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Is Prison Why I'm sick? Examining Health Conditions Among Minority Males Within
Correctional Facilities

A thesis

presented to

the faculty of the Department of Criminal Justice and Criminology

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Master of Arts in Criminal Justice and Criminology

by

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Keywords: Life-course Theory, Strain Theory, Health Care, Corrections

ABSTRACT

Is Prison Why I'm sick? Examining Health Conditions Among Minority Males Within Correctional Facilities

by

Mary Hannah Hughes

Given the current United States prison population of 1.5 million persons, many states have begun to examine how to effectively reduce correctional expenditures, considering in 2011 healthcare related prison costs increased to approximately eight billion (The Pew Charitable Trusts, 2014). Recent research attributes much of this increase to the prevalence of disease and aging within the prison population (Williams et al., 2012; Dumont et al., 2012; Gallagher, 2001; Ahalt et al., 2013). Alternatively, little attention has been devoted to measuring the disparity in health among minority male inmates or the effects of identifying more cost effective health initiatives that address negative health outcomes. With incarceration and health expenditures rates steadily increasing within the United States, studies have highlighted the positive correlation between incarceration and the costs of inmate health, as well as the implications associated with physical illness and its overarching effects on the performance of correctional health care. This study represents an attempt at bridging the gap between preventative health care and criminal justice efforts within the literature in its examination of the demographics, history of incarceration, chronic illness, and current medical conditions of minority male inmates within the state correctional facilities.

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CHAPTER 1

INTRODUCTION

To date, extensive literature has been collected highlighting the racial disparities across both the criminal justice system and the continuum of medical care in disease prevalence, prevention, management, and outcomes (Adler & Newman, 2002; Binswanger et al., 2011; Dumont, Brockmann, Dickaman, Alexander, & Rich, 2012; London & Myers, 2006; Williams et al., 2012). Comparatively, little attention has been directed at understanding how these population health disparities effect the criminal justice system, specifically with regard to corrections, recidivism, and the overarching offender treatment process (Adler & Newman, 2002; Binswanger et al., 2011; Binswanger, Kruger, & Steiner, 2009). Though the prevalence of disease is seen across all racial and ethnic groups, in general minority males prove to receive poorer care when compared to their white counterparts (Binswanger et al., 2011; Wilper et al., 2009). For example, in 2002 life expectancy at birth was 5.4 years lower for Blacks than Whites (London & Myers, 2006) In addition to the present health disparity seen among minority groups, research suggests that minority males are more involved in the criminal justice system in areas of arrests and prolonged sentences than whites (Adler & Newman, 2002; Binswanger et al., 2011; Binswanger, Kruger, & Steiner, 2009; London & Myers, 2006). As a result of the increasing inequalities within the criminal justice system, exploratory studies focusing on epidemiology have confirmed that prison inmates are at a higher risk of chronic disease including hypertension, diabetes, asthmas, and cancer than the general population, even when adjusting for confounders such as age (Adler & Newman, 2002; Binswanger et al., 2011; Binswanger, Kruger, & Steiner, 2009). In addition, inmates are at a higher risk for substance abuse, mental health disorder, victimization, and transmission of disease (Dumont et al., 2012). As a consequence of the present

effects of imprisonment when coupled with the disparities among minority males, an increased need for addressing health discrepancies within correctional facilities has emerged among criminal justice professionals (Dumont et al., 2012; Hammett, Roberts, & Kennedy, 2001 London & Myers, 2006).

When discussing the criminal justice system, current research highlights the system's disproportionate interactions with high-disparity populations, which are defined as individuals who identify as belonging to a minority group, as well as persons who categorize themselves as low socioeconomic status. (Adler & Newman, 2002; Binswanger et al., 2011; Binswanger, Kruger, & Steiner, 2009). In 2010, the Department of Justice reported that approximately seven million Americans were under the supervision of the criminal justice system, including those both on parole and incarcerated. Conversely, this data only displays the supervised population at one point during a given year (Bureau of Justice Statistics, 2010). As a result of this collection approach, little attention is focused on the high rates of individuals who came into contact with the correctional system. In 2011, 22.9 million individuals interacted with the justice system, in addition to the 15.9 million that were sentenced to both jail and prison (Sabol, 2011). Exploring these numbers, in more depth shows racial disparity among the incarcerated population. Specifically that one in three Black males will be incarcerated within their lifetime. Furthermore, the Bureau of Justice Statistics (2010) identified that African American males were incarcerated at a rate of 3,000 per 100,000 persons compared to the 487 per 100,000 for white males. Despite the known rates of racial disparity seen within correctional facilities, little knowledge exists with regard to the large scale health care costs within the criminal justice system and its ability to both mitigate and exacerbate health disparities among racial groups.

Recent years have seen increased attention towards criminal justice involvement and its association with health outcomes in areas of physical and mental illness due to the growing costs of medical care within correctional facilities (Adler & Newman, 2002; Binswanger et al., 2011; Binswanger, Kruger, & Steiner, 2009; Dumont et al., 2012). Due to the population of individuals involved in the criminal justice system being from predominately low socioeconomic status and therefore at a higher risk for poor health outcomes, health screening and care provided by prisons have been labeled as an area of concern for future health care disparities (Adler & Newman, 2002; Binswanger et al., 2011; Dumont et al. 2012). More specifically, when coupling the population of individuals in the prison system with present minority health issues, criminal justice professionals are identifying the need for investigating the detrimental effects among minority males with regard to the prison experience (Alder & Newman, 2002; Dunmont et al., 2012). All correctional facilities provide access to health care due to constitutional mandates, the quality of the care provided is an area that should be investigated (Baillargeon et al., 2009; Freudenber, 2001). Additionally, given the high rates of recidivism, the health care of parolees and probationers is an area of interest due to their reintegration back into the community (Binswanger et al., 2011; Parichard, Cox, & Dawson, 1997). As a result of correctional facility budget constraints, inmates once released are having difficulty accessing healthcare post-incarceration due to a lack of early release and diversion programs (Binswanger et al., 2011).

In response to economic restraints, inmates often experience multiple healthcare transitions once involved in the criminal justice system (Dumont et al., 2012). As a result of these transitions, inmates have difficulty accessing an adequate continuity of care in areas of proper treatment, access to medication, and delayed treatment (Binswanger et al., 2011; Dumont et al., 2012). For example, Binswanger and colleagues (2011) noted that inmates with diabetic

issues are typically placed on chronic medication upon arrest, in which they are typically transferred to a variety of prisons, released to half-way houses, discharged back into their communities on parole, while being a risk for re-incarceration. This is due largely to the convoluted medical documentation of the correctional healthcare system (Dumont et al., 2012). Furthermore, the transitions when joined with the complexity of the health care system within corrections can lead to health disparities among the incarcerated population with regard to access to care, inability to afford treatment, and poor transfers of medical conditions (Binswanger et al., 2011; Dumont et al., 2012).

In addition to the negative health effects on inmates, health inequalities neglected by the criminal justice system have the ability to cascade into the health of families and communities within the general population (Adler & Newman, 2002; Binswanger, Kruger, & Steiner, 2009). This can be noted in offenders who identify themselves as substance abusers, those suffering from physical illness, and individuals with mental health concerns due to a decreased availability of assisted housing, employment, and overall health care as result of the incarceration experience (Adler & Newman, 2002; Binswanger, Kruger, & Steiner, 2009; Dumont et al., 2012). For example, studies on urban communities suggest that inner city neighborhoods that face high rates of incarceration experience “forced migration” when reentering into a community after their release from a prison system (Binswanger et al., 2011). Binswanger and colleagues (2011) define “forced migration” as the disruption of social, family, and intimate relationships as well as secondary health effects once an offender attempts to reenter the general population. This can not only enhance the current medical conditions inmates face upon entering into a community, but also place other community members at risk of contracting a variety of illnesses such as tuberculosis, Hepatitis C, and HIV (Dumont et al., 2012; Binswanger et al., 2011).

As a result of the known detrimental effects of criminal justice involvement, studies suggests more attention should be focused on identifying the impact of incarceration on physical heath, while also highlighting areas for health intervention developments. By addressing the illnesses that widen the racial health disparity gap, research can assist in the identification of physical illness through methods of better medical documentation, while discovering areas that can result in reductions in correctional health care spending.

The current study focuses on the identification of health disparity within state correctional facilities and explores the impact on the health of incarcerated minority males. It does so by seeking to apply both strain and life course theory to the health disparity among incarcerated minority males. Specifically, it seeks to determine if state correctional facilities have an impact on enhancing current physical illnesses or the development of new chronic illnesses among the minority male population. In so doing, the research will examine how strain within the system results in increasing one's risk of developing a physical illness, while also utilizing life course theory through examining a health trajectory as it relates to treatment. Furthermore, the study will explore the idea of reforming correctional facilities into an opportunity to increase an individual's health through preventative, cost-effective measures.

This introduction serves to outline the purpose for the current study. The following chapter examines existing research regarding correctional health care, as it relates to health disparity and its theoretical standpoint within the criminological field. Chapter three will discuss the methodology used to examine the effects of incarceration on inmate health, specifically minority males. Subsequently, chapter four will discuss the results from the statistical analysis, in addition to providing an explanation for each statistical model output. The final chapter, will

discuss the how the findings contribute to current research, the policy implications, study limitations, and areas in which future research should be conducted.

CHAPTER 2

REVIEW OF LITERATURE

This review of the literature is organized into two parts. The first, examines patterns of incarceration within the United States and the extent to which the prison structure influences poor health outcomes. The second identifies the contributing effects of incarceration on physical illness and the racial health disparity phenomenon through theoretical explanations. Finally, it will describe how highlighting the factors related to physical illness within prison can aid in reforming adult correctional facilities into a cost-effective health prevention strategy.

The provision of correctional healthcare has remained an overlooked issue within the United States. Over 1.5 million individuals serving time throughout state and federal correctional facilities (Carson, 2015), while more than half have reported suffering from a chronic illness while being incarcerated (Maruschak, Berzofsky, & Uangst, 2015). Such an upsurge can be attributed to America's techniques of crime control methods, which have enabled the prison population to expand by approximately 375 percent since the 1980s (Mears & Cochran, 2012). This expansion has resulted in an increase of expenditures to 178 billion dollars due to prison overcrowding, and therefore those incarcerated have become more vulnerable to disproportionate health outcomes due to the unhealthy environments in which they are exposed (Cloud, Parsons, & Delany-Brumsey, 2014).

Despite this growth in prison expenditures, gaps in research remain when exploring the prevalence of chronic diseases and illnesses among prison inmates (Binswanger, Krueger, & Steiner, 2009). Compared to the general population, those individuals living within correctional facilities have significantly higher rates of infectious and chronic diseases (Binswanger et al., 2009). Specifically, the United States Department of Justice reported that, 40 percent of inmates

in both federal and state prisons reported having a chronic illness, 74 percent suffer from obesity, 66 percent require medical treatment, and over 70 percent were diagnosed with a serious illness such as hepatitis C, HIV, or tuberculosis (Maruschakmet al., 2015).

Although, healthcare services within correctional facilities exist to combat these illnesses, the quality of those services prove to be insufficient when compared to the standard level of care provided to the general population in areas of proper treatment and adequate medical documentation (Cloud et al., 2014). Researchers Cloud, Parsons, & Delany-Brumsey (2014) suggest that the health disparity among those incarcerated has resulted from inmates being subjected to overcrowding within prison facilities, which has proven to produce detrimental outcomes to an individual's physical and mental health. For example, overcrowded prison facilities have been identified as optimum breeding grounds for infectious diseases (Zulificar, 2005).

In order to combat the complex issues surrounding correctional healthcare, the current model of healthcare that is being implemented should be analyzed, as well as, addressing the current health disparity among minority male inmates. Furthermore, by assessing the current state of health of those incarcerated, researchers can develop more cost-effective approaches toward correctional healthcare. Additionally, incorporating a preventative approach can aid in determine the current effectiveness of the correctional health care and display the need for a more preventative approach.

Patterns of Incarceration

Incarceration rates within the United States have increased dramatically over the past thirty years. Prior to the 1970s, incarceration rates averaged roughly one per 100,000 individuals (Scnittker et al., 2011). Beginning in 1973, the rate of individuals being incarcerated began to

rise by approximately six percent per year, leading to a 500 percent increase within prison populations by year 2010 (Glaze & Bonczar, 2010). Between 2000 and 2009, the overall prison rate had increased by 16.3 percent. By 2009, over 2.4 million individuals were incarcerated or were under parolee supervision. Furthermore, an estimated 4 million inmates were released back into the general population by 2011 (Schittker et al., 2011). Carson (2015) currently notes that prison rates have decreased by one percent, but recidivism rates have increased. In light of this, Durose, Cooper, and Synder (2014) concluded that 76.6 percent of those inmates released are rearrested within five years of their release, majority consisting of parole violations. As a result, researchers have attributed recidivism growth to policy reforms that were implemented during the 1980s shift toward more punitive practices within criminal justice (Auerhahn, 2002; Schnittker et al., 2011; Williams, 2007).

In exploring the shift in punitive practices, contributing policy initiatives to the heightened rates of recidivism have been identified as mandatory minimums, three-strikes, and truth-in sentencing laws (Auerhahn, 2002). Such policies have resulted in offenders serving longer sentences, thereby causing individuals to be faced with a multitude of challenges, specifically contracting health related illnesses during their incarceration (Williams, 2007). As a result punitive practices, policy initiatives focusing on sentencing guidelines have reshaped the demographics of the prison system (Williams et al., 2012). For example, between the years 1992 to 2001 the number of inmates aged 50 years or older increased by 172.2% and represented roughly 8% of the overall population by 2001 (Williams, 2007). Williams et al., (2012) highlighted the growing prisoner age groups as middle aged and older, consisting of those between the ages 45 to 54 and 55 and over, and further stating that as prison rates increased at an overall rate of 16.3 percent between the years 2000 to 2009, the population of older inmates,

defined as those aged 45 and older, increased their serving time by 79 percent. As a result of the demographic patterns following incarceration, evidence of growing prison rates among those incarcerated and the risk associated with the aging prison population displays the crucial need for exploring the current state of correctional healthcare.

Correctional Health Care

In discussing the current state of correctional facilities, researchers suggest that correctional facilities present themselves as institutions that can provide a positive influence on linking the underserved population to proper healthcare services (Dunmont et al., 2012). This impact can be seen most prominently since the 1976 Supreme Court ruling, *Estelle vs. Gamble*, which mandated that correctional facilities must provide timely and sufficient medical care to all inmates (Ahalt et al., 2014; Dunmont et al., 2012). Following this ruling, the United States Department of Corrections has seen an annual increase in prison spending of approximately 77 billion dollars, with over ten percent being utilized for health care purposes (Ahalt et al., 2013). Regardless of this increase, correctional facilities still struggle with logistical difficulties during the implementation of healthcare, specifically, insufficient staffing and protocols, reluctant administrators, and offender recidivism within the criminal justice system (Dunmont et al., 2012). As a result of the emerging concerns that surround correctional healthcare, researchers have categorized the present challenges into two main categories, short-term and long-term (Cloud et al., 2013).

Short-term

Short term issues surrounding current correctional health care are presented in areas of offender reentry into the criminal justice system. Currently, reentry challenges can be seen within the elevation of recidivism rates among inmates within the United States. Ninety percent

of individuals serving a prison term will transition back into the general population (Morani, Wikoff, Linhorst, & Bratton, 2011). Of those individuals released, approximately half will commit a parole violation within the first three to five years of release resulting in reentry into the prison system (Durose et al., 2014). Research suggests that collaborative barriers of health conditions and a lack of basic resources have contributed to an inmates inability to transition back into the community (Hammett, Roberts, & Kennedy, 2001; Morani et al., 2011; Kurlychek, Wheeler, Tinik, & Kempinen, 2010). Kurlychek, Wheeler, Tinik, & Kempinen (2010) define collaborative challenges as areas of recidivism, employment, and homelessness stemming from physical and mental illnesses. These challenges can be seen in areas of inadequate treatment and discharge programs implemented by correctional facilities, which research attest to the increasing recidivism rates among inmates (Hammett et al., 2001). Furthermore, challenges of homelessness, unemployment, and inadequate treatment services in low socioeconomic communities have created obstacles for healthcare professionals which make correctional facilities unable to assist those in need mainly due to overcrowding, understaffing of medical assistance, and economic difficulties (Cloud et al., 2014).

Over half of prison populations have reported being diagnosed with a health issue that requires the need for effective resources when transitioning back into the community (Durose et al., 2014). A majority of individuals imprisoned lack fundamental resources such as shelter, health, transportation, education, food, and support groups, specifically when reintegrating back into the community, contributing to a relapse into illegal behavior (La Vigne, Davies, Paler, and Halberstadt, 2008). When investigating the cumulative effects of inadequate resources on health on the criminal justice system, Gendreau, Little, and Goggin's (1996) meta-analysis on predictive recidivism revealed that struggles with mental health and substance abuse contribute

to higher rates of recidivism. This can be seen in 2006, when 76 percent of state inmates were diagnosed with a mental health problem stemming from substance abuse such as anxiety, panic attacks, bipolar disorders, and depression (James & Glaze, 2006). Of those, only one in three state inmate received proper medical treatment within their facility, suggesting that access to treatment is becoming more difficult within the correctional setting. With mental disorder occurring at exponentially high rates among prison populations, limited access to proper treatment is becoming more prevalent (Cloud et al., 2014). Due to this growth, offenders are unable to effectively reform their behavior resulting in reoccurrence within the prison system. In response to this growth, research attributes the absence of healthcare services to the heightened recidivism rates (Cloud et al., 2014; Durose et al., 2014).

Current research discusses the absence of aftercare assistance for inmates as challenges associated with finding housing, employment, access to healthcare, and social bonds in areas of intimate relationships within the greater community. In examining the role of aftercare assistance as it relates to the offender, Kurlychek and Colleagues (2011) note that post-incarceration assistance is essential to the inmate transitioning process (Kurlychek et al., 2011). Two core areas identified within correctional health as methods to combat recidivism and transitioning challenges are healthcare timeliness and adherence to medication (Reznick et al., 2013). The development of these short-term challenges is most vital in cases involving HIV. With inmates having a higher likelihood of contracting HIV while being imprisoned due to higher rates of victimization, the need for a continuation of correctional health care throughout the parole process is necessary to assist in the transition process of a medically ill individual back into society (Howell et al., 2004; Mears & Cochran, 2012; Woods et al., 2013). Furthermore, studies suggest that short-term consequences associated with poor healthcare can persist into long-term

consequences, leading to increased cost expenditures of correctional facilities, while simultaneously widening the healthcare gap among the incarcerated population (Dumont et al., 2014).

Long-Term

In addition to short-term issues, correctional facilities are also experiencing long-term complications due to the substantial growth of older inmates (Mara, 2008). Since 2000, the number of older prisoners in the United States has increased by 181%, compared to the 17% growth of the overall prison population due to punitive practices within the justice system (Williams et al., 2012). Additionally, older inmates cost correctional facilities approximately three to nine times more than younger prisoners due to increased medical problems, the need for higher-quality healthcare, and the differences in healthcare spending (Ahalt et al., 2013). As a result, this growth within the aging inmate population has generated higher healthcare costs among correctional facilities, coupled with the new and emerging health concerns among the general prison population.

In response to this growth, researchers have designated incarceration as a health risk, suggesting that inmates are exposed to unique health risks when compared to the general population (Ahalt et al., 2013; Dumont et al., 2012). These health risks can be seen most commonly in areas of chronic illness and serious mental disorders (Ahal et al., 2013). According to Cuddeback and Colleagues (2010), between 58 and 74 percent of persons incarcerated reported having a severe mental illness. In addition to mental health risks, physical health risks are becoming a growing concern among criminal justice professionals, specifically with regard to the prevalence rate of chronic illnesses among aging inmates.

When discussing older inmates, chronic illnesses are on average three illnesses per one inmate and refer to conditions such as hypertension, diabetes, and pulmonary disease (Williams et al., 2012). Moreover, those incarcerated are 40% more likely to have a general medical problem and 30% more likely to have multiple medical conditions (Cuddeback et al., 2010). In comparing this rate to the general population, research suggests that physical health disparities vary by disease (Ahalt et al., 2013; Mears & Cochran, 2012). Although rates of disease differ, Mears and Cochran (2012) note that certain illnesses prove to be pronounced when examining inmate health. For example, the prevalence of AIDS among inmates is five times higher among inmates when compared to the general population (Mears & Cochran, 2012). Furthermore, inmates account for one fourth of American people who are infected with HIV, AIDS, Hepatitis C, or Tuberculosis (Mears & Cochran, 2012). This high rate of chronic illnesses among the aging prison population has resulted in a growing burden on correctional facilities to provide access to effective healthcare due to cost restraints (Williams et al., 2012). One area in particular highlighted within research is functional impairment among elderly inmates (Gallagher, 2001; Williams et al., 2012).

Functional impairments are defined by the Center of Disease Control (2016) as any part of a person's body structure that displays delayed function, or mental functioning; examples include impairments such as a loss of a limb, loss of vision, or memory loss. According to, Gallagher (2001) emerging functional impairments among the elderly have been identified as one of the strongest predictors of high healthcare costs. These impairment costs can be noted in an area of an individual's the inability to perform traditional tasks such as eating, bathing, and dressing oneself (Williams et al., 2012). As a result of this emergence of elderly impairments, it has brought to question correctional facilities ability to deliver safe and effective care due to its

reductions in staffing (Gallagher, 2001). With over 2.5 million inmates seeking healthcare through both jail and prisons, studies suggest that access to healthcare and the overall quality of treatment is becoming deficient as a result of overcrowding (Gallagher, 2001; Mears & Cochran, 2012; Williams et al., 2012; Wilper et al., 2009). Specifically, in areas of access to medical examinations, pharmacotherapy, prescriptions medication, laboratory tests, and adequacy of acute care (Wilper et al., 2009). In response the emerging functional impairments, correctional facilities have shifted their healthcare focus to finding new alternatives for housing aging inmates in an attempt to offset rising healthcare costs (The Pew Charitable Trusts, 2014). Alternatives include medication and special therapy, in addition to technology such as motorized wheelchairs and improved prosthetics to better assist immobile inmates (Duin & McSweeney-Feld, 2005). Due to prisons being built prior to the Americans with Disabilities Act (ADA), correctional facilities are not adequately suited to withstand the growing population of aging inmates (Duin & McSweeney-Feld, 2005). In response to these implications, prison management must consider the long-term issues surrounding correctional facilities ability to adapt effective healthcare practices when assisting and managing the expenditures necessary for this growing segment of the prison population (Duin & McSweeney-Feld, 2005). Moreover, research highlights the importance of discussing current mental and physical healthcare issues among inmates in order to determine cost effective approaches to assisting the inmate population (Ahalt et al., 2013; Mears & Cochran, 2012).

Health Related Issues among Inmates

Large-scale increases in correctional facilities have resulted in the growing rates of disorder, infection, and violence among inmates (Mears & Cochran, 2012). According to Wilper and colleagues (2010), approximately 1% of United States adults are currently imprisoned and

rely on their correctional facility to them with provide healthcare. As a result of this overcrowding, 13.9% of federal inmates and 20.1% of federal inmates reported having a persistent medical condition that received no medical attention since the time of incarceration (Wilper et al., 2010). Recent research has concluded that in order to better determine the barriers afflicting correctional healthcare performance, health concerns among prison population should be explored, specifically with regard physical and mental illness (Dumont et al., 2012; Hammett et al., 2001; Mears & Cochran, 2012).

Physical Illness

Physical illness proves to be an area of high concern due to the overwhelming presence of chronic and communicable illnesses within the United States prison populations (Williams, 2007). The Center for Disease Control (2017) defines a chronic illness as any disease that lasts for more than three months. This includes, but is not limited to illnesses such as cancer, diabetes, heart disease, stroke, obesity, and respiratory disease. Currently, over half of United States inmates have reported having some type of chronic illness, in addition to twenty percent of the population having an infectious disease (Maruschak et al., 2015). When comparing the general population to that of inmates, the U.S. Department of Justice (2015) revealed in a survey focusing on medical problems of federal inmates that inmates were disproportionately subject to medical problems resulting from prison sentences. Research has highlighted this disproportionality as the heightened risk of victimization and overcrowding that exists within correctional facilities (Hammett et al., 2001; Maruschak et al., 2015; Mears & Cochran, 2012).

Health issues among male inmates can be seen in the following areas of communicable and chronic disease: oral health, HIV, mental health, tuberculosis, hepatitis C, and substance abuse. Research displayed that the concern among the criminal justice professionals when

discussing inmates' health relates to communicable and chronic diseases due to the lack of health care services available to the offender both prior and after their release date (Hammett et al., 2001; Mears & Cochran, 2012; Williams, 2007). According to Williams (2007), health related illnesses that have drawn attention to prison populations susceptibility is that of hepatitis C and tuberculosis. In 2007, approximately 300,000 inmates had cases of hepatitis C and 130,000 had contracted latent tuberculosis. Additionally, high rates of infectious diseases among inmate populations pose a potential risk to both the inmates and their communities (Williams, 2007). With inmates contracting infectious diseases, then being released back into communities without proper health care, it increases the risk of infection among the general population (Hammett et al., 2001; Williams, 2007). Although, research highlights that poor health outcomes are present within prison populations, gaps in the literature exist when discussing correctional facilities ability to serve as an effective public health tool. Specifically, correctional facilities fail to expand upon both the proper procedures needed to treat medical illnesses among inmates and knowledge on how to effectively organize proper healthcare services prior to an inmate's transition back into the community (Mears & Cochran, 2012; Williams, 2007).

This absence can be seen frequently when examining a correctional facilities approach to HIV infected prisoners. The Center of Disease Control (2017) report that 1.2 million Americans have been diagnosed with HIV in the United States. According to Ahalt and colleagues (2013), when comparing the current rates of HIV among the general population to those imprisoned, HIV rates prove to be four times higher (Adams et al., 2013). Similarly, Culbert (2011) found that roughly twenty percent of individuals entering a correctional facility are diagnosed with HIV, and of those more than 135,000 are released annually. This high risk of HIV among newly released inmates can be noted in the 17 percent of individuals on probation and parole that have

reported being diagnosed with the illness. Such an increased risk displays the lack of knowledge among healthcare professionals on the proper procedures needed to treat inmates (Adams et al., 2013). As a result, high rates of HIV infections have been linked to an individual's increased risk of drug use, homelessness, socioeconomic status, and low education levels (Springer et al., 2004).

Adams and colleagues (2013) outline the advantages of correctional facilities implementing risk assessment plans when combating health issues among inmates through assessing high risk behaviors associated with chronic disease. In this, the scholars revealed that the period in which offenders are incarcerated represented an opportunity for correctional healthcare professionals to implement education and interventions to combat health risks among high-risk groups. By expounding on this opportunity, healthcare developments within correctional facilities could better assist in the employment of accessible health services, as well as increase the acceptance of these services by those imprisoned (Culbert, 2011). Furthermore, utilizing the research related to addressing incarcerated individuals' health concerns displays new approaches in areas of risk assessment and prevention initiatives to combating physical illnesses within prison (Williams, 2007). Specifically, approaches should focus on educating inmates on preventing disease transmission, providing advice on the consequences of living a high risk lifestyle, offering support with regard to adopting healthy behavior patterns, and integrating measures that promote positive mental health by increasing inmate contact with family times (Culbert, 2011; Williams, 2007). According to The Pew Charitable Trusts (2014) majority of state correctional healthcare professional challenges stem from improper staffing, a lack of inmate transportation, increased disease prevalence, older inmates, and the overall location of the prison systems. In response to this, correctional facilities have sought to develop preventative

measures with regard to healthcare such as telehealth, outsourcing care, and providing Medicaid financing for eligible inmates (The Pew Charitable Trusts, 2014). Currently, states such as Ohio, Louisiana, New York, Connecticut, and California have begun to develop reforms focusing on increasing inmates' health through cost-effective measures, which have allowed for a dramatic decrease among healthcare spending. For example, in 2011 Ohio passed a geriatric parole legislation focusing on reducing the amount of aging inmates within correctional facilities. As a result, Ohio saved 46.3 million dollars over three years while simultaneously reducing the prison population by seven percent (The Pew Charitable Trusts, 2014). By incorporating these approaches, prison management could both increase the quality of life for incarcerated individuals while also decreasing health expenditures (Williams, 2007).

Mental Illness

As with physical illness, mental illness is identified as an area of health concern among inmates. Studies display areas of overlap when discussing the patterns of mental illness among prison inmates and the associated complexities surrounding imprisonment (James & Glaze, 2006; Mears & Cochran, 2012; Williams, 2007; Woods et al., 2013). The Bureau of Justice Statistics (2006) reported that more than half of United States prison and jail inmates suffer from a mental health problem. Of those diagnosed, approximately 74 percent reported as diagnosed with a mental illness that resulted from substance abuse (James & Glaze, 2006). Moreover, research suggests that as a result of the high rates of mental illness among inmates, prisons serve as the largest institutions in the United States for treating the mentally ill (Dumont et al., 2012; Mears & Cochran, 2012). This can be seen in a study conducted by Mears and Cochran (2012) indicating that mental disorders were occurring at exceptionally higher rates among prison populations; noting that depressive disorders were three times greater, psychotic disorders were

five times greater, and mania disorders were 21 times greater than that of the general population (Mears & Cochran, 2012). As a result of the burden of mental illness on the criminal justice system, many individuals experience a lack of access to treatment upon entering a correctional facility (Williams, 2007). Previous research defines this lack of access as delayed transfer of medical records, inadequate education on reentry into the general population, and a lack of knowledge regarding how to obtain healthcare once released from the prison system (Williams, 2007; Hammett et al., 2001).

In discussing the lack of treatment access, in 2005 only one in three state prisoners received mental health treatment within their facility (James & Glaze, 2006). As a neglected topic within corrections, newly emerging illnesses among inmates is becoming more rampant. More problematic, is the lack of documentation of data displaying the current prevalence of the wide range of mental disorders present within state and federal prison facilities (Mears & Cochran, 2012). Osher and Steadman (2007) proclaimed that due to the complexities surrounding the assessment of mentally ill individuals, diversion efforts within the front-end processing of the criminal justice system have allowed for those diagnosed with mental illness to become overrepresented within the prisons. Previous research attributes this overrepresentation to overcrowding among prison systems due to the rise in prison populations from 2001 to 2008 (The Pew Charitable Trusts, 2013; Williams, 2007). As a result, inmates aged 55 or older increased by 96 percent, in addition to inmates younger than 55 with mental health illnesses which grew by 12 percent (The Pew Charitable Trusts, 2014). Moreover, such an increase in illness has redirected researcher interest in exploring the effects of prison confinement on an individual's overall health and its impact on the greater society (Ahalt et al., 2013; Hammett et al., 2001; Mears & Cochran, 2012; Williams, 2007).

Physical Illness and Prison Confinement

In reflecting on correctional facilities, the demographics of those incarcerated is displayed as individuals of low-socioeconomic status, who are more likely to be identified as the medically underserved, in that they face more health complications than that of the general population (Adler & Newman, 2002; Binswanger, Kruger, & Steiner, 2009; Dumont et al., 2012; Massoglia, 2008). According to Wilper and colleagues (2010), attribute this increase of health conditions to inmates' dependency on prison healthcare, suggesting that those incarcerated fail to receive proper healthcare services when transitioned back into the general population. This can be seen in the plethora of research focusing on emerging chronic illnesses among the incarcerated, specifically with regard to HIV (Dumont et al., 2012). For example, HIV prevalence remains five times higher in state and federal correctional facilities than in the general public. Research attributes these increased rates to the culture of the prison system, in which individuals are exposed to a higher risk of both physical and sexual assault (Mears & Cochran, 2012; Wilper et al., 2010). As a result of the risk for victimization, correctional healthcare has been burdened with increased diagnosis of mental health disorders such as anxiety, personality disorder, and posttraumatic stress disorder (Wilper et al., 2010). Despite known relationship between prison violence and the transmission of disease, research has failed to explore prison confinement's ability to increase an inmates' current medical condition.

With the emergence of chronic illness trends such as diabetes and hypertension, a need for research on physical illness and confinement has developed. Similar to the spread of infectious disease within correctional facilities, Dumont and colleagues (2012) suggest that trends in chronic illness could be due to prisons' ability to effect the stages of chronic illnesses once incarcerated. Moreover, confinement's ability to increase violence, stress hormones, and

the spread of disease presents barriers when exploring preventative healthcare techniques (Dumont et al., 2012; Hammet et al., 2001). Such barriers are most notable within the aging prison population, where chronic conditions prove to be at more advanced stages when compared with the age-adjusted general public (Binswinger et al., 2011; Dumont et al., 2012). For example, between 39% to 43% of inmates are diagnosed with diabetes, hypertension, or asthma at higher rates than the general population. Furthermore, issues of obesity are also emerging among prison populations, as a result of the neglected chronic illnesses among inmates (Dumont et al., 2012). As a result of the presence of chronic illness within correctional facilities, prisons have begun better explore the long-term consequences associated with chronic illness, as well as the populations whose health is disproportionately afflicted by prison confinement.

The Minority Male Health Disparity Gap and Confinement

With regard to racial disparity and incarceration rates, little attention has been given to the consideration of whether prison confinement contributes to health disparities among minority males. According to Primm and colleagues (2010) racial minorities face barriers in accessing both physical and mental healthcare as a result of fragmented treatment services and the overall costs associated with access to healthcare. For example, 25% of African Americans and 40% of Hispanics reported being uninsured when compared to the 16% of the overall United States population (Primm et al., 2010). Due to this lack of access to services, minority males are more likely to live their lives with a chronic illness (Hayward et al., 2000; Massoglia, 2008). Moreover, studies commonly display the health of minority males within the general population as disadvantaged when relative to whites (Hayward et al., 2000; Iguchi, Bell, Ramchand, & Fain, 2005; London, Myers, 2006; Massoglia, 2008). In 2010, Primm and colleagues reported that African Americans were more likely than whites to use emergency services, alternative

treatments, and primary care physicians. Furthermore, African Americans proved to be overrepresented in areas of inpatient treatment and underrepresented in outpatient treatment (Primm et al., 2010). As a result of this, minority males are at a higher risk of having shorter lifespans and contracting illnesses when compared to their white counterpart (Massoglia, 2008; Schnittker, Massoglia, & Uggen, 2011). In response to this racial health disparity, correctional facilities have shifted their efforts to explore the range of factors and structural conditions within the prison system in an attempt to offset cost expenditures (The Pew Charitable Trusts, 2014).

In applying health disparity among the minority population to the prison structure, studies suggest that the worsened health status of minority males can be attributed to the implementation of punitive incarceration initiatives (Hayward et al., 2000; Iguchi, Bell, Ramchand, & Fain, 2005; London, Myers, 2006; Massoglia, 2008). For example, Link and Phenlan (1995) have suggested that the penal system has resulted in a system of health inequality. This is due to prison systems being prone to violent behavior, in addition to exposing inmates to health risks due to the presence of unique illnesses such as tuberculosis and hepatitis C (Dumont et al., 2012; Massoglia, 2008). Moreover, with minority males entering prison being vulnerable for poor health, the prison facility can serve as a trigger for disease (Dumon et al., 2012; Schnittker, Massoglia, & Uggen, 2008). Although, prison can serve as breeding grounds for disease, little research has been conducted on confinement and the minority health gap. The current study strives to explore both the incarceration experience as it relates to health disparity and its impact on minority males.

Theoretical Explanation

Criminological theory provides adequate explanations in regards to prison confinement's contributions to an increase physical illness among underserved populations, while

simultaneously increasing their risk of recidivism. By examining the contributing negative factors embedded within the incarceration experience through both strain and life course concepts, theoretical explanation posits a better understanding of prison's role on individual's overall health and negative life outcomes. By doing this, General Strain and Life Course Theory will assist in determining if an individual's time incarcerated can be reconstructed into a rehabilitative method that aids in preventing both future delinquency, while demonstrating itself as a cost-effective health initiative.

General Strain Theory (Agnew, 1992) posits the notion of status frustration and the relationships that prevent individuals from achieving positively valued goals within society (Lilly, Cullen, & Ball, 2015). In this, Agnew (1992) focused on three main types: strain as a failure to meet goals, strain as the removal of positively valued stimuli, and strain as the presentation of negative stimuli. Moreover, General Strain Theory has application at the macro-level when focusing on the social structure of the prison system and its effects on inmate health outcomes (Blevins et al., 2010; Hassine, 2004; Haugebrook et al., 2010; Massoglia, 2008; Thoits, 1995). In this, the theory may suggest that strain can be produced through the prison experience, which in itself can prove to be a stressful or strain-inducing situation for some individuals, therefore the strain experienced from the prison experience can potentially lead to future negative health outcomes (Agnew, 1992, 2009; Blevin et al., 2010; Pollock, 2002; Steiner & Wooldredge, 2008).

Previous research has employed general strain theory at the macro-level when assessing correctional health care. On the whole, current literature appears to support the idea that the structural environment of the prison system has an effect on inmates health, and even more so for minority males (Blevins et al., 2010; Hassine, 2004; Haugebrook et al., 2010; London & Myers,

2006; Massoglia, 2008). Therefore, the application of this theory to examine the relationship between the prison structure and minority male inmates health would be beneficial and yield valuable results.

Life course theory is based upon the notion of that an individual experiences a sequence of stages that are affected by life trajectories, which persist long after transitions are completed (Sampson & Laub, 1993). In essence, it suggests that the process of becoming an adult includes success in fulfilling adult roles and responsibilities, in that once those responsibilities become effected it can alter one's life course (London & Myers, 2006; Sampson & Laub, 1993). Thus, focusing on an individual's life course, specifically their health trajectory, can give insight into the racial health disparity among incarcerated males (London & Myers, 2006; Sampson & Laub, 1993; Settersten, 2003). To date, little research has been conducted on health trajectories as it relates to correctional health (London & Myers, 2006; Western, Kling, & Weiman, 2000). However, past studies have attempted to incorporate life-course perspective into racial disparities with regard to recidivism in order to better understand re-entry problems stemming from poor health outcomes (Browing & Cagney, 2003; Hagan & Dinovitzer, 1999; Pettit & Western, 2004 London & Myers, 2006). Therefore, by applying this theory to health, rather than criminogenic behavior, the effects of prison confinement on physical health disparities among the incarcerated population could potentially be better explored.

The application of these two theories to the examination of physical illness and the incarceration experience requires measures that derive from the core tenets of each. Measures consistent with the general strain approach focus on the length of incarceration, suggesting that prison confinement enhances physical illness and health disparity among minority males as a result of stress, and utilize the data available on inmate healthcare. Additionally, the measures for

life course theory stem from the previous applications of the theory by focusing on an individual's life trajectory, and include age, race, education level, socioeconomic status, and the number of prior incarcerations.

General Strain Theory

General Strain theory introduced by Agnew (1992) is highlighted as the most notable revision to the strain theories. In this, Agnew (1992) observed several sources of strain and stress within society, postulating that crime and delinquency were an adaptation to stress. Previous research has attempted to focus on strain theory within the everyday experiences, suggesting that daily interactions generate strain in people's lives (Cawley & Danziger, 2005; Morris, 2006). Thus, for Agnew (1992), the major strain was more immediate, such as blockage from any positively valued goal. Agnew (1992) argued that Merton's (1938) classic strain theory only identified one category of strain, being blocked from economic desired goals. Unlike Merton (1938), Agnew (1992) extended beyond economic goals and introduced two new sources of strain, and expanded on the original source of strain.

The first source of strain, strain as the failure to achieve positively valued goals, is described as the traditional source of strain as presented by Merton (1938). Merton (1938) proposed that the social structure of society limits access to the goal of economic success through legitimate means, such as achieving a college education, corporate employment or family connections, furthermore, this source of strain is noted as being disproportionately distributed among the lower class. For example, Merton (1938) stated that members of the lower class were particularly burdened due to the lack of resources within the achievement for success, and, as a result of this, the means to attain success within the lower class was determined by exceptional talent and one's ability to catch up to the higher social classes increasing one's risk

of engaging in criminal behavior. It is this disjunction between cultural achievement and the limited legitimate opportunities within the social structure that places large segments of the American population in strain-engendering positions of desiring the goal that they cannot reach through conventional means, specifically economically, which produce the intense pressure for deviance (Merton, 1938). Similarly, Agnew (1992) utilized the same basis when expanding upon Merton's (1938) initial conceptualization of strain, developing two additional sources of strain which sought to generalize the theory making it applicable beyond economic models.

The second strain identified by Agnew (1992) is the removal of positively valued stimuli from the individual and is described as the actual or anticipated removal of positive connections from an individual such as a loss from of one's job or intimate relationship. These situations, increase an individual's likelihood of engaging in negative stress-managing activities such as drug use, illegal means to replace losses, or revenge against those who caused the strain to occur (Williams, 2007;). In applying the removal of positively valued stimuli to the incarcerated population, previous studies attribute negative stress management to the pains of imprisonment, which result in low levels of perceived liberty and personal control once incarcerated (Belvins et al., 2010; Goodstein et al., 1984; Ruback, Carr, & Hopper, 1986). In short, research suggests that the removal of positive stimuli may produce low self-control, resulting in an individual's lack of positive coping techniques (Blevins et al., 2010; Williams, 2007).

The final source of strain introduced by Agnew (1992), the presentation of negative stimuli, is highlighted as situations that include exposure to physically abusive relationships, disorganized family structures, or negative work experiences. As a result, Agnew (1992) suggested that crime and delinquency is a response to adversities faced by the individuals as a means to escape, eliminate, or reduce the effects of the present strain. For example, this can be

seen in situations in which an individual uses violence to cope with strain or drug use to reduce psychic pain associated with the negative stimuli.

In short, Agnew's (1992) general strain theory allows for a broadened understanding of strain by extending beyond economics. In doing this, Agnew (1992) established the assumption that higher doses of strain experienced by an individual increase the likelihood of an individual engaging in crime or a form of deviance. Agnew (1992) did this by identifying the variables that effect an individual's response to strain. These variables include the range of factors that diminish the risk of criminal activity, such as availability of goals and individual coping resources, the denial of access of illegitimate means, and the presence of strong social bonds. Furthermore, Agnew's (1992) conceptualization of strain proposes that factors that foster the predisposition to criminality must occur in conjunction with strain in order for the increase in the likelihood of crime to develop. These factors are identified as disadvantaged communities, economic deprivation, inequality, and high population mobility (Agnew, 1992). In response to such factors, Agnew (1992) proposes that more alternatives must be available in regards to macro-level variables, such as resources and social support, in order to reduce negative reactions to strain.

By applying this theoretical concept to that of negative health outcomes among the incarcerated population, it displays a possible explanation for why inmates that are at a higher risk of physical illness are more likely to engage in criminal behavior. Although this theoretical explanation can be applied, little research has utilized General Strain Theory on the explanatory perspectives on the link between health and crime (Cawley & Danziger, 2005; Morris, 2006; Sabia, 2007). In applying the concepts of the three sources of strain, an individual who enters

into a prison system with a physical illness is at a greater likelihood of engaging in criminal activity both during incarceration and post release (Agnew, 1992).

In conceptualizing the failure to achieve positively valued goals within the prison structure as it relates to inmates whom identify as unhealthy, this can be seen most prominently in the inmates post release experience, in which they are identified as having a higher likelihood for recidivism than that of their healthy counterpart (Cawley & Danziger, 2005; Morris, 2006; Sabia, 2007). Moreover, disproportionate recidivism rates among unhealthy inmates are a result of limited access to economic success due to the blockage of desired goals (Agnew, 1992). Studies attribute this blockage to an individual's inability to perform job tasks due to the effects of a present physical illness (Cloud, Parsons, & Delany-Brumsey, 2014; Prince, 2009; Williams, 2007). Additionally, the social structure of the prison institution itself further limits the access to the goals of success through legitimate means such as employment, proper housing, and access to healthcare treatment (Agnew, 1992). Research suggests that if an individual with prior negative health problems enters into a prison, their health deteriorates at an expedited rate compared to the general population (Cloud, Parsons, & Delany-Brumsey, 2014). This deterioration is a result of the violent culture and overcrowding within prison systems, which permit higher rates of transmission with regard to infectious and chronic illnesses (The Pew Charitable Trusts, 2014; Williams, 2007). Furthermore, Cloud, Parsons, and Delany-Brumsey (2014) contend that the deterioration of an inmates' health directly effects their ability to reintegrate into society effectively following release due to their inability to access proper treatment. As evidenced by Massie's (2000) examination of female inmates' weight gain, inmates who displayed an increase in obesity rates while imprisoned proved to be at a higher risk for recidivism upon release due to lower self-esteem and discrimination in employment, housing, and job wages. Researchers

attribute such an increase to the structural make-up of the prison, in which there is a lack of access to health initiatives (Binswanger, Krueger, & Steiner, 2009; Cloud, Parsons, & Delany-Brumsey, 2014; Ginn, 2012; Massie, 2000; Prince, 2009). The lack of access to health initiatives further embeds low self-esteem among inmates, while simultaneously reducing their ability to be marketable once released (Massie, 2000). As a result of correctional facilities ability to enhance negative health outcomes, specifically in areas of chronic illness, the prison structure allows for strain to develop upon the inmate population with regards to the post-release experiences in the labor market (Prince, 2009).

In Strain Theory and economic models of crime, disadvantaged individuals are viewed as those with constrained opportunities for engaging in legitimate activities relative to illegitimate activities. Researchers have categorized inmates as an underserved, disadvantaged population due to the disparity among social class and race (Binswanger, Krueger, & Steiner, 2009; Cloud, Parsons, Delany-Brumsey, 2014; Prince, 2009). Agnew (1992) contended that the limited opportunities to engaging in legitimate activities increased the likelihood of crime and allowing for the development of strain associated with the failure to achieve positively valued goals. In applying this concept to that of individuals who suffer from poor health, research suggests that chronic illness and medical conditions are more prevalent in minority and low socioeconomic populations as a result of limited economic opportunity. Moreover, studies reveal that individuals diagnosed with a chronic illness suffer from the same constraints within the labor market as those incarcerated (Cawley, 2004; Centers for Disease Control, 2015; Morris, 2006; Price, 2009). According to Prince (2009) when opportunities for engaging in legitimate activities such as being employed in the labor market are constrained for unhealthy individuals, the probability of those individuals participating in illegitimate activities such as crime increases. As a result,

studies have begun to explore the relationship between unhealthy persons and criminal behavior (Cawley, 2004; Morris, 2006; Prince, 2009).

In discussing rates of recidivism and chronic illness among inmates, researchers have highlighted a positive correlation between physical illness and crime (Gyimah-Brempong & Prince, 2006; Prince, 2009). Unhealthy individuals suffer from lower wages (Cawley, 2004), lower rates of labor force participation (Cawley & Danzinger, 2006), and constraints in regard to cultural attainment (Morris, 2006). These pressures are highlighted as contributing factors to the lack of positive valued goal attainment, thereby increasing strain among the incarcerated population (Agnew, 1992). Due to the disadvantages associated with offenders in regards to stigmatization, when coupled with physical illness (Massie, 2000; Prince, 2009), research suggests that an individual's ability to engage in the workplace is reduced. Therefore, as a result of these constraints, an inmate whom suffers from both the confinements of a prior prison sentence and physical illness will most likely suffer from higher rates of strain than that of their healthy counterpart. Furthermore, due to the extent of both prison confinement and the labor market effects on physical illness in regards to reducing an individual's incentives to engage in the legitimate labor market activities, it is plausible that the diagnosis of a physical illness could increase an individual's incentives for engaging in illegitimate activities, specifically crime (Agnew, 1992; Prince, 2009). Such an engagement in crime as explained by the development of strain through lack of attainment of positively valued goals demonstrates an accurate explanation to the increase of recidivism among inmates.

Aside from the lack of achievement of positively valued goals, Agnew's (1992) second type of strain, removal of positively valued stimuli, can provide insight on the higher risk of crime associated with unhealthy inmates. In reassessing the prison structure and its long-term

effects of health, studies support the idea that inmates' removal from their communities and transition into the prison system fosters criminogenic behavior as a response to coping (Brinkley-Rubinstein, 2013; Cloud, Delany-Brumsey, 2014). When entering a correctional institution, an individual loses autonomy and develops a reliance on their peers whom reside in the general population (Brinkley-Rubinstein, 2013; Horton, 2011; Petersilla, 2008). If an inmate loses peers on the outside, it can produce both poor health outcomes and increase one's risk for violence (Brinkley-Rubinstein, 2013).

In applying the idea of the loss of positive stimuli to one's adaptation to the prison culture, specifically in regards to health, inmates who receive monetary support from family or peers are more likely to utilize healthier eating habits compared to an individual whom lacks access to outside peers (Curd et al., 2013). This can be seen in regards to commissary, in which inmates who maintain a stable account balance due to outside support from the general population are presented with the ability to engage in healthier eating habits (Galea & Vlahov, 2002). This availability to commissary enables one's ability to control dietary needs; a regulation of dietary needs has been associated with a regulation of violent behavior (Anton & Miller, 2005; Burdette & Hill, 2008). Research has suggested that healthier eating habits reduce the risk for violence within prison due to their ability to better regulate an inmate's cortisol levels (Burdette & Hill, 2008). As evidenced by Burdette and Hill (2008), elevated levels of distress lead to a chronic activation of the physiological stress response, such an elevation triggers the fight or flight response, and the release of stress hormones into the blood stream. Burdette and Hill (2008) stated that the flight or fight response is regulated by cortisol in its conversion of unhealthy fats into stored energy suggesting that inmates who are obese are more likely to utilize violent behavior while imprisoned as a coping mechanism for stress due to their

disproportionately higher cortisol levels. Therefore, when an unhealthy individual becomes isolated from their outside peers in combination with a lack of monetary support while imprisoned resulting in a lack of positive stimuli and increasing their likelihood of both stress and utilizing the fight or flight response while incarcerated. As a result of the loss of positive stimuli, Agnew's (1992) theoretical application suggests that the presence of negative stimuli can then emerge.

The presentation of negative stimuli can be highlighted as the final source of strain noted within the prison structure (Agnew, 1992). Agnew (1992) describes negative stimuli as disorganized structures and physically abusive relationships. Studies display the presence of negative stimuli being associated with the prison experience, specifically to the high exposure to violence (Brinkley-Rubinstein, 2013). As a result of this exposure to violence, developments of psychological distress among the inmate population have emerged. Studies have shown that the violence presented due to the prison structure has been linked both physical and mental health issues (Brinkley-Rubinstein, 2013; Burdette & Hill, 2008). With the prison system representing the largest institution for treating the mentally ill, gaps remain in research in determining the long-term mental effects of prison confinement on physical illness. With approximately 74 percent of state prisoners being diagnosed with a mental illness (James & Glaze, 2006), research suggests that those within prison are suffering from psychological disorders at exponentially higher rates than the general population (James & Glaze, 2006; Mears & Cochran, 2012). In regard to inmates who suffer from chronic illness during their incarceration, Burdette and Hill (2008) stated that psychological distress is displayed at higher rates among diabetic individuals. Further stating, chronic illness stems from psychological distress, which enables both negative health outcomes and violent behaviors as methods for coping. For example, those that suffer

from psychological distress are consistently more likely to eat foods that are rich in sugar, salt, and saturated fat when experiencing negative emotions (Anton & Miller, 2005; Burdette & Hill, 2008; Hill, 2006). When psychological stress couples with physical illness, it displays a higher amount of present stress for those incarcerated. As a result of the negative relationships present within prison, poor health outcomes, and psychological distress, inmates are at a disadvantage when attempting to develop positive coping mechanisms to negative stimuli. Such a disadvantage allows for criminogenic behavior to occur as a response strain developed by stress-related stimuli.

Due to the little amount of research conducted on the effects of physical illness among the inmate population, Agnew's (1992) general strain theory presents itself as an adequate explanation to the higher rates of recidivism through its ability to highlight poor health as a contributing factor to the development of strain. Agnew (1992) proposed that strain does not typically result in crime, but rather the opportunity of crime is regulated by an individual's ability to cope with situations in which strain is present. Furthermore, these individuals that engage in criminogenic coping mechanisms are those that lack conventional strategies to deal with strain. Therefore, Agnew's (1992) strain theory suggests that inmates suffering from negative health outcomes such as chronic illnesses, both while imprisoned and post release, represent a distinct population whom suffer from an absence of conventional coping mechanisms, allowing for the engagement in criminogenic behavior to occur.

Life-Course Theory

Life course theory developed by Sampson and Laub (1993), along with Agnew's (1992) General Strain theory, can also explain the effects of prison exposure on physical illness and

crime. Life course theory (Sampson & Laub, 1993), seeks to explain human development through a multidisciplinary approach utilizing history, biology, psychology, and sociology. In life course theory, Sampson and Laub (1993) claimed that two concepts underlie the analysis of life course dynamics, the concepts of both a trajectory and a transition. The first concept, a trajectory, is defined as the pathway development over one's life course which is marked by a sequence of transitions. Sampson and Laub (1993) proposed that trajectories have three key dimensions: entrance, success, and timing. Entrance is defined as the first dimension, which recognizes that not all individuals enter particular developmental trajectories. For example, some individuals engage in criminal or deviant behavior, whereas other individuals participate in culturally accepted norms such as getting a job or getting married (Sampson & Laub, 1993). Following this dimension is that of success; this dimension recognizes both the variation and context of developmental trajectories across individuals (Sampson & Laub, 1993). Success, in this dimension, is defined by successful life trajectories such as a successful job or marriage. The final dimension is that of timing, referring to the timing of particular events along the trajectory which can significantly alter one's developmental trajectories across persons (Sampson & Laub, 1993). Furthermore, Sampson and Laub (1993) postulated that timing of distinct life events can differentially impact one's developmental trajectory at different stages along the life course. In response to the nature of the life event, an individual can experience both positive and negative effects on his or her trajectory. Sampson and Laub (1993) suggested that these positive and negative effects have distinct role in shaping an individual's criminal trajectory.

The second concept, transition, is defined as a life event embedded within the trajectory (Sampson & Laub, 1993). These transitions are referred to as the changes in one's state, which can be either more or less abrupt depending upon an individual's situation (Elder, 1985; Piquero

& Mazerolle, 2001; Sampson and Laub, 1993). Sampson & Laub (1993) stated that transitions over an individual's life tend to be consequential in terms of an individual's position within the life course, and transitions occurring through the life-span have the ability to either strengthen emerging patterns of behavior or alter the developmental trajectories. As a result of this, life course dynamics focus on the context of the transition such as the focalization on time, duration, and the ordering of major life events to determine the consequences on future life development within an individual (Piquero & Mazerolle, 2001; Sampson & Laub, 1993).

As a result of the study of trajectories and transitions the concept of turning points is the final aspect of life-course theories. Turning points are defined by Sampson and Laub (1993) as a significant changes to one's developmental course which have the ability to produce radical turnarounds or changes that separate one's past from the future. Moreover, turning points can vary by individual; in this, an individual can experience both gradual and incremental turning points (Sampson & Laub, 1993).

In sum, the life-course perspective seeks to identify concepts as trajectories, transitions, and turning points as important aspects for undertaking criminogenic behavior over the course of one's life span (Sampson & Laub, 1993). Sampson and Laub's life course theory (1993) seeks provide a potential explanation to the relationship between prison confinement, physical illness, and the risk for criminal behavior. This can be seen in the longitudinal perspective of life course theory with health viewed as a life trajectory. By incorporating this theoretical explanation, the diagnosis of a chronic illness or medical condition can be viewed as a negative turning point for an individual.

When examining health through Sampson and Laub's (1993) theoretical perspective, health is represented as a trajectory. In this, one's health would be viewed as sequence of linked

states within a conceptually defined realm of behavior and experiences. Therefore, an individual's health would have a direct role on an individual's life course outcome. Due to its ability to encompass various dimensions, it can enable both a positive or negative effect on an individual's behavior. As a result of this, life course theory (Sampson & Laub, 1993), suggests that transitions embedded within the health trajectory represent turning points or changes in one's life course, specifically behavioral and developmental outcomes.

In regards to physical illness, research identifies eating habits and one's environment as a consequential role on the health trajectory (Brinkley-Rubinstein, 2013; Burdette & Hill, 2008; Clarke & Waring, 2012; Gates & Bradford, 2015). These consequences can be both positive and negative. For example, individuals who engage in healthy eating habits are less likely to develop diabetes or chronic illnesses such as heart disease. Therefore, one's learned health habits can contribute a turning point within the life course. As evidenced by Brinkley-Rubinstein (2013), once an individual becomes diagnosed with a physical illness, they acquire a myriad of health consequences, as well as a stigmatization by society. Further suggesting that the diagnosis of a physical illness represents a change within the life course, allowing for the potential for future consequences to occur in regards to human development. Studies highlight these consequences as an increased risk of diseases and health conditions including type two diabetes and cardiovascular disease, in addition to a lack of involvement within the community (Clarke & Waring, 2012). Due to a physical illnesses ability to alter the health trajectory, physical illness also enables behavioral changes through psychological distress. Furthermore, being diagnosed with a medical condition increases the likelihood for one to engage in delinquent activity due to the lack of ability to engage in conventional activities (Burdette & Hill, 2008). In this, physical illness allows for anti-social behaviors to develop through the disease's ability to isolate

individuals from their peers through a stigmatization process. As evidenced by Prince (2009), unhealthy individuals are less likely to engage in the workforce, interact with peers, and contribute to society as a whole. As a result of the physical illness turning point, the diagnosis of a disease can enable one's ability to engage in delinquent behavior, permitting long term criminogenic behavior through an inmate's limited access to conventional goals (Massie, 2000; Prince, 2009; Sampson & Laub, 1993). Due to this, and individuals likelihood for becoming incarcerated increases, which stems from the collective effects of the diagnosis of a physical illness, representing a turning point in one's health trajectory.

Sampson and Laub's (1993) theory suggests that physical illness can act as a negative turning point in one's life course. Due to the long-term effects of a physical illness on behavior, studies argue that the diagnosis of an illness can increase the likelihood for incarceration (Clarke & Waring, 2012; Massie, 2000; Prince, 2009). Moreover, once an individual becomes incarcerated, the prison experience further embeds the negative effects on an individual's health trajectory. When assessing the role of prison on one's health trajectory, studies display that health status is correlated to the intrinsic characteristics of the prison environment such as violence, overcrowding, and isolation (Alves et al., 2015; Leddy et al., 2009; Lindquist & Lindquist, 1999). In addition to the characteristics of prison, insufficient and inadequate health care services have been reported. As a result of the continuity of negative consequences produced by prison confinement on inmates, studies suggests that negative consequences enable the risk of recidivism, as a result of long-term detrimental health outcomes. Multiple research studies highlight that a lack of resources and opportunities contribute to incarceration and the difficulties following an inmate's release (Glaser & Greifinger, 1993; Thomas & Torrone, 2006; Woods et al., 2013). For example, Woods, Lanza, Dyson, & Gordon (2013) noted that inmates

with physical health problems, specifically chronic illnesses, suffer from the inability to effectively reintegrate into society compared to their healthy counterpart. Sampson and Laub's (1993) life course theory suggests that due to prison's inability to produce a life altering effect on one's preexisting negative health trajectory, it is not a turning point, but rather a transition, furthering an inmates present health trajectory.

Alternatively, in order to combat criminal behavior and the likelihood for recidivism, Sampson and Laub's theory (1993) suggested that institutions should be implemented as a means to alter one's health trajectory positively in order to control both physical illness and future criminality among inmates. Present research proposes that incarceration has the ability to enable a positive impact on an individual's health trajectory. Theory, when coupled with research, suggests that such a utilization of correctional facilities would assist in controlling criminal behavior while simultaneously improving the health of inmates through cost-effective measures (Hamett et al., 2001; Kurlycket et al., 2011; Winterbauer & Diduk, 2012). In this, life course theory (Sampson & Laub, 1993) suggests that prisons have the ability to represent an environment that promotes the reduction of health risk behaviors by interrupting histories of maltreatment through the facility's ability to provide access to health care and preventative health education plans (Alves et al., 2015). As a result, the correctional facility would be reconstructed into a health care facility for the underserved, specifically offenders. By controlling one's health once incarcerated through positive initiatives, studies suggest that reconstructing correctional facilities through efforts of providing foods that meet high nutritional guidelines, preventative health care, more mobility in regards to exercise, and health education would effectively reduce physical illness rates among inmates, while reintegrating those positive health outcomes into the general population (Alves et al., 2015; Clarke & Waring, 2012; Hamett

et al., 2001; Leddy et al., 2009). In response to such an implementation, a positive alteration within an inmates' health trajectory would result, leading to a reduction in physical illness, which would decrease one's likelihood for anti-social behavior and prevent long-term criminality through cost-effective measures.

Current Study

While rates of incarceration and physical illness continue to be near historic highs and the literature exploring the relationship between health and incarceration proliferates, it is crucial to understand the mechanisms through which incarceration impacts both health status and future criminality. This study has attempted to delineate the link between physical illness and criminogenic behavior and the impact it has on incarcerated individuals and the general population. Using both Agnew's (1992) General Strain Theory and Sampson and Laub's (1993) life course theoretical frameworks, it allows for a better understanding of the link between incarceration, health outcomes, and crime by focalizing on the cumulative effect of racial disparity, life events, and structural factors. Such an explanation suggests that multi-level approaches should focus on integrative health initiatives through the correctional setting in order to establish proactive alternatives to negative health outcomes for the incarcerated population. Past research highlights the positive impacts of healthcare access reform in areas of both the incarcerated and formerly incarcerated individuals. However, general strain (Agnew, 1992) and life course theoretical perspectives (Sampson & Laub, 1993) encourage the idea of a macro-level initiatives focusing on drastic reformatory policy paradigm shifts within correctional facilities in order to address the collateral consequences of incarceration on those suffering from physical illnesses, which cascades to impact the communities in which they reside.

The current study will seek to explore the effects of incarceration on physical illness by focusing on the two research questions (1) is an individual's health effected by incarceration? (2) does incarceration increase future medical conditions? This will assist in determining if correctional facilities can be reformed into a preventative health care opportunity. Furthermore, the study will control for race in an attempt to examine the racial health disparity.

CHAPTER 3

METHODOLOGY

This chapter will discuss the methodology behind the current study. Included in this methodology are: the sample and sample design; the research question and hypotheses guiding the study; description of the dependent, independent and control measures, and including how they were developed; and the analytic strategy utilized to test the research question.

Sample

This current study relies upon secondary data collected by the United States Department of Justice as part of the 2004 Survey of Inmates in State and Federal Correctional Facilities (SISCF). The SISCF utilizes a nationally representative, stratified, systematic sample to gather data on inmates held within both State and Federal prisons in the United States. The survey is representative of respondents of at least 18 years of age who had been held in a correctional facility from October 2003 to May 2004. The 2004 sample contained 297 participating male state facilities, with 11,569 completed individual state interviews for the SISCF. Following the interviews, the state facilities were each grouped into eight strata, defined by census regions as: Northeast, New York, Midwest, South, Florida, Texas, West, and California. The SISCF was selected from the Bureau of Justice Statistics (BJS) 2000 Census of state and Federal Correctional Facilities, which included a sampling frame of 1,549 state facilities collected by the United States Department of Justice.

The sample was conducted utilizing a two stage sampling process, in which prisons were selected in the first stage and inmate survey selection was conducted in the second stage. The survey accounted for more than 14,752 variables, which provided information about the inmate's

current offense and sentence length, criminal background, family history, personal characteristics, prior drug and alcohol abuse and treatment programs, engagement in prison activities, programs, and services. Due to the defined strata of state facilities, this study focused on the data collected on males in state correctional facilities. The variables of interest were then presented in installments of the survey and coded similarly.

Research Questions

This study aims to bridge the gap between preventative healthcare and criminal justice efforts within the literature in its examination of prison's effects on overall health and behavior. More specifically, this study utilizes data to determine the impact of the prison confinement on both long-term health complications and healthcare expenditures. Additionally, this study lends support to future knowledge on health impacts among disadvantaged populations, in an attempt to become more cost-effective. Though mental health has been examined frequently among the prison population (Dumont et al., 2012; London & Myers, 2006), little emphasis has been given to the impact of physical illness among individuals.

Listed below are the research questions and hypotheses guiding the current study. The first research question seek so explore prison confinement's effect on an inmate's physical health. Previous research highlights the lack of knowledge surrounding chronic illness and its ability to be enhanced by the prison environment (Dumont et al., 2012; London & Myers, 2006; Massoglia, 2008). By testing both the relationship between one's length of incarceration and number of times incarcerated as it relates to chronic disease, it can assist in determining if prison can be reformed into an opportunity for a preventative measure of health care. The second research question focuses on incarcerations effect on future medical conditions. By exploring the relationship between incarceration and medical conditions, it can assist in determining if

correctional health care address medical conditions with proper treatment. Furthermore, this relationship can assist in determine appropriate methods for creating more cost effective health care frameworks with regard to the treatment of medical conditions.

Research Question 1: Is an individual's health effected by incarceration?

H1: Does length of incarceration effect chronic disease

H2: Do the number of incarcerations effect chronic disease

Research Question 2: Does incarceration increase future medical conditions?

H3: Does length of incarceration impact current medical conditions

H4: Do the number of incarcerations impact current medical conditions

Measures

Dependent Variables

Chronic disease is defined by the Center for Disease Control (CDC, 2015) as a human health condition or disease that is long-term and persistent in its effects. Chronic illness has been attributed to seven out of ten deaths each year, and accounts for 86% of the United States national health care costs (Center for Disease Control, 2015). Due to the correlation between prison confinement and negative health outcomes, this study investigates the effects of incarceration on chronic illness. Specifically, the dependent measure is measured at the micro-level, representing whether or not each individual person suffers from a chronic condition and is denoted as *chronic illness* within the paper. This variable was created by collecting the number of inmates who currently suffer from a chronic illness during imprisonment. This variable was recoded and collapsed into a dichotomous variable which contained the following chronic illnesses: Tuberculosis (TB), Diabetes, and Cancer. Specifically, inmates who did not suffer from a chronic illness received a "0" value for the measure, whereas those who have one or more will

be given a “1” value. The reasons that only three chronic illnesses were contained within the dependent variable, is because the national survey only reported those within the data collection.

Due to previous research exploring the effects of prison confinement on medical conditions with regards to cost expenditures, this study will also use current medical condition as a dependent variable. The second dependent variable is labeled as *medical condition*. This variable is utilized to determine if an individual has a present medical condition while imprisoned. By noting the presence of a medical condition while imprisoned, it permits the ability to determine the effects of confinement on both an inmates’ health and prison expenditures.

(See Table 1 for a list of the dependent measures).

Table 1. *Dependent Variables: Chronic Illness and Current Medical Condition*

Variable	Description
Chronic Illness	Whether the inmate has present chronic illness during incarceration. Chronic Illness is defined as Tuberculosis (TB), Cancer, or Diabetes.
Current Medical Condition	Whether or not the inmate has a current medical condition while incarcerated

Independent Variables

The prominent focus of this study is to investigate the effects of the prison structure on male inmates’ health in state facilities. Literature has emphasized the increase in prison expenditures due to the health of inmates, specifically in regards to mental illness. Due to the gap

in research on the effects of physical illness, length of incarceration and number of times an individual has been incarcerated were selected as the primary independent variables within the study.

Length of incarceration was operationalized as months served and is used to test if prison confinement has an effect on an individual's health outcome. Length of incarceration allows for the examination of physical illness prevalence within prison by determining if time spent within the correctional facility has an effect on negative health rates. This independent variable assisted in testing hypothesis one and three in determining if the prison structure plays a role in a subject's health. Current research suggests that prison confinement exacerbates an individual's well-being in regards to stress and unique health conditions, not displayed among the general population (Binswinger et al., 2011; Dumont et al., 2012)

Number of Incarcerations was operationalized by recording how many times an individual has entered a prison system during their lifetime. The number of incarcerations allows for a better understanding on if the amount of times incarcerated proves to be stronger than the length of time served. Furthermore, measuring the amount of times an individual has been incarcerated displays the effectiveness of correctional healthcare through measuring one's health, as it relates to their time entering a prison facility.

(See Table 2 for a list of the independent measures)

Table 2. *Independent Variables: Length of Incarceration and Number of Incarcerations*

Variable	Description
Length of Incarceration	Length of time incarcerated (Listed in Months)
Number of Incarcerations	Number of times an individual has been incarcerated.

Control Variables

To account for spuriousness when running the statistical analyses, various control variables were included in the statistical models. Due to the limited amount of information available in regards to inmate health, there are also other sources of spuriousness that are not controlled for in the statistical models. As a result of this, the present spurious variables are noted in the limitations portion of this study. The variables that are controlled for are race (denoted as *race*), age of inmate (*age*), monthly income before incarceration (*socioeconomic status*), education level prior to incarceration (*education*), and diagnosed within the last year or admitted to a mental hospital in the year prior to arrest or since admission to prison facility (*drug dependency*).

Race, which is incorporated as a control variable within social science studies, determines the presence of bias. Due to the racial make-up within the correctional facilities, race was collapsed into the following two categories: (0) White, (1) Non-White. Due to previous research stating that minorities have disproportionate health rates when compared to their white

counterpart, the attributes of the variables were recoded and collapsed to control for minority males. By doing controlling for race in both length of incarceration and times incarcerated it enabled the determination of the effects of prison confinement on racial groups.

Age, represents a control variable within the study. The control variable is labeled as “Age” and was collapsed into the following categories: (1) <25 yrs, (2) 25-33, (3) 34-44, (4) 45-54, (5) 55-64, and (6) 65-95. Therefore, the reasoning for controlling age is due to the health disparity among older inmates. Doing this allowed for a determination of the effects of incarceration on the health of older inmates. As a result of older inmates’ lack of mobility, controlling for age allowed for an explanation for the possibility of a disproportionality in negative health prevalence among older inmates.

Drug Dependency is also controlled for. More specifically, a dichotomous variable was created with “0” representing inmates that have not been admitted to a mental hospital prior to their arrest or since admission to a prison facility and “1” being those individuals that have been diagnosed with a mental illness. Recent research suggests that mental illness can enhance an individual’s present physical illness (Dumont et al., 2012; Binswinger et al., 2011; London & Myers, 2006). Therefore, by controlling for mental illness it allows for insight on health outcomes as related to both mental and physical illness.

Education is controlled for due to the fact that negative health practices are correlated to one’s education level. This measure was coded as based on education level, starting with “0” for those who never attended or attended kindergarten only to “18” which was labeled as graduate school for two or more years, in addition to “19”, attended school in other country/system not comparable to grades. The final control variable used within the statistical model is *socioeconomic status*. This variable was created by forming categorical attributes based on each

individual’s monthly income prior to incarceration. The variable was coded as followed: “0” no income, “1” \$1-199, “2” 200-399, “3” 400-599, “4” 600-799, “5” 800-990, “6” 1,000-1,199, “7” 1,200-1,499, “8” 1,500- 1,999, “9” 2,000-2,499, “10” 2,500-4,999, “11” 5,000-7,499, and “12” 7,500 or more. This is controlled for because one’s access to treatment, dietary needs, and medical dependency has been directly associated with one’s socioeconomic status (Dumont et al., 2012).

(See Table 3 for a list of the control measures)

Table 3. *Control Variables: Race, Age, Drug Dependency, Education, and Socioeconomic Status*

Variable	Description
Race	Race of inmate
White	(0)
Non-White	(1)
Age	Age of inmate
<25 yrs	(1)
25-34	(2)
34-44	(3)
45-54	(4)
55-64	(5)
65-95	(6)
Unknown	(7)
Drug Dependency	Diagnosed within the last year or admitted to a mental hospital in the year prior to arrest or since admission to prison facility
No	(0)
Yes	(1)
Education	Education level prior to incarceration
Never attended or attended Kindergarten only	(0)
First grade	(1)
Second Grade	(2)
Third Grade	(3)
Fourth Grade	(4)

Fifth Grade	(5)
Sixth Grade	(6)
Seventh Grade	(7)
Eight Grade	(8)
Ninth Grade	(9)
Tenth Grade	(10)
Eleventh Grade	(11)
Twelfth Grade	(12)
College Freshman	(13)
College Sophomore	(14)
College Junior	(15)
College Senior	(16)
Graduate School one year	(17)
Graduate school two or more years	(18)
Attended school in other country/system not comparable to grades	(19)

Socioeconomic Status

No income	Monthly income before arrest
\$1-199	(0)
200-399	(1)
400-599	(2)
600-799	(3)
800-999	(4)
1,000-1,199	(5)
1,200-1,499	(6)
1,500- 1,999	(7)
2,000-2,499	(8)
2,500-4,999	(9)
5,000-7,499	(10)
7,500 or more	(11)
	(12)

Strengths

The study has a displays a variety of strengths, which are due to the unique variables collected within the data set. Furthermore, the data consists of 11, 569 state inmates over the course of 2004. Using a data set of this size that also includes such a large demographic increases the validity of the findings; reducing the effects of outliers within the study. Therefore, high repeat offenders prove to be balanced out by such a rich data set that it eliminates skewness. Furthermore, the data set includes enough variables to display the current physical illnesses that are recognized within prison facilities. In sum, the magnitude of the sample size affords external validity when compared that of a smaller sample.

Analytic Strategy

Due to the nature of the data utilized within the study, a form of regression is used to test the four hypotheses under examination. Regression is utilized as a means to predict the effects of a set of independent variables on the target, dependent variable (Bachman & Paternoster, 2017). Furthermore, this allows for multiple variables to be controlled in order to establish a clear relationship between the hypothesized independent and dependent variables (Bachman & Paternoster, 2017). In the current study, this structure assists in determining the influence of multiple independent variables on the outcomes of interest *physical illness*, which is simultaneously measured through the use of four distinct models.

The testing for each model was conducted in SPSS and employed binary logistical regression in assessing the interactions of the independent and dependent variables. Logistic regression allows for the inclusion of multiple independent variables in measuring their

individual and combined effect on a dichotomous dependent variable. Due to the dependent variables, *chronic illness* and *current medical condition*, being dichotomous, binary logistical regression proved to be the most appropriate analysis to test the hypotheses. By measuring the relationship between the dependent variables, *chronic illness* and *current medical condition*, and the independent variables, *length of incarceration* and *number of incarceration* it allows for an interpretation of the binary logistical model used to estimate the binary response (Bachman & Paternoster, 2017). Such an analysis will allow for a determination of the relationship between the independent and dependent variables. In testing the four hypotheses, four separate logistical regression models are required. Logistical regression is required to determine the relationship between incarceration and physical illness, in order to determine if the prison environment is associated with negative health outcomes. Each of these models will address the research questions that drive the current analysis.

Conclusion

This chapter examined the source of the data by describing how the data was collected and coded from the original secondary dataset. The independent, dependent, and control variables were described. In addition, the type of analysis selected was explained. The following chapter will contain the results of the models used to explore the four hypothesis.

CHAPTER 4

RESULTS

The results chapter of this thesis begins by detailing the descriptive statistics of the dataset used to explore the research question. Following this, the logistical regression models will be discussed, in addition to four tables that represent the separate binary logistical regression models.

Descriptive Statistics

The descriptive statistics for the sample are detailed in Table 4. The sample is predominately nonwhite males, with only 4,002 whites (34.6 percent) and 7, 548 non-white (65.4 percent) being included in the present study. The mean *age* of the participants within the study was between the ages 25-34 (standard deviation of 1.117). For *socioeconomic status*, on average those imprisoned received a monthly wage between 1,000- 1,199 (standard deviation 3.224) prior to incarceration. In regards to education level, the mean education level of those surveyed was a 10th grade education level (standard deviation 3.224). Lastly, in relation to the *drug dependency* variable, 1,332 (11.5 percent) reported having been diagnosed or admitted to a mental hospital prior to arrest or since their admission to the prison facility, whereas 10, 237 (88.5 percent) stated that they had not been diagnosed or admitted to a mental hospital.

For the dependent variables, *chronic illness* and *current medical condition*, 1, 140 males (12.2 percent) within state correctional facilities reported having a chronic illness during their confinement, whereas 10, 159 (87.8 percent) did not report having a chronic illness. In regards to *current medical condition*, approximately half of the sample size 4, 832 (41.8 percent) reported

having a current medical condition, compared to the 6, 737 (58.2 percent) that did not report having a current medical condition.

Aside from the dependent variables, the independent variables *length of incarceration* and *number of incarcerations* are displayed within the frequencies. For *length of incarceration* the current sample records the length of one's incarceration in months. The frequencies revealed that the average time spent in prison is 1028.80 months with a standard deviation of 2814.551. In regards to number of incarcerations, of those surveyed the mean number of times of being incarcerated was 1.94 with a standard deviation of 3.224, suggesting that on average individuals with state facilities are incarcerated twice unto 2004.

Table 4. *Descriptive Statistics*

Variable	Percent (N)	Mean (SD)
Age		2.257 (1.117)
Race		
White	34.6 (4002)	
Non-White	65.4 (7548)	
Socioeconomic status		6.53 (3.224)
Education		10.80 (10.391)
Drug Dependency		
Yes	11.5 (1332)	
No	88.5 (10,237)	
Length of Incarceration		1028.80 (2814.551)
Number of Incarceration		1.94 (3.224)
Chronic Illness		
Yes	12.2 (1,140)	
No	87.8 (10,159)	
Current Medical Condition		
Yes	41.8 (4,832)	
No	58.2 (6,737)	

Bivariate Analysis

Table 5 contains a complete overview of the bivariate correlations among the variables utilized within the current study. The bivariate correlations within the table display the relationships between the measures that are included in the bivariate logistical regression analysis. For the current study, overdispersion does pose as a limitation due to the dependent variables being dichotomous. Therefore, the measures prove to be normally distributed (Kennedy, 2003). However, a bivariate analysis is necessary because it allows for a better understanding of the relationships between the measures and it allows for an assessment of the issue of multicollinearity in the bivariate logistical regression analysis (Berry & Feldman, 1985). The bivariate correlations for the present study indicate that multicollinearity may not be an issue, meaning that the relationships found between the dependent variable and independent measures should not be biased. Current research suggest that Person correlation coefficients above .80 constitute a threshold for determining whether measures are too closely related to each other in large sample sizes (Berry & Feldman, 1985; Kennedy, 2003;). Only one relationship within the study displays a correlation close to .80: The relationship between current *medical condition* and *length of incarceration*.

Table 5. *Bivariate Analysis*

Measure	1	2	3	4	5	6	7	8	9
1. Age	--								
2. Length of Incarceration	.170**	--							
3. Drug Dependency	.013	-.004	--						
4. Current Medical Condition	.304**	.079**	.126**	--					
5. Chronic Illness	.224**	.068**	.027**	.440**	--				
6. Education	.071**	.004	.003	.004	-.035**	--			
7. Socioeconomic Status	-.007	-.059**	-.017	-.022*	-.019	.138**	--		
8. Number of Incarcerations	.059**	-.035**	.037**	.055*	.015	-.039**	.032**	--	
9. Race	-.115**	.015	-.107**	-.056**	.025**	-.080**	-.097**	-.056**	--

** . Correlation is significant at the 0.0 Level (2-tailed)

* . Correlation is significant at the .05 level (2-tailed)

b. Cannot be computed

Bivariate Logistical Regression

The study utilizes four bivariate logistical regression analysis to test the research questions and corresponding hypotheses. Model one tests the relationship between *the length of incarceration* and *chronic illness*. Model two measures the relationship between *the number of incarceration* and *chronic illness*. Model three tests the relationship between *the length of incarceration* and *current medical conditions*. The final fourth model measures the relationship between *the number of incarcerations* and *current medical conditions*. The final portion of the results section discusses the findings of each model utilized and their support to the tested hypotheses. The results of the separate logistic regression models for each hypothesis are presented in Tables 6-9.

Model One

In examining the results of the model one, *sentence length, education, age, race, and drug dependency* all show to be statistically significant predictions of chronic illness while imprisoned. Each one unit increase in the one's drug dependency on prescription medicine is associated with a 1.34 times greater likelihood of developing a chronic illness while imprisoned ($b=.29$). Those who reported as a minority male are 1.43 times more likely to have a chronic illness when compared to their white counterpart ($b= .35$). A relationship with age is also present as well, for every one unit increase in an inmates age, they are 1.77 ($b= 1.77$) times more likely to develop a chronic illness during their time incarcerated. Level of education displays a relationship with chronic illness while incarcerated, as an individual increases one unit in education their likelihood to have a chronic illness decreases by 5 percent ($b= -.05$). Finally, the length of one's sentence appears to play a role in the development of a chronic illness among

minority males, with minority males reporting higher levels of chronic illness being more prevalent among those serving longer sentences ($b = .00$; $Exp(b) = 1.00$).

Table 6. *Model One: Chronic Illness and Length of Sentence*

Measure	<i>B</i>	<i>SE</i>	<i>Exp(B)</i>
Race	.359***	.071	1.432
Age	.571***	.029	1.770
Education	-.053***	.012	.949
Socioeconomic Status	-.003	.010	.997
Length of Sentence (Months)	.000*	.000	1.000
Drug Dependency	.299**	.096	1.349
Constant	-3.320	.184	.036
χ^2	(465.737; $p < .001$)		
-2 Log Likelihood	6447.825		
Cox and Snell R^2	.049		
Nagelkerke R^2	.093		
Hosmer-Lemeshow	$(\chi^2 = 11.437; p = .178)$		

Note. * $p < 0.5$; ** $p < .01$; *** $p < .001$

Model Two

In discussing the number of incarcerations in relation to model two, drug dependency, race, age, and education level proved to be significant predictors of the development of a chronic illness while imprisoned. Minority males showed to be at 1.46 ($b = .38$) higher risk of obtaining a chronic illness than that of their white counterpart. Similar to model one, as an inmate ages, their likelihood of developing a chronic illness is 1.79 times more likely to occur ($b = .58$). Those with a drug dependency while imprisoned are at a 1.35 ($b = .30$) times greater likelihood of developing a chronic illness while incarcerated when compared to a non-drug dependent inmate. The current level of education an inmate is associated with the likelihood of developing a chronic illness, with a one unit increase in education, one's likelihood to have chronic illness decreases by 5 percent ($b = -.05$).

Table 7. *Model Two: Chronic Illness and Number of Incarcerations*

Measure	<i>B</i>	<i>SE</i>	<i>Exp(B)</i>
Race	.384***	.071	1.468
Age	.585***	.028	1.795
Education	-.053	.012	.948
Socioeconomic Status	-.003	.010	.997
Number of Incarcerations	.003	.007	1.003
Drug Dependency	.307***	.095	1.359
Constant	-3.320	.184	.036
χ^2	(475.866; $p < .001$)		
-2 Log Likelihood	6551.530		
Cox and Snell R^2	.049		
Nagelkerke R^2	.093		
Hosmer-Lemeshow	$(\chi^2 = 15.039; p = .058)$		

Note. * $p < 0.5$; ** $p < .01$; *** $p < .001$

Model Three

Model three represents the likelihood of developing a medical condition while imprisoned. Drug dependency, socio-economic status, and sentence length are all shown as statistically significant predictors of developing a medical condition while incarcerated. Incarcerated males who identify as drug dependent are 2.30 ($b = .83$) times more likelihood have a current medical condition. Older incarcerated males are also at a greater likelihood of having a medical condition, with a one unit increase in age, one's likelihood of developing a medical condition increases by of 1.77 ($b = .00$) times when compared to their younger counterpart. A final area to note is sentence length, those individuals serving prolonged sentences are at a higher risk of developing a medical condition ($b = .00$; $Exp(b) = 1.00$).

Table 8. *Model Three: Medical Conditions and Length of Incarceration*

Measure	<i>B</i>	<i>SE</i>	<i>Exp(B)</i>
Race	-.066	.047	.936
Age	.572***	.022	1.772
Education	-.010	.009	.990
Socioeconomic Status	-.011	.007	.989
Length of Sentence (Months)	.000***	.000	1.000
Drug Dependency	.835***	.069	2.304
Constant	-1.702	.127	.182
χ^2	(1031.524; p<.001)		
-2 Log Likelihood	11744.165		
Cox and Snell R^2	.104		
Nagelkerke R^2	.140		
Hosmer-Lemeshow	($\chi^2= 6.218$; p= .623)		

Note. *p<0.5; **p<.01; ***p<.001

Model Four

The final displays the relationship between medical conditions and the number of incarcerations an individual has received in their lifetime. In relation to sentence length, drug dependency, age, and number of incarcerations show to be statistically significant. Each one unit increase in a male inmate's age is associated with a 1.78 ($b= .58$) times greater likelihood of having a current medical condition. A relationship with drug dependency is also present, with those who claim to be drug dependent being 2.31 ($b= .83$) times more likely to have a current medical condition. Finally, the number of incarcerations display a significant relationship, in that males that have been incarcerated more than once are 1.02 ($b= .02$) times more likely to have a current medical condition.

Table 9. *Results of Model Four: Medical Conditions and Number of Incarcerations*

Measure	<i>B</i>	<i>SE</i>	<i>Exp(B)</i>
Race	-.055	.046	.946
Age	.581***	.021	1.788
Education	-.011	.009	.989
Socioeconomic Status	-.013	.007	.988
Number of incarcerations	.022***	.006	1.22
Drug Dependency	.838***	.069	2.311
Constant	-1.734	.126	.177
χ^2	(1060.413; p<.001)		
-2 Log Likelihood	11956.205		
Cox and Snell R^2	.105		
Nagelkerke R^2	.141		
Hosmer-Lemeshow	$(\chi^2= 13.534; p= .095)$		

Note. *p<0.5; **p<.01; ***p<.001

Conclusion

Chapter four of this thesis addressed the results obtained from the four bivariate logistical regression models, in addition to the descriptive frequencies and bivariate analysis of the data set. These four models helped to examine if prison confinement had an effect of any kind on an individual's physical health. In the final chapter, the results from the four models will be discussed which will include the implications, opportunities for future research, and limitations presented in the current study.

CHAPTER 5

DISCUSSION

Chapter five of this thesis is a discussion of the findings from the four models that were utilized in the results section of chapter four. This analysis is broken into five sections: conclusions from the results, implications associated with minority males and the presence of physical illness and its impact on correctional health care, ideas for future research, and the limitations of the current study. A final conclusion will be given at the end of this discussion to briefly sum up the overall findings of the thesis and its contribution to the current literature on this topic.

The results of the four models display support for the research question and the hypotheses guiding the study in that incarceration has an effect on the prevalence of physical illness among the incarcerated population. Each of the models display a significant relationship between physical illness and incarceration among minority males. Furthermore, the control variables such as *age*, *education*, and *drug dependency* proved to display unique relationships for both *length of incarceration* and *number of incarcerations*. Whereas, *socioeconomic status* had no statistically significant impact on health outcomes for minority males with regard to *incarceration length* and *number of incarcerations*.

When discussing the support for the research questions, there are multiple conclusions that can be made by the four models. First, it is important to note that *chronic illness*, is significant with regard to both *sentence length* and *number of incarcerations*. Thus, the logistical regression in models one and two suggest that the longer an individual is incarcerated, in addition to the number of times they have entered into a prison facility plays a role in one's likelihood to develop a chronic illness within their lifetime. Additionally, minority males prove

to be at a higher risk of contracting a *chronic illness* such, as tuberculosis, cancer, or diabetes, the longer they reside within a correctional facility, further suggesting that institutionalized minority males may be at a higher risk of physical illness than their white counterpart. It is important to note that despite the outcome of the regression, implications from these findings are present. For example, this can suggest that white males are less at risk for contracting a physical illness while incarcerated and therefore, may not need to engage in certain preventative measures such as health education, dietary regulation, and medical treatment. Additionally, the results imply that physical illness is statistically significant among minority males with a drug dependency, suggesting that one's risk of developing a chronic illness could be a result of a prior substance abuse or a present mental illness.

A second significant finding that should be discussed is the relationship between *chronic illness* and *age*. As displayed in previous research (Binswanger et al., 2011; Dumont et al., 2012) despite one's length of incarceration and number of previous incarcerations, as an individual ages they are more prone to developing a chronic illness as evidenced by models one and two. When discussing the results from the models, it is important to note how age plays a role within the prison system. Binswanger and colleagues (2011) suggest that an inmate ages at a rapid pace compared to that of the general population. Specifically, a male inmate receiving a lengthy sentence has a life expectancy rate of 45 years of age, in comparison to the 72 years of age seen within the general population. In applying this with the relationship between age and chronic illness, the results display the need for efficient correctional healthcare that addresses chronic illness prevention upon an offender's arrival into a prison facility.

In addition to one and two, models three and four focus on *medical conditions* among incarcerated males. Models three and four display a significant relationship between medical

conditions and both *number of incarcerations* and *sentence length*. Model three answers both hypothesis three and four, suggesting that *medical conditions* are affected by incarceration. Similar to *chronic illness*, model three displays that *medical conditions* are more likely to occur in older male inmates and those who identify as drug dependent. Therefore, both *age* and *drug dependency* play a role in the development of medical conditions among inmates. As a result of the relationship between *drug dependency* and *medical conditions* while incarcerated, it is important to address the implications associated with the output of both regression model three and four. For example, research notes that medical conditions can utilize *drug dependency* to both enhance and reduce a medical condition depending on the patient (Dumont et al., 2012). As a result of this, mixed conclusions can be obtained when focusing on drug dependency as it relates to *medical conditions*. Furthermore, it suggests that correctional healthcare utilizes prescription medication as a core method of combating physical illness, which is in align with current research (Binswanger et al., 2011; Dumont et al., 2012). In response to the outcomes from model three and four, correctional facilities should place more focus on developing new preventative methods outside of prescription medications.

The present study lends support to Sampson and Laub's (1993) life-course theory, suggesting that an inmate's health trajectory can be altered once admitted into a correctional facility. First, as seen in each of the four models, *sentence length* and *number of incarcerations* display a significant relationship with both *chronic illness* and *medical conditions*. In applying Life Course Theory to the correctional setting, a correctional facility can be identified as a transition onto one's healthy trajectory, by further embedding physical illness among minority males (Sampson & Laub, 1993). Due to the rapid aging of inmates within prison facilities, which a lack of both preventative health techniques and adequate education, male inmates are at a

health disparity when compared to the general population. This can be seen in the relationship between *age* and *education*, as it relates to hypothesis four. By restructuring current correctional healthcare into a positive life transition, it could potentially lead to a turning point, or a positive change in an inmate's health. Therefore, both current theory and research imply that correctional healthcare has the ability to have an effect on physical illness among incarcerated minority males.

Aside from the support displayed for Sampson and Laub's (1993) life course theory, little support was displayed for Agnew's (1992) General Strain Theory in regards to *socioeconomic status*. This inference can be the result of a variety of factors. First, all four models displayed no significant relationship with both *chronic illness* and *medical conditions* and *socioeconomic status*. As a result of this, the findings suggest that economic strain does not play a large role in the development of physical illness among incarcerated minority males. This does not imply that individuals do not experience economic strain while incarcerated, but rather physical illness is more likely to be affected by other factors such as *drug dependency*, *age*, *race*, and overall prison confinement.

Although Agnew's (1992) General Strain Theory is not supported through socioeconomic status, the results do suggest that the presence of negative stimuli can enhance one's physical illness. This can be seen in the outcome of the four models which suggest that prison structure can enhance physical illness. With the relationship between *drug dependency* and *physical illness*, it presents prison as a breeding area for both physical and mental health issues, which research suggests goes hand in hand. Therefore, it can be inferred that physical illness and mental illness work together to enhance chronic illnesses among the general population and even more so for the incarcerated population.

Although, not all of the relationships were displayed as significant, those that did, show that incarceration does effect physical illness among minority males. For example, both *chronic illness* and *medical conditions* proved to be significantly affected by incarceration. Furthermore, the finding that *chronic illness* was affected by *race* lends support to current research regarding health disparities among minority males. This can be attributed to the already present health disparity among the general population with regard to minority males, as well as the overrepresentation of minority males within the criminal justice system (London & Myers, 2006; Massoglia, 2008). Therefore, with the disproportionate rates of physical illness among the incarcerated population, it suggests that current correctional healthcare lacks in areas of preventative care.

Policy Implications

There are few policy implications that can be garnered from the current study. The results from the statistical analyses indicate that physical illness is effected by incarceration. First, as stated by previous research (Hammett et al., 2002) correctional facilities are critical settings in which interventions can be provided with regard to prevention and treatment for physical illness. Furthermore, the outcome of models one and two, propose that minority males are disproportionately burdened with physical illness. Suggesting that correctional facilities should investigate the different stress-related factors that affect minority males both prior and post incarceration. By focusing on prevention, rather than assisting medical conditions, it could prove to be beneficial for correctional healthcare with regard to economics.

A final implication that could potentially reduce physical illness among incarcerated minority males is the significant findings regarding *age* and *education level*. By targeting physical illness upon entry, rather than allowing it to persist, can aid in reducing the severity of

health complications among inmates. Furthermore, by increasing one's knowledge on preventative healthcare with regard health education benefits can be noted. This is displayed within the statistical relationship between *chronic illness* and *education*, as an inmate's educational level increases, their risk of contracting an illness decreases.

Limitations

Several limitations of this study should be acknowledged. First, the data used is more than a decade old; however, it is the most updated comprehensive data set with health variables available on prisoners in the United States. Despite the age of the data, the demographic distribution continues to reflect that of the current prison population, according to the Federal Bureau of Prisons (Federal Bureau of Prisons, 2015; Glaze, 2014). Therefore, this dataset continues to reflect today's prison environment. Additionally, due to the current strain of correctional budgets over the past decade, it can be inferred that little changes have been made in regard to correctional healthcare.

A second limitation noted within the data collection process, is also the lack of identification of chronic illness. For example, the survey only noted three chronic illnesses among inmates: cancer, tuberculosis, and diabetes. Of those reported, the data did not assess if inmates were utilizing medications as a form of treatment. While chronic illness did prove to be significant, if more illnesses were recorded, the strength of the relationship could have proved to be stronger. Furthermore, due to the data collection period, the study was unable to directly update the prevalence of chronic illness and the current approaches implemented by correctional health care professionals.

The data being self-reported proves to be another limitation for this study. Because the dataset utilized surveys, the data are associated with recall biases and discordance between self-

reported measures. Therefore, both medical conditions and chronic illnesses were not diagnosed by health care professionals, rather they were self-reported by respondents. With this in mind, the actual prevalence of these conditions among the incarcerated population is likely to be higher than reported (Gonzalez & Connell, 2014). To reduce the potential for bias regarding this, the length of incarceration was included as a dependent variable.

Additionally, the dataset did not include indicators of age onset, there for one cannot determine when the physical illness emerged. Although the dataset did highlight present physical illness conditions, the study was not able to compare the amount of inmates with diseases prior to entering a facility with those entering back into the general population. Despite this, the dataset was still able to display if physical illness was enhanced by incarceration by testing the relationship between both *chronic illness* and *medical conditions* and *length of incarceration*. By testing for this relationship, the data shed insight on the presence of physical illnesses within correctional facilities and the health disparity among minority male inmates.

A final limitation is that the dataset did not contain incarcerated women. Current research suggests that incarcerated women are an ignored population with regards to corrections (Braithwaite et al., 2005). Although, incarcerated women do have physical illnesses, this study only focused on males due to the disproportionate female to male ratio within the sample. Also, males make up majority of the prison population, by focusing on minority males it allowed for a better representation of the presence of current physical illness within correctional facilities.

Future Research

Studies on inmate health have typically focused on mental health, disease prevalence, and mortality in contrast to preventative health services such as screening and services. Furthermore, little data has been collected on inmate health, as reflected by the fact that in the latest survey on

inmate characteristics was released in 2004. Although, health data within correctional systems prove to be accessible, it is fractured, little knowledge exists due to a lack of a uniform data collection process across the criminal justice continuum. This study highlights the lack of correctional health care research due to the use of self-reported secondary data. Future research should strive to assess better methods in collecting data on inmate health.

Another area for future research is to explore the prevalence of a variety of chronic diseases, such as obesity and heart disease, in order to assess the costs associated with treating physical illness. Little data are collected on the extent to which physical illness exists among inmates. By measuring more illnesses more light can be shed on areas in which preventative measures could be implemented within correctional facilities.

A final area for exploration is the use of implementing preventative health programming into correctional facilities. This study shows the opportunity for correctional facilities to serve as institutions that can reduce the health disparity among minority males. Restructuring correctional healthcare through preventative initiatives would assist in reducing disease, while simultaneously improving public safety and reducing correctional spending. Moreover, prior research suggests that coordination efforts between correctional and community setting should be strengthened in regards to health care (Binswanger et al., 2011). When applying this to physical illness and health disparity among incarcerated minority males, it is clear that future research should focus on incorporating health interventions in order to reduce correctional spending. Therefore, the results of the current study suggest that correctional health care should be reevaluated to account for physical illness and health disparity.

Conclusion

The convergence of medical and criminological data is a relatively rare occurrence; however, inmates who have lingering, untreated physical health conditions are likely to pose a major public health risk in the future in areas of recidivism. As the inmate population continues to rise within the United States, this study aims to add to the limited literature examining correctional healthcare and health disparity among minority males. Moreover, this study suggest that greater attention is needed to understand the current health status of minority males and racial inequalities among inmates. This research highlights the importance of public health agencies and how they can benefit the correctional health care setting by displaying frameworks that better understand omitted groups and health outcomes. Prior to this study, little research has explored the topic of physical illness prevention, while also taking into account racial inequalities. In sum, this study explored the challenges presented with regard to correctional healthcare, and gives insight into areas of further research and areas of improvement.

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