

EFFECT OF JUVENILE MENTAL ILLNESS AND ADULT OFFENDING

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**ABSTRACT**

Individuals with mental illness interact with both the juvenile and adult criminal justice systems. Over 50% of inmates in jail and prisons have been diagnosed with mental health problems (James & Glaze, 2006; Al-Rousan, et al. 2017; Wilson & Wood, 2014; Torrey, 1995), while offenders in the juvenile justice system appear to have considerably higher rates of mental illness than those who do not offend (Cashman & Thomas, 2017). The current study utilizes data obtained from The National Longitudinal Study of Adolescents Health (Add Health). Adolescents from “selected schools, urbanity, school size and school type,” (Beaver, 2013, Daigle & Teasdale, 2018) were randomly selected during 1994-1995 to take a survey.

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## INTRODUCTION

Individuals with mental illness interact with both the juvenile and adult criminal justice systems. Over 50% of inmates in jail and prisons have been diagnosed with mental health problems (James & Glaze, 2006; Al-Rousan, et al. 2017; Wilson & Wood, 2014; Torrey, 1995), while offenders in the juvenile justice system appear to have considerably higher rates of mental illness than those who do not offend (Cashman & Thomas, 2017). About 70% of juveniles who interact with the juvenile system have at least one mental disorder (El Sayed et al., 2015; Cauffman, 2004).

Due to the abundance of individuals who are incarcerated with a mental illness, the criminal justice system has started to be referred to as “America’s New Mental Hospitals,” (Wilson & Wood, 2014; Torrey, 1995). Part of this is a result of the deinstitutionalization movement that began in the 1950s. Deinstitutionalization alludes to the various changes in treatment and policy innovation that enabled a 50% decrease in the number of mental health patients in institutions (Pub. L. No 187). During the 1950s individuals who were mentally ill filled asylums and mental hospitals; where the ratio was three times higher than the incarceration rates (Pub. L. No 187). However, as new policies were implemented the number of individuals in mental institutions has decreased at least 40% and incarceration rates have increased by at least 30% (Pub. L. No 187) Thus, deinstitutionalization increased the risk of individuals with mental illness to be homeless or incarcerated (Pub. L. No 187) and could contribute to transinstitutionalization.

However, these numbers do not reflect the juvenile population who may also have mental illness and engage in criminal behavior. According to Cashman and Thomas (2017), about 30% of young adults have been diagnosed as mentally ill and are in the juvenile system. Juveniles with mental illness and other adversities are at higher risk of delinquency and encountering the system more than once (Barrett & Katsiyannis, 2016). Offending as a juvenile leaves individuals vulnerable with the capacity and probability of offending as adults (Barrett & Katsiyannis, 2016). Therefore, the number of individuals with a mental illness that cycle through the criminal justice system is at least one-third of the inmate population (Seltzer, 2005). Unfortunately, there is limited data that reflect official crime records for both adults and juveniles with mental illness. Studies examining juveniles and mental illness are rare (Cashman & Thomas, 2017) although there is extensive research examining juvenile offending as a predictor of future delinquency (Basta-Pereira & Maia, 2017; Barrett & Katsiyannis, 2016). “There have been relatively few studies that have examined the implications of mental health problems and long-term offending,” (El Sayed et al., p.2, 2015). The relationship between mental illness, juveniles and subsequent adult offending lacks attention. Because offending typically is at its highest during adolescence and decreases through adulthood (Cashman & Thomas, 2017) it is important to understand how mental illness may impact this decline. Therefore, the purpose of this study is to examine the impact, if any, mental illness as a juvenile has on adult offending.

It is imperative attention be given to mental illness because it is significant to social sciences, the public and policies (El Sayed et al., 2015). There is minimal information regarding incarceration across age, (Al-Rousan, et al. 2017) and mental illness history. According to Curtis (2011) the study of mental illness is especially important because it is not geographically equal and communities have higher risks than others to suffer from mental health. In addition, the cost

of the criminal justice system continues to rise and maintaining inmates with mental illness is expensive (Al-Rousan, et al. 2017). The cost of healthcare for inmates who are mentally ill is about \$400 million to \$1.2 billion a year for a single state (Wilson & Wood, 2014). Furthermore, the impact mental illness has on individuals deserves recognition as it has been a subject that is rarely studied.

## **LITERATURE REVIEW**

### *MENTAL ILLNESS*

Over the years mental illness has been interpreted and handled differently. Individuals with mental illness are deemed as inferior, have been alienated by society and are seen as societal ills (Huxter, 2013). Age, poverty, education and resource access influence mental illness (Jaggers et al., 2018). Mental illness can cause chronic and long-term health problems (Curtis, 2011). However, being able to define mental illness accurately and treat mental illness has been a challenge throughout the years. During the Progressive Era (about 1820s-1930s), confining individuals in institutions was seen as the appropriate way to manage those who were mentally ill (Kim, 2016; Curtis, 2011). Throughout this time period the rise of individuals in asylums noticeably increased from approximately 40,000 to 263,000 by 1923. This occurred due to transinstitutionalization of the poor with the decline of almshouses and rise of the asylums. At this time, incarceration rates remained low (Kim, 2016). This trend continued until the 1960s and 1970s. Due to scandals and exhibits of inhumane treatment to individuals, asylums and psychiatric hospitals became unpopular with the public and change occurred (Huxter, 2013).

Political influence and policy change of the 1960s led to the closing of asylums and a change of treatment for the mentally ill (Kim, 2016; Pub. L. No 187). During this time period, legislation was put in place to treat individuals with mental illness differently and provide them the opportunity to reintegrate in their communities (Curtis, 2011; Wood & Wilson, 2018). These changes and innovations for mentally ill individuals is referred to deinstitutionalization which created outpatient programs through policy (Pub. L. No 187). Deinstitutionalization consisted of three parts: (1) discharge of individuals from mental placements, (2) the diversion of individuals of mental health institutions, and (3) the creation and evolution of community resources (Frazier et al., 2015). Deinstitutionalization was supposed to help individuals with mental illness in their communities (Frazier et al., 2015; Huxter, 2013). This shift allowed for individuals to benefit from freedoms, feel independent and have a sense of humanity, as before the treatment of those who were mentally ill was almost barbaric (Huxter, 2013). For example, the 1963 Community Health Act (Pub. L. No.88-164) created places where individuals could attend for treatment. However, these policies dislocated many individuals and increased the probability of homelessness and offending (Kim, 2016). According to Prins (2014) deinstitutionalization of mental health institutions allowed those mentally ill to return to communities who were not ready to take care of them, and increased the propensity of deviant behavior. The lack of adequate services for the mentally ill since being discharged is concerning as only 11 percent are treated (Huxter, 2013). Therefore, criminal justice systems were forced to intervene to alleviate issues resulting in these unprepared communities (Prins, 2014).

During the 1980s to 1990s incarceration rates grew five times higher than before (Pub. L. No 187). Approximately 4% to 7% of the incarceration increase can be attributed to deinstitutionalization and the policies in place to treat those with mental illness (Pub. L. No 187).

Individuals with mental illness who were released to their communities faced many adversities and lacked resources (Frazier et al., 2015; Huxter, 2013). This allowed for comorbidity of mental illness, substance abuse, and homelessness, which assisted with potential delinquent behavior (Fisher et al., 2009). Post-deinstitutionalization, jails started to become substitute psychiatric treatment facilities (Fisher et al., 2009). Failure to access inpatient treatment, individuals ran the risk of being involved in the criminal justice system due to sporadic behavior (Fisher et al., 2009). For example, in order to manage behavior in communities, law enforcement may be involved and arrest individuals in order to ensure their safety and the safety of communities (Fisher et al., 2009), thus, mental illness is criminalized as individuals have to sit and wait in a cell in order to get treatment or for a bed to be open in a psychiatric hospital (James & Glaze, 2006; Fisher et al., 2009). This has resulted in an outcome where individuals with mental illness have to wait at least four more months in jail or prisons compared to the general population (James & Glaze, 2006).

However, it is unclear if individuals with mental illness contribute to offending at a higher rate than those in the general population (James & Glaze, 2006; Pub. L. No 187). Campbell and Lloyd (2012) found from previous research 22.5% of individuals are diagnosed with a mental disorder and alcohol or drug usage. Due to this, individuals with mental illness are at risk of offending due to drug usage (Campbell & Lloyd, 2012). Other factors that attribute to offending by the mentally ill are poverty, homelessness, lack of adequate housing, incarceration, and unemployment (Campbell & Lloyd, 2012, p.20; Barrett & Katsiyannis, 2016).



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### *JUVENILES WITH MENTAL ILLNESS*

Juveniles with mental illness are disproportionately represented in the juvenile justice system (Robst et al., 2017; National Mental Health Association, 2004; Kerig et al., 2009). Approximately 20% of the general juvenile population meet the criteria for mental illness disorders (Robst et al., 2017). Mental illness for the juvenile population includes depression, bipolar disorder, and attention deficit disorder (Barrett & Katsiyannis, 2016). According to Delman et al. (2014) by the time individuals are in their mid-teens about 50% of all lifetime mental disorders emerge. Treatment for juveniles range from counseling to prescribing psychotropic medication (Delman et al., 2014, Mansheim, 1982). Juveniles with mental illness have different needs than adults and are treated differently (Delman et al., 2014). For example, juveniles who are arrested and have mental issues tend to have serious difficulties in other areas like school, parental neglect and other emotional trauma (Mansheim, 1982).

However, there is little research that examines the long-term effect of mental illness in juveniles. Juveniles with mental illness are considered to be more vulnerable and at jeopardy to victimization (El Sayed et al., 2015; Hoeve et al., 2013; Copeland et al., 2007; Jeong, 2016).

### *JUVENILES WITH MENTAL ILLNESS AND OFFENDING*

Understanding youth offending is essential to comprehend short and long-term consequences (Cashman & Thomas, 2017). Approximately 1 out of 5 juveniles commit offenses which range from theft to violent crime (Cashman & Thomas, 2017). Poverty, socioeconomic status, age and gender are just a few characteristics that create a risk for youth offending (Jaggers, et al., 2018). Another factor that affects young offenders is mental illness. Juveniles are

susceptible to victimization and offending if they have been diagnosed with mental illness (Cashman & Thomas, 2017). Specifically, juveniles who are physically or emotionally victimized are likely to experience sadness, depression, and loneliness (Jeong, et al., 2016). For example, juveniles with mental illness are considered to be at risk of not just offending, but are vulnerable of committing serious offenses (El Sayed et al., 2015; Hoeve et al., 2013; Copeland et al., 2007). Unfortunately, juveniles with mental illness are traditionally thought of as menial and inferior (Mansheim, 1982). Juveniles with behavior issues and low self-control have been stigmatized as mentally ill (Mansheim, 1982). Youth with mental illness are usually portrayed as monsters and extremely dangerous to communities (Cashman & Thomas, 2017). Furthermore, marginalized juveniles encounter obstacles that disable them to engage in appropriate coping skills or treatment (Kelly et al., 2018). Therefore, their encounter with the juvenile justice system is more likely to occur (Jaggers et al, 2018). For example, in a study conducted by Cashman and Thomas (2017) juveniles with mental illness were found to be 8 times more likely to have offending history. According to Basto-Pereira and Maia (2018) approximately 15% of juvenile delinquency is associated with psychological distress.

Although research has shown juveniles involved in the juvenile justice system have higher rates of mental illness and juveniles with mental illness are more likely to commit some types of offenses. There is limited information between mental illness and the type of offenses committed by juveniles (Cashman & Thomas, 2017) or adult offending. Part of the issue is defining mental illness. For example, juveniles diagnosed with mental illness range from 50 to 89 percent, depending on the definition and diagnosis in studies (Cashman & Thomas, 2017; Karnik et al., 2009). However, juveniles who commit violent and property crimes are strongly linked to other psychiatric disorders (Carkin & Tracy, 2017; Cashman & Thomas, 2017; Karnik

et al., 2009). Previous research has focused in juvenile delinquency to project adult criminality (Carkin & Tracy, 2017). As such, the focus of research tends to be in finding risk factors and neglecting the offenses committed throughout adolescence that will impact adult offending and sentencing (Carkin & Tracy, 2017). Doreleijers (2008) hypothesized that the prevalence of mental health problems in juveniles increases the further into the juvenile justice system the study is performed. Hence, offenses and issues among juveniles change depending on exposure to the juvenile justice system and their age (Doreleijers, 2008). The need to incorporate mental illness and offenses in the juvenile stage is needed to account and understand the outcomes in adulthood.

#### *MENTAL ILLNESS IN ADULTHOOD AND OFFENDING*

Future criminal behavior is often associated with past offenses and interactions with the juvenile system (Basta-Pereira & Maia, 2017). There are many risk factors that attempt to account for the behavior of individuals. According to Calhoun (2016) adult offenders who have a history of mental illness started their criminal career before their 18<sup>th</sup> birthday. Currently there are about 3.5 million mentally ill individuals in some type of correctional supervision who are repeat offenders (Wilson & Wood, 2014). Approximately 60% of the inmate population has mental illness (James & Glaze, 2006; Al-Rousan, et al. 2017). Offenses by those individuals who are mentally ill range from property crime to violent acts (Swartz & Lurigio, 2017). Interestingly, individuals who are incarcerated and are mentally ill, are more likely to have a past of violent offending (James & Glaze, 2006; Wilson & Wood, 2010). These individuals also have a 58% chance as compared to the regular population to break facility regulations, where offending could be as minimal as behavior disruption (James & Glaze, 2006). Therefore, adult

offenders with mental illness diagnosis recidivate 47% more violently than those not mentally ill (James & Glaze, 2006; Calhoun, 2016).

Criminal behavior appears to have a different relationship with mental illness depending on the mental illness diagnosis (James & Glaze, 2006; Wilson & Wood, 2010). Individuals in prison differ in race, age and ethnicity (Wilson & Wood, 2014). However, just like the disproportionality found with these variables in the adult inmate population, being mentally ill increases the chances of having a longer sentence or encountering the law sooner (James & Glaze, 2006). In addition the demographics of the individuals with mental illness are different as they tend to be homeless and of low socioeconomic status (Curtis, 2011). Therefore, they tend to be in areas where crime is more prevalent, violation of probation occurs and committing offenses is higher (Curtis, 2011).

Adults who are mentally ill commit many crimes and are overrepresented in the criminal justice system (Swartz & Lurigio, 2007; James & Glaze, 2006; Wilson & Wood, 2014; Al-Rousan, et al. 2017; Basta-Pereira & Maia, 2017). Adults who are 24 years of age and younger have a 63% chance of mental illness than those over the age of 55 (James & Glaze, 2006). Furthermore, early intervention should be considered for juveniles with mental illness as the possibility of adult offending is obvious (Calhoun, 2016).

## **CURRENT STUDY**

Although research has focused on mental illness in juveniles the relationship it has with adulthood offending has not yet been thoroughly analyzed and recognized (El Sayed et al., 2015). This omission is important to both the juvenile and criminal justice system as over half of the populations is characterized with at least one mental illness (Basta-Pereira & Maia, 2017; Carkin & Tracy, 2017; James & Glaze, 2006; Prins 2014; Torrey, 1995, Wilson & Wood, 2014). In addition the influence mental illness has on the cost of the criminal justice system at state and federal levels, as well as the effect it has on the public and policies (Al-Rousan, et al. 2017; Wilson & Wood, 2014, El Sayed et al., 2015) it is imperative attention be given. Therefore, the present study will attempt to directly examine the relationship, if any, mental illness as a juvenile has on adult offending. Using The National Longitudinal Study of Adolescents Health which followed juveniles for a period of about 7 years into adulthood, the following question is addressed:

Does mental illness as a juvenile affect offending in adulthood?

## **METHODS**

### *Data*

The current study utilizes data obtained from The National Longitudinal Study of Adolescents Health (Add Health). Adolescents from “selected schools, urbanity, school size and school type,” (Beaver, 2013, Daigle & Teasdale, 2018) were randomly selected during 1994-1995 to take a survey. Adolescents in grades 7-12 completed an in-school questionnaire which asked specific questions about demographic characteristics, education, family, social networks,

physical health, psychological well-being and cognition, and risk behavior (Beaver, 2013; Harris, 2003). Following this questionnaire some students were subsequently chosen to have an in-home interview and became the focus sample, which was attempted to be followed throughout their pass-over to adulthood by conducting 4 follow-up interviews at different ages (Harris, 2013). Thus, creating 4 waves for the study measuring different variables, but utilizing the same sample. “The Wave I in-home sample is the basis for all subsequent longitudinal follow-up interviews and thus this innovative design remains a major strength of the longitudinal data as well,” (Harris, 2013, p.4). Wave I had an original sample size of 20,745 participants. Following Wave I, the in-home interviews were done for Wave II in 1996 approximately 1 to 2 years later (Beaver, 2013; Harris, 2013). The sample size for Wave II consisted of 14,738 individuals who were still in their teen years and the same question guideline was used for them.

Wave III data was collected from 2001-2002 where the total sample size was 15,197. The design of the in-home questionnaire was modified and changed because the follow-up occurred approximately 7 years later (Beaver, 2013; Harris, 2013). Respondents were between the ages 18-26 and transitioning into adulthood (Beaver, 2013; Harris, 2013). The purpose of the redesigned questionnaires in Wave III was to help understand how what occurs in adolescence may have an effect in the transition to adulthood (Beaver, 2013; Harris, 2013). Finally, Wave IV was conducted approximately 13 years after Wave I. During Wave IV the same individuals interviewed were 24-32 years old in 2008, therefore some of the questions were changed and only 15,701 of the original respondents were interviewed again (Beaver, 2013; Harris, 2013). In this study only Wave I and Wave IV will be utilized. In Wave IV the study focused in capturing the health and life trajectories of the original sample group size and the transition to adulthood is measured by age. Hence, making Wave I and Wave IV appropriate for this study.

## **Independent Variable**

### *Mental Health.*

Add Health contains several strong measures which tap into the concept of mental illness and as such, is the ideal data for this study. Because the definition of mental illness is vast and there are unlimited number of symptoms or diagnoses (Cashman & Thomas, 2017), a scale was created for this study. Mental Health was measured by creating a scale with questions from the Add Health questionnaire in Wave 1. Being the key independent variable, Wave 1 was utilized to capture respondents reported mental health symptoms during adolescence. The scale for mental health was created by using 8 questions from the questionnaire. These questions included the following: (1) whether respondents had received psychological or emotional counseling in the past year, (2) family planning counseling or services, (3) if respondents did not feel like eating, (4) their appetite was poor, (5) felt that they could not shake off the blues—even with help from family and friends, (6) had trouble keeping their mind on what they were doing, (7) felt depressed, and (8) felt lonely and if they feel socially accepted. Each response was coded where the higher value indicated the greater presence of the symptom and then summed together. Ranging from 0-20, the higher values indicate increased comorbidity of mental health symptoms as an adolescent.

## **Dependent Variable**

### *Formally Convicted*

The variable capturing official adult convictions was assessed in Wave IV. Respondents were asked the question, “Have you ever been convicted of or pled guilty to any charges other than a minor traffic violation?” The response to this answer was then coded dichotomously

where 1=yes and 0=no. In this way, the variable captures whether there was a conviction in early adulthood and not necessarily the amount of convictions, if any. Wave IV was utilized to ensure proper time-order between the independent and dependent variables.

## **Control Variables**

### *Race*

Racial minorities appear to be overrepresented in the juvenile system, evidence about their role varies (Desai et al., 2012). In order to account for race a variable was created. Race was examined in Wave I. Respondents were asked the question, “What is your race?” The response to this answer was then coded dichotomously where 1=White and 0=Non-white.

### *Change Weight*

Weight is a variable often overlooked and rarely accounted for (Jeong et al., 2016). Therefore, it was of interest to see if there were any significant findings regarding weight. Measuring respondents change in weight was assessed in Wave I, with the variable change-weight. Respondents were asked the question, “Are you trying to lose weight, gain weight, or stay the same weight?” The response to this answer was then coded dichotomously where 1=yes and 0=no.

### *Sleep*

Sleep is associated as a symptom of common mental disorders (Curtis, 2011; Seltzer, 2005). Respondents’ measure for sleep was assessed in Wave I. Respondents were asked the question, “Do you usually get enough sleep?” The response to this answer was then coded dichotomously where 1=yes and 0=no.



### *Out of School Suspension*

Prior studies have used education as a control variable (Barrett & Katsiyannis, 2006), where negative behavior can lead to adult offending. To measure education the variable out-of-school suspension was created. Out-of-school suspension was then assessed in Wave I. Respondents were asked the question, “Have you ever received out of school suspension?” The response to this answer was then coded dichotomously where 1=yes and 0=no.

### *Expelled*

Negative behavior can be a predictor of future offending (Cashman & Thomas, 2017). Since, the respondents were school age their negative behavior was measured by creating the variable expelled. Respondents’ measure for being expelled was examined in Wave I. Respondents were asked the question, “Have you ever been expelled from school?” The response to this answer was then coded dichotomously where 1=yes and 0=no.

### *Socially Accepted*

Because individuals with mental illness are seen as less than the general population (Huxter, 2013) considering their perspective about acceptance was important. Therefore the social acceptance of a juvenile was included in order to see if it had any effect on the outcome. Respondents’ measure for socially accepted was assessed in Wave I. Respondents were asked the question, “You feel socially accepted.” The response to this answer was then coded dichotomously where 1=yes and 0=no.

### *Smoking*

Conduct disorders and substance use disorders are found amongst most young offenders (Cashman & Thomas, 2017). Because smoking is associated with conduct disorders it was measured in this study. Smoking was captured in Wave I. Respondents were asked the question, “Have you ever tried cigarette smoking, even just 1 or 2 puffs?” The response to this question was then coded dichotomously where 1=yes and 0=no.

### *Drinking*

The presence of alcohol use is a risk factor for adult offending (Basto-Pereira & Maia, 2018). Therefore, the measure for drinking was analyzed in Wave I. Respondents were asked the question, “Do you ever drink beer, wine, or liquor-not just a sip or a taste of someone else’s drink-more than 2 or 3 times in your life?” The response to this question was then coded dichotomously where 1=yes and 0=no.

### *Adults Care*

Individuals with mental illness face many hardships and rejections from society (Frazier et al., 2015) and their support system appears to be limited. Therefore, the measure for adults caring was assessed in Wave I. Respondents were asked the question, “How much do you feel that adults care about you?” The response to this question was then coded dichotomously where 1=yes and 0=no.

### *Parents Care*

Because individuals with mental illness are seen as less than the general population (Huxter, 2013) considering their perspective about their parents was of interest. Respondents’ measure for parents caring was assessed in Wave I. Respondents were asked the question, “How

much do you feel that your parents care about you?” The response to this answer was then coded dichotomously where 1=yes and 0=no.

### *Safe Neighborhood*

Individuals with mental illness face many adversities in their communities (Frazier et al., 2015; Huxter, 2013). Therefore, respondents were asked the question, “Do you usually feel safe in your neighborhood?” The response to this answer was then coded dichotomously where 1=yes and 0=no.

### *Religious*

Because juveniles who are physically or emotionally victimized are likely to experience sadness, depression, and loneliness (Jeong, et al., 2016) religion was considered to examine if it potentially served as a coping mechanisms for respondents. Respondents’ measure for religion (religious) was examined in Wave I. In order to see if there was any relationship or significance regarding the beliefs of juveniles and offending as adults. Respondents were asked the question, “What is your religion?” The response to this answer was then coded dichotomously where 1=yes and 0=no.

### *Embarrassed*

Juveniles with mental illness have a higher risk of being victimized (Jeong, et al., 2016). Therefore, the perception of the interviewer was utilized. Respondents’ measure for embarrassed was examined in Wave I. Respondents were asked the question, “Did the respondent ever appear embarrassed about answering questions during the interview?” The response to this answer was then coded dichotomously where 1=yes and 0=no.

## Analysis

There is limited research that has addressed the impact mental illness has on juveniles and its impact, if any, on adult criminal offending (James & Glaze, 2006). Using Wave I and Wave IV from Add Health, an analysis was conducted assessing the impact of mental illness during childhood on convictions during adulthood. To test this possibility, a negative binomial regression equation for the full sample (N=945) was used. The current study tests the hypotheses in a series of three interrelated steps. First, questions tapping into mental health were selected under the guidance from prior literature to create a sum scale measuring mental health during adolescence (see variable description for a detailed description of the scale composition). The second step involved estimating a step-wise negative binomial regression initially examining the key independent variable and the dependent variable. The third step estimated another negative binomial regression model building on model 1 by including all control variables. The current study estimated the negative binomial regressions utilizing official criminal convictions as the dependent variable. Prior research finds that using official and self-reported measures of crime typically produces similar results (see Piquero et al., 2014). Collectively, this analysis examined whether mental health symptoms during adolescence impact official offending as an adult. Additionally, the coefficients ( $b$ ) estimated in the negative binomial model can be transformed to incidence-rate ratios ( $IRR$ ). The obtained incidence-rate ratios can further be converted so that it is interpreted as a percent change on the dependent variable for every one-unit increase in the independent variable:

$$IRR = 100 * \left( \frac{\exp(\hat{b}_1[IndependentVariable_i])}{\exp(\hat{b}_1[IndependentVariable_i + 1])} - 1 \right)$$

## Results

**Table 1** displays self-reported variables predicting offending in adulthood. On average, the sample has 0.64 formal convictions. Out of a scale of 20, the sample on average had a mental health score of 4.25. Individuals in the study had a 0.69 average of being white.

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TABLE 1: Self-Reported Variables Predicting Offending in Adulthood (N=945)

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Variable	Mean	Standard Error	{95% Confidence Interval}	
Formally Convicted	0.64	0.02	0.59	0.69
Mental Health	4.25	0.10	4.05	4.46
White	0.69	0.02	0.66	0.72
Change Weight	2.27	0.03	2.20	2.33
Sleep	0.68	0.02	0.65	0.71
Out-of-School Suspension	0.53	0.02	0.50	0.56
Expelled	0.11	0.01	0.09	0.13
Counseling	0.20	0.01	0.17	0.22
Family Services	0.09	0.01	0.07	0.11
Poor Appetite	0.52	0.03	0.47	0.57
Blue	0.47	0.02	0.42	0.52
Focus	0.93	0.03	0.88	0.99

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Depressed	0.61	0.03	0.55	0.66
Lonely	0.52	0.02	0.48	0.57
Socially Accepted	0.91	0.02	0.87	0.96
Smoking	0.80	0.01	0.78	0.83
Drinking	0.75	0.01	0.72	0.78
Adults Care	3.19	0.03	3.13	3.25
Parents Care	3.71	0.02	3.67	3.75
Safe Neighborhood	0.89	0.01	0.87	0.91
Religious	0.85	0.01	0.83	.87
Embarrassed	0.07	0.01	0.05	.09

**Table 2** displays summary statistics for each variable utilized in the analysis. The minimum was 0 and the maximum was 20, where the average measure was 3.72 for mental health. Findings resulted with an 81% of juveniles being unable to focus with a standard deviation of .81. Interestingly, 46% of the sample felt both lonely and had a poor appetite.

TABLE 2: Descriptive statistics for mental health scale

Variable	Obs	Mean	SD.	Min	Max
Counseling	6,485	0.13	0.33	0	2

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Family Services	6,484	0.06	0.23	0	1
Poor Appetite	6,487	0.46	0.71	0	3
Blue	6,480	0.38	0.70	0	3
Focus	6,485	0.81	0.81	0	3
Depressed	6,484	0.51	0.75	0	3
Lonely	6,485	0.46	0.71	0	3
Mentalhealth	6,463	3.72	3.07	0	20

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**Table 3** shows the negative binomial regression equation used to examine the direct effect mental illness had on adulthood official conviction a net of appropriate control variables. Across both models mental health had little to no effect on future adult offending. However, model 2 indicates a negative relationship between juvenile mental health symptoms and adult offending. Specifically, a unit increase in mental symptoms is related to a 10% decrease in the likelihood of being convicted for an adult offense. There were statistically significant associations between race (white) and out of school suspension. For a juvenile who is white, the odds of official conviction in adulthood is increased 21%. While there was a 59% increase in the likelihood of conviction during adulthood for juveniles who received out of school suspension.

TABLE 3: Negative Binominal Regression Estimating Formal Conviction as an Adult

Model 1

Model 2

Variable	IRR	SE	IRR	SE	{95% CI}	
Mental Health	0.99	0.05	0.90	0.05	0.80	1.01
White			1.21**	0.12	1.01	1.47
Change Weight			1.03	0.04	0.95	1.11
Sleep			1.04	0.10	0.87	1.26
Out of School Suspension			1.59**	0.14	1.34	1.90
Expelled			1.16	0.14	0.91	1.50
Smoking			1.14	0.13	0.91	1.43
Drinking			1.04	0.10	0.85	1.27
Adults Care			0.93	0.05	0.85	1.03
Parents Care			1.07	0.07	0.93	1.23
Safe Neighborhood			0.95	0.13	0.73	1.23
Religious			1.05	0.13	0.83	1.32
Embarrassed			0.91	0.15	0.69	1.27

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\*\*p<0.05

n= 945; CI = Confidence Interval



## Discussion

The relationship between mental illness as a juvenile and adult offending has not been the focus of much academic research. Prior studies explaining adult offending vary (El Sayed et al., 2015). For example, many studies have focused on different predictors like politics, age, poverty and demographics (Kim, 2016) or behavior discontinuity (Sorensen, & Davis, 2011). Because approximately 70% of juveniles have at least one mental disorder (El Sayed et al., 2015; Cauffman, 2004), mental illness should be considered in future empirical research. This study makes a few contributions to a small, but growing evidence base that has examined the association between mental illness and adulthood offending. Using 945 adolescents from the Add Health study who were followed over a period of 13 years, it was questioned if mental illness as a juvenile affected offending in adulthood. This allowed for the examination of what the long-term outcome of adult offending could be when respondents reported at least one mental illness symptom as an adolescent. The findings resulted in a non-statistically significant relationship between mental illness as a juvenile and adult offending. Of substantive significance is that the relationship between mental illness in adolescence and adult convictions is negative. In other words, a one unit increase in mental illness was related to a 10% decrease in an adult conviction. This finding is counter to what other studies have found (see Cashman & Thomas, 2017; Robst et al., 2017; National Mental Health Association, 2004; Kerig et al., 2009).

Due to the findings in in this study, mental illness can be considered a potential protective factor. Protective factors “present a lower probability of recidivism, and mitigate the effect of risk factors” (Ortega-Campos, et al., p.2, 2016). For instance, the variables included in this study were demographics, race, family and education. The relationship these juveniles had

within their communities could be seen as a strength and protective factor from future aggression and crime (Anderson et al., 2015). Additionally, individual resilience helps cope with adverse situations (Johnson et al., 2018). The findings in this study indicate that certain mental illnesses may serve as a protective factor from committing crime in adulthood. Particular mental illnesses, such as those utilized in the mental health scale, are conducive to behaviors related to staying at home and limiting social activities. As a result, there is less opportunity for engaging in criminal behavior.

Another consideration that should be made is the amount of resources provided to juveniles with mental illness during adolescence preventing possible adult offending. School based mental health, positive psychology and other instruments have been used to improve mental well-being of juveniles (Rose et al., 2017). Lastly, mental illness could also be a deterrent factor for offending. For example, individuals who showcase symptoms of depression and anxiety are less likely to be offenders and instead have a higher risk of being victimized (Jeong, et al., 2016).

In this study, it is important to consider some of the limitations of the data and methods (El Sayed et al., 2015; Cauffman, 2004). First, the mental health scales was derived of 8 questions based on key words associated with mental illness and therefore other possible variables were left out. Therefore, the findings may differ from others if the scale was more inclusive of various mental health symptoms. Given the age of the sample, however, most serious mental health symptoms such as antisocial personality disorder and schizophrenia are too early to diagnose. Second, Add Health has various variables that were not controlled for in this study and could possibly attribute and provide different outcomes and coefficients. Finally, this

study did not account for other deviant behaviors that were not classified as an official conviction but the respondents may have engaged in.

Future studies should consider the relationship between mental illness and the education system, particularly individuals who are given out-of school suspension as this variable had the strongest impact on adult convictions in this study. Another area of interest should consider a different and specific types of offenses associated with mental illness. For example, assault, theft and burglary. Furthermore, it is imperative attention continue to be emphasized in the juvenile population and mental illness.

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