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Childhood maltreatment and unprotected sex among female juvenile offenders: evidence of mediation by substance abuse and psychological distress

Kristen Clements-Nolle, PhD, MPH¹, Sandra Larson, MPH¹, Aliya Buttarw, MPH¹, and Lindsey Dermid-Gray, MPH¹

¹University of Nevada, Reno School of Community Health Sciences

Introduction

Female adolescents involved with the juvenile justice system often engage in risky sexual behaviors such as early age of sexual initiation, having sex with multiple partners, and inconsistent condom use (Bryan, Schmiede, & Magnan, 2012; Elkington, Teplin, Mericle, Welty, Romero, & Abram, 2008; Hendershot, Magnan, & Bryan, 2010; Teplin, Elkington, McClelland, Abram, Mericle, & Washburn, 2005) resulting in a disproportionate burden of sexually transmitted infection (Spaulding et al., 2013). Traumatic life histories are also highly prevalent among female juvenile offenders (Dierkhising, Ko, Woods-Jaeger, Briggs, Lee, & Pynoos, 2013; Fox, Perez, Cass, Baglivio, & Epps, 2015; King, Abram, Romero, Washburn, Welty, & Teplin, 2011) and studies evaluating the cumulative impact of childhood maltreatment have found a strong and often graded influence on sexual risk behaviors in this population (Lopez, Kopak, Robillard, Gillmore, Holliday, & Braithwaite, 2011; Odgers, Robins, & Russell, 2010; Smith, Leve, & Chamberlain, 2006). Collectively these studies provide evidence that child maltreatment is an important risk factor for sexual risk taking among female juvenile offenders; however, the mechanisms by which child maltreatment influences sexual risk behaviors such as unprotected sex in adolescent populations remain poorly understood.

It has been hypothesized that maltreated children may develop coping strategies such as substance use to deal with the trauma they experience (Dube et al., 2006). Studies with female juvenile offenders have demonstrated a strong relationship between child maltreatment and substance use (King et al., 2011; Smith & Saldana, 2013) and the relationship between substance use and unprotected intercourse in this population is also well-established (Castrucci & Martin, 2002; Bryan et al., 2012; Elkington et al., 2008; Hendershot et al., 2010; Kingree, Braithwaite, & Woodring 2000; Schmiede, Levin, & Bryan, 2009; Templin et al., 2005). However, findings from studies designed to assess the mediating

Corresponding Author: Kristen Clements-Nolle, PhD, MPH, University of Nevada, Reno School of Community Health Sciences, Mailstop 274, Reno, NV 89557-0274, United States. (phone) +1-775-682-7097, clements@unr.edu.

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role of substance use in the relationship between childhood maltreatment and unprotected sex are inconsistent. A study with adolescents recruited from outpatient treatment settings found that drug abuse and dependence symptoms mediated the relationship between childhood neglect and unprotected sexual intercourse. However, the path from childhood sexual abuse to unprotected sex via drug symptoms was mediated in the opposite direction and no mediation through alcohol symptoms was detected (Oshri, Tubman, & Burnette, 2012). Furthermore, a study that matched female adolescents recruited from child protective service agencies to hospital-based controls found a significant relationship between child maltreatment, regulatory deficits, and risky sexual behaviors, but an indirect mediation effect was not detected when substance use was added to the model (Noll, Haralson, Butler, & Shenk, 2011).

Another mechanism by which childhood maltreatment may influence unprotected sex is psychological distress. Studies with juvenile offenders have shown that childhood maltreatment is related to internalizing problems such as depression and anxiety (King et al., 2011; Wanklyn, Day, Hart, & Girard, 2012) and female adolescents who experience psychological distress experience greater barriers to condom use, lower perceived control in a sexual relationship, more fear of the adverse consequences of negotiating condom use, and lower condom use self-efficacy (DiClemente et al., 2001; Seth, Raiji, DiClemente, Wingood, & Rose, 2009; Seth, Patel, Sales, DiClemente, Wingood, & Rose, 2011). While a study with female and male youth with an arrest history did not find an association between depressive symptoms and condom use (Tolou-Shams, Brown, Houck, & Lescano, 2008) several studies with community samples of African-American female adolescents have shown that psychological distress increases the risk of inconsistent condom use (Brown et al., 2006; DiClemente et al., 2001; Seth et al., 2009; Seth et al., 2011). Despite the extant literature linking emotional distress to childhood trauma as well as unprotected sex, only two studies have assessed emotional distress as a potential mediator in the relationship between child maltreatment and sexual risk taking. A study with female juvenile detainees found a significant path between childhood trauma, depressive self-concept (a combination of depression and self-esteem measures), alcohol-related sexual enhancement expectations, and unprotected sex (Lopez et al., 2011). Another study with low-income urban girls explored internalizing symptomology (depression, anxiety, and somatic complaints) and external symptomology as mediators in the relationship between childhood violence exposure and unprotected sex and only found evidence of mediation through external symptoms (Wilson, Pettineo, Edmonds, Goodman, Emerson, & Donenberg, 2015).

Another potential mediator in the relationship between child maltreatment and unprotected sex is dating violence, which is commonly reported by girls involved with the juvenile justice system (Buttar, Clements-Nolle, Haas, & Reese, 2013; Kelly, Cheng, Peralez-Dieckmann, & Martinez, 2009). Research has linked child maltreatment with dating violence during adolescence (Miller, Breslau, Chung, Green, McLaughlin, Kessler, 2011). Furthermore, female adolescents exposed to dating violence have lower rates of condom use (Walton, Resko, Whiteside, Chermack, Zimmerman, & Cunningham, 2011; Wingood, DiClemente, McCree, Harrington, & Davies, 2001), possibly due to fear of the consequences of negotiating condom use (Wingood et al., 2001). We are not aware of research assessing dating violence as a potential mediator in the relationship between child

maltreatment and sexual risk taking, but this is a plausible pathway that warrants investigation.

To further elucidate the relationship between childhood maltreatment and adolescent sexual risk taking among female adolescents, we conducted a study with 289 sexually active female juvenile offenders to determine: 1) whether there is a direct relationship between cumulative childhood maltreatment and unprotected sex after controlling for sociodemographics, juvenile justice involvement, substance abuse, psychological distress, and dating violence; and 2) whether substance abuse, psychological distress, and dating violence mediate the relationship between childhood maltreatment and unprotected sex (Figure 1).

Material and Methods

Participants and Procedures

The methods for this study have been described in detail previously (Buttar et al., 2013). Female adolescents (13-17 years) involved with two juvenile justice systems (on formal probation, deferred status probation, or diversion) in Nevada completed an audio computer-assisted self-interview (ACASI). Girls on formal probation were adjudicated and under the supervision of a probation officer as an alternative to commitment. Those on deferred status probation were not adjudicated, but received probation supervision and a judge imposed conditions that, if met, would result in dismissal of charges. Girls who were in a diversion program were referred to programs in the community to divert entry into the juvenile court system (National Juvenile Defender Center, 2016). Girls under supervised probation (formal or deferred status) typically have more serious offenses and receive more court-ordered substance use and mental health services, but referral and/or provision of substance use, mental health and other social services is foundational for all levels of supervision. Girls were not eligible to participate if they were: 1) on state parole; 2) in residential treatment programs during the entire study period; 3) wards of the state; or 4) unable to complete an interview in English.

Study packets were mailed to all parents/guardians of eligible juvenile offenders. The study packet included an introduction letter from each juvenile justice system, a study description letter from the principal investigator, and a decline to participate form. If parents/guardians did not want their child to participate they were asked to return a decline to participate form within two weeks in a pre-paid envelop. All materials clearly stated that declining to participate would not affect services, court hearings, or detention/probation decisions.

If a decline to participate form was not returned within three weeks, research team members worked with juvenile justice staff to set up a recruitment/interview appointment at times that did not conflict with programming, visitation, or dining. During this appointment, a research team member met with the eligible juvenile in a private room to describe the study objectives and procedures. The research team member explained that while her parents/guardians did not decline participation, she was free to do so. After fully describing the study and answering questions, the research team member obtained written assent from girls who chose to participate and scheduled an interview appointment immediately or at a later date. At the interview appointment, assent was reconfirmed and then the research team

member left the room while the adolescent completed the anonymous audio computer-assisted self-interview in privacy. After the interview was completed the research team member returned to answer questions and provide referrals.

Of the 517 eligible girls, 64 (12.4%) had a parent/guardian decline participation, 26 (5.0%) did not provide assent, and 122 (23.6%) could not be scheduled before the end of the study period. Overall, 305 completed the ACASI interview and there were no demographic differences between participants and non-participants. The analyses were restricted to 232 girls (76.1%) who reported engaging in vaginal sex in the past six months.

The University of Nevada, Reno Institutional Review Board approved all study procedures.

Measures

Exposure (childhood mal treatment)—Childhood maltreatment was measured with four questions from the National Longitudinal Study of Adolescent Health (Add Health) Wave III survey: By the time you started 6th grade how often had your parents or other caregivers... 1) slapped, hit, or kicked you? (physical abuse); 2) touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations? (sexual abuse); 3) left you at home alone when an adult should have been with you? (supervision neglect); 4) not taken care of your basic needs, such as keeping you clean or providing food or clothing? (physical neglect). The items demonstrated acceptable internal reliability in our study (Chronbach Coefficient Alpha=.66). Consistent with previous research using ADD Health maltreatment measures (Hahm, Lee, Ozonoff, & Van Wert, 2010; Hussey, Change, & Kotch, 2010; Shin, Miller, & Teicher, 2013; Suglia, Clark, Boynton-Jarrett, Kressin, & Koenen, 2014) sexual abuse, physical abuse, supervision neglect and physical neglect were coded as positive if each form of childhood maltreatment occurred one or more times before 6th grade. Given the co-occurrence of various forms of child maltreatment and the cumulative impact on behavioral health outcomes (Dong, Anda, Felitti, Dube, Williamson, Thompson, Loo, & Giles, 2004), a total childhood maltreatment score was created by summing each form of abuse or neglect (range 0-4) (Hahm et al., 2010). There was no difference in unprotected sex between girls who experienced one type of childhood maltreatment and those who did not experience maltreatment and there were consistently high levels of unprotected sex among participants who experienced 2-4 types of maltreatment (data not shown). Therefore a dichotomous total maltreatment variable was used for the mediation analyses (0-1 types of maltreatment vs. 2-4 types of maltreatment).

Mediators (substance abuse, emotional distress, and dating violence)—The CRAFFT screening tool was used to assess adolescent substance abuse (Knight, Sherritt, Shrier, Harris, & Chang, 2002). The CRAFFT screening tool was developed specifically for adolescents and is the most thoroughly studied and used screening tool for this population (Pilowsky & Wu, 2013). The CRAFFT consists of 6 items designed to measure lifetime history of risky alcohol and other drug use. A “yes” response to each question receives a point and a total score of 2 or higher results in high sensitivity and specificity for identifying substance abuse problems, disorders and dependence (Knight et al., 2002). Internal reliability of the CRAFFT was high in our study (Chronbach Coefficient Alpha=.79) and

previous research demonstrates that the CRAFFT is valid (Knight et al., 2002) and reliable (Levy, Sherrit, Harris, Gates, Holder, Kulig, & Knight, 2004).

The Brief Symptom Inventory-18 (BSI-18) was used to measure symptoms of psychological distress during the past seven days (Derogatis, 2000). The BSI-18 is a shortened form of the 53-item BSI which was developed from the Symptom Checklist-90-Revised (SCL-90-R); however, the BSI-18 only includes three subscales (depression, anxiety and somatization). Each subscale has six items measured on a 5-point Likert scale ranging from 0 (not at all) to 4 (extreme). Research has demonstrated high internal consistency with the BSI-18 subscales and correlation with the SCL-90-R subscales (Derogatis, 2000; Recklitis & Rodriquez, 2007). The three BSI-18 subscales can also be summed to calculate a global severity index (GSI) of psychological distress with raw scores ranging from 0-72 (Derogatis, 2000). The GSI was used as a measure of overall psychological distress in our analyses and internal reliability of this measure was high (Chronbach Coefficient Alpha=.93).

Two questions from the 2011 Youth Risk Behavior Surveillance Survey (YRBSS) were adapted to measure physical and sexual dating violence: 1) “During the past six months, has a partner hit, slapped, or physically hurt you on purpose?” and 2) “During the past 6 months, has a partner physically forced or pressured you to have sex when you did not want to?” (CDC, 2011). Participants reporting either or both forms of dating violence were coded as experiencing dating violence in the past six months.

Covariates—Sociodemographic measures included age (categorized as 13-14, 15-16, and 17 years) and race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic and other). Supervision status (formal probation, deferred status probation, or diversion) was documented from juvenile justice records and participants reported the number of time they had been referred into the juvenile justice system (1, 2, 3 or more referrals).

Outcomes (unprotected sex)—Participants reported the number of vaginal sex partners they had in the past six months. Participants who reported engaging in vaginal sex with 1 or more partners were asked the following question regarding condom use frequency: “When you had vaginal sex in the past six months, how often was a condom used?” Responses were recorded on a five-point Likert scale (always, almost always, sometimes, almost never, and never). A dichotomous measure of engaging in any unprotected sex in the past 6 months was created (always used condoms vs. almost always, sometimes, almost never, never used condoms). Participants were also asked if a condom was used the last time they had sex (yes vs. no) and reported the number of sexual partners they had in the past six months.

Analyses

The relationships between the exposure, mediators, and frequency of unprotected sex were assessed with the chi-square test (categorical variables), the Fisher's exact test (categorical variables with cell size less than 5), and the ANOVA test (continuous variables). The Cochran-Armitage test, the Fisher's exact test, and the mean test with bootstrap adjustment were used for multiple comparisons between the exposure and mediator variables and each level of condom use frequency (10 comparisons for the exposure and each mediator; 40 total comparisons). The results demonstrated that for most comparisons, participants who always

used condoms had lower levels of childhood maltreatment, substance use, emotional distress, and dating violence than participants who reported other categories of inconsistent condom use or no condom use; however, no other pairwise comparisons (e.g., almost always vs. never) were significant (Table 2). Therefore, a dichotomized variable measuring any unprotected sex in the past six months (always used condoms vs. almost always, sometimes, almost never, and never used condoms) was used as the primary outcome for mediation analyses.

To measure the impact of potential mediators on the relationship between childhood maltreatment and any unprotected sex in the past six months, we developed 5 logistic regression models. Model 1 included childhood maltreatment (0-1 versus 2-4 events) and controlled for age, race/ethnicity, probation status, and number of juvenile justice referrals. Models 2-4 included all variables in model 1 and each potential mediator. Model 5 included all variables from models 1-4. Consistent with previous research evaluating the impact of adverse childhood experiences on a range of health outcomes (Anda, Brown, Felitti, Dube, & Giles, 2008; Chartier, Walker, & Naimark, 2009), we used the risk decrement to estimate the mediation effect of substance abuse (model 2), psychological distress (model 3), dating violence (model 4), and all potential mediators together (model 5) on the relationship between childhood maltreatment and inconsistent condom use. The risk decrement was calculated by comparing model 1 to each individual mediation model (models 2-4) and the full model (model 5): $[\text{OR (model 1)} - \text{OR (model 2, 3, 4, or 5)}] / (\text{OR (model 1)} - 1) \times 100\%$.

Additionally, we conducted mixed mediation analyses appropriate for dichotomous mediators and/or outcomes (Jasti, Dudley, & Goldwater, 2008) based on the work of MacKinnon & Dwyer (1993). The Sobel test and Goodman I test were used to evaluate whether mediation by substance abuse, emotional distress, and dating violence was present and the percent of the total effect mediated by each variable was assessed. The primary outcome variable (any unprotected sex) was first assessed and then sensitivity analyses were conducted to determine whether the results were consistent when using no condom used at last sex as the outcome variable. All analyses were conducted using the Statistical Analysis System (SAS®) for Windows Release 9.4 (The SAS Institute, Cary, NC).

Results

The sample was diverse, with 45.9% self-reporting that they were non-Hispanic white, 25.1% non-Hispanic black, and 22.9% Hispanic. Almost two thirds of participants were on formal probation and over half (52.6%) had three or more referrals to a juvenile justice system. Maltreatment before 6th grade was common, including physical abuse (48.7%), sexual abuse (14.7%), supervision neglect (57.3%), and physical neglect (18.5%). Cumulative maltreatment before 6th grade was also high, with 22.8% reporting two types of maltreatment and 19.4% reporting three to four types. High levels of substance abuse (76.7%), psychological distress (mean score=15.8), and dating violence (41.8%) were reported by participants. Almost one third (29.5%) of the sample reported 3 or more sexual partners in the past six months and inconsistent condom use was common, with only 39% reporting that they always used condoms in the past six months and 47.8% stating that they did not use a condom the last time they had sex (Table 1).

As shown in Table 2, participants who reported always using condoms during the past 6 months generally had lower levels of childhood trauma, substance abuse, emotional distress, and dating violence than all other groups of condom users. However, the prevalence of childhood trauma and the proposed mediators did not differ significantly between different groups of inconsistent condom users (e.g., sometimes use condoms vs. never use condoms).

Five logistic regression models were developed to assess the risk decrement in the relationship between childhood maltreatment and any unprotected vaginal sex after the mediators were included (Table 3). After controlling for demographics and juvenile justice involvement (model 1), girls who experienced 2-4 types of maltreatment had higher odds of engaging in unprotected sex than those with 0-1 types of maltreatment (OR=3.44, 95% CI=1.89, 6.26). Adjustment for potential mediators was associated with small to modest reductions in the strength of association between childhood maltreatment and unprotected sex: model 2 including substance abuse (17.2% decrease); model 3 including psychological distress (31.6% decrease); model 4 including dating violence (6.6% decrease); and model 5 including all potential mediators (41.4% decrease).

Individual mediation analyses confirmed the risk decrement results. Substance abuse (Sobel=2.54, $p=.01$; Goodman I=2.49, $p=.01$) and psychological distress (Sobel=2.55, $p=.01$; Goodman I=2.51, $p=.01$) were significant mediators, but dating violence was not (Sobel 1.54, $p=.12$; Goodman I 1.48, $p=.14$). The percent of the total effect in the relationship between childhood maltreatment and unprotected sex that was mediated by substance abuse was 16.4% and psychological distress accounted for 23.7%. The mediation analyses were repeated using no condom used at last sex and the results were very similar with significant mediation effects found for substance abuse and emotional distress, but not dating violence (Table 4).

Discussion

The purpose of this study was to assess whether there is a direct relationship between cumulative childhood maltreatment and unprotected sex and to determine whether substance abuse, psychological distress, and dating violence mediate this relationship. We found that childhood maltreatment was highly prevalent among female juvenile offenders and after controlling for sociodemographics, juvenile justice involvement, substance abuse, psychological distress, and dating violence, girls who experienced multiple types of maltreatment had higher odds of engaging in unprotected sex. This finding is consistent with previous studies (Lopez et al., 2011; Odgers et al., 2010; Smith et al., 2006) and demonstrates the need to better understand how childhood maltreatment influences adolescent sexual risk behaviors to guide intervention development.

Over three-fourths of our sample met the screening cut-off for probable substance abuse and we found that mediation by substance abuse accounted for about a quarter of the relationship between childhood maltreatment and unprotected sex. Our findings support a study conducted with adolescents in out-patient treatment settings that found that childhood neglect was associated with unprotected sex via drug use and abuse symptoms (Oshri et al., 2012). Additionally, while Lopez and colleagues did not directly measure substance use or

abuse, they did find a significant pathway linking childhood trauma to unprotected sex via depressive self-concept and alcohol-based expectancies for sexual enhancement (Lopez et al., 2011). We were not able to ascertain how substance abuse affected adolescent decision-making regarding condom use. However, childhood neglect and childhood sexual abuse have both been shown to be related to having sex while using alcohol through alcohol and drug symptom pathways (Oshri et al., 2012).

Girls involved with the juvenile justice system exhibit high levels of anxiety and depression (King et al., 2011; Lopez et al., 2011; Wanklyn et al., 2012) and we found that emotional distress was a significant mediator, accounting for nearly one third of the association between childhood maltreatment and unprotected sex. This supports research conducted with female adolescent detainees demonstrating a relational pathway between childhood trauma, depression, and condom use (through alcohol-related sexual enhancement expectations) (Lopez et al., 2011). While another study with low income girls did not find evidence of mediation through internal symptomology, the authors note that this may be because childhood exposure to violence was not strongly associated with anxiety and depression in their sample (Wilson et al., 2015).

It is important to note that none of the proposed mediators in our study fully explained the association between childhood maltreatment and unprotected sex. It is therefore important to explore other possible causal pathways. For example, while Wilson and colleagues did not find that internalized symptoms mediated the relationship between childhood violence exposure and unprotected sex, they did find evidence of mediation through externalizing symptoms which are common among female juvenile offenders (Wilson et al., 2015). Additionally, maltreated adolescents may have difficulty regulating emotions, cognitions and behaviors and psychological dysregulation has been shown to mediate the relationship between childhood maltreatment and sexual risk taking (Noll et al., 2011). A recent study also found that pubertal timing mediated the association between sexual abuse and age of first intercourse, which has been linked to other sexual risk behaviors (Ryan, Mendle, & Markowitz, 2015). Finally, there is a need for studies that evaluate the impact of chronic stress exposure on neurocognitive development and how this may influence adolescent decision making and risk taking.

Findings from our study should be interpreted in light of some limitations. First, while the demographics of our sample reflected the systems from which participants were recruited, random sampling was not used and our results are not generalizable to other systems or geographic regions. Second, our measure of childhood maltreatment only captured events occurring before sixth grade and, therefore, may underestimate the prevalence of childhood maltreatment. Third, while the CRAFFT is a validated and widely used screening tool for adolescent substance abuse, it does not capture specific information on types of substances used, frequency of use, and many substance use consequences. Assessment of mediation could be strengthened by including information on actual substance abuse diagnoses and more specific measures of substance use. Fourth, the condom use measures available in this study were limited and required analytic approaches appropriate for dichotomous outcomes. Future research should document the actual number of sexual episodes and the proportion that are unprotected. Fifth, although the use of ACASI technology improves the accuracy of

adolescent self-report, our participants may have underreported sensitive information such as childhood maltreatment or unprotected sex. However, such underreporting is likely to be non-differential and as such, would lead to an underestimate rather than an overestimation of the effects. Finally, this was a cross-sectional study and temporal relationships between childhood maltreatment, the mediators, and unprotected sex cannot be established.

Implications for Practice and/or Policy

Our study provides data that can be used to better understand the mechanisms linking childhood maltreatment to risky sexual behaviors in a high risk population of female adolescents. Our results support other research demonstrating a strong association between childhood maltreatment and unprotected sex among female juvenile offenders (Lopez et al., 2011; Odgers et al., 2010; Smith et al., 2006) and provide evidence of mediation in this relationship through substance abuse and emotional distress. These results lend support for trauma-informed interventions that may reduce sexual risk behaviors by impacting substance use and emotional distress. For example, trauma-focused cognitive behavioral therapy (TF-CBT) has been shown to reduce symptoms of depression and post-traumatic stress disorder (PTSD) among children with sexual abuse-related PTSD symptoms (Cohen, Deblinger, Mannarino, & Steer, 2004; Leenarts, Diehle, Doreleijers, Jansma, & Lindauer, 2013).

While we did not find that dating violence was a significant mediator in the relationship between childhood maltreatment and unprotected sex, all of the proposed mediators, including dating violence, remained significantly associated with unprotected sex in the fully adjusted model. These findings demonstrate the importance of addressing a range of psychosocial issues when designing sexual health interventions for this population (Teplin, Mericle, McCelland & Abram, 2003).

Finally, routine screening for childhood maltreatment in juvenile justice systems may be an effective way to identify girls who are high risk for sexual risk taking and other emotional, behavioral, and physical health problems (Fox et al., 2015). Ideally, such screening would occur at the early stages of juvenile justice involvement when referrals to intervention and treatment are likely to have the most significant impact. Given the elevated prevalence of childhood trauma among female juvenile offenders (Dierkhising, Ko, Woods-Jaeger, Briggs, Lee, & Pynoos, 2013; Fox, Perez, Cass, Baglivio, & Epps, 2015; King, Abram, Romero, Washburn, Welty, & Teplin, 2011), such screening should be coupled with comprehensive training of juvenile justice staff in trauma-informed approaches to service provision (Griffin, Germain, & Wilkerson, 2012).

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Biographies

Kristen Clements-Nolle, PhD, MPH, is an associate professor of epidemiology in the School of Community Health Sciences at the University of Nevada, Reno. She is a principal investigator on several studies designed to assess the impact of adverse childhood experiences on a range of behavioral health outcomes across the lifespan.

Sandra Larson, MPH is a State Epidemiologist at the Nevada Division of Public and Behavioral Health. At the time of the study, Sandra was a Research Associate for the Young Women's Health Study at the University of Nevada, Reno.

Aliya Buttar, MPH is a Management Analyst with the Ryan White Program, at the Clark County Health District. At the time of the study, Aliya was a Research Associate for the Young Women's Health Study at the University of Nevada, Reno.

Lindsey Dermid-Gray is the Nevada State Breastfeeding Coordinator for the Nevada Division of Public and Behavioral Health. At the time of the study, Lindsey was a Research Associate for the Young Women's Health Study at the University of Nevada, Reno.

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Figure 1.
The relationship between childhood maltreatment and unprotected sex. Potential mediation by substance abuse, emotional distress, and dating violence

Table 1
Descriptive characteristics of 232 sexually active female juvenile offenders

	N (%)
Age	
13-14 years	32 (13.8)
15-16 years	122 (52.6)
17 years	78 (33.6)
Race / Ethnicity	
Non-Hispanic white	106 (45.9)
Non-Hispanic black	58 (25.1)
Hispanic	53 (22.9)
Other	14 (06.1)
Current supervision level	
Formal probation	146 (62.9)
Deferred status probation	51 (22.0)
Diversion	35 (15.1)
Number of times referred to juvenile justice system	
1	55 (23.7)
2	55 (23.7)
3+	122 (52.6)
Physical abuse before 6th grade	
Yes	113 (48.7)
No	119 (51.3)
Sexual abuse before 6th grade	
Yes	34 (14.7)
No	198 (85.3)
Supervision neglect before 6th grade	
Yes	133 (57.3)
No	99 (42.7)
Physical neglect before 6th grade	
Yes	43 (18.5)
No	189 (81.5)
Total childhood maltreatment before 6th grade	
None	66 (28.5)
1 type	68 (29.3)
2 types	53 (22.8)
3-4 types	45 (19.4)
Positive substance abuse screen	
Yes	178 (76.7)
No	54 (23.3)
Psychological distress^a	
Mean (range)	15.78 (0-62)

	N (%)
Dating violence (past 6 months)	
Yes	97 (41.8)
No	135 (58.2)
Number of partners (past 6 months)	
1	109 (47.4)
2	53 (23.0)
3	35 (15.2)
4 or more	33 (14.3)
Frequency of condom use during sex (past 6 months)	
Always	91 (39.2)
Almost alw	47 (20.3)
Sometimes	35 (15.1)
Almost never	24 (10.3)
Never	35 (15.1)
Any unprotected sex (past 6 months)	
Yes	141 (60.8)
No	91 (39.2)
No condom used last time had sex	
Yes	111 (47.8)
No	121 (52.2)

^aBrief Symptom Inventory Global Emotional Distress Score (continuous)

Table 2
Factors associated with frequency of condom use in the past six months among 232 sexually active female offenders

	Always # (column %)	Almost Always # (column %)	Sometimes # (column %)	Condom Use		Overall P-Value ^a	Multiple comparisons ^b
				Almost Never # (column %)	Never # (column %)		
Total childhood maltreatment							
0-1 types	67 (73.6)	20 (42.6)	20 (57.1)	11 (45.8)	16 (45.7)	0.002	<i>c d e f</i>
2-4 types	24 (26.4)	27 (57.4)	15 (42.9)	13 (54.2)	19 (54.3)		
Positive substance abuse screen							
Yes	56 (61.5)	40 (85.1)	28 (80.0)	22 (91.7)	32 (91.4)	<.001	<i>c d e f</i>
No	35 (38.5)	7 (14.9)	7 (20.0)	2 (08.3)	3 (08.6)		
Mean psychological distress score							
	11.26	19.67	15.74	19.58	19.97	0.002	<i>c e f</i>
Dating violence (past 6 months)							
Yes	25 (27.5)	29 (61.7)	18 (51.4)	9 (37.5)	16 (45.7)	0.002	<i>c d f</i>
No	66 (72.5)	18 (38.3)	17 (48.6)	15 (62.5)	19 (54.3)		

^a Chi-square test (categorical variables), Fisher's Exact test (cell size < 5), and ANOVA test (continuous measure) used^b Cochran-Armitage test, Fisher's Exact test and mean test used for multiple comparisons with bootstrap adjustment^c always vs. almost always (p<.05)^d always vs. sometimes (p<.05)^e always vs. almost never (p<.05)^f always vs. never (p<.05)^g almost always vs. sometimes (p<.05)^h almost always vs. almost never (p<.05)ⁱ almost always vs. never (p<.05)^j sometimes vs. almost never (p<.05)^k sometimes vs. never (p<.05)

(5) almost never vs. never /

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Table 3
Multiple Logistic Regression: Factors independently associated with engaging in any unprotected sex in the past 6 months

	Model 1 ^a AOR (95% CI)	Model 2 ^b AOR (95% CI)	% Decrease	Model 3 ^c AOR (95% CI)	% Decrease	Model 4 ^d AOR (95% CI)	% Decrease	Model 5 ^e AOR (95% CI)	% Decrease
Childhood maltreatment before 6th grade									
0-1 types	1.0	1.0		1.0		1.0		1.0	
2-4 types	3.44 (1.89, 6.26) [‡]	3.02 (1.63, 5.58) [‡]	17.21%	2.67 (1.42, 5.02) [‡]	31.56%	3.28 (1.78, 6.03) [‡]	6.56%	2.43 (1.27, 4.65) [‡]	41.39%
Positive substance abuse screen									
No	1.0	1.0						1.0	
Yes		3.87 (1.84, 8.16) [‡]						3.12 (1.42, 6.88) [‡]	
Psychological distress^f									
No				1.0				1.0	
Yes				1.04 (1.02, 1.07) [‡]				1.04 (1.01, 1.06) [‡]	
Dating Violence (past 6 months)									
No						1.0		1.0	
Yes						2.47 (1.35, 4.52) [‡]		1.91 (1.01, 3.60) [*]	

^a Adjusted for age, race, probation status, & juvenile justice referrals

^b Adjusted for age, race, probation status, juvenile justice referrals, & substance abuse

^c Adjusted for age, race, probation status, juvenile justice referrals, & emotional distress

^d Adjusted for age, race, probation status, juvenile justice referrals, & dating violence

^e Adjusted for age, race, probation status, juvenile justice referrals, substance abuse, emotional distress, & dating violence

^f Brief Symptom Inventory Global Emotional Distress Score (continuous)

^{*} p< .05

[‡] p<.01

^{‡‡} p<.001

Table 4

Any Unprotected Sex (past six months)				
Mediator	% total effect mediated	Sobel Coefficient	p	Goodman I Coefficient
Substance abuse	16.4%	2.54	0.01	2.49
Psychological distress	23.7%	2.55	0.01	2.51
Dating violence	8.5%	1.54	0.12	1.48
No Condom Used Last Time Had Sex (Sensitivity Analysis)				
Mediator	% total effect mediated	Sobel Coefficient	p	Goodman I Coefficient
Substance abuse	20.1%	2.24	0.02	2.18
Psychological distress	34.3%	2.54	0.01	2.50
Dating Violence	12.7%	1.53	0.13	1.47