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Mental health of adolescents with currently and formerly incarcerated parents

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Abstract

Reliable information about children of incarcerated people is difficult to obtain, and major gaps exist in our understanding of their well-being. This study aims to determine whether adolescents with incarcerated parents report higher levels of mental health problems than those without an incarcerated parent, and whether the relationship between parental incarceration and adolescent mental health is moderated by parent-child relationships. Using a statewide survey from one US state, we compared adolescents with a currently incarcerated parent to those with a formerly incarcerated parent and those with no history of parental incarceration on self-reported indicators of mental health, and examined whether strong parent-child relationships were protective against mental health concerns. Results indicate that adolescents with incarcerated parents are at elevated risk for mental health problems, and strong parent-child relationships partially buffer children from risk. Findings underscore the need for more investment in effective early interventions for adolescents in highly adverse contexts.

Keywords

Adolescent well-being; Parental incarceration; Mental health; Parent-child closeness

Between 1980 and 2000, the rate of imprisonment in the United States more than tripled (West & Sabol, 2008). On any given day, there are about 1.9 million children in the United States who have a parent in a state or federal prison (Glaze & Maruschak, 2008) and millions more have a parent incarcerated in a county jail. As the number of individuals under correctional custody who are parents of minor children increases, so does the need to understand the wide-ranging impacts on the families of incarcerated people.

Incarceration of a parent is a stressful event for families and children (Bocknek, Sanderson, & Britner, 2008; Kampfner, 1995; Nesmith & Ruhland, 2008). Children of incarcerated parents often experience multiple emotional and social difficulties, including exposure to the parent's criminal activity, witnessing the parent's arrest and court proceedings, separation from parents, loss of family income, housing instability, changes in caregiving, stressful visits with the incarcerated parent, and shame or stigma associated with a parent's involvement in the criminal justice system (Murray, Farrington, & Sekol, 2012). One

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potential impact of parental incarceration and the stressors associated with it is compromised emotional well-being of children.

Children and adolescents with incarcerated parents are thought to be at elevated risk for mental health problems, though research has produced mixed results. A recent meta-analysis by Murray et al. (2012) concluded that children of incarcerated parents are no more likely than comparison groups to exhibit poor mental health outcomes. There are several potential explanations for these findings. First, parental incarceration was measured at different times in each of the individual studies, with some studies including parents' arrests occurring before children were born. Children's mental health was also assessed at a variety of different developmental stages, rather than during adolescence, when mental health problems are most likely to occur. Finally, most studies included in the meta-analysis examined internalizing symptoms, with limited attention paid to other types of mental health problems (e.g. self-injurious behavior, suicide ideation). Many high-quality studies have produced results that contradict the findings from the meta-analysis. For example, a study in England found that children of incarcerated parents were more than twice as likely as children in the general population to experience significant mental health problems (Murray & Farrington, 2008b). A similar study from the United States (R. Johnson, 2009) compared children who had experienced parental incarceration with a non-incarcerated control group and found that after controlling for confounders such as parent education, parent age, and neighborhood quality, children of incarcerated parents were 4.7 times more likely than children of matched controls to exhibit internalizing problems when they were 11–16 years old. Because there is considerable variability in developmental trajectories for these children, research on risk and protective factors can shed light on the processes of resilience that have the potential to contribute to positive functioning in children of incarcerated parents.

Mental health problems in childhood have important implications for development across the lifespan. Previous research suggests that adults who experience the onset of depression in childhood or adolescence have more impaired social and occupational functioning and poorer quality of life than those whose depression first begins in adulthood (Zisook et al., 2007). Furthermore, childhood mental health concerns might contribute to worse outcomes across a variety of domains (Cox, Mills-Koonce, Propper, & Gariepy, 2010) such as low educational attainment, poor occupational functioning, and early childbearing (Rao, 2006). Deleterious effects of parental incarceration on the mental health of offspring are likely to persist throughout the life course (Colman, Wadsworth, Croudace, & Jones, 2007; Fergusson & Woodward, 2002). For example, Murray and Farrington (2008a) found that men who had experienced parental incarceration during their childhood were significantly more likely to have high levels of anxiety and depression at age 48 than those in a comparison group.

Adolescence is characterized by significant changes in social, emotional, and cognitive capacities, and it is a particularly sensitive period for mental health concerns, with emotional problems often onsetting during these years. The prevalence of emotional and behavioral disorders in children has been estimated at 13% in childhood (Merikangas, He, Brody, et al., 2010) and over 30% by adolescence, including 22.2% with a disorder of severe impairment (Merikangas, He, Burstein, et al., 2010). Mental health problems in adolescence are a

particularly salient issue for children of incarcerated parents because mental health problems might contribute to adolescents' problem behavior and intergenerational patterns of low achievement, criminality, and poverty (Farrington, Jolliffe, Loeber, Stouthamer-Loeber, & Kalb, 2001). Although strong parent-child relationships have been investigated as a protective factor for younger children of incarcerated parents (Mackintosh, Myers, & Kennon, 2006; Poehlmann, 2005), there are no studies in the published literature examining how the quality of parent-child relationships in adolescence might buffer children of incarcerated parents from negative mental health outcomes. This study addresses this gap in the literature by examining the associations between parent-child relationships and mental health indicators in adolescents with currently and formerly incarcerated parents.

1. Theoretical framework

This study is grounded in a risk and resilience framework. Resilience refers to the maintenance or development of positive functioning in the face of exposure to significant stress or adversity (Masten, Best, & Garmezy, 1991). Masten (2001) argued resilience is common and is the result of normative adaptational systems of humans. Developmental scientists are particularly interested in elucidating processes that contribute to resilience in childhood and adolescence because early deviations from normative developmental trajectories can have cascading effects on later developmental processes (Masten & Cicchetti, 2010).

The study of resilience often focuses on identification of risk and protective factors. Risk and protective factors can be qualities of a child, or qualities of the child's environmental context (Masten & Obradovi, 2006). Important risk factors for children that are relevant to this study include parental incarceration, family instability, and poverty.

Many families with an incarcerated parent are known to have significant problems beyond criminal involvement that may include a history of child abuse or neglect, parental substance abuse or mental health problems, lack of education and opportunity, poverty, or the experience of racism (Phillips, Erkanli, Costello, & Angold, 2008). Incarceration can serve to exacerbate these problems and can also result in additional strains for families and children such as loss of family income, disrupted attachment with caregivers, poor parenting skills, social stigma, and inadequate supervision of children. The stress associated with having an incarcerated family member can cause declines in personal well-being and impaired parenting skills in caregivers. These corollaries of parental incarceration represent significant threats to the optimal development of the children of incarcerated parents (Phillips, 2010).

Despite the prevalence of multiple risk factors, families with incarcerated parents can also display considerable resilience. Strong family relationships have been identified as a critical mechanism for facilitating resilience in the face of environmental risks (Miller, 2007). One of the primary mechanisms of resilience for children is positive relationships with parents and other caregivers, which foster protective psychological processes; children who experience chronic adversity fare better when they have a good and stable relationship with a

competent adult (Masten et al., 1991). In the current study, parental closeness is hypothesized as a protective factor for children's mental health.

The incarceration of a parent is often a stressful event for families. In addition to concern about the well-being of the incarcerated person, parents remaining at home may face a multitude of challenges such as reduced income, residential instability, increased demands related to advocating for the imprisoned parent, and shame or stigma associated with incarceration, all of which can increase stress for parents and negatively impact parent-child relationships. Although there is reason to believe they are important, there is currently no evidence regarding whether strong parent-child relationships protect against mental health problems among adolescents with currently or formerly incarcerated parents. This study aims to investigate the relationships between risk (e.g. race, poverty, and family structure) and protective factors (parent-child closeness) and mental health in children with both currently and formerly incarcerated parents.

1.1. Poverty

Poverty is a particularly salient issue for families of incarcerated people. Research demonstrates that people who are poor are more likely to become involved in the criminal justice system (Wakefield & Uggen, 2010; Wheelock & Uggen, 2006). Incarceration can worsen or prolong existing financial problems, and these effects persist beyond the incarceration term. Slightly more than half of incarcerated mothers and fathers report they were providing primary financial support for their children prior to becoming incarcerated (Glaze & Maruschak, 2008). When parents are incarcerated, family incomes decline, regardless of whether the parent who is incarcerated was a custodial parent or not at the time of arrest. Kjellstrand and Eddy (2011) found that parents in families with a history of parental incarceration worked fewer hours, had less household income, received more financial assistance, and had lower overall SES than families with no history of parental incarceration. Because low family income has been shown to be associated with poor mental health in adolescence (Emerson, Graham, & Hatton, 2006) it is important to consider the effects of exposure to poverty as a potential avenue through which parental incarceration exerts effects on children's mental health.

1.2. Racial and ethnic disparities

The racial and ethnic disparities that exist in the criminal justice system are well-documented (Carson, 2014). The considerably higher incidence of incarceration in communities of color means that there are also racial disparities among the children of incarcerated parents. In 2007, Black children were almost eight times more likely and Hispanic children were almost three times more likely than White children to have a parent in prison (Maruschak, Glaze, & Mumola, 2010). Race has important implications for mental health problems in adolescence. The experience of racial discrimination has been shown to be stressful for both adults (Williams, Yu, Jackson, & Anderson, 1997) and adolescents (Fisher, Wallace, & Fenton, 2000; Scott, 2003). Further, serious emotional disorders are more common in Black and Native American adolescents than in Whites (Cauce et al., 2002).

Not only are rates of mental health problems higher in racial minority adolescents, but diagnosis and help seeking behaviors might vary as well. The unmet need for mental health services appears to be greatest among racial and ethnic minority groups (Garland et al., 2005). Cuffe, Waller, Cuccaro, Pumariega, and Garrison (1995) reported that girls and African American children with psychiatric disorders were undertreated, and undertreatment of Hispanic or Latino youth has also been documented (Kataoka, Zhang, & Wells, 2002).

Cultural groups might differ on issues such as what constitutes a mental health problem (H Fabrega, Ulrich, & Mezzich, 1993; Horacio Fabrega, 1993). Some cultures might be more accepting of certain psychiatric symptoms (Alegría, Carson, Goncalves, & Keefe, 2011; Kessler et al., 2001) and differences have been found in parents' "distress thresholds" (Weisz et al., 1988) with respect to their children's mental health problems. Access to appropriate and culturally sensitive care is also likely to contribute to lower rates of treatment in non-White youth, particularly for those residing in underserved communities. There are significant racial and ethnic disparities in mental health care as well. The Institute of Medicine has documented that racial and ethnic minority youth have access to less and lower quality of care than their White counterparts (Nelson, 2002).

1.3. Family structure

Children of incarcerated parents are likely to undergo changes in family structure and caregiving (Glaze & Maruschak, 2008; Mumola, 2000; Myers, Smarsh, Amlund-Hagen, & Kennon, 1999). Research has shown that children of incarcerated parents are more likely to live in single parent households than children who have not experienced parental incarceration (Kjellstrand & Eddy, 2011). When fathers are imprisoned, children's mothers usually care for them, but when mothers are incarcerated, only about a quarter of fathers retain custody (E. I. Johnson & Waldfogel, 2002; Mumola, 2000). Children of incarcerated parents are likely to be placed with grandparents or other relatives (Glaze & Maruschak, 2008; E. I. Johnson & Waldfogel, 2002), who often have limited resources and multiple existing needs such as chronic health problems (Burton, 1992; Butler & Zakari, 2005).

1.4. Parent-child relationships

Parental incarceration can have profound effects on relationships between parents and children. For parents who are incarcerated, maintaining connections with children while in custody is a particular challenge (Shlafer, Loper, & Schillmoeller, 2015). Many inmates serve their sentences hundreds of miles away from their families, and prisons are often located in rural areas that are difficult to get to (Nesmith & Ruhland, 2008). Further, visiting areas are not friendly to children and families (Nesmith & Ruhland, 2008; Poehlmann, Dallaire, Loper, & Shear, 2010; Shlafer et al., 2015).

There is little existing research on the associations between positive parent-child relationships and psychosocial outcomes in children of incarcerated parents. Scholars have examined the association between attachment relationships and child well-being in children of incarcerated parents, but this work has largely been conducted in very young or school-age children (Murray & Murray, 2010; Poehlmann, 2005, 2010). However, children's perceptions of strong parent-child relationships have been examined as a protective factor

for adolescent mental health in both normative and high-risk contexts. Work by Kandel and Davies (Kandel & Davies, 1982) demonstrated that self-reported feelings of parental closeness in high school students were associated with lower levels of depressed mood. Similarly, Amato (Amato, 1994) found self-reported closeness to both mothers and fathers was associated with less psychological distress in a sample of older adolescents. Zweig showed that self-reported closeness with parents was negatively associated with depression and suicide attempt in high risk adolescents (Zweig, Phillips, & Lindberg, 2002).

The early adolescent years are a period when adjustment problems may emerge or intensify in youth living in divorced, separated, or remarried families (Hetherington, 1993). The protective nature of strong parent-child relationships may differ based on whether the adolescent is being cared for by biological, adoptive, or stepparents (Amato, 1994). For example, Kapinus and colleagues (Kapinus & Gorman, 2004) found that the impact of parental closeness on adolescent risk taking was most salient for youth who were living with two biological parents. However, strong relationships with involved stepparents can also be protective; research has shown that children in stepparent families who report high levels of closeness to their stepparents also report lower levels of stress (Jensen, Shafer, & Holmes, 2015). Thus, the association between parental closeness and mental health symptoms is likely to be a function of both the youth's affective relationships with caregivers and legal and familial ties to those caregivers.

2. Research questions

This study aims to explore the associations between parent-child relationships, parental incarceration, and mental health in children of incarcerated parents. First, we describe the demographic context in which children of incarcerated parents are situated. Second, we examine indicators of compromised mental health in children of currently and formerly incarcerated parents as compared to children with no history of parental incarceration, and whether the relationship between mental health and parental incarceration is moderated by the quality of parent child relationships.

3. Methodological challenges

Datasets that can be used to examine relationships between parental incarceration, parent-child relationships and children's outcomes are challenging to obtain, and the lack of appropriate data sources in the US has contributed to the paucity of research in this area. The most widely available data on incarcerated people are collected by corrections departments, yet few corrections departments systematically track the parenting status of inmates. Even when corrections data does include information about children, relying on data from prisoner informants presents some challenges. Parents involved in the criminal justice system may be reluctant to provide information about their children and families due to concerns about privacy, current or future involvement with the child welfare system, or sanctions for failure to provide financial support for children (e.g. unpaid child support; Maruschak et al., 2010); thus, data gathered directly from prisoners might significantly under-report parenting status.

However, parenting status is not the only limitation of using data from corrections departments to examine the children of incarcerated parents. Parents who are engaged in criminal activity often fail to be fully involved in their children's lives and they might be unable to accurately report information about their children. Therefore, relying on prisoner informants limits the scope of the research questions that scholars can undertake.

Large panel studies provide the ability to compare incarcerated and non-incarcerated persons, but these datasets usually do not collect data from the minor children of incarcerated parents. A notable exception is the National Longitudinal Study of Adolescent to Adult Health (Add Health; Harris et al., 2009). Add Health has been used to examine self-reported symptoms of depression in children of formerly incarcerated fathers (Swisher & Roettger, 2012) and diagnosis of depression, anxiety, and post-traumatic stress disorder in formerly incarcerated parents (Lee, Fang, & Luo, 2013). However, to our knowledge, no existing studies have examined self-reported mental health indicators among children of incarcerated mothers and fathers, and in children of both currently and formerly incarcerated parents, and no studies have examined parent-child closeness as a protective factor for adolescents with incarcerated parents. Given that children are the best reporters of their own emotional distress (Moretti, Fine, Haley, & Marriage, 1985) and their relationships with their parents, a promising alternative strategy for documenting the experiences and challenges of children with incarcerated parents is population-based surveillance of youth themselves.

In Minnesota, statewide surveillance of health-related behaviors is conducted tri-annually through the Minnesota Student Survey (MSS). The MSS is widely used for exploring risk and protective factors relevant to the healthy development of young people including suicide attempts (Borowsky, Ireland, & Resnick, 2001), self-injurious behavior (Taliaferro, Muehlenkamp, Borowsky, McMorris, & Kugler, 2012), and adolescent violence perpetration (Duke, Pettingell, McMorris, & Borowsky, 2010). For the first time in 2013, children were asked to report whether they have a parent or guardian who is currently or has ever been in jail or prison. Thus, the MSS represents the largest and most comprehensive dataset available for examining mental health of Minnesota youth who have experienced parental incarceration.

4. Method

4.1. Data source

Data for this study were drawn from the 2013 MSS. The survey is given to all fifth, eighth, ninth, and eleventh grade students in Minnesota. It includes data on indicators of mental health including internalizing symptoms, self-injury, suicidal ideation and suicide attempts. It also includes information on parental incarceration (with the exception of fifth graders, for whom this item was deemed too sensitive for inclusion), and demographic characteristics. The survey is administered every three years. Student participation is voluntary and all surveys are completely anonymous. School districts that participate in the survey are required to follow federal laws regarding parental notification as required by the Family Educational Rights and Privacy Act (FERPA) and the Protection of Pupil Rights Amendment (PPRA). Students may choose not to participate, or may skip any individual

question on the survey. In 2013, 71% of eighth graders, 69% of ninth graders, and 62% of eleventh graders participated (Minnesota Department of Education, 2015).

4.2. Participants

Participants in this study were 122,180 children in eighth ($n = 42,841$), ninth ($n = 42,381$), and eleventh ($n = 36,958$) grade. On average, youth were 14.87 years old ($SD = 1.34$, $Range = 12-19$ years), and half of the youth in the sample (50.2%, $n = 61,341$) were boys. Reflecting the demographics of the state of Minnesota as a whole, most of the youth in the sample (72.9%) were White and not Hispanic. Just under one-third of the youth (30.9%) were experiencing at least one form of poverty, and 8.4% were not living with any biological parents. Prevalence rates for mental health variables can be found in Table 1.

4.3. Measures

4.3.1. Dependent variables—Indicators of mental health status tested in this study include: internalizing symptoms; suicidal ideation; suicide attempts; self-injurious behavior; diagnosis of mental, emotional or behavioral problems; and treatment for mental health concerns.

Internalizing problems: Internalizing problems were measured with five items indicating significant mental distress (e.g., anxiety, intrusive thoughts, somatization) in the past 12 months. These items were drawn from a validated mental health screening instrument (Dennis, Chan, & Funk, 2006) that has been shown to be strongly correlated with the 43-item mental distress subscale of the Global Appraisal of Individual Needs (Dennis, Titus, White, & Unsicker, 2003; Dennis et al., 2006). As recommended by the instrument developers, endorsement of one item was categorized as moderate and endorsement of three items was categorized as high probability of diagnosis with an internalizing disorder (Dennis et al., 2006).

Suicidal ideation: Suicidal ideation was measured with one item: “Have you ever seriously considered attempting suicide?” Response choices were “No,” “Yes, during the last year,” or “Yes, more than a year ago.” Responses were coded 0 = “No,” 1 = “Yes, during the last year,” or “Yes, more than a year ago.”

Suicide attempts: History of suicide attempt was measured with one item: “Have you ever actually attempted suicide?” Response choices were “No,” “Yes, during the last year,” or “Yes, more than a year ago.” Responses were coded 0 = “No,” 1 = “Yes, during the last year,” or “Yes, more than a year ago.”

Self-injurious behavior: Self-injurious behavior was measured with one item: “During the last 12 months, how many times did you do something to purposely hurt or injure yourself without wanting to die, such as cutting, burning, or bruising yourself on purpose?” Six response choices ranged from “0 times” to “20 or more times.” Responses were coded 0 = “0 times” 1 = “1 to 20 more times.”

Diagnosis of mental, emotional or behavioral problems: Diagnosis of a mental, emotional, or behavioral disorder was measured with one item: “Do you have any long-term mental health, behavioral, or emotional problems? Long-term means lasting 6 months or more.” Responses were “Yes” or “No”, and were coded 1 or 0, respectively.

Treatment for mental health concerns: Treatment for mental health concerns was measured with one item: “Have you ever been treated for a mental health, emotional or behavioral problem?” Responses were coded 0 = “No,” 1 = “Yes, during the last year,” or “Yes, more than a year ago.”

4.3.2. Independent variables—Predictor variables in this study were experience of parental incarceration, race, family structure, poverty, gender, and age.

Parental incarceration: Parental incarceration was assessed with one item “Have any of your parents or guardians ever been in jail or prison? (Mark ALL that apply).” Answer choices were “None of my parents or guardians has ever been in jail or prison,” “Yes, I have a parent or guardian in jail or prison right now,” and “Yes, I have a parent or guardian in jail or prison in the past.” Most respondents (77.5%) indicated no experience of parental incarceration, 13% indicated a formerly incarcerated parent, and 1.8% indicated a currently incarcerated parent; 7.7% were missing. There were a small number of children ($n = 579$; 0.47%) who reported they had both a currently and formerly incarcerated parent; these children were included in the currently incarcerated parent category. Thus, parental incarceration was a three-level variable coded 0 = “No experience of parental incarceration,” 1 = “Formerly incarcerated parent,” and 2 = “Currently incarcerated parent

Race and Ethnicity: Race and ethnicity were measured with six items. Children were asked to endorse whether they identified with any of the following racial or ethnic groups: Hispanic or Latino/a; American Indian or Alaskan Native; Asian; Black, African, or African American; Native Hawaiian or Other Pacific Islander; White. Children could endorse multiple races and ethnicities. Ideally, the racial and ethnic groups would be compared, given potential differential outcomes by race or ethnic group. However, because a large majority of the sample was White and non-Hispanic, sample sizes for the other races and ethnicities were too small for reliable inferential statistics to be computed. Thus, race and ethnicity were treated dichotomously; based on responses to the individual items, responses were coded 0 if youth endorsed only “White,” otherwise they were coded 1.

Family Structure: Family structure was assessed with one item: “Which adults do you live with? (*Mark ALL that apply*).” Responses included “Biological mother (the women who gave birth to me),” “Biological father,” “Adoptive mother,” “Adoptive father,” “Sometimes mother, sometimes father,” “Stepmother,” “Stepfather,” “Parent's girlfriend/partner,” “Parent's boyfriend/ partner,” “Grandparent(s) or other adult relative(s),” “Foster parent(s),” “Other adult(s) I am not related to,” and “None.” Responses were coded 0 if youth endorsed living with at least one biological parent, otherwise they were coded 1. Although research has demonstrated that family structure alone accounts for little of the variability in children's mental health outcomes (Carlson & Corcoran, 2001), it has important implications for lack

of involvement in children's lives (Carlson, 2006), which, in the context of parental incarceration represents an important contextual risk.

Poverty: Poverty status was assessed with three items: “Do you currently get free or reduced-price lunch at school?” “During the last 30 days, have you had to skip meals because your family did not have enough money to buy food?” and “During the past 12 months, have you stayed in a shelter, somewhere not intended as a place to live, or someone else's home because you had no other place to stay?” Respondents who endorsed any one of these items were coded 1, otherwise they were coded 0.

Parental closeness: Parental closeness was created by combining two items about communication (one each for both mother and father) with a subjective rating of how much children feel their parents care about them. Similar strategies have been used to measure parent-child relationships in previous studies using large public datasets (Kierkus & Baer, 2002; Zweig et al., 2002). Two items asked about communicating with mothers and fathers, respectively: “Can you talk to your father about problems you are having?” and “Can you talk to your mother about problems you are having?” Response options for both questions were “Yes, most of the time,” “Yes, some of the time,” “No, not very often,” “No, not at all,” and “My father [or mother] is not around.” Responses were coded so that higher scores indicated better communication with parents. The response choices “No, not at all” and “My father [or mother] is not around” were combined, resulting in a four-point scale. Responses to the items about talking to fathers and mothers were highly correlated ($r = 0.432$, $p < 0.001$). Talking to mother was rated slightly higher (on average) than talking to father –53.2% rate mother and father the same, 10.3% rate father better, 35.0% rate mother better, and 1.5% are missing one of the variables. The two items were averaged to create a single item that indexed parent-child communication. Respondents with missing data for one of the variables received the score for the parent for whom data was provided.

The third item that was used to create parental closeness was “How much do you feel your parents care about you?” Answer choices were “Not at all,” “A little,” “Some,” “Quite a bit,” and “Very much.” Responses to this item were highly correlated with the parent-child communication variable ($r = 0.486$, $p < 0.001$). Because the parent-child communication variable was on a four-point scale and the perceptions of parental care variable was on a five-point scale, both variables were standardized and then averaged. The final parental closeness variable ranged from -4.01 to 1.03 ($M = -0.0048$, $SD = 0.87$).

4.4. Data analysis

Mental health indicators were examined using a series of consecutive logistic regression models. For all dependent variables, we modeled the probability that the mental health problem was observed. First, we began by modeling the dependent variable using age, gender, family structure, poverty, race/ethnicity and parental incarceration. Next, we ran each of the models with the previous variables, parental closeness, and the closeness X incarceration interaction. Descriptive statistics were analyzed with SPSS version 22. Logistic regression models and multiple imputation were conducted in SAS version 9.4.

4.4.1. Missing data—Prior to analyses, data were inspected for missingness. Missing data on the mental health variables ranged from 2.7% for diagnosis of a mental, emotional, or behavioral problem to 7.0% for suicidal ideation. Missing data for the independent variables were less than 2%, with the exception of the parental incarceration variable, which has a missing rate of 7.7%. Chi-square tests and t-tests were used to compare those who were missing the parental incarceration variable to those whose parental incarceration status was known for all independent and dependent variables. Tests indicated that there were small but significant differences between the two groups on all the mental health outcome variables with the exception of suicidal ideation, with children who were missing the parental incarceration variable more likely to exhibit the mental health problem. Children missing the parental incarceration variable were also different from those not missing the variable on the independent variables; they were less likely to be White and to be living with at least one biological parent, and more likely to be boys, and to be experiencing poverty than those children who were not missing the parental incarceration variable. There was a statistically significant but practically negligible difference in age between children who were and were not missing the parental incarceration variable. Children missing the parental incarceration variable also rated their parental closeness lower than children not missing incarceration. Additional information about missing data can be found in the Appendix.

Because there were significant differences between children who were and were not missing data on parental incarceration, multiple imputation was used to reduce the potential bias. Multiple imputation can be used even when missing data are known to be nonignorable (Allison, 2002; Schafer, 1997). The PROC MI FCS command in SAS was used to compute five complete datasets. At levels of missingness of 8% or less as observed in this study, five imputed datasets are 98% efficient (Schafer & Graham, 2002).

5. Results

5.1. Differences among groups by experience of incarceration

In order to address our first research question, we explored whether children of currently and formerly incarcerated parents were different from children with no experience of parental incarceration on both demographic characteristics (i.e., gender, race/ethnicity, experience of poverty, family structure, and parental closeness) and mental health indicators (see Table 1). Results of ANOVA and chi-square analyses indicated significant differences by parental incarceration status for all independent and dependent variables. Because the omnibus test was significant, follow-up analyses were used to explore differences between each of the three groups (i.e., never vs. former vs. current). A Bonferroni adjustment was used to adjust the alpha level and correct for the use of multiple non-independent tests. All tests of differences between groups on independent variables were significant with the exception of age and gender, and results were in the expected direction. For example, a greater proportion of children with formerly incarcerated parents were experiencing poverty compared to children with no experience of incarceration, and a greater proportion of children with currently incarcerated parents were experiencing poverty compared to both other groups.

Analyses also indicated significant differences between groups on all of the dependent variables, and follow up analyses revealed results in the expected direction (see Table 1). For

each of the dependent variables, children of currently incarcerated parents were most likely to exhibit the outcome, followed by children of formerly incarcerated parents, and then children with no history of parental incarceration.

5.2. Closeness as a moderator of association between incarceration and mental health

Hierarchical logistic regression models were conducted to examine our second research question, that is, whether parental closeness moderates the association between parental incarceration and each indicator of mental health, after accounting for demographic characteristics. The PROC LOGISTIC procedure was used on the multiply imputed datasets, and the PROC MIANALYZE procedure was used to combine the results. Moderation analyses were run in two steps. The first step of the model included race/ethnicity, family structure, poverty, age, gender, and the three-level parental incarceration variable. The second step of the model included the previous variables, the parental closeness variable, and an interaction term between parental closeness and incarceration (closeness X incarceration) which provides a test of moderation. Analyses were replicated with the non-imputed data; there were no differences in statistical significance between the imputed and non-imputed data.

Results of logistic regression models are shown in Table 2. As expected, age and gender were positively associated with mental health outcomes, with older children and girls being at greater risk. Family structure (ORs = 1.25 to 1.71) and poverty (ORs = 1.33 to 1.85) were also associated with poor mental health outcomes across all models; both variables exerted small effects on the outcomes, as indexed by Cohen's *d*. There were mixed results for race. Being non-White was positively associated with mild internalizing, suicidal ideation, suicide attempt, and self-injury, but was negatively associated with diagnosis of mental, emotional, or behavioral problem, and treatment for a mental health concern. All effect sizes for race were small.

Across all the mental health outcomes, results show that children of incarcerated parents are at greater risk for poor mental health outcomes, with children of currently incarcerated parents displaying the most risk, relative to children of formerly incarcerated parents. Across all seven outcomes, children of formerly incarcerated parents were about twice as likely (a small to medium effect) to experience the outcome, and children of currently incarcerated parents were between two and a half and four times as likely (a medium to large effect) to experience the outcome.

Parental closeness was protective against mental health outcomes in all models. However, the closeness X incarceration interaction was also significant in all models, indicating that the effect of parental incarceration was moderated by parental closeness. That is, the protective effect of parental closeness was strongest for children with no experience of parental incarceration. For example, among children with no experience of parental incarceration, higher parental closeness was associated with less than half the risk of moderate internalizing problems (OR = 0.40) but, for children with formerly incarcerated parents, the same change in parental closeness was associated with an odds of 0.51, and for children with currently incarcerated parents, the odds were 0.59. See Fig. 1 for a graphical representation of the closeness by incarceration interaction.

6. Discussion

Results of this study indicate that parental incarceration is strongly associated with higher rates of mental health problems (e.g. internalizing, self-injurious behaviors, suicide attempt, etc.) among adolescents in the state of Minnesota. Furthermore, the association between parental incarceration and mental health in youth is apparent even after controlling for socio-demographic risk factors that are often present in the lives of children whose parents have been incarcerated such as race, poverty, and family structure. These results lend support to the claim that parental incarceration is a risk factor for compromised mental health in children above and beyond its association with other known risk factors (Murray & Farrington, 2008b; Wildeman, Wakefield, & Turney, 2013).

This study uses large-scale health surveillance data gathered from young people to assess the relationship between parental incarceration and symptoms of mental health problems, treatment for mental health concerns, and presence of mental health diagnoses. To our knowledge, this study is the first to document an association between self-reported mental health concerns and both current and former incarceration of mothers and fathers. Population-based data represents a methodological improvement over prior efforts in this area, which have relied on prisoner informants or small sample sizes while attempting to match children of incarcerated parents with similar controls. This study used data from a majority of public school students in the state of Minnesota and an adequate procedure to adjust for missingness, which increases the generalizability of the findings.

Findings from this study demonstrate that mental health concerns are quite prevalent among Minnesota youth, with mild internalizing experienced by more than 50% of youth, moderate internalizing by more than a quarter of youth, and 6% of youth attempting suicide. Furthermore, the prevalence of mental health problems is considerably higher than the prevalence of treatment for mental health problems across all groups. For example, for youth with currently incarcerated parents, nearly half report moderate symptoms of internalizing, and more than a third report at least one instance of purposeful self-injury, but only 29.7% report any type of treatment for a mental health concern. This disparity reflects the documented gap between need for mental health treatment and service utilization in adolescents (Merikangas et al., 2011). Early intervention for serious mental health concerns is essential due to the poorer long-term outcomes associated adolescent-onset mental health problems (Zisook et al., 2007), as well as the potential for mental health problems to compromise other areas of functioning (Cox et al., 2010).

These findings concur with prior research in adult populations indicating that individuals from racial and ethnic minority groups have less access to adequate health care than Whites (Garland et al., 2005; Nelson, 2002). This study found that children who are members of ethnic or racial minority groups are more likely than White children to exhibit most of the mental health problems examined in this study; however, those same children are less likely than White children to have been diagnosed with a mental, emotional, or behavioral problem or to have received treatment for mental health concerns. This disparity is an important public health concern that underscores the need for more access to high quality health care

for minority populations, as well as culturally-specific education programs about symptoms of compromised mental health in young people.

This study is unique in that it investigated the effect of parental incarceration both for youth with currently incarcerated parents, and youth whose parents had been incarcerated at some point in the past. Comparing children with currently and formerly incarcerated parents to children with no experience of parental incarceration reveals that the substantially increased risk for poor mental health associated with parental incarceration is not limited to the time during which parent is imprisoned. This finding emphasizes that the serious health disparities that exist for the children of incarcerated people are likely to persist into adulthood (Fergusson & Woodward, 2002) and contribute to intergenerational transmission social inequality (Wakefield & Uggen, 2010).

While parental closeness partially buffers children from poor mental health outcomes associated with parental incarceration, the protective effect of strong parent-child relationships appears weakest for children in the contexts of highest risk. Although parental closeness is negatively associated with mental health problems for all children, the strength of the association is greatest for those children with no history of parental incarceration, followed by those with formerly incarcerated parents, and then those with currently incarcerated parents. The findings of this study demonstrate that although strong parent-child relationships are protective against mental health problems, they appear less so in contexts of higher adversity. These results are consistent with previous scholarship demonstrating that in some particularly adverse contexts, even exceptionally high parenting quality is, by itself, unlikely to fully buffer children from negative outcomes associated with adversity. For example, in a study of homeless families residing in a shelter, Masten and colleagues found that parenting quality partially buffered children from negative outcomes (Miliotis, Sesma, & Masten, 1999).

The finding that parenting quality alone is insufficient to fully protect children in adverse circumstances from negative outcomes is important because those highly adverse contexts are exactly the arenas in which scholars would like to identify protective mechanisms that serve to promote well-being in children. There is a tremendous amount of scholarship across disciplines such as public health, prevention science, and child development that aims to elucidate factors of children and their environments that contribute to their resilience (Fergus & Zimmerman, 2005; Masten, 2007; Sesma, Mannes, & Scales, 2013). While this work is essential, the findings of this study indicate that some types of adverse contexts are fundamentally risky. Parental incarceration is one such context. The incarceration of a parent contributes to an increased risk of mental health problems in young people, despite strong parent-child relationships. It is important for scholars to remember that the most effective interventions for children in very adverse contexts are likely to be multifaceted programs that target several risk and protective factors, including individual child-level factors, children's relationships, and the environments in which they reside.

There are several important implications of these findings. The children of incarcerated parents are a vulnerable population and they should continue to be the targets of intervention efforts aiming to buttress their personal and social resources, including strong relationships

with caregivers. Education programs for incarcerated parents often include prison-specific strategies for communicating with children (Loper & Tuerk, 2006), but it is unclear how effective such programs are and how many inmates have access to them (Loper & Novero, 2010). Another promising avenue for intervention might be supporting the mental health of incarcerated parents and parent-child attachment, which may in turn operate as a mechanism for improved mental health in their children. Some such interventions have shown promising results, though improvement in children's outcomes have yet to be demonstrated (Loper & Tuerk, 2006, 2011). Many inmates do not return to their families upon release from prison (Day, Acock, Bahr, & Arditti, 2005) and those inmates who do attempt to reconcile with families often have ambiguous or unrealistic expectations about relationships with spouses and children. There is very little research on parent-child relationships in the period immediately following the parole of a parent, but existing studies point to increased parent-child conflict in parents who were recently incarcerated (Aaron & Dallaire, 2010).

The findings of this study also speak to the level of need for mental health services that children of currently and formerly incarcerated face. Our findings are practically significant because they document the very high rates of mental health problems in these vulnerable young people. Indeed, more than one in five youth with a currently incarcerated parent and 14% of those with a formerly incarcerated parent report having attempted suicide; this represents more than 2500 young people in this survey alone. Similarly, more than 5000 children of formerly and currently incarcerated parents reported purposely injuring themselves in the previous 12 months. These young people are also more likely to have other characteristics that are associated with limited access to health care services, such as living in poverty and being members of racial and ethnic minority groups (Garland et al., 2005; Nelson, 2002). As such, this represents an enormous challenge to our systems of care. Identifying and intervening with these youth should be a priority for governments and social service organizations.

6.1. Limitations

Although the use of large surveillance datasets provide an excellent opportunity to examine the relationships between family characteristics, parental incarceration and compromised mental health, there are a number of limitations to the current study that must be acknowledged. First, there are several points of ambiguity in parental incarceration data that could be important. For example, for those students with a previously incarcerated parent, we cannot know when the parent was incarcerated. It is also possible that some youth experienced parental incarceration when they were very young and have limited or no memory of this experience. Evidence indicates that younger children might experience parental incarceration quite differently than older children or adolescents (Shlafer & Poehlmann, 2010). We also do not know whether the incarcerated parent was a mother or father. Although some research indicates that under particular circumstances maternal incarceration could be protective (Wildeman et al., 2013), other evidence shows it is associated with greater likelihood of negative outcomes for minor children, such as being in foster care (Dallaire, 2007; Hahl, Alarid, Harris, & Firestone, 2016). For children who endorsed both a currently and formerly incarcerated parent, we do not know whether one parent experienced multiple incarcerations, or both parents were incarcerated. We also do

not have information about whether the parent who was incarcerated was a custodial parent at the time of arrest. Although research indicates that children's well-being declines when parents are incarcerated regardless of whether the parent was living with the child at the time of incarceration or not (Geller, Garfinkel, Cooper, & Mincy, 2009), children who were separated from their custodial parents due to incarceration might experience parental incarceration as a more salient life event than children of non-custodial parents. Finally, we are not able to measure the total number of incidents of parental incarceration and are therefore unable to distinguish between children who experienced a single or brief bout of parental incarceration (i.e., a short term jail stay) from those whose parents are serial recidivists; the strength of the associations between parental incarceration and negative mental health outcomes could be driven by a subset of children who experienced the most disruptive effects of parental incarceration.

In addition to the issues surrounding the ambiguity of parental incarceration, we are unable to examine some aspects of the context of parental incarceration that could be substantively important. Although we included relevant demographic variables in an attempt to minimize bias due to confounding characteristics, it is certainly possible that those children whose parents experienced incarceration are systematically different than those whose parents have never been incarcerated, and that it is those systematic differences that account for the increased odds of experiencing mental health problems. Particularly, we do not have any information about the mental health status of parents; given the potential genetic association underpinnings of mental health problems (Caspi et al., 2003; Kendler & Walters, 1994) this is an important omission. Additionally, because it is well-documented in the literature that mental health is a contributing factor for adult incarceration, it could be that parents' compromised mental health is a common antecedent of both parental incarceration and children's mental health problems. Perhaps the most important limitation of the current study is that we do not have any measure of adolescents' functioning pre-incarceration, thus we cannot know whether problems increase following incarceration. Because this study utilized cross-sectional data, we must refrain from making causal inferences about the effect of parental incarceration on children's mental health outcomes. These results should be replicated with longitudinal data. Finally, we recognize that the adolescents who were the reporters in this study exist in ecological contexts that include classrooms, school districts, and neighborhoods, and therefore, observations are unlikely to be truly independent. Because of the anonymous nature of the data, we are unable to examine these relationships with hierarchical or nested models; however, such techniques would improve our confidence in the results of the study.

6.2. Implications for policy

The intersections between correctional policies and the health and well-being of young people are often overlooked. Parental incarceration is an issue of social policy. In efforts to reform the system of mass incarceration in the United States, the health and well-being of the children of incarcerated people must be considered. Evidence of poorer mental health functioning in children of incarcerated parents should be used to advocate for alternative sentencing arrangements for parents, especially those who commit non-violent crimes.

Mental health problems are a serious concern for young people. This study showed that children of incarcerated parents report higher levels of mental health problems than children without an incarcerated parent. Although strong parent-child relationships are an important protective factor for young people, very high-risk contexts such as poverty and parental incarceration take a toll on the mental well-being of young people.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.adolescence.2016.10.006>.

Fig. 1. Odds ratios and 95% confidence intervals for incarceration by closeness interaction for moderate internalizing.

Table 1

Descriptive statistics by parental incarceration status.

	0 = None		1 = Former		2 = Current		<i>F</i> or χ^2 ^a	0 vs. 1		0 vs. 2		1 vs. 2
	Mean (SD)		Mean (SD)		Mean (SD)							
Age (years)	14.88 (1.34)		14.83 (1.31)		14.79 (1.29)		<i>F</i> (2, 112569) = 16.65, <i>p</i> < 0.001	***		**		
Parental closeness	0.10 (0.79)		-0.44 (0.99)		-0.84 (1.11)		<i>F</i> (2, 112731) = 4179.67, <i>p</i> < 0.001	***		***		***
Gender (1 = Female)	0.50		0.54		0.48		χ^2 (2, <i>N</i> = 112,787) = 67.88, <i>p</i> < 0.001	***		***		***
Race (1 = Not White)	0.22		0.39		0.54		χ^2 (2, <i>N</i> = 111,677) = 2828.83, <i>p</i> < 0.001	***		***		***
Poverty (1 = At least 1 risk)	0.24		0.60		0.75		χ^2 (2, <i>N</i> = 112,772) = 9685.37, <i>p</i> < 0.001	***		***		***
Family structure (1 = No bio parents)	0.07		0.13		0.21		χ^2 (2, <i>N</i> = 112,123) = 9,38.54, <i>p</i> < 0.001	***		***		***
Mild internalizing (1 = Yes)	0.50		0.74		0.77		χ^2 (2, <i>N</i> = 110,891) = 3584.10, <i>p</i> < 0.001	***		***		**
Moderate internalizing (1 = Yes)	0.22		0.44		0.50		χ^2 (2, <i>N</i> = 110,891) = 3777.58, <i>p</i> < 0.001	***		***		***
Self injury (1 = Yes)	0.12		0.27		0.37		χ^2 (2, <i>N</i> = 111,732) = 2879.09, <i>p</i> < 0.001	***		***		***
Suicidal ideation (1 = Yes)	0.15		0.33		0.37		χ^2 (2, <i>N</i> = 110,909) = 3321.70, <i>p</i> < 0.001	***		***		***
Suicide Attempt (1 = Yes)	0.04		0.14		0.21		χ^2 (2, <i>N</i> = 111,598) = 2343.00, <i>p</i> < 0.001	***		***		***
Diagnosis of MEB problem (1 = Yes)	0.10		0.22		0.28		χ^2 (2, <i>N</i> = 111,884) = 1948.48, <i>p</i> < 0.001	***		***		***
Treatment for MEB problem (1 = Yes)	0.12		0.23		0.30		χ^2 (2, <i>N</i> = 111,656) = 1620.71, <i>p</i> < 0.001	***		***		***
<i>N</i>	94,732		15,853		2202							

* *p* < 0.05

**

* *p* < 0.01*** *p* < 0.001.

Note:

^a ANOVA or chi-square tests comparing children with no history of parental incarceration, those with formerly incarcerated parents, and those with currently incarcerated parents. Descriptives are based on nonimputed data.

Table 2

Logistic regression models of risk and protective factors associated with mental health outcomes.

	Diagnosis of problem						Mental health treatment							
	B	SEB	OR	LCL	UCL	d	B	SEB	OR	LCL	UCL	d		
Model 1														
Age	0.05	***	0.01	1.05	1.04	1.07	0.03	0.10	***	0.01	1.11	1.09	1.12	0.06
Gender (ref = Male)	0.50	***	0.02	1.65	1.59	1.71	0.28	0.33	***	0.02	1.39	1.34	1.44	0.18
Family structure (ref = at least 1 bio parent)	0.44	***	0.03	1.55	1.47	1.64	0.24	0.54	***	0.03	1.71	1.63	1.81	0.30
Poverty (ref = at least 1 risk)	0.42	***	0.02	1.52	1.46	1.58	0.23	0.28	***	0.02	1.33	1.28	1.38	0.16
Race/Ethnicity (ref = White non-Hispanic)	-0.16	***	0.02	0.85	0.81	0.89	-0.09	-0.23	***	0.02	0.80	0.76	0.83	-0.12
Incarceration (ref = none)														
Formerly	0.74	***	0.02	2.10	2.01	2.20	0.41	0.69	***	0.02	1.98	1.90	2.07	0.38
Currently	1.01	***	0.05	2.76	2.49	3.05	0.56	1.02	***	0.05	2.76	2.52	3.03	0.56
Constant	-3.31	***	0.10	0.04	0.03	0.04	-1.77	-3.76	***	0.10	0.02	0.02	0.03	-2.16
Model 2														
Age	0.04	***	0.01	1.04	1.02	1.05	0.02	0.09	***	0.01	1.10	1.08	1.11	0.05
Gender (ref = Male)	0.43	***	0.02	1.54	1.49	1.60	0.24	0.27	***	0.02	1.32	1.27	1.36	0.15
Family structure (ref = at least 1 bio parent)	0.26	***	0.03	1.30	1.23	1.38	0.14	0.42	***	0.03	1.52	1.44	1.61	0.23
Poverty (ref = at least 1 risk)	0.21	***	0.02	1.23	1.18	1.29	0.11	0.13	***	0.02	1.14	1.10	1.19	0.07
Race/Ethnicity (ref = White non-Hispanic)	-0.27	***	0.02	0.76	0.73	0.80	-0.15	-0.30	***	0.02	0.74	0.71	0.77	-0.17
Incarceration (ref = none)														
Formerly	0.63	***	0.03	1.89	1.79	1.99	0.35	0.61	***	0.02	1.85	1.76	1.94	0.34
Currently	0.84	***	0.07	2.31	1.99	2.67	0.46	0.88	***	0.06	2.41	2.13	2.73	0.49
Closeness	-0.65	***	0.01	0.52	0.51	0.53	-0.36	-0.48	***	0.01	0.62	0.61	0.64	-0.26
Incarceration × closeness														
		***							***					
Closeness at incarceration = none	-0.65	***	0.02	0.52	0.50	0.54	-0.36	-0.47	***	0.02	0.62	0.60	0.64	-0.26
Closeness at incarceration = formerly	-0.46	***	0.02	0.63	0.61	0.65	-0.25	-0.30	***	0.01	0.74	0.72	0.76	-0.17
Closeness at incarceration = currently	-0.42	***	0.03	0.66	0.62	0.70	-0.23	-0.29	***	0.02	0.75	0.72	0.77	-0.16
Constant	-3.04	***	0.11	0.05	0.04	0.06	-1.65	-3.56	***	0.10	0.03	0.02	0.03	-1.93
Internalizing - Mild						Internalizing - Moderate								

Diagnosis of problem													Mental health treatment					
<i>B</i> <i>SEB</i> <i>OR</i> <i>LCL</i> <i>UCL</i> <i>d</i>													<i>B</i> <i>SEB</i> <i>OR</i> <i>LCL</i> <i>UCL</i> <i>d</i>					
<i>B</i> <i>SEB</i> <i>OR</i> <i>LCL</i> <i>UCL</i> <i>d</i>													<i>B</i> <i>SEB</i> <i>OR</i> <i>LCL</i> <i>UCL</i> <i>d</i>					
Model 1																		
Age	0.07	***	0.00	1.07	1.06	1.08	0.04	0.08	***	0.01	1.08	1.07	1.09	0.04				
Gender (ref = Male)	0.83	***	0.04	2.30	2.07	2.56	0.46	0.90	**	0.12	2.45	1.79	3.37	0.49				
Family structure (ref = at least 1 bio parent)	0.23	***	0.03	1.25	1.18	1.33	0.11	0.27	***	0.02	1.31	1.25	1.37	0.15				
Poverty (ref = at least 1 risk)	0.46	***	0.03	1.59	1.46	1.72	0.26	0.52	***	0.02	1.69	1.60	1.78	0.20				
Race/Ethnicity (ref = White non-Hispanic)	0.23	*	0.07	1.25	1.04	1.51	0.11	0.16		0.07	1.18	0.98	1.42	0.09				
Incarceration (ref = none)																		
Formerly	0.79	***	0.04	2.20	2.00	2.42	0.43	0.78	***	0.03	2.18	2.02	2.36	0.43				
Currently	0.90	***	0.07	2.45	2.12	2.84	0.49	0.96	***	0.06	2.61	2.29	2.97	0.53				
Constant	−1.58	***	0.09	0.21	0.17	0.25	−0.86	−3.06	***	0.20	0.05	0.03	0.08	−1.65				
Model 2																		
Age	0.06	***	0.00	1.06	1.05	1.07	0.03	0.06	***	0.01	1.07	1.05	1.08	0.04				
Gender (ref = Male)	0.80	***	0.04	2.24	1.99	2.52	0.44	0.88	**	0.13	2.40	1.68	3.42	0.48				
Family structure (ref = at least 1 bio parent)	0.06		0.03	1.06	1.00	1.13	0.03	0.04		0.03	1.04	0.98	1.11	0.02				
Poverty (ref = at least 1 risk)	0.27	***	0.03	1.30	1.21	1.41	0.14	0.28	***	0.02	1.32	1.26	1.39	0.15				
Race/Ethnicity (ref = White non-Hispanic)	0.11		0.07	1.12	0.92	1.36	0.06	0.03		0.08	1.03	0.82	1.29	0.02				
Incarceration (ref = none)																		
Formerly	0.58	***	0.03	1.79	1.68	1.90	0.32	0.62	***	0.04	1.86	1.71	2.03	0.34				
Currently	0.67	***	0.07	1.95	1.69	2.26	0.37	0.75	***	0.08	2.12	1.81	2.49	0.41				
Closeness	−0.85	***	0.04	0.43	0.39	0.47	−0.47	−0.92	***	0.04	0.40	0.36	0.45	−0.51				
Incarceration × closeness																		
		***							***									
Closeness at incarceration = none	−0.85	***	0.04	0.43	0.39	0.47	−0.47	−0.92	***	0.05	0.40	0.36	0.44	−0.51				
Closeness at incarceration = formerly	−0.66	***	0.06	0.52	0.46	0.58	−0.36	−0.68	***	0.04	0.51	0.47	0.55	−0.37				
Closeness at incarceration = currently	−0.39	***	0.06	0.68	0.61	0.76	−0.21	−0.53	***	0.03	0.59	0.56	0.62	−0.29				
Constant	−1.20	***	0.10	0.30	0.25	0.37	−0.66	−2.80	***	0.22	0.06	0.03	0.11	−1.55				
Self-injurious behaviors													Suicidal ideation					
<i>B</i> <i>SEB</i> <i>OR</i> <i>LCL</i> <i>UCL</i> <i>d</i>													<i>B</i> <i>SEB</i> <i>OR</i> <i>LCL</i> <i>UCL</i> <i>d</i>					

Diagnosis of problem							Mental health treatment						
	<i>B</i>	<i>SEB</i>	<i>OR</i>	<i>LCL</i>	<i>UCL</i>	<i>d</i>	<i>B</i>	<i>SEB</i>	<i>OR</i>	<i>LCL</i>	<i>UCL</i>	<i>d</i>	
Model 1													
Age	-0.04	***	0.01	0.96	0.95	0.97	0.02	0.10	***	0.01	1.11	1.12	0.06
Gender (ref = Male)	1.00	***	0.02	2.72	2.61	2.84	0.55	0.77	***	0.02	2.16	2.07	0.42
Family structure (ref = at least 1 bio parent)	0.35	***	0.03	1.42	1.34	1.51	0.19	0.38	***	0.03	1.46	1.39	0.21
Poverty (ref = at least 1 risk)	0.49	***	0.02	1.64	1.58	1.70	0.27	0.41	***	0.02	1.50	1.45	0.22
Race/Ethnicity (ref = White non-Hispanic)	0.13	***	0.02	1.14	1.08	1.19	0.07	0.08	**	0.02	1.08	1.03	0.04
Incarceration (ref = none)													
Formerly	0.79	***	0.02	2.20	2.10	2.31	0.43	0.88	***	0.02	2.41	2.32	0.49
Currently	1.18	***	0.05	3.25	2.96	3.57	0.65	1.04	***	0.05	2.82	2.58	0.57
Constant	-2.16	***	0.10	0.12	0.09	0.14	-1.17	-3.91	***	0.09	0.02	0.02	-2.16
Model 2													
Age	-0.06	***	0.01	0.94	0.93	0.95	-0.03	0.10	***	0.01	1.10	1.09	0.05
Gender (ref = Male)	0.96	***	0.02	2.62	2.50	2.74	0.49	0.72	***	0.02	2.06	1.97	0.40
Family structure (ref = at least 1 bio parent)	0.12	***	0.03	1.13	1.06	1.20	0.07	0.14	***	0.03	1.16	1.09	0.08
Poverty (ref = at least 1 risk)	0.24	***	0.02	1.27	1.22	1.32	0.13	0.13	***	0.02	1.14	1.10	0.07
Race/Ethnicity (ref = White non-Hispanic)	0.00		0.03	1.00	0.95	1.05	0.00	-0.06	*	0.03	0.94	0.89	-0.03
Incarceration (ref = none)													
Formerly	0.68	***	0.03	1.98	1.86	2.09	0.38	0.75	***	0.02	2.12	2.03	0.41
Currently	0.98	***	0.07	2.65	2.28	3.08	0.54	0.83	***	0.06	2.30	2.03	0.46
Closeness	-0.86	***	0.01	0.42	0.41	0.43	-0.48	-0.92	***	0.01	0.40	0.39	-0.51
Incarceration × closeness													
		***							***				
Closeness at incarceration = none	-0.86	***	0.03	0.42	0.40	0.44	-0.48	-0.92	***	0.03	0.40	0.38	-0.51
Closeness at Incarceration = formerly	-0.60	***	0.02	0.55	0.53	0.57	-0.33	-0.67	***	0.02	0.51	0.49	-0.36
Closeness at incarceration = currently	-0.56	***	0.03	0.57	0.53	0.61	-0.31	-0.58	***	0.03	0.56	0.53	-0.32
Constant	-1.78	***	0.11	0.17	0.14	0.21	-0.98	-3.73	***	0.10	0.02	0.02	-2.16
Suicide attempt													
	<i>B</i>			<i>SEB</i>		<i>OR</i>				<i>LCL</i>		<i>UCL</i>	<i>d</i>
Model 1													

	Diagnosis of problem					Mental health treatment						
	B	SEB	OR	LCL	UCL	d	B	SEB	OR	LCL	UCL	d
Age	0.13		***		0.01	1.14		1.11		1.16		0.07
Gender (ref = Male)	0.78		***		0.03	2.17		2.04		2.32		0.43
Family structure (ref = at least 1 bio parent)	0.48		***		0.04	1.62		1.51		1.74		0.27
Poverty (ref = at least 1 risk)	0.61		***		0.03	1.85		1.75		1.95		0.34
Race/Ethnicity (ref = White non-Hispanic)	0.21		***		0.03	1.23		1.16		1.30		0.11
Incarceration (ref = none)												
Formerly	0.98		***		0.03	2.66		2.51		2.82		0.54
Currently	1.37		***		0.06	3.94		3.51		4.42		0.76
Constant	-5.69		***		0.14	0.00		0.00		0.00		-3.04
Model 2												
Age	0.12		***		0.01	1.12		1.10		1.14		0.06
Gender (ref = Male)	0.69		***		0.03	1.99		1.87		2.13		0.38
Family structure (ref = at least 1 bio parent)	0.21		***		0.04	1.23		1.14		1.33		0.11
Poverty (ref = at least 1 risk)	0.32		***		0.03	1.38		1.30		1.47		0.18
Race/Ethnicity (ref = White non-Hispanic)	0.09		**		0.03	1.09		1.02		1.16		0.05
Incarceration (ref = none)												
Formerly	0.93		***		0.04	2.53		2.36		2.72		0.51
Currently	1.32		***		0.09	3.75		3.16		4.46		0.73
Closeness	-0.90		***		0.02	0.41		0.39		0.42		-0.49
Incarceration × closeness			***									
Closeness at incarceration = none	-0.90		***		0.04	0.41		0.38		0.44		-0.49
Closeness at incarceration = formerly	-0.62		***		0.03	0.54		0.51		0.57		-0.34
Closeness at incarceration = currently	-0.50		***		0.03	0.61		0.57		0.64		-0.27
Constant	-5.57		***		0.14	0.00		0.00		0.01		-3.04

*
 $p < 0.05$,**
 $p < 0.01$,***
 $p < 0.001$.