examination of Control Factors and FIS

Age, Justice Involvement and FIS

The estimated magnitude of the effects of age on FIS differed between the equations as seen in Table 13.

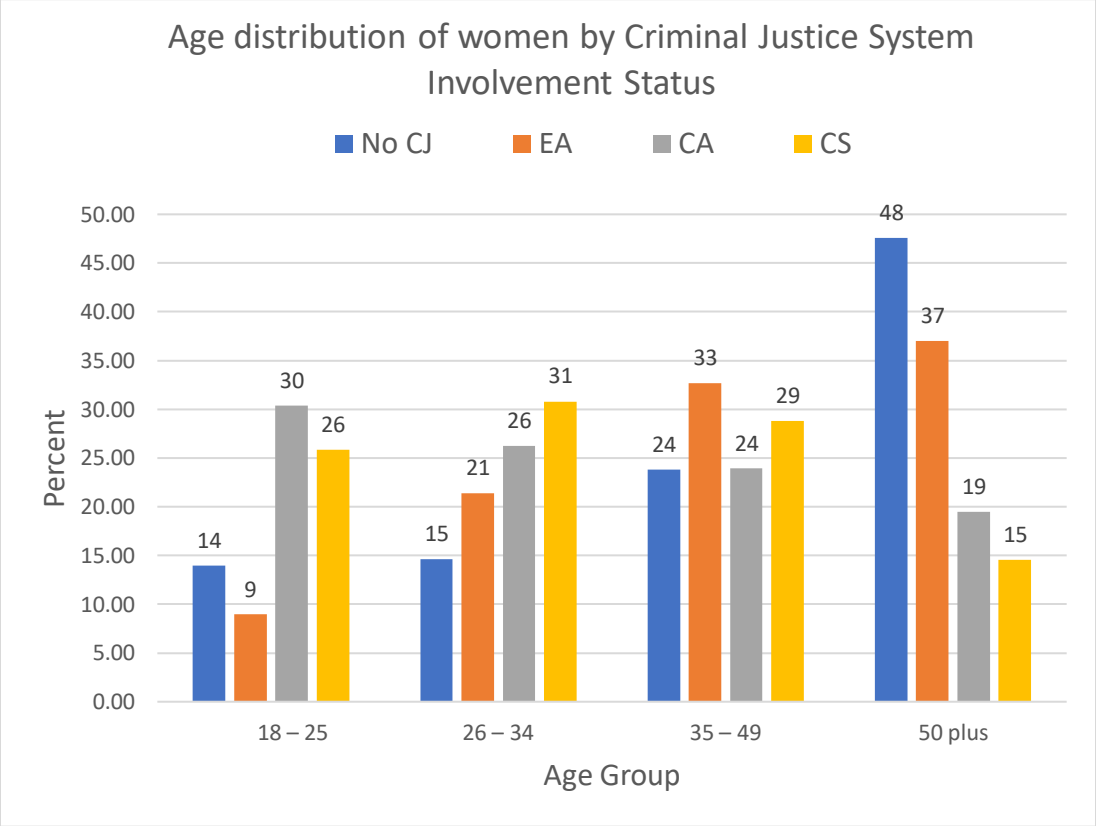
Table 13
Functional Impairment Linear Regression results for adult women in the NSDUH survey 2014-2014: Age 18-25 as compared to Age 50+

Criminal Justice Type	*B*	*SE*	*95% CI*	*p*- value
No Justice Involvement	2.10	0.07	1.96 – 2.24	*p* <.0001
Lifetime arrest	1.52	0.32	.54 – 1.82	*p* <.0001
Current arrest	1.28	0.31	.67 – 1.81	*p* <.0001
Community supervision	1.32	0.32	.70 – 1.95	*p* <.0001

B- Beta; *SE* – Standard Error; *CI* – Confidence Interval; *p* – probability.

Age appears to significantly predict FIS across all four criminal justice type regressions. The estimated magnitude of the effect of age on FIS differs between women with no justice involvement and those who have any kind of criminal justice involvement. However, the estimated effect of age on FIS does not appear to significantly differ among women who have any kind of justice involvement. Specifically, the results in Table 13 demonstrate that the effect of belonging to the 18-25 age group for women not involved in criminal justice that, holding all else constant, is associated with a 2.10 increase in expected FIS. When comparing the three criminal justice involved groups, the expected effect is an increase of ever arrested (1.52), current arrest (1.28), and (1.32) for community supervision, respectively. It is important to note the significant difference in age of non-justice involved women who are significantly older. As seen in Figure 2 the age distribution is heavily skewed towards the younger age groups (18 – 25 and 26 – 34) among the justice involved women.

Figure 2



Age Distribution by Type of Justice Involvement for adult women in the NSDUH survey 2014-2016.

No CJ = No justice involvement; EA = Ever Arrest; CA = Current Arrest; CS = Community Supervision

Race, Justice Involvement and FIS

Upon closer examination, race contributes to the difference in FIS between non-justice and justice involved women. Black women report lower FIS as compared to white women, however there are a greater number of black women in each of the justice involved groups (No CJI = 11.9%, EA = 16.6%, CA = 23.2%, CS = 18.3%). The impact of race on FIS is less for justice involved women than for non-justice involved women. For example, the effect of being non-Hispanic black seen in Table 15 for the former decreases predicted FIS by 1.66, 1.76 (CA),

and 1.64 (CS). For non-justice involved women, this effect on FIS is smaller (-1.28). The effect of depression on FIS is less for black women in the criminal justice system than for black women not in the justice system. There appears to be some protective factor for black women who are justice involved and report depression.

Income, Justice Involvement and FIS

Income categories were not significant predictors of FIS. Women in poverty (under 20K in family income) make up twice the percentage of participants in the current arrest (46.4%) and community supervision (42.5%) groups as compared to the never arrested group (18.5%). Poverty contributes approximately 6% of the difference in FIS between non-justice involved women and women currently involved in the justice system. Overall, it did not produce robust estimates in the model, nor did it impact the difference in FIS between groups substantially, though group composition differs.

Table 15

Regression Analyses Functional Impairment and Types of Justice Involvement for Adult Women in the NSDUH survey 2014-2016, Full Model

	NO CJI			EA			CA			CS		
Variable	B	t	p	B	t	p	B	t	p	B	t	p
	-1.16	-12.64	<.0001	-0.84	-4.11	<.0001	0.70	2.28	0.027	0.55	2.05	0.0459
Age (years)												
18 – 25	2.10	30.00	<.0001	1.18	3.65	0.0006	1.28	4.14	0.0001	1.32	4.19	0.0001
26 – 34	1.52	23.56	<.0001	1.24	4.31	<.0001	1.27	4.63	<.0001	1.30	4.58	<.0001
35 – 49	1.07	17.32	<.0001	1.17	4.98	<.0001	1.31	5.79	<.0001	1.22	5.22	<.0001
Race												
Non-Hispanic Black	-1.28	-16.71	<.0001	-1.66	-6.72	<.0001	-1.76	-6.57	<.0001	-1.64	-6.60	<.0001
Non-Hispanic Other	-0.51	-5.97	<.0001	0.30	0.74	0.4606	0.39	0.92	0.3612	0.31	0.78	0.4400
Hispanic	-1.02	-14.72	<.0001	-0.49	-1.71	0.0928	-0.57	-2.06	0.0448	-0.48	-1.70	0.0956
Education												
< High School	-0.95	-11.32	<.0001	-0.84	-2.71	0.0093	-0.79	-2.33	0.0241	-0.80	-2.53	0.0145
High School	-0.67	-11.47	<.0001	-0.64	-2.51	0.0155	-0.70	-2.73	0.0087	-0.60	-2.36	0.0221
Some College	-0.13	-2.38	0.0211	0.27	1.19	0.2392	0.27	1.18	0.2441	0.31	1.37	0.1753
Income												
< 20,000	0.20	2.29	0.0260	0.59	1.62	0.1115	0.78	2.35	0.0228	0.71	2.27	0.0275
20– 49,000	-0.01	-0.17	0.8628	0.24	0.79	0.4325	0.30	1.05	0.2991	0.27	0.99	0.3275
50 – 74,000	0.03	0.64	0.5224	-0.08	-0.29	0.7701	0.01	0.02	0.9825	0.04	0.15	0.8795
Work												
Full Time	-0.22	-1.93	0.0598	-0.25	-0.74	0.4624	-0.47	-1.44	0.1574	-0.33	-1.02	0.3117
Part Time	0.10	0.73	0.4673	0.41	1.22	0.2281	0.21	0.63	0.5315	0.32	0.93	0.3553
Other	0.04	0.32	0.7468	0.42	1.12	0.2660	0.20	0.55	0.5823	0.34	0.92	0.3607
Marriage												
Never Married	-0.14	-1.93	0.0594	-0.27	-1.25	0.2189	-0.24	-1.09	0.2800	-0.28	-1.28	0.2067
Married	-0.48	-7.42	<.0001	-0.54	-2.24	0.0297	-0.54	-2.15	0.0361	-0.59	-2.41	0.0199
Depression Past 12	5.80	36.10	<.0001	5.67	12.92	<.0001	5.61	12.32	<.0001	5.68	12.83	<.0001
Depression Lifetime	4.08	38.85	<.0001	3.79	11.46	<.0001	3.80	11.48	<.0001	3.81	11.51	<.0001
Alcohol Abuse	1.53	9.25	<.0001	0.15	0.38	0.7064	0.03	0.06	0.9520	0.22	0.56	0.5751
Insured	0.25	2.59	0.0124	0.21	0.75	0.4594	0.27	0.96	0.3416	0.19	0.68	0.5016
Overall Health												
Fair/Poor	2.96	26.51	<.0001	3.83	10.78	<.0001	3.93	10.49	<.0001	3.84	10.75	<.0001
Good	1.38	19.29	<.0001	1.84	7.69	<.0001	1.91	7.73	<.0001	1.86	7.73	<.0001
Very Good	0.75	14.43	<.0001	1.34	6.39	<.0001	1.36	6.11	<.0001	1.33	6.29	<.0001
R2	0.38			0.39			0.39			0.38		
RMSE	4.35			5.31			5.27			5.33		
F-Value	1686.65			191.84			175.68			190.39		

N	67893	7659	6985	7690
N missing	871	125	799	94

The following reference categories were dropped from each regression of FIS: Unemployed, Widowed/Divorced/Separated, Alcohol = no, Insured = no, DEP 12MO = no, DEP LT = no, 50+, Excellent Health, non-Hispanic White, College Graduate, $75K+, *Model 4 includes all controls and can be found in the appendix in detail.
DEP12MO - Depression past 12 months; DEPLT - Depression Lifetime; *B* = Beta, *SE* = Standard Error; *t* = t score.
BOLD are significant at p < .01, * significant at p < .05

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CHAPTER FOUR

DISCUSSION, CONCLUSION, AND IMPLICATIONS

The primary purpose of this study was to determine if psychological distress (PD) and functional impairment score (FIS) differed by type of justice involvement among adult women in the United States by examining NSDUH data from years 2014 – 2016 (*National Survey on Drug Use and Health Public Use File Codebook*, 2016). Justice involvement may be a stressor that impacts chronic stress in women (Patnaik, 2014). Chronic stress has been linked to chronic health problems in women (Raposa, Hammen, Brennan, O'Callaghan, & Najman, 2014). Additional goals of this study were to examine the effects of depression, alcohol abuse, insured status, and overall health on psychological distress and functional impairment among women in each type of justice involvement. Based on the Stress Response Model, stress proliferation may cause a "spill-over" effect where exposure to one stressor may lead to additional stressors (Pearlin, 2010). Prior research suggests these predictors may be related to stress and negative health conditions in women (Benoit et al., 2016; Elliott & Lowman, 2015; Ford, 2014; Glasheen et al., 2015; Ward & Martinez, 2015). PD and FIS are used as proxy measures for stress as determined by the Kessler Psychological Distress Scale (K6)(Bessaha, 2017) and the World Health Organization Disability Assessment Schedule (WHODAS) (Axelsson, Lindsäter, Ljótsson, Andersson, & Hedman-Lagerlöf, 2017), in this study.

These results support the hypothesis that current justice involvement is a stressor that impacts mental health; however, past justice involvement may not be, as the ever-arrested group did not differ from the never arrested group. Findings support the original hypothesis that justice involvement is a stressor that impacts daily functioning. Results suggest that type of justice involvement explains a portion of the outcome, but compositional factors were also impactful.

There were stark differences in the ways the groups were comprised. For example, the non-justice-involved groups were older, wealthier, and healthier than the justice-involved groups. These differences had a significant impact on both PD and FIS results.

PD by Type of Justice Involvement

A higher proportion of currently justice-involved women reported PD than non-justice involved women. These findings are consistent with the literature that suggests experiencing a stressful situation, particularly justice contact through arrest or incarceration (even brief), may impact mental health by increasing stress in other areas according to the Stress Process Model (Sugie & Turney, 2017). Further, this stress may become chronic which could contribute to the increase in distress (Alvord, 2019). Women in this study who only report previous lifetime contact with the justice system through an arrest did not report a significantly greater proportion of psychological distress. This finding is consistent with research that suggests stress may be situational and can diminish over time (Au, 2017). According to the Stress Process Model, a stressor may by discrete and disrupt daily life (an arrest), however, if it does not cause a trauma that becomes chronic (it was over a year ago and they are not serving community service) then stress levels diminish (Au, 2017). Interestingly, PD did not greatly differ between currently justice-involved women (current arrest and community supervision) which suggests both groups may be experiencing elevated stress associated with justice involvement. Women under community supervision reported slightly lower proportions of PD than women who reported a recent arrest which suggests once the arrest is resolved, there may be a reduction in distress.

Another possible explanation for the decrease in PD among women under community supervision is these women may be receiving services that reduce their distress. For instance, in

Georgia, woman under community service can receive services from a local agency that provides wraparound mentoring, education and employment services, and life skills training, and parenting skills training for those women who may be mothers. This program begins providing services while the women are incarcerated in jail by giving them legal aid, small group counseling, skill building and parenting classes. Support continues once they transition into the community with housing assistance, education and employment training, transportation assistance, additional parenting training and counseling services ("CHRIS 180," 2018). This type of program may reduce the chronic stress found among women under community supervision by meeting their basic needs. Little is known, however, about how well disseminated such program are; thus, further research should examine how widespread these types of services are and how well the program is meeting the needs of the populations served.

It is also important to note that, though the prevalence of PD is greater among justice involved women, the composition of women within the justice involved groups differs significantly from those with no justice involvement. As seen in Table 7., a greater proportion of women you are young, low-income women, and women who report being in poor health comprise the justice involved groups. Additionally, the proportion of women who suffer from depression is much higher within the justice involved groups. These compositional differences accounts for nearly half the difference in the prevalence of PD between groups. Studies show individuals who are incarcerated are disproportionately poor, and bear a much greater burden of disease and illness than their non-incarcerated counterparts, including disproportionate rates of mental illness, and infectious diseases (Tyler & Brockmann, 2017).

FIS by Type of Justice Involvement

FIS differed by type of justice involvement in this study. Women with justice involvement reported higher FIS than women with no justice involvement, which is consistent with the theory of stress proliferation (Pearlin, 2010). Notably, FIS among women with a lifetime arrest is higher than never arrested, but lower than woman who have had a past 12-month arrest and or are currently enrolled in community supervision. The results of this study support our conclusion that justice involvement is a stressor that impacts daily functioning. A recent study found that exposure to a potentially traumatic event increases the risk of poor mental and physical health outcomes, including functional impairment (Forman-Hoffman et al., 2019). The results of this study suggest justice system involvement may be a traumatic event that is associated with elevated functional impairment scores. A traumatic event is an incident that causes physical, emotional, spiritual, or psychological harm. The person experiencing the traumatic event may feel threatened, anxious, or frightened as a result. According to the American Psychiatric Association (2000), the majority of people experience symptoms such as hyperarousal, hypervigilance, angry outbursts, nightmares, or emotional numbing for a short period of time (< 1 month) after experiencing a traumatic event (Jäggi, Mezuk, Watkins, & Jackson, 2016). In some cases, they may not know how to respond, or be in denial about the effect such an event has had. The person will need support and time to recover from the traumatic event and regain emotional and mental stability.

Interestingly, similar to PD, FIS in this study is slightly reduced among women under community supervision as compared to women who report arrest in the past year. As stated previously, community supervision may provide stress-reducing services to women in the justice system that impact daily functioning. Or women under community supervision may be past the

acute phase of experiencing the trauma of justice involvement. An alternate explanation may be that the requirements of community supervision may supersede the individual's desire to remain home or avoid employment/school and the WHODAS, which measures daily functioning, specifically asks about work, school and maintaining responsibilities. Women under community supervision may be required to maintain employment, attend school or vocational training, maintain stable housing, pay fees, and other responsibilities to avoid incarceration (Morash, Kashy, Smith, & Cobbina, 2019). The nature of community supervision may force women to function within societal norms, thus reporting lower impairment scores. Further research into the requirements of women and the services received by women on community supervision would be warranted to fully understand the association with functional impairment scores.

Once again, it is important to note that the difference in FIS scores between justice-involved and non-justice involved groups is due, in part to compositional differences. Roughly 30-40% of the difference in scores is due to the proportion of women within the justice-involved groups that report experiencing depression or poor health, as compared to the non-justice involved group. Though compositional differences account for some of the group differences in FIS, there remains group differences in FIS due to justice type. Further research should examine ways to reduce the mental and physical health burdens for women who are justice involved.

The role of Depression, PD and FIS by Type of Justice Involvement

Depression was found to be strongly associated with both outcome variables, PD and FIS. The magnitude of this relationship did not differ between types of justice involvement. Though it is not surprising that depression is associated with PD and FIS, the lack of difference between groups is surprising. This finding is contrary to what was expected based on previous

research that notes the proportion of women who report depression is higher among justice involved groups (Glasheen et al., 2015). Similarly, based on this study, twice the proportion of women currently involved in the justice system report depression as do women not involved in the justice system. These findings do not support the Stress Process Model. Future research should examine this relationship more closely to determine if there are interventions in place that mediate the relationship between depression and stress for women involved in the justice system.

One potential explanation for the lack of differences between groups in depression scores in this study could be due to emotional numbing as a result of exposure to cumulative trauma. Emotional numbing is a type of cognitive avoidance that typically includes restricted emotional affect, detachment from others and a loss of interest in activities (Feeny et al., 2000). This emotional numbing shuts down the individual's affective system which includes the feelings of sadness and depression (Feeny et al., 2000). Emotional numbing could result in less than accurate depression scores for participants who have experienced chronic stress. Future research should examine this relationship among women involved in the justice system.

The role of Overall Health Status, PD and FIS by Type of Justice Involvement

Poor health was strongly associated with both outcome variables, PD and FIS, across all groups. The variance between groups was minimal for PD but strongest in the non-justice group. The magnitude of the effect of poor health on FIS differed between non-justice involved women and justice-involved women with the stronger effect found among justice involved women. The findings of FIS support the stress proliferation theory (Pearlin, 2010), that the stressor of poor health is combined with the stressor of justice involvement and they may exacerbate each other. Research shows poor health has been linked to stress in women, though the correlation between poor mental health and stress is stronger than poor physical health and stress (Salleh, 2008). It is

worthwhile to note that the proportion of women with poor health in in the current arrest group is double in comparison to those in the never arrested which is consistent with prior research which suggests justice involvement is linked to poor health outcomes (Binswanger et al., 2012). A limitation of this measure is that it is a single, self-reported question about overall health so validity may not be high. This is a measure of the participants' perception of their overall health. Future research should examine what interventions are available to women who are involved in the justice system that may be mediating their poor health status and reducing their odds of PD to look similar to those women who are not justice involved and in poor health.

Control Variables by Type of Justice Involvement:

Age, PD and FIS by Type of Justice Involvement

Age was a strongly associated with both PD and FIS across all justice types. The estimated magnitude of the effect of age on PD and FIS differed between women with no justice involvement and any kind of justice involvement. There are twice the proportion of younger women (under the age of 35) involved in the justice system than older women. The odds of having PD were 3-4 times higher for younger women than they were for older women (over the age of 50). However, odds of PD were lower among justice involved women as compared to non-justice involved women. Similarly, FIS was higher among young women with no justice involvement. These findings were surprising. Once again, this suggests there may be supportive services available to women once they enter the justice system that are ameliorating their stress. In a recent study of diversion programs it was discovered that, although there remains a serious need for gender specific programs designed for women, those women who do enter diversion programs after arrest are more likely to utilize outpatient mental health treatment (88%) than women who do not enter diversion programs (74%) (Robertson et al., 2020). Future research

should examine this relationship more closely to determine if service utilization explains why young women in the justice system appear to manage their elevated stress better than young women outside the justice system.

Race, PD and FIS by Type of Justice Involvement

Holding all other variables constant, black women had lower odds of PD and lower FIS than all other races in this study. This held true across all justice types. This finding is surprising as it has been reported that the incarceration rate of black women is twice that of white women (Carson, 2018), due in part to harsher sentencing policies and public policies that disproportionately affect minority populations (Tyler & Brockmann, 2017). This study shows that the proportion of black women arrested in the past year are twice the proportion of black women who have never been arrested. One possible explanation is that black women do not acknowledge stress as a legitimate feeling. Beauboeuf-Lafontant (2009) postulated that black women bury their stress and emotions and engage in other behaviors when they feel stressed, as opposed to acknowledging it (Beauboeuf-Lafontant, 2009). An alternative explanation is that black women may disengage or internalize their feelings to help them deal with feelings of stress. For instance, a study of black female college students focused on discrimination, it was found that black women in the study utilized detachment and internalizing feelings which mediated the relation of gendered racism to psychological distress (Szymanski & Lewis, 2016).

An alternate explanation is that the measures of PD and FIS have been validated primarily for white samples and they may not have accurate cut off scores for culturally diverse populations. For example, according to recent research, there may be differences in assessment of the “effort” and “worthless” items in the PD questionnaire by black respondents as a result of possible cultural differences in symptom expression (Stolk, Kaplan, & Szwarc, 2014) Future

research should examine the racial and cultural bias that exists in measurement that may influence study results.

On a policy level, it would be of interest to conduct further analyses to investigate the interaction between race and income to determine the effect on PD and FIS. Future studies should examine these predictors as, historically, black women have earned less than their white counterparts ("Pay Equity & Discrimination," 2019). Black women have disproportionately higher risk for living in poverty with nearly 1 in 4 black women living below the poverty line (Belle & Doucet, 2003b). It would also be of interest to further investigate the interaction between race, and depression. Black women have suffered disproportionately high levels of cumulative trauma and stress from discrimination and racism (Thomas et al., 2019). This cumulative trauma may result in emotional numbing, as mentioned earlier, that impacts study results. Future research should examine if black women suffer from PTSD due to daily microaggressions and are experiencing emotional numbing that prevents them from feeling sadness or depression.

Income, PD and FIS by Type of Justice Involvement

Income was only slightly stronger associated with PD among justice involved women than non-justice involved women. The effect of income on FIS did not emerge as significant. Our study sample indicates a higher proportion of low-income women comprise the justice-involved groups than the non-justice involved group. A body of research has established poverty is linked to depression (Belle & Doucet, 2003b; Siefert, Heflin, Corcoran, & Williams, 2001). It's surprising to see the magnitude of the effect of income on PD is not much different between groups, even though the proportion of women earning less than $20,000 annually is more than doubled in the current arrest group as compared to the never arrested group. These findings do

not support the theory of stress proliferation (Pearlin, 2010) as poverty does not seem to compound with justice involvement to increase PD or FIS. Though low-income women have greater odds of PD, this effect remains similar across all justice types and is minimally larger than non-justice involved women.

Strengths of current study

This study was the first to use a gender-pathway approach to examine stress in adult women by type of justice involvement. A recent published study examining exposure to the U.S. criminal justice system and measures of well-being along 5 domains (physical, mental, social, spiritual, and overall life evaluation) found that exposure to police stops, arrests, and incarceration were each associated with lower well-being in every domain compared with those not exposed (Sundaresh et al., 2020). This study further supports these recent findings that suggests exposure to the justice system is associated with stress but focuses on women. This study supports justice involvement as a stressor for adult women in the US. Stress has a negative impact on health (Schneiderman, Ironson, & Siegel, 2005). Also, due to the large sample size used over the three years of the NSDUH, the results are generalizable.

Study Limitations

Like all studies, this study has several limitations. First, this survey does not have a fully representative sample as it does not include institutionalized women. No women who were incarcerated, hospitalized, or homeless were included in this study. Considering this study examined justice-involved women, this could influence the study outcomes. Justice-involved populations are difficult to study considering the average length of time in jail is 24-48 hours.

Second, these data are cross-sectional, so directionality of relationships are suggested, but

not definitive. Conducting a longitudinal study of justice involved women would be helpful in the future. Third, our measures of stress are proxy measures. Stress can be measured using cortisol levels in the blood and future research could examine stress levels by obtaining blood samples of participants and comparing them to evaluate stress at a biological level. By including institutionalized populations, conducting a longitudinal study, and obtaining biological samples, these limitations could be overcome.

Further, as all measures used in this study are self-report, they are limited by the participant's willingness to answer the questions as they are asked. We did not access criminal records or health records. In an effort to promote honesty and openness in answering questions, the computer assisted method was used for questions of a sensitive nature.

Additionally, this study focused on individual characteristics that impact psychological distress and functional impairment among women by type of justice involvement; however, I recognize that there are factors at other levels of the social ecological system that could drive these outcomes. For example, at the microsystem level, women in the justice system may have more relationships with justice-involved peers or have grown up in families with chaotic environments. At the neighborhood (mesosystem) level, women who report current justice involvement may live in more violent neighborhoods where crime is socially accepted as a way of life. And finally, at the community level (exosystem), those women who have never reported justice contact may reside in resource-rich areas where jobs and housing are obtainable (Walker, 2011). Future studies could examine these factors to determine their impact on psychological distress and functional impairment by type of justice system involvement.

Finally, the categories of justice involvement or "types" were created for the purpose of this study to clearly identify separate groups without the benefit of previous research. The definitions of these groups were created based on a combination of the flowchart of events in the criminal justice system from the Bureau of Justice Statistics ("Bureau Of Justice Statistics: What is the sequence of events in the criminal justice system?,") and the questions available in the National Survey of Drug Use and Health years 2014 – 2016. It is unclear exactly how valid and distinct these separate categories are.

Conclusion and Implications

This study serves to better understand the relationship between justice involvement and stress among adult women in the United States. The findings from this study support justice involvement as a stressor for adult women in the U.S. Stress impacts mental health and alters executive functioning (Girotti et al., 2017). According to these findings, women who are currently involved in the justice system are experiencing stressors that are reducing daily functioning and increasing distress. Interestingly, women under community supervision had better outcomes in this study than women who had only been arrested. This suggests there may be successful probation interventions in place that are ameliorating these negative effects.

Unfortunately, the young, minority, ill, less fortunate women in America are more justice-involved than their older, wealthier, white, healthier counterparts. Many of these women come into the system already stressed due to other life events and I propose their entry into the system through an arrest could be an opportunity to help alleviate stress by providing social support through intervention services. Findings from this study can be used to support the implementation of interventions for women who have contact with the justice system to reduce

stressors and improve health outcomes. Several programs currently exist that show promise in assisting women who have already been incarcerated and are reentering society such as those available through the Second Chance Act ("Second Chance Act Grant Program," 2019). The Second Chance Act was passed in 2008 and is designed to reduce recidivism and improve outcomes in those individuals who have been to jail, prison, or juvenile facilities. However, as seen from this study, women who have experienced arrest have the worst health outcomes. It is imperative to increase focus on helping women who have contact with the justice system prior to going to jail or prison. Additional intervention programs should be created for women to meet their immediate needs, so they are available for referral once they have contact with law enforcement. This may keep women out of the justice system completely and provide the supportive services they need. One example of an existing program includes The Center for Family Resources which offers housing assistance, food, and help with transportation for those in need, regardless of arrest history (Bridges, 2020).

Law enforcement officers need training to recognize the needs of women and refer them to available resources. Consistent with the recommendations from the 50-State report on Public Safety from the Council of State Governments (2020), Part 1, Strategy 2, law enforcement officials should improve the identification of individuals with existing behavioral health needs and divert them to services instead of the justice system ("Advancing safety and second chances ", 2020). This referral process will likely reduce the number of women in the justice system for petty crimes and improve the lifelong health of the women involved. Women who are under stress will likely be highly anxious and would be better served by receiving assistance instead of being arrested and entering the justice system. Public safety and health officials working together can improve women's health outcomes.

Future research should examine how intervention programs impact the long-term health trajectories of women involved in the justice system, particularly those most vulnerable. This study found both group composition and type of justice involvement contributed to stress levels, so it is important to focus future studies on vulnerable populations including youth, black women and women who live in poverty. Future studies should include a longitudinal examination of justice-involved women to include a randomized controlled study with one group receiving interventions such as housing assistance, employment assistance, medical care, and mental health services as well as a mentor who will help recently released women reintegrate back into society; and one sample receiving services as usual. Health outcomes should be compared among these randomized samples to validate the efficacy and effectiveness of intervention programs targeted at improving overall health of women in the justice system. Criminal justice contact is a stressor that impacts health in women in the U.S. Considering millions of women continue to experience this stressor ("Policing Women: Race and gender disparities in police stops, searches, and use of force," 2019),intervention programs that ameliorate the stress could impact public health for years to come.

APPENDIX

Table 16
Descriptive Statistics for Adults Women in the National Survey of Drug Use and Health Unweighted, Years 2014 - 2016, (N=68697).

Characteristic		Frequency (n)	Percent (%)
Age (years)			
	18 – 25	21702	31.6
	26 – 34	14225	20.7
	35 – 49	18300	26.6
	50 – 64	8552	12.4
	65 or Older	5985	8.7
Race			
	Non-Hispanic White	41526	60.5
	Non-Hispanic Black	8978	13.0
	Non-Hispanic Other	6574	9.5
	Hispanic	11686	16.9
Education			
	Less than HS	8427	12.1
	High School	17884	26.0
	Some College	23407	34.1
	College Grad	19046	27.8
Family Income			
	Less than 20,000	16502	23.8
	20,000 – 49,000	22100	32.1
	50,000 – 74,000	10671	15.6
	75,000 and up	19491	28.5
Employment			
	Full Time	30954	45.1
	Part Time	13095	19.1
	Unemployed	3850	5.6
	Other	20865	30.3
Marital Status			
	Never Been Married	28213	41.0
	Widowed/Divorced/Separated	11903	17.3
	Married	28648	41.8
Overall Health			
	Fair/Poor	8246	12.0
	Good	18854	27.4
	Very Good	25710	37.4
	Excellent	15941	23.2
Major Depressive Disorder (12 Months)			
	No	61018	89.7
	Yes	7009	10.3
Major Depressive Disorder (Lifetime)			
	No	55637	81.6
	Yes	12532	18.4
Alcohol Abuse			
	No	66835	97.2
	Yes	1929	2.8
Insured			
	No	7501	10.9
	Yes	61263	89.1
Justice Involvement			
	Never Arrested	60730	88.4
	Ever Arrested	5901	8.6
	Current Arrest	874	1.3

Community Supervision	1189	1.3

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