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Abuse and Mental Health Outcomes Among Detained African American Adolescent Females:
The Mediating Role of Attachment

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2013

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An abstract of
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Abstract

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Introduction: Rates of child maltreatment among adolescents in the United States juvenile justice system are substantially higher than rates among the general population. This population of detained girls also frequently experience mental health outcome such as depression and substance use. The number of girls in the juvenile justice system is increasing with girls accounting for approximately 30% of juvenile arrests. The subpopulation of detained African American adolescent girls are at increased risk of adverse health outcomes, making them an important target population.

Objective: The purpose of this study is to assess the role of attachment in this relationship between abuse and the health outcomes of depressive symptoms and substance use among a sample of detained African American adolescent girls.

Methods: This cross-sectional study included 188 African American girls age 13-17 in a short-term juvenile detention facility in Atlanta, Georgia. This study used baseline data collected in 2011 to evaluate the association between exposure to abuse and psychological variables.

Results: Significant associations were found between experiencing abuse and depressive symptoms ($B= 4.80$ $p<. 001$ $R^2= .091$) and abuse and substance use ($B= 4.04$ $p=. 001$ $R^2= .055$). Significant associations were also found between abuse and attachment ($B= -1.04$ $p=. 006$ $R^2= .041$), and attachment and depressive symptoms ($B= -.848$ $p<. 001$ $R^2= .072$). These variables were included in the mediation model, which showed that attachment partially mediated the relationship between abuse and depressive symptoms ($B= 3.92$ $p<. 001$).

Conclusions: This study is one of the first known to examine the relationship between experiencing abuse, mental health outcomes, and attachment within the specific population. These findings can help inform future interventions aimed at preventing the development of mental health problems by enhancing attachment among this population. Future studies should utilize a more compressive variable for abuse and incorporate additional covariates into the model.

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Chapter I: Background and Significance

Child maltreatment is a health concern in the United States (U.S) resulting in 4.5 deaths per day and a new abuse report made every ten seconds (National Child Abuse Statistics, 2013). Child maltreatment includes neglect, physical abuse, sexual abuse, psychological maltreatment and medical neglect (National Child Abuse Statistics, 2013). In the year 2012, over 500,000 abuse cases were reported with 78.39% of reports due to child neglect, 18.3% physical abuse, 9.3% sexual abuse, 8.5% psychological maltreatment, 2.3% medical neglect and 10.8% due to unknown causes (National Child Abuse Statistics, 2013). There is considerable evidence that youth with a history of maltreatment are more likely to engage in delinquent behaviors than those who did not experience maltreatment with research showing that between 40-90% of girls in the juvenile justice system experienced childhood maltreatment (Goodkind et al., 2013; Postlethwait et al., 2010; Stewart et al., 2008). With a high prevalence of child maltreatment in the U.S, and the relationship between abuse and delinquency, a public health focus on this issue is necessary.

Child maltreatment is a multilevel health concern impacting individuals and families on all levels. Research has shown that child maltreatment is linked to a variety of individual, interpersonal and community risk factors (Goldman et al., 2003). A variety of private and governmental organizations such as the U.S Department of Health & Human Services, the Division of Family and Children Services (DFCS), Child Protective Services (CPS), and local community organizations are devoted to helping children and families experiencing maltreatment. An abundance of legislation provides funding for these welfare agencies while public policies guide the foster care system and family reunification process (Goldman et al., 2003). As such, the issue of childhood maltreatment maps onto the Social Ecological Model. This model

illustrates the interconnectedness of individual, interpersonal, organizational, community and public policy level factors (Sallis et al., 2008).

Theory

Social Ecological Model: Individual Risk Factors

There is not one cause of child abuse and neglect but rather an interaction between risk factors that results in a higher probability of maltreatment. Risk factors of child maltreatment can be grouped into four categories: parent/ caregiver, family, child, and community factors. Important individual caregiver factors are parental mental health and personality characteristics (Goldman et al., 2003). Studies have shown that parents experiencing depression, anxiety, antisocial behaviors, impulsivity and low self-esteem are at increased risk to maltreat their children (Hien et al., 2010; Campbell, et al., 2010; Goldman et al., 2003). History of maltreatment as a child is also an important risk factor. Research has shown that 30% of maltreated children will later go on to become the abuser (National Child Abuse Statistics, 2013). Parental drug and alcohol abuse have repeatedly been seen to predict child maltreatment (Dubowitz et al., 2011). Research shows that infants who were exposed to in-utero drugs were 6.5 times more likely to experience maltreatment than other non-maltreated children (Dubowitz et al., 2011). Similarly, another study found that children whose parents abused alcohol were three times more likely to experience abuse and four times more likely to experience neglect than those whose parents do not (Goldman et al., 2003). Lastly, research suggests that younger mothers are more prone to maltreat their children however, this may be confounded by other factors such as lack of social support, financial stability and stress (Campbell et al., 2010; Zhou et al., 2006).

Specific child characteristics make them more vulnerable to experiencing abuse. Child's age has been shown to correlate with abuse; younger children (0-3 years) are more likely to experience neglect and failure to thrive, whereas older children are at higher risk for sexual abuse (Goldman et al., 2003). Children with disabilities, impaired cognitive functioning, and failure to thrive may be at increased risk of maltreatment (Dubowitz et al., 2011). Furthermore, white children are at increased risk of child maltreatment reoccurrence than other children (Palusci, 2011).

Social Ecological Model: Interpersonal and Community Risk Factors

Aside from individual factors of both parents and children, interpersonal family factors impact maltreatment as well. Like other risk factors, interpersonal family factors do not cause child maltreatment but have been shown to increase the likelihood of experiencing maltreatment. Family structure, including living in a single parent household, having a low family income, having more children and having a greater number of people living in a household are risk factors for abuse (Dubowitz et al., 2011; Sedlak et al., 2010). Reports have shown that 30-60% of children living in families where domestic violence is present also experience child maltreatment (Children's Bureau, 2014). Parent child interactions also greatly impact abuse. For example, harsh parenting and parent-child aggression have been associated with potential child abuse (Knerr et al., 2013; Rodriguez, 2010)

Lastly, community factors such as living in poverty, social isolation, violent communities, receiving public assistance and inadequate housing increase forms of child maltreatment (Dubowitz et al, 2011; Palusci, 2011; Lyons et al, 2005; Goldman et al., 2003). These individual, interpersonal and community risk factors have been repeatedly shown to impact the experience of maltreatment potentially resulting in lifelong adverse health outcomes for the individual.

While each level of the model critically impacts child maltreatment, interpersonal connectedness or attachment as described by the Attachment Theory, significantly impacts both issues of child maltreatment and adolescent delinquency.

Attachment Theory

Attachment Theory is an empirically grounded theory grounded in developmental psychology. It posits that attachment is a significant interpersonal aspect of the relationship between a child and parent with the primary purpose being to build secure attachments to foster a sense of protection (Benoit, 2004). There are four patterns of attachment: secure, avoidant, resistant and disorganized, with disorganized attachment being a significant predictor of later psychopathology and maladjustment later in life (Cicchetti et al., 2006). Research shows that about 80% of maltreated children have disorganized attachment, which is significantly higher than children who were not maltreated (Benoit, 2004). Adolescents who had disorganized attachment during childhood display higher rates of mental health problems, impaired self-regulation, and increased social difficulties (Benoit, 2004). Overall, attachment is an essential developmental process that establishes how individuals interact with their peers and social environments later in life.

Attachment Theory is similar to the public health concept of connectedness. Connectedness refers to the protective relationships that adolescents have with individuals and environments in their lives (Bernat and Resnick, 2009). Research shows that family connectedness can be protective against several health factors including emotional distress, suicide, sexual debut, violence, and substance use among adolescents in a nationally representative sample (Resnick et al., 1997). Similarly, adolescents with connections to non-parental adults were more likely to engage in positive health behaviors and less likely to engage

in problem behaviors such as violence (DuBois & Silverthorn, 2005). School connectedness has also been found to be a protective factor against emotional distress, violence and substance abuse among adolescents (Resnick et al., 1997). Lastly, research suggests that there is a positive association between adolescents who have a connection to their community, and higher levels of prosocial behaviors and lower levels of risky health behaviors (Bernat and Resnick, 2009). It is clear that connectedness and secure attachments are critical to health and social behaviors. However, many children who experience child maltreatment have multiple foster care placements and therefore are often unable to engage in these various levels of connectedness (Stott, 2012).

Public Health Relevance

A wealth of research has been conducted to evaluate long-term health outcomes of child maltreatment in the U.S. The Adverse Childhood Experiences Study (ACE) conducted in conjunction with the Centers for Disease Control and Prevention (CDC) and Kaiser Permanente reports the lasting health effects of adverse experiences during childhood. Adverse experiences included emotional abuse, neglect and household dysfunction (violence towards the mother, household substance abuse, household mental illnesses, parental separation or divorce, and incarceration of a household member) (Adverse Childhood Experiences Study, 2013). The study found that as the number of adverse childhood events reported increased, so did the risk of negative health outcomes (alcoholism, chronic obstructive pulmonary disease, depression, fetal death, illicit drug use, heart disease, liver disease, intimate partner violence, STIs and unintended pregnancies) (Adverse Childhood Experiences Study, 2013). The ACE study has given rise to a multitude of studies on this topic. A 30-year long follow-up study had similar results showing

that adults who were maltreated as children also had increased risk of developing diabetes, lung disease, malnutrition and vision problems (Widom, et al., 2012).

Adverse outcomes also surface during adolescence. A longitudinal study evaluated the relationship between child maltreatment and adolescent self-rated health outcomes stratified by each type of abuse (emotional neglect, physical neglect, physical assault, and sexual abuse). Among each category, the odds ratios indicated overall worse health, being overweight, depression, increased cigarette, alcohol and marijuana use, and involvement in violent fights among those who experienced childhood maltreatment, as compared to those that did not (Hussy, Chang & Kotch, 2006). Research has found that child abuse predicted aggression, depression, anger and anxiety among victimized children (Johnson et al., 2002). Additionally, reports show that children who were abused are 25% more likely than those not abused to experience teen pregnancy, and more likely to engage in risky sexual behaviors thus increasing their likelihood of acquiring sexually transmitted infections (STIs) (National Child Abuse Statistics, 2013). Lastly, research shows that children who experience child maltreatment are nine times more likely to become involved in criminal activity than those who did not experience maltreatment (National Child Abuse Statistics, 2013).

The number of girls in the juvenile justice system is increasing with girls accounting for approximately 30% of juvenile arrests (Zahn et al., 2010). In 2011, one-third of simple assault arrests and one in five juvenile violent crimes involved adolescent girls (Puzzanchera, 2013). Overall, juvenile arrests have decreased in recent years. However, female arrests have decreased less than male arrests (Puzzanchera, 2013). In addition to a rising amount of detained adolescent girls, this population also experiences victimization at a rate significantly higher than males involved in the juvenile justice system, and it is often more extreme and consistent forms of

victimization (Bender, 2010; Marsiglio et al., 2014). These female offenders are more likely than male offenders to report that their victimization was a significant component leading to their delinquent activity (Belknap and Holsinger, 2006).

Juvenile arrests in the U.S disproportionately involve minorities, specifically black youth. In 2011, 51% of violent crimes, 68% of robberies, 42% of motor vehicle thefts and 23% of drug abuse violations involved black youth (Puzzanchera, 2013). Compared to white adolescent girls, more African American girls reported being involved in a physical fight, bringing a weapon on to school property in the last 30 days, and reported using alcohol and marijuana before age 13 (Snyder and Sickmund, 2006). African American girls in the juvenile justice system are an important population that needs public health attention.

Purpose and Study Aims

Given the vast amount of adverse health outcomes associated with child maltreatment, and the association between maltreatment and adolescent delinquency, additional research on better understanding health among adolescents in the justice system who experienced child maltreatment is essential. This study focused on the relationship between abuse and the specific health outcomes of depressive symptoms and substance use among detained African American adolescent females. Specifically, this study focused on the role of attachment in this relationship between abuse and health outcomes among the aforementioned population. The findings from this study enhance our understanding of the importance of attachment as a mediating factor on these adverse health outcomes, which can inform future public health interventions.

Study Aims:

Aim 1: Is abuse (sexual, emotional and physical) associated with depressive symptoms and substance use?

Aim 2: Is abuse (sexual, emotional and physical) associated with attachment?

Aim 3: Is attachment associated with depressive symptoms and substance use?

Aim 4: If aims 1-3 are confirmed, does attachment mediate the relationship between abuse and health outcomes (depressive symptoms and substance abuse)?

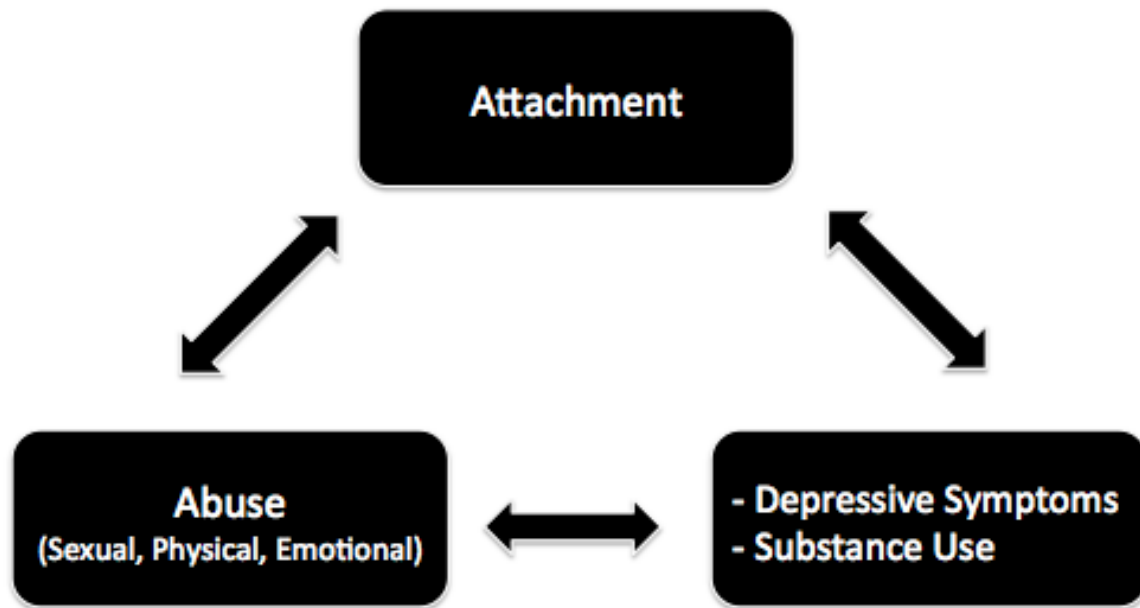


Figure 1: Proposed Mediation Model

Chapter II: Literature Review

Youth in The Juvenile Justice System

In 2012, the U.S handled over 1.3 million cases involving juvenile arrests (Puzzanchera, 2014). While this number is lower than it has been in recent years, this is an overall 7% increase since 1985. As a whole, females in the juvenile justice system represent a smaller portion of cases than males. In 2011, 345,100 cases involved females compared to 891, 100 involving males (Hockenberry & Puzzanchera, 2014). However, adolescent girls comprise approximately one third of juvenile arrests (Snyder & Sickmund, 2006). Despite a smaller amount of females in the system, the proportion of females has increased between 2002 and 2011 showing that females experienced a smaller decrease in cases than males (Hockenberry & Puzzanchera, 2014). For example, between 2003 and 2012, the number of theft arrests for females fell by 26% whereas male arrests declined by 33% (Puzzanchera, 2014). These statistics also show that 42% of theft arrests, 26% of arrests for aggravated assault, 37% of juvenile arrests for simple assault, and 9% of arrests for murder involved females (Puzzanchera, 2014). While the proportion of females under the age of 18 in the juvenile justice system is rising, so is the proportion of minority youth.

There is an overrepresentation of African American youth in the juvenile justice system. Using the Relative Rate Index it can be seen that in 2012, African American youth comprised about 17% of American youth however, they accounted for 31% of all arrests (Puzzanchera & Hockenberry, 2015). These adolescents were also more likely to be referred to juvenile courts, were less likely to have their cases diverted, and were more likely to be detained, than their white counterparts (Puzzanchera & Hockenberry, 2015). These racial differences are greater for young African American males however, a higher percentage of African American adolescent girls are

incarcerated compared to other races (Child Trends Databank, 2012). This growing population of African American adolescent girls in the juvenile justice system is at an increased risk of adverse health outcomes associated with involvement in the justice system.

Adverse Health Among Youth in the Juvenile Justice System

Mental health problems among this detained population are a serious concern. It has been estimated that rates of mental health problems among incarcerated youth are as high as 70% (Mallett, Soddard & Seck, 2009). More specifically, one study found that 74% of detained female adolescents meet criteria for a DSM diagnosis (Templin et al., 2002). This is considerably higher than rates among the general population ranging from 14%-22% (Vincent et al., 2008). These mental health problems can include depression, attention and hyperactivity disorders, behavioral control, anxiety, substance abuse, bipolar, and trauma (Welch-Brewer et al., 2011). Detained girls are 1.4 times as likely as boys to have a mental health disorder across almost all diagnostic categories except disruptive and substance use disorders (Welch-Brewer et al., 2011; Vincent et al., 2008). A study examining the prevalence of psychiatric disorders of detained youth found that 88% of male and 92% of females had a mental health disorder when controlling for conduct disorder and oppositional defiant disorder (Karnik et al., 2009). Significant gender differences were found showing that more girls had anxiety disorders and higher stimulant dependence than males in the sample (Karnik et al., 2009). These researchers also found that more than 80% of the sample met criteria for a substance use disorder however, gender differences for substance use disorders in this detained population are not consistent in the literature (Karnik et al., 2009).

Research done by Templin et al. (2002) found no significant differences in substance use disorder between males and females with roughly 50% of the sample having the diagnosis within each sex. Similar results were found in a sample of youth on probation showing that 26% of males and 22% of females had a substance use problem (Wasserman et al., 2004). Other studies reveal that substance use disorder is more prevalent among males in the juvenile justice system (Schubert et al., 2011; Welch-Brewer et al., 2011; Vincent et al., 2008). Furthermore, research suggests that major mental disorders are comorbid with a substance use disorder. One study found that 30% of detained adolescent girls in the sample who had a substance use disorder, also had a major mental disorder (psychosis, manic episode, major depression) (Abram et al., 2003). This comorbidity of major mental disorders and substance use disorders puts detained youth at an increased risk of acquiring STIs, including human immunodeficiency virus (HIV).

African American adolescent girls are at increased risk for STIs/ HIV in the general population and within the juvenile justice system (Centers for Disease Control and Prevention, 2011b; Teplin et al., 2005). African Americans are most affected by HIV in the U.S with rates eight times that of the white population; accounting for 44% of all new HIV infections (Centers for Disease Control and Prevention, 2015). Rates of chlamydia, gonorrhea and syphilis for African American girls aged 15-19 are more than six times the rate among white females of the same age (Centers for Disease Control and Prevention, 2011a). Detained adolescent females also have a disproportionately high number of STIs compared to the girls ages 12-18 in the general public. For example, chlamydia rates were 49 times higher among this detained population than their counterparts in the general population (Voisin, et al., 2013). A study measuring the relationship between ethnic identity and chlamydia and gonorrhea infections among detained African American adolescent females found rates of chlamydia and gonorrhea to be 25.6% and

5.6% respectively (Voisin, et al., 2013). Furthermore, when STI correlates were controlled for, those who indicated higher ethnic identity were 4.3 times more likely to have an STI than those scoring lower on this measure (Voisin, et al., 2013). Overall, research supports that females in the juvenile justice system experience more adverse health outcomes including mental health, substance use, and sexual health outcomes while also experiencing increased rates of child maltreatment.

Child Maltreatment, Health and Delinquency

Adolescents in the juvenile justice system are at increased odds of having experienced child maltreatment (Barrett, et al., 2014; Kazemian et al., 2011; Yun et al., 2010). Using the National Longitudinal Study of Adolescents data, research by Yun et al., found that childhood sexual abuse and neglect were predictors of violent juvenile delinquency (2010). Kazemian et al. found similar results showing neglect and other adverse characteristics to be predictive of offending behaviors among adolescents (2011). A recent study used a matched-control group study design to examine the role of adverse experiences, mental health problems, and disabilities in predicting involvement with the Juvenile Justice System and recidivism (Barrett et al., 2014). Results show that having been involved with foster care or experiencing maltreatment during childhood increased the odds of delinquency, with adjusted odds ratios of 1.35 and 2.54 respectively (Barrett et al., 2014). Additionally, the presence of a DSM-IV diagnosis involving aggression or impulse control had the highest odds ratio of 9.36, whereas having any other DSM-IV diagnose had an odds ratio of 3.24 (Barrett et al., 2014). Researchers also assessed recidivism and found that youth that had been in Child Protective Services (CPS) were 50% more likely than those not in CPS to commit a second crime (Barrett et al., 2014). Results from this study

illustrate the impact both mental health and adverse childhood experiences have on predicting future adolescent delinquency.

There is also an evident relationship between child maltreatment, depression and delinquency. One such study aimed to determine whether delinquency predicted depression or whether depression predicted delinquency among a sample of adolescent females in the child welfare system. The authors chose to focus on females since research shows that compared to men, the amount of young female arrests has increased by 35% over a 20 year span with a greater number of females having severe mental illnesses (Lalayants and Prince, 2014). Results from the study found that females in out-of-home care were 4 times more likely to be depressed than those living at home (Lalayants and Prince, 2014). Additionally, participants with physical abuse reports were four times more likely to be depressed than those with other reports of abuse (Lalayants and Prince, 2014). Researchers also found that females with delinquency in the past six months were about three times more likely than other participants to be depressed (Lalayants and Prince, 2014). A similar study assessing abuse, depression and alcohol use disorders found that physical and sexual abuse accelerated the onsets of major depressive disorders and alcohol use disorders among adolescents (Clark et al., 2003). Additionally, it was found that physical abuse significantly predicted the initial onset of major depressive disorders and alcohol use disorders (Clark et al., 2003).

To further understand the relationship between child maltreatment, depression and delinquency, Stuewig & McCloskey (2014) assessed shame and guilt as psychological routes to these endpoints. They found that youth who experienced parental rejection (classified as a form of maltreatment) were more shame-prone which was associated with higher depression. Childhood maltreatment was correlated with depression and delinquency, with depression being

positively correlated with harsh parenting during childhood, childhood depression and parental rejection (Stuewig and McCloskey, 2005). This emphasizes the importance of parental attachment in the relationship between maltreatment, depression and delinquency.

Self-esteem is also associated with both child maltreatment and delinquency. A study in Spain assessed the effects of polyvictimization on self-esteem and PTSD (Post Traumatic Stress disorder) among adolescents. Findings showed that 88.4% of the sample had been exposed to some sort of victimization and that decreased self-liking was significantly associated with those reporting polyvictimization. Furthermore, girls were twice as likely to report child maltreatment and sexual abuse than boys (Soler et al., 2012). Another study similarly assessed various forms of child abuse including emotional neglect, emotional abuse, physical abuse and sexual abuse in relation to negative self-associations. Results showed that all forms of child abuse were associated with negative self-associations, however emotional abuse and emotional neglect had the strongest correlation to negative self-associations (Van Harmelen et al., 2010). These studies emphasize that all forms of abuse can lead to decreased self-esteem, and that forms of emotional abuse may be more highly associated with negative views of ones self, including self-esteem.

One of the few studies assessing child victimization, delinquency and self-esteem in the same study, examined whether self-esteem influenced the relationship between victimization and delinquency. Results showed that experiencing violent victimization contributed to delinquency in general, but more specifically violent delinquency (Kort-Butler, 2010). Additionally, among those with lower levels of self-esteem, experiencing violent victimization significantly predicted delinquency (Kort-Butler, 2010). Conversely, among those with higher levels of self-esteem, having been victimized was unrelated to delinquency (Kort-Butler, 2010). Overall, it can be concluded that self-esteem and delinquency are interrelated, forms of emotional abuse and

polyvictimization are often more strongly related to decreased self-esteem, and violent victimization is directly associated with delinquency.

The role of family relations also impacts self-esteem and delinquency. Church et al. (2012) studied the relationship between adolescent delinquency, self-worth and family cohesion among a sample of at risk African American youth. Results showed that delinquency was negatively associated with parental warmth and self-worth, in that lower parental warmth indicated increased delinquency (Church et al., 2012). This study highlights not only associations between delinquency and self-worth, but also the importance of early family relationships as they relate to psychosocial factors. These early attachments are essential in child development and can have a lasting impact on the adolescents' behaviors.

Attachment

Secure attachment, as described by Attachment Theory, emphasizes the importance of the early caregiving environment on child development. The theory posits that consistent and sensitive contact with a parent is critical to the development of security in social and personal relationships of the child (Dallaire, 2007). Children in the child welfare system often do not have these connections which act as protective relationships that help prevent against social isolation and disconnections from the environment (Bernat & Resnick, 2009). Research has shown that the greater the degree of social disconnect, the higher the risk of later participation in delinquent behaviors (Ryan and Testa, 2005). This weakened sense of social commitment and attachment can make adolescents more susceptible to delinquent behaviors (Ryan and Testa, 2005). A meta-analysis assessing the association between attachment, parental bonds and violent behaviors in adolescents found a strong association between attachment and violence even when controlling

for experiences of child abuse (Savage, 2014). These results were consistent for both genders and across cultures. Early and secure attachments are essential in protecting against delinquent behaviors and are often lacking in adolescents who experienced child maltreatment.

Exposure to childhood maltreatment disrupts attachment and can vary based on type of abuse. A study examining types of child maltreatment and risk behaviors in relation to attachment types among older adolescents found that emotional and sexual but not verbal abuse, were related to insecure attachment styles (Oshri et al., 2015). This cross sectional study supports the link between child maltreatment and risk behaviors from an attachment perspective. Results from a study assessing attachment among those with a history of maltreatment also found that emotional/psychological abuse was the largest predictor of adverse outcomes among older adolescents (McLewin and Muller, 2006). Lowell et al. similarly found that participants' experience of childhood maltreatment significantly predicted weakened attachments to mothers, fathers and peers, with emotion neglect being the most significant predictor (2014). Emotional abuse has also been shown to impact future romantic relationships. History of childhood emotional abuse was associated with insecure attachments among older adolescents significantly contributing to functioning in these intimate relationships (Reyome, 2010). This body of research highlights that emotional maltreatment is most significantly associated with weakened attachments during adolescence and that these weakened attachments can be associated with violent and delinquent behaviors.

Current Study

Attachment to family, peers and/ or the environment have been found to mediate the relationship between abuse and youth violence (Herrenkohl et al., 2003; Williams & Herrera,

2007; Salzinger et al., 2007) and has also been shown to mediate psychopathological outcomes in adulthood (Dimitrova, et al., 2009). The current study will contribute to this body of research by exploring the role of attachment as a mediator in the relationship between abuse and behavioral health outcomes (depressive symptoms and substance use) among detained African American adolescent females. Results can be applied to future public health interventions to strengthen attachments for adolescents at risk of becoming involved in the juvenile justice system.

Chapter III: Methods

This cross-sectional study is part of a larger longitudinal study called Imara, aimed at reducing STIs among African American girls in a short-term juvenile detention facility (DiClemente et al., 2014). The current study used baseline data collected in 2011 to evaluate the association between exposure to abuse and psychological variables.

Participants

Study participants consisted of African American adolescent girls age 13-17 detained in a short-term juvenile detention facility in Atlanta, Georgia in March 2011. Inclusion criteria included self-identifying as African American, being between 13 and 17 years old, and reporting ever willingly having vaginal intercourse with a male partner. Individuals were excluded if they were married, pregnant, Wards of the State in Georgia or if they would be placed in a restricted location, such as a group home, after being released. Participants gave written informed assent and verbal consent was obtained from parents/ guardians prior to study initiation. After consent was obtained, adolescents meeting inclusion criteria completed the baseline assessment. The Emory University Institutional Review Board (IRB) approved all study protocols.

Participant Recruitment

Recruiters approached and screened 393 females, 202 (51%) of which met eligibility requirements resulting in 188 enrolled in the study (93% participation rate). Of the 191 ineligible adolescents, 45% reported no vaginal intercourse, 10% were going to be released to a secure location, and 9% were pregnant.

Study Procedures

The study utilized a two-arm randomized controlled trial. Adolescents that were randomized to the intervention condition participated in the Imara intervention and those in the

control condition received the usual standard of care procedure. Data was collected at baseline, and at 3-and 6-month follow-ups after their release from the facility. Data collection consisted of a urine pregnancy screen, chlamydia and gonorrhea vaginal swabs, audio computer-assisted self-interview (ACASI), and a condom skills assessment. The current study used only the baseline ACASI data to assess socio-demographics, abuse history and psychosocial variables.

Measures

Measures included in the baseline ACASI assessment included but not limited to demographics, condom attitudes, condom use history, STD history, abstinence beliefs, HIV/STD knowledge, partner relationships, depression, and drug and alcohol use. The current study only includes measures assessing abuse history and a subset of individual level, psychosocial variables.

Abuse History

Abuse history was assessed by asking participants a series of 3 questions aimed at determining emotional, physical and sexual abuse in addition to age at which the abuse occurred. Emotional abuse was assessed by asking, "Have you ever been emotionally abused?" with responses being "Yes" or "No". Physical abuse was assessed by asking, "Have you ever been physically abused?" with responses being "Yes" or "No". Lastly, sexual abuse was assessed by asking, "Has anyone ever forced you to have vaginal sex when you didn't want to?" with responses being "Yes" or "No". A new dichotomous variable measuring experience of any form of abuse (physical, emotional or sexual) was computed by summing if participants answered "Yes" or "No" to any of the abuse questions. All "Yes" responses were coded as 1 and those responding "No" to all 3 were coded as 0.

Attachment

Attachment was assessed using 4 questions assessing different dimensions of attachment including secure, dismissing, preoccupied and fearful adult attachment styles that were summed to create an overall attachment score (Bartholomew et al., 1991). Response answer options ranged from (1) not at all like me to (4) very much like me. Sample items include, “It is hard for me to feel close to people” and “I don’t seem to care if I am close to people”. Three questions were reverse coded prior to computing the total score by summing responses to all 4 items. Scores could range from 4 to 16, with higher scores indicating more security.

Substance Use

Substance use was assessed using a 10-item scale with answer options ranging from (0) zero times to (6) eleven or more times. Sample items include, “How many times have you spent all or most of the day using alcohol or other drugs, or getting over the effects?” and “How many time have you neglected your responsibilities because of alcohol or other drug use?”. The total substance use score was computed by summing the responses to all 10 items. Scores could range from 0 to 70, with higher scores indicating more substance use. Cronbach’s alpha reliability for this scale was .863 suggesting good internal consistency of scale items.

Depressive Symptoms

Depressive symptoms were assessed using the 8-item Center for Epidemiologic Studies Depression Scale (CES-D scale) with answer options ranging from (1) less than 1 day to (4) 5-7 days (Radloff, 1977). Sample items included “I thought my life had been a failure” and “My sleep was restless”. The total depressive symptom score was computed by summing responses to all 8 items. Scores could range from 8 to 32, with higher scores indicating more days of

depressive symptoms. Cronbach's alpha reliability for this scale was .905 suggesting very high internal consistency of scale items.

Data Analysis

All data from the Imara intervention were deidentified and cleaned prior to receipt and analysis. SPSS Statistics 22 for Windows was used for all analyses related to this study.

Prior to analyzing the data, depressive symptoms and substance use scales were computed and reliability was measured for each. A total attachment score was computed, and a new variable measuring whether abuse was experienced was computed. Descriptive statistics were conducted for demographic variables, predictor variables, hypothesized mediator, and outcome variables.

To answer each study aim and to test for mediation, a series of three analyses were conducted:

Aim 1: Is abuse associated with depressive symptoms and substance use?

Simple linear regressions were run between the predictor variable (experience of abuse) and the hypothesized health outcomes (depressive symptoms and substance use). Significant associations of at least $p \leq 0.05$ between abuse and each health outcome were required in order to progress to the next step in the model.

Aim 2: Is abuse (sexual, emotional and physical) associated with attachment?

A simple linear regression was run between the predictor variable (abuse) and the proposed mediator variable (attachment). A significant association of at least $p \leq 0.05$ between abuse and attachment was required in order to progress to the next step in the model.

Aim 3: Is attachment associated with depressive symptoms and substance abuse?

A multivariate regression was conducted between the hypothesized mediator and hypothesized health outcomes while controlling for the predictor variable. A significant association of at least $p \leq 0.05$ between attachment and depressive symptoms was required in order to progress to the next step in the model.

Aim 4: If aims 1-3 are confirmed, does attachment mediate the relationship between abuse and health outcomes?

After including the proposed mediator in the multivariate regression model from Aim 3, the association between the proposed predictor and proposed health outcomes were reassessed and compared to the results from Aim 1 to determine full or partial mediation, if any.

Chapter IV: Results

Demographics

A total of 188 African American girls were included in this sample. Ages ranged from 13-17 years old with the average age being 15.32 years old ($sd=1.06$). The majority of the sample had most recently completed 9th or 10th grade ($n=119$, 63.3%) while 29.8% ($n=56$) most recently completed 8th grade or less, and 6.9% ($n=13$) most recently completed 11th or 12th grade. When asked who they live with, the largest portion of participants indicated living with their mother (55.3%, $n=104$). The remainder of the participants reported either living with another relative (14.4%, $n=27$), living with both their mother and father (12.8%, $n=24$), living with their mother and mother's boyfriend (9.6%, $n=18$), living with just their father (9%, $n=11$), or reported living in a group home or foster home (1.1%, $n=2$).

Table 1: Age

	Range	Mean (sd)
Age (years)	13-17	15.32 (1.06)

Table 2: Grade Last Completed in School

	Frequency	Percent (%)
8 th grade or less	56	29.8
9 th or 10 th grade	119	63.3
11 th or 12 th grade	13	6.9

Table 3: Living Situation

	Frequency	Percent (%)
Mother and Father	24	12.8
Mother	104	55.3
Father	11	5.9
Another relative	27	14.4
Group home/ foster care	2	1.1
Mother and mother's boyfriend	18	9.6
Other	2	1.1

Predictor Variable

Of the 188 girls in the sample, 63.8% (n=120) reported experiencing abuse. Of those who experienced abuse, 56.4% (n=106) indicated having ever been emotionally abused, 42.6% (n=80) indicated having ever been physically abused and 23.9% (n=45) indicated having ever been forced to have vaginal sex when they didn't want to. Among participants that experienced abused, 20.2% (n=38) experienced one form of abuse, 28.2% (n=52) experienced two forms of abuse and 15.4% (n=29) experienced all three forms of abuse being measured.

Table 4: Experience of Abuse (yes/ no)

	Frequency	Percent (%)
Yes	120	63.8
No	68	36.2

Table 5: Polyvictimization

	Frequency	Percent (%)
No Abuse	68	36.2
One form of abuse	38	20.2
Two forms of abuse	53	28.2
Three forms of abuse	29	15.4

Table 6: Type of Abuse Experienced

Indicated yes to...	Frequency	Percent (%)
Emotional abuse	106	56.4
Physical abuse	80	42.6
Been forced to have vaginal sex unwillingly	45	23.9

Hypothesized Mediator

Scores on the attachment scale ranged from 4 to 16 with a mean score of 11.19 (sd=2.48).

Outcome Variables

All 188 study participants responded to the substance use and depressive symptoms questions. Scores on the depressive symptoms scale ranged from 8 to 32 with a mean score of 17.86 (sd=7.68). Scores on the substance use scale ranged from 0 to 46 with a mean score of 5.35 (sd=8.32).

Table 7: Mediator and Outcome Variables

	Range	Mean (sd)	Cronbach's Alpha
Attachment	4-16	11.19 (2.48)	N/A
Depressive Symptoms	8-32	17.87 (7.68)	.905
Substance Use	0-70	5.35 (8.32)	.863

Mediation Analyses

In order to test for potential mediation, bivariate analyses were run between each potential pathway in the mediation model to determine if a significant association exists.

Predictor Variable and Health Outcomes

Results of the simple linear regression analysis indicate that history of abuse is a statistically significant predictor of depressive symptoms (B=4.80, 95% CI=2.60; 6.99, p<.001) suggesting that on average, those who were abused have a mean depressive symptoms score that is 4.80 points higher than those who did not experience abuse. The R² for this model is .091,

indicating that about 9.1% of the variance in depressive symptoms can be explained by having a history of abuse.

Results of the simple linear regression analysis indicate that history of abuse is a statistically significant predictor of substance use ($B=4.04$, 95% CI=1.61; 6.47, $p=.001$) suggesting that on average, those who were abused have a mean substance use score that is 4.04 points higher than those who did not experience abuse. The R^2 for this model is .055, indicating that about 5.5% of the variance in substance use can be explained by having a history of abuse.

Predictor Variable and Proposed Mediator

Results of the simple linear regression analysis indicate that history of abuse was a statistically significant predictor of attachment ($B=-1.04$, 95% CI=-1.77;-0.31, $p=.006$) suggesting that on average, those who were abused have a mean attachment score that is 1.04 points less than those who were not abused. The R^2 for this model is .041 indicating that about 4.1% of the variance in attachment can be explained by having a history of abuse.

Proposed Mediator and Health Outcomes

Results of the multiple logistic regression analysis indicate that attachment was a statistically significant predictor of depressive symptoms ($B=-.848$, 95% CI= -1.27; -.428, $p<.001$) suggesting that on average, with each unit increase in attachment, there is a .848 point decrease in depressive symptoms. The R^2 for this model was .072 indicating that about 7.2% of the variance in depressive symptoms can be explained by attachment. Attachment was not a statistically significant predictor of substance use ($p=.685$) in this sample of adolescent females. As such, substance use was dropped from the mediation model.

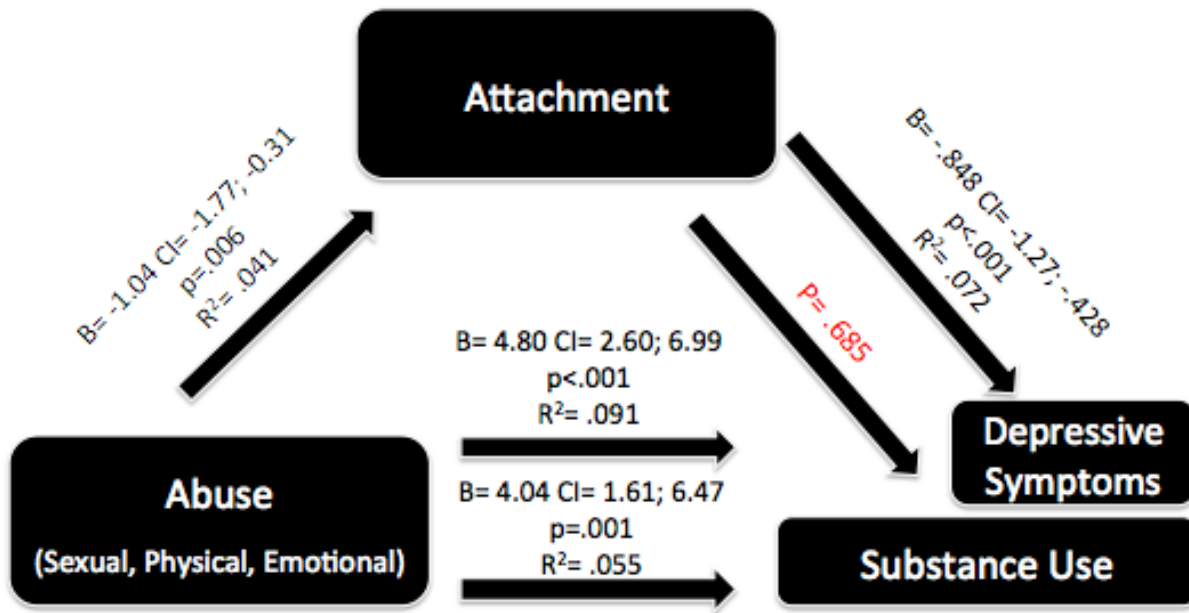


Figure 2: Regression Model Results

Mediation

Since all pathways in the mediation model were statistically significant for the outcome of depressive symptoms, comparisons were made between the p-values and slopes from step 1 and step 3 to determine if mediation was evident. When controlling for attachment, abuse was still a significant predictor of depressive symptoms ($B = 3.92$ $p < .001$). While abuse was still significant, the slope (B) decreased when attachment was introduced into the model. This suggests that the association between experiencing abuse and depressive symptoms is partially mediated by attachment.

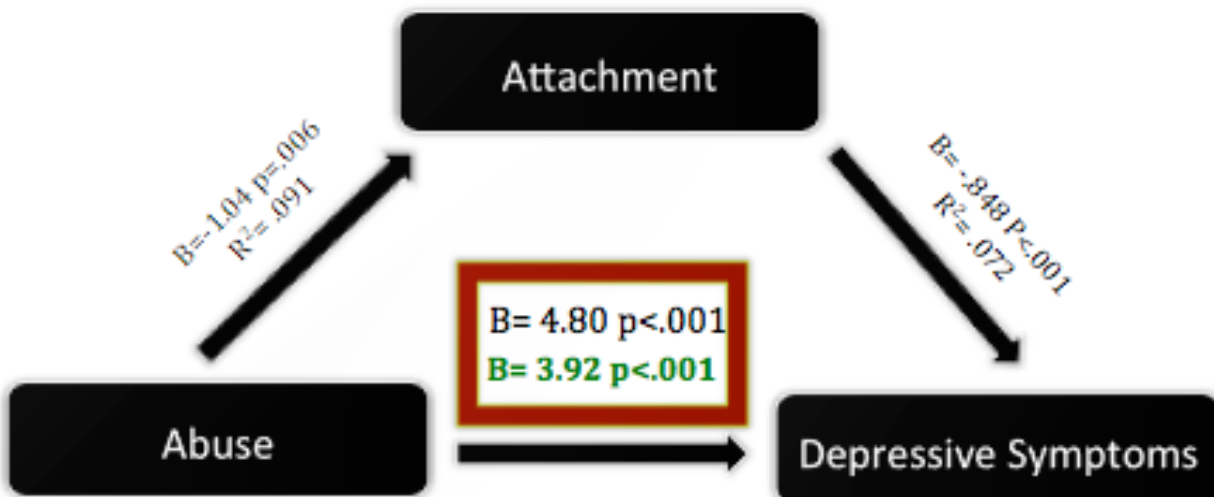


Figure 3: Mediation Results

(*Green indicates results when controlling for attachment)

Chapter V: Discussion

This study is one of the first known studies to examine the relationship between experiencing abuse, mental health outcomes, and attachment within the specific population of detained African American females. Results suggest that having less secure attachment mediates the established relationship between experiencing abuse and depressive symptoms. These findings can help inform future interventions aimed at both preventing the development of mental health problems and possibly decreasing recidivism rates among this population.

Findings from this study are consistent with the literature suggesting that between 40-90% of girls in the juvenile justice system have experienced childhood maltreatment (Goodkind et al., 2013; Postlethwait et al., 2010; Stewart et al., 2008). Among the sample of detained females in this study, 64% reported experiencing abuse, although the type of abuse experienced differs from national statistics. Nationally, neglect is the most common form of maltreatment followed by physical abuse, sexual abuse, and emotional abuse (Child Welfare Outcomes, 2013). In the current study, emotional abuse was the most prevalent type of abuse experienced (56%), followed by physical abuse (42.6%) and lastly, sexual abuse (23.9). The most common form of maltreatment nationally is neglect (including medical and emotional neglect) (Child Welfare Outcomes, 2013) however, the current study did not measure this form of maltreatment. As such, it is possible that respondents reported experiencing emotional abuse instead of neglect since this was not assessed. Polyvictimization is common among youth involved in the juvenile justice system. This is particularly so for youth of color and females (Ford et al., 2013). The current study supports this claim; 55% of the girls in the current study reported experiencing more than one form of abuse.

In order to address the study aims, a series of analyses were conducted to assess each pathway in the proposed mediation model to determine if attachment mediated the relationship between experiencing abuse and mental health outcomes (depressive symptoms and substance use). The following are the research findings for each of the study aims:

Aim 1: Is abuse (sexual, emotional and physical) associated with depressive symptoms and substance use?

Findings from the current study indicate that experiencing abuse significantly predicted depressive symptoms in the sample of detained females. This finding is consistent with prior findings that maltreated youth, specifically females, in the juvenile justice system are at increased risk of adverse mental health including depression (Karnik et al., 2009; Woodson et al., 2010; Welch-Brewer et al., 2011). Similarly, it was found that experiencing abuse was a statistically significant predictor of substance use in this sample. This adds to the large body of research on this topic supporting the correlation between abuse and substance use. These combined findings support findings from Clark et al., (2003) in which physical abuse significantly predicted the onset of depression and alcohol use disorders among a sample of adolescents. The current study extends these findings within to a sample of detained African American females.

Aim 2: Is abuse (sexual, emotional and physical) associated with attachment?

When testing the relationship between history of abuse and attachment, it was found that experiencing abuse significantly predicted a lower attachment score in the study sample. This finding correlates to research assessing child maltreatment and attachment. Research has shown

that exposure to childhood maltreatment disrupts attachment and varies based on type of abuse. Based on the literature review, emotional abuse negatively impacts secure attachments with mothers, fathers and peers, and is the largest predictor of adverse health outcomes among adolescents (Oshri et al., 2015; McLewin and Muller, 2006; Lowell et al., 2014). Emotional abuse was the most frequent form of abuse reported by the females in this study, which might be a factor in the relationship between abuse and attachment in this sample.

Aim 3: Is attachment associated with depressive symptoms and substance use?

Findings from this study show that attachment is a statistically significant predictor of depressive symptoms in this sample; each unit increase in attachment resulted in a decrease in depressive symptoms. This relates to the attachment theory, highlighting the importance of secure attachments in potentially protecting against the development of adverse mental health (depression) among this population (Karnik et al., 2009; Woodson et al., 2010; Welch-Brewer et al., 2011). Attachment however, did not significantly predict substance use in the sample. This finding was surprising given the literature on connectedness as protective factors against substance use (DuBois & Silverthorn, 2005; Resnick et al., 1997). The attachment variable in this study however, is a composite score of questions measuring secure, dismissing, preoccupied and fearful adolescent attachment styles that were summed to create an overall attachment score (Bartholomew et al., 1991). These questions do not explicitly measure connectedness at the family, peer or school levels which could be important factors to assess when measuring attachment. This could explain the lack of significant association between these variables. Furthermore, this sample reported low substance use; possible scores ranged from 0-46 with a mean score of 5.35. Females in this study were minors between the ages of 13 and 17, and

were thus below the legal drinking age in this country. This could partially contribute to the low substance use score. These factors likely account for the lack of significant association between attachment and substance use in this sample.

Aim 4: If aims 1-3 are confirmed, does attachment mediate the relationship between abuse and health outcomes (depressive symptoms and substance abuse)?

Among this population, attachment partially mediated the association between experiencing abuse and depressive symptoms. After introducing attachment into the logistic regression model, the relationship between abuse and depressive symptoms was weakened, meaning that attachment partially explains the association between the two variables. Attachment has been found to mediate the relationship between psychopathological outcomes in adults (Dimitrova, et al., 2009), and has repeatedly been shown to mediate the association between abuse and youth violence (Herrenkohl et al., 2003; Williams & Herrera, 2007; Salzinger et al., 2007). The findings from this mediation study further advance this body of research by specifically focusing on these outcomes among a detained sample of African American adolescent females.

Limitations

As with any scientific study, this one is not without limitations. This study relied on secondary data and as such, variables were limited to those already collected. The abuse questions do not differentiate between child maltreatment, intimate partner violence, bullying or any other forms of abuse. Ideally, the questions measuring abuse would have specified the type of abuse experienced in addition to the perpetrator. Knowing the perpetrator and specific type of

abuse experienced would have helped further explain the results. For example, risk and protective factors for intimate partner violence would be different than those for child maltreatment. This additional information about the perpetrator could also help to better understand the attachment variable and the degree of attachment among subgroups of those who experienced abuse by different perpetrators. This would have allowed for more specific and detailed analyses. Furthermore, the abuse measures used do not ask about child neglect, which is the most common form of maltreatment in the U.S (Child Welfare Outcomes, 2013). As such, it is possible that females in the sample did not report experiencing abuse when in fact they could have been neglected. Thus, the amount of abuse reported in this sample is likely an underestimate.

Health outcomes associated with abuse can vary depending on the type of abuse experienced. This study used a combined measure of all forms of abuse to complete the analyses and did not stratify by type of abuse. Additionally, length of time the individual experienced abuse was not collected. This is important since participants could have for example, experienced a lifetime of emotional abuse compared to a one-time sexual assault, which would likely impact health outcomes differently. Having more information on length of abuse and severity of abuse experienced could help expand the current findings.

This study did not control for covariates such as age when abuse occurred, or social support. Now that a mediation effect has been established, these other variables can be added into the model. This study relied on self-reported measures of demographic information, abuse history and health outcomes, which could have impacted the validity of the data. Furthermore, results are not generalizable beyond the scope of this very specific sample of detained African American females. The females involved with this study were a sensitive population of detained

minors. This raised ethical and confidentiality issues that limited the questions and scope of survey measures. Despite these limitations, the findings from this mediation study provide a baseline understanding of the mediating effect of attachment between the study variables in which future research can build upon.

Implications and Future Directions

The significant findings from this introductory mediation model can be applied to future public health research projects and interventions. While the measure of attachment in this study was appropriate to answer this study's aims, future studies can specifically measure school, family, peer and environment attachment to gain additional insights into how these other forms of attachment mediate the association between abuse and depression. Accounting for more forms of attachment in future studies will likely increase the mediation effect.

Based on the findings from this study and the literature, interventions should be focused on supporting attachment as a protective factor for adverse health and societal outcomes. Interventions can work on strengthening at risk youths' home environments, support systems, access to positive role models and school relationships (Woodson, et al., 2010). Since secure attachments are often established early in life, interventions can also target families that are at risk for maltreating their children. One such program is Nurse- Family Partnership, which is an evidence based nurse home visitation program for first time, low-income, unmarried mothers. Nurses visit the women about once per month during their pregnancy and into the first two years of the child's life. During these visits, the nurses teach positive health behaviors, appropriate childcare, and life skills (Top Tier, 2014). When compared to a control group, this program decreased child maltreatment and related injuries by 20-50% (Top Tier, 2014). Furthermore, this

intervention decreased juvenile and adult arrests for both the mother and child by more than 50% (Top Tier, 2014). This intervention highlights the importance of early parent-child attachment as a preventative measure for both child maltreatment and criminal activity.

It is also important to consider that youth who are exposed to violence are often involved with the child welfare system so particular interventions can be tailored to adolescents living in out-of-home care. Instability in foster care placements have been shown to have problematic health outcomes including negatively affecting self-efficacy, self-esteem and lack of inclusion in positive social networks (Stott, 2012). These teens often express that they cannot connect with peers or caregivers due to the constant state of flux they live in (Stott, 2012). Establishing a relationship between caregiver and youth in care is an essential first step towards engaging in a dialogue about health including mental health, sexual health and development.

Another at-risk population is youth that have already been involved with the juvenile justice system. Recidivism often occurs within six months following release from detention and mental health facilities (Quinn & Van Dyke, 2004). Research shows that recidivism rates are much higher for those who have been involved with the child welfare system. Specifically, researchers found that 70% of these youth were referred for a new offense within two years compared to those not involved with the child welfare system (34%) (Sickmund & Puzzanchera, 2014). One of the most important factors to prevent recidivism is family and social support networks after being released (Woodson et al., 2011). Greater emphasis should be placed on fostering supportive relationships with the family, peers and counseling services. Furthermore, these providers should be trained in trauma-informed care, as incarceration is a traumatic event that can be confounded by prior traumatic experiences including abuse (Burrell, 2013). Adolescents who experience abuse are often exposed to various service providers including the

police department, child protective services, mental health professionals and the juvenile justice system. Research shows that incorporating a trauma-informed perspective into the practices of each organization can enhance the quality of care for the youth being served while also improving job satisfaction for staff (Ko et al.,2008; Burrell, 2013). This trauma-informed approach could help increase adolescents' relationships to their families, peers, providers, communities and environments, and thus help to improve secure attachments.

Conclusions

This study suggests that attachment style is an important mediating factor in the relationship between experiencing abuse and depressive symptoms in this sample of detained African American females. Both child maltreatment and involvement in the juvenile justice system are multilevel problems impacting health. Improving health outcomes for these adolescents will involve an interdisciplinary approach to both research and program implementation. This research study suggests that attachment is a possible target for intervention to decrease depression and potentially other health outcomes among this specific population and particularly those with histories of abuse.

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