

National Study of the Role of Recent Illicit Substance Use on the Relationship Between Depressive Symptoms and Sexual Risk Behavior Among Child Welfare–Involved Adolescents

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ABSTRACT. Objective: The present study examined the association between early-adolescent depressive symptoms and lifetime sexual risk behavior and whether that association was moderated by recent illicit substance use among adolescents reported for maltreatment. **Method:** Data came from Waves 1 (baseline) and 4 (36-month follow-up) of the National Survey of Child and Adolescent Well-Being, a national probability study of youths undergoing investigation for abuse or neglect ($n = 861$). Multivariate logistic regression was used to explore main effects and moderation models among baseline depressive symptoms, lifetime sexual risk behavior, and recent illicit substance use. **Results:** Baseline depressive symptoms and recent illicit drug use played little role in predicting ever having intercourse, age at first intercourse, or pregnancy. Recent use of illicit substances moderated the relationship between

early-adolescent depressive symptoms and condom use behavior (odds ratio = 0.85, $p < .001$) such that individuals who were more depressed at baseline and who used illicit drugs within the last 30 days were less likely to have often/always used condoms. Conversely, individuals with higher levels of depressive symptoms at baseline who had not engaged in illicit substance use in the last 30 days were more likely to often use condoms during sexual activity. **Conclusions:** Results suggest that among adolescents reported for maltreatment, use of illicit substances may moderate the relationship between elevated levels of depressive symptoms during early adolescence and condom use as children age through adolescence. Interventions for child welfare–engaged youths should focus on prevention and treatment of depression and substance use. (*J. Stud. Alcohol Drugs*, 74, 589–597, 2013)

CHILD MALTREATMENT IS DEFINED AS any act of physical, sexual, or emotional abuse or neglect by a caregiver that results in harm, potential for harm, or threat of harm to a child (Centers for Disease Control and Prevention [CDC], 2012). More than 3 million reports of child maltreatment are received by state and local agencies each year, and 772,000 are substantiated by child protection services (U.S. Department of Health and Human Services, 2010). Experiencing maltreatment can have lasting and deleterious consequences for children as they age into adulthood (Copeland et al., 2009). Adolescents who have suffered maltreatment are at elevated risk for depressive symptoms, substance use, and sexual risk behavior (Anderson and Libby, 2011; Leslie et al., 2010). Studies show that young adults with a history of child maltreatment are more likely to become depressed or suicidal than those without an abuse history (Libby et al., 2007). Furthermore, children with a history of maltreatment and mental health needs are more likely to engage in illicit substance use (Aarons et al., 2008; Vaughn et al., 2007).

Childhood maltreatment has also been established as a strong predictor of sexual risk behaviors later in life, including early first intercourse, poor use of contraception, and

high rates of pregnancy (Parillo et al., 2001). Numerous studies have identified a co-occurrence of substance use and sexual risk behavior (Miller et al., 2000), and child maltreatment is known to be a risk factor for both substance use and sexual risk behavior (Bensley et al., 2000). These data are especially troubling given the negative health outcomes that can result from depressive symptoms, drug use, and sexual risk behavior, such as sexually transmitted infections (STIs) and unintended pregnancy.

Although evidence points to the possible confounding role that childhood maltreatment may play in establishing the relationship among depression, illicit substance use, and sexual risk behavior, relatively little empirical attention has been devoted to this population in the literature. In particular, it is unclear how depression and substance use may interact to produce susceptibility for sexual risk behavior. The present study sought to examine the relationship between early-adolescent depressive symptoms and lifetime sexual risk behaviors and whether recent illicit substance use moderates this relationship among adolescents involved in the child welfare system.

Adolescent mental health and sexual risk

Numerous studies have examined the link between depressive symptoms and sexual risk taking in adolescence among the general population. The majority have used a

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cross-sectional design and therefore were unable to isolate a causal relationship (Kaltiala-Heino et al., 2003; Paxton et al., 2007; Shrier et al., 2001; Waller et al., 2006). Far fewer studies have examined the temporal relationship between these two variables using longitudinal or panel data. Most previous studies on this topic have relied exclusively on the National Study of Adolescent Health, a longitudinal study examining various health issues among youths in the United States (Hallfors et al., 2005; Khan et al., 2009; Lehrer et al., 2006; Shrier et al., 2002). These studies have led to conflicting findings that high-risk sexual behavior results in greater levels of depression (Hallfors et al., 2005; Shrier et al., 2002) and that depression leads to higher levels of sexual risk (Khan et al., 2009; Lehrer et al., 2006). Findings from these studies have been limited in generalizability because of (a) clustering risk behaviors to create risk profiles that prevent the examination of unique effects of depression on sexual outcome variables (Hallfors et al., 2005), (b) examination of limited variables related to STI transmission and diagnosis (Lehrer et al., 2006; Shrier et al., 2002), (c) a focus on small subpopulations of adolescents that are not generalizable to the greater adolescent population (Lehrer et al., 2006), and (d) large gaps in time between data collection windows (Khan et al., 2009).

One of the few longitudinal studies not using Add Health data found that adolescent Black females with higher emotional distress levels at baseline were more likely to engage in a cadre of sexual risk behaviors (DiClemente et al., 2001). However, the results of this study were limited in their generalizability because the study was conducted exclusively with Black females, and the longitudinal window was only 6 months from baseline to follow-up.

Adolescent substance use and sexual risk

Numerous studies have identified co-occurrence of substance use and sexual risk behavior (Guo et al., 2002; Levy et al., 2009; Santelli et al., 2001). Adolescent substance use appears to be an early indicator of sexual risk, as several studies have shown a longitudinal association between different types of substance use (tobacco, alcohol, and illicit drugs) and risky sexual behaviors (early first intercourse, low levels of condom use, multiple sexual partners) and health outcomes (STIs and early pregnancy) (Guo et al., 2002; Stueve and O'Donnell, 2005; Wells et al., 2004).

Role of child welfare in adolescent risk behavior

The literature on sexual risk behavior among maltreated youths has not identified any robust psychosocial predictors of sexual risk behavior, including placement type, maltreatment type, or caregiver connectedness (James et al., 2009). This is unusual given the high levels of depression, drug use, and sexual risk behavior for this population. The only

correlates of sexual risk behavior that have consistently been identified in the literature are depression and substance use (James et al., 2009; Thompson and Auslander, 2007). Although evidence points to the possible confounding role that childhood maltreatment may play in establishing the relationship among depression, substance use, and sexual risk behavior, we could not locate any studies that specifically addressed the co-occurrence of these issues.

There is great evidence of the interaction between depression and subsequent substance use. Although some studies suggest that substance disorders possibly precipitate mental disorders (Crum et al., 2005; Lukassen and Beaudet, 2005; Semple et al., 2005), reports of the reverse order predominate, with mental disorders typically found to begin at earlier ages than substance use (Costello et al., 1999; Falk et al., 2008; Kessler, 2004; Merikangas et al., 1998) and to predict subsequent onset of substance use and disorders (Armstrong and Costello, 2002; Cohen et al., 2007; King et al., 2004; Pardini et al., 2007). Such an impact would presumably be greatest for youths because the risk of substance use is highest when mental disorders begin during childhood and early adolescence (Kessler et al., 2004).

Although few studies have explored the specific interaction between depression and substance use that potentially contributes to sexual risk behavior, given the clear association that depression often predates substance use and that both depression and substance use are related to sexual risk behavior, there is likely a complex risk process at play when these factors are present in an adolescent's life (Saban and Flisher, 2010). There is a lack of empirical support for substance use mediating the relationship between depression and sexual risk behavior (Shrier, 2002), suggesting that there is no causal precedence such that depression causes substance use and that substance use precedes and causes sexual risk behavior (MacKinnon and Luecken, 2008). Therefore, it is possible that substance use actually moderates this complex relationship between depression and sexual risk. Moderation analysis allows for the investigation of when, under what conditions, and for whom does early depression result in sexual risk behavior (MacKinnon and Luecken, 2008).

As such, the present study sought to further elucidate the association between early-adolescent depressive symptoms in relation to specific sexual risk behaviors and to determine whether recent illicit drug use might moderate those associations among a national sample of adolescents who were subjects of a maltreatment report. The present study addresses the following research questions: (a) Is there an association between early depressive symptoms and sexual risk behavior among adolescents in the child welfare system, and (b) does recent illicit substance use in older adolescence moderate the relationship between early depressive symptoms and sexual risk behavior among adolescents in the child welfare system?

Method

Data for the current research come from the National Survey of Child and Adolescent Well-Being (NSCAW), the first national longitudinal probability study of child welfare-involved youths. NSCAW used a stratified two-stage cluster sampling strategy to select 100 primary sampling units (PSUs) from a national sampling frame; the probability of PSU selection was proportional to the size of the PSU's service population (NSCAW Research Group, 2002; U.S. Department of Health and Human Services, 2005).

Of the 100 PSUs identified by the sampling strategy, the NSCAW study ultimately collected child-level data in 92 PSUs representing 96 counties and 36 states. In participating counties, children were randomly selected from among the population of children between birth and age 14 years for whom an investigation of abuse or neglect had been opened by the child welfare system between October 1999 and January 2001. Any child who had been the subject of a maltreatment report was included in the sample, regardless of whether the report was substantiated. This choice was made given the robust body of literature indicating that the behavioral and developmental outcomes of children with unsubstantiated versus substantiated maltreatment reports are indistinguishable (Cross and Casanueva, 2009; Drake et al., 2003; Hussey et al., 2005; Kohl et al., 2009).

The current analysis reports on a subset of preadolescent and adolescent youths who were 11 years or older at baseline ($n = 1,180$), were interviewed at Waves 1 and 4 ($n = 1,030$), and for whom sexual risk behavior data were available ($n = 861$). This sample was selected because only children ages 11 years or older received surveys about their sexual and substance use behavior. Children without sexual risk behavior data were not statistically different from the study sample in terms of gender, age, or ethnicity.

Field representatives conducted face-to-face interviews with youths, biological parents and/or caregivers, and caseworkers over a 36-month period at four points (baseline, 12 months, 18 months, and 36 months). For a more detailed description of NSCAW, including information about sampling, weighting, item nonresponse, and informed consent, refer to NSCAW Research Group (2002) and U.S. Department of Health and Human Services (2005).

Study design and measures

For the current analysis, we examined the relationship between depressive symptoms at baseline (Wave 1) and lifetime engagement in specific sexual risk behaviors (Wave 4). We also examined whether recent illicit substance use (Wave 4) moderated the relationship between early depressive symptoms and lifetime sexual risk behavior. We used measurement and analysis approaches that have previously been used to successfully investigate risk

and protective factors for various health risk behaviors among youths in the NSCAW sample (James et al., 2009; Leslie et al., 2010).

Demographic risk and protective factors. Demographic factors of interest were collected from caseworkers at Wave 1 and included gender, age (in years at baseline), and race/ethnicity (Black/non-Hispanic, Hispanic, White/non-Hispanic, and other). These variables were chosen for inclusion because they have been identified in prior sexual health and substance use research as potential confounding factors (CDC, 2010).

Depressive symptoms. Baseline depressive symptoms were measured using the Children's Depression Inventory (CDI; Kovacs, 1992), which consists of 27 items asking about depressive symptoms within the last 2 weeks. Each question has a response scale of 0, 1, or 2. Overall, total scores of depressive symptomatology range from 0 to 54, with higher scores indicating more severe depressive symptoms. For univariate reporting purposes, adolescents were classified as depressed if they fell at or above the 91st percentile for their age and gender group, based on the CDI normative sample's rates of depression in the CDI manual (Kovacs, 1992).

For all subsequent statistical analysis, scores on all 27 questions were summed. This total score was converted to a standardized t score ranging from 0 to 100 using the standardized tables in the CDI Profile Form (Kovacs, 1992). Higher scores indicated more severe depressive symptoms, whereas lower scores indicated few or no problems. Alpha reliability coefficients of the CDI ranged from .71 to .89 (Kovacs, 1992). For this sample, $\alpha = .81$.

Sexual risk behavior. Sexual risk behaviors were measured using four dichotomous variables gathered during interviews with youths at Wave 4, including (a) consensual sexual intercourse (lifetime), (b) age at first intercourse (13 years and younger or older than 13 years), (c) average frequency of condom use during consensual intercourse (never/rarely/sometimes or often/always), (d) having ever been pregnant. Data on consensual sexual activity were selected to avoid any confounding effects of sexual abuse. Wave 4 sexual activity data were used to broadly assess lifetime sexual behavior of the adolescents in the sample.

Illicit substance use. Wave 4 substance use was measured by the Drug-Free Schools and Communities Act adapted for NSCAW. Illicit substance use was assessed as a dichotomous variable indicating whether the youths reported having sniffed glue, gasoline, or other liquids and gases or used marijuana, cocaine, crack, heroin, pain killers, tranquilizers, stimulants, or sedatives when they were not prescribed in the last 30 days. The time frame of "last 30 days" was chosen rather than lifetime substance use because changes in lifetime substance use would only reflect new initiation by youths who never used before at each time point.

Data analysis

All of the analyses were conducted with weighted data to take into account the complex sampling design of NSCAW. Sample weights and the two-stage cluster sample design were accounted for in all analyses. Wave 4 weights adjusted for attrition between Waves 1 and 4 and were constructed to represent the original target population based on data from study participants present at Wave 4. SUDAAN software (Version 9.0; Research Triangle Institute, 2004) was also used to estimate variances and calculate weighted frequencies, odds ratios (ORs), and 95% confidence intervals. All data in the text, tables, and figures provided in this article are weighted.

Multivariate logistic regression analyses were used to test the associations among baseline depressive symptoms, illicit substance use during the last 30 days at 36-month follow-up, and sexual risk behavior at 36-month follow-up. We also assessed for multiplicative interaction between baseline depressive symptoms and illicit drug use in the last 30 days on sexual risk behaviors. To assess interaction on a multiplicative scale (Kleinbaum and Klein, 2010), we evaluated whether the interaction term, Depressive Symptoms \times Illicit Substance Use, was statistically significant ($p < .05$) in logistic regression models that also included independent terms for depressive symptoms, illicit substance use, and covariates. Our final model adjusted for the confounding effects of age, ethnicity, and gender.

Missing data

As with many longitudinal survey studies, NSCAW contains a considerable amount of missing data, and final multivariate models were performed on reduced sample sizes.

Given that nonresponse analyses have suggested that missing data in NSCAW “is unlikely to be consequential for most types of analyses” (U.S. Department of Health and Human Services, 2005, p. 2-12), as well as problems inherent to data imputations (Brick and Kalton, 1996), we used listwise deletion but conducted sensitivity analyses to explore patterns of missing data. No statistically significant differences were found for any of the covariates when comparing the eligible sample sizes with the final sample sizes.

Results

Sample description

The sample of 861 child welfare-involved youths for whom sexual activity data were available were 15.3 years old ($SD = 0.07$) on average at baseline. Fifty-four percent of the sample was female. More than half of the youths were White, 27.9% were Black, 13.3% were Hispanic, and 6.7% fell into the “other” category of racial/ethnic background. Close to 15% (14.4%) of the sample qualified for a diagnosis of depression. About half of the sample (49.7%) reported having experienced consensual sexual intercourse. Of those who experienced consensual sexual intercourse, 48.2% reported being 13 or younger at first consensual intercourse. More than two thirds (68.2%) of sexually active youths reported using protection often or always during consensual sex. Forty percent of all girls indicated having been pregnant at some time.

Table 1 presents descriptive findings of the sexual risk behaviors of interest in this study by hypothesized covariates, depressive symptoms, and illicit substance use. Teens who had never engaged in sexual activity had the lowest number of depressive symptoms (3.1 below the mean). A large

TABLE 1. Prevalence of Wave 4 sexual risk behavior

Variable	Lifetime intercourse (<i>n</i> = 861)		Age at first intercourse (<i>n</i> = 415)		Regular condom use (<i>n</i> = 414)		Pregnancy ^a (<i>n</i> = 241)	
	Yes	No	≤13 years	>13 years	Never/ sometimes	Always/ often	Yes	No
Gender, %								
Male	49.7	50.3	48.2	51.8	31.8	68.2	N.A.	100.0
Female	50.8	49.2	34.2	65.8	30.7	69.3	39.3	60.7
Race, %								
White	51.9	48.1	35.5	64.5	27.9	72.1	38.5	61.5
Black	50.5	49.5	51.0	49.0	17.0	83.0	20.9	79.1
Hispanic	47.9	52.1	46.1	53.9	64.7	35.3	73.1	26.9
Other	41.2	58.8	27.4	72.6	60.4	39.6	33.1	66.9
Age, years, <i>M</i>	13.3	12.1	13.2	13.3	13.2	13.3	13.6	13.2
Depression, ^b <i>M</i>	51.4	48.2	52.9	50.3	55.0	49.7	53.2	53.7
Depression, centered, ^c <i>M</i>	0.1	-3.1	1.6	-1.0	3.7	-1.6	1.9	2.4
Illicit drug use, %								
Yes	59.4	40.6	63.9	36.1	33.6	66.4	15.3	81.7
No	49.5	50.5	38.9	61.1	31.3	68.7	41.5	58.5

Notes: N.A. = not applicable. ^aFemale respondents only; ^bbased on the Children’s Depression Inventory (range: 0–54), with higher scores representing more depressive symptoms; ^cbased on results from the Children’s Depression Inventory.

TABLE 2. Multivariate logistic regression models for Wave 4 sexual risk behaviors

Variable	Lifetime intercourse ^a (n = 861) OR [95% CI]	Age at first intercourse ^b (n = 406) OR [95% CI]	Regular condom use ^c (n = 408) OR [95% CI]	Pregnancy ^{d,e} (n = 238) OR [95% CI]
Male gender	1.10 [0.60, 2.02]	2.40 [1.02, 5.65]*	2.06 [0.88, 4.82]	N.A. ^h
Race (ref. = White)				
Black	1.04 [0.50, 2.12]	2.24 [1.02, 4.91]*	0.59 [0.25, 1.38]	0.34 [0.09, 1.31]
Hispanic	1.08 [0.48, 2.43]	2.14 [0.58, 7.88]	7.17 [1.99, 25.91]**	7.22 [2.38, 21.89]***
Other	0.73 [0.20, 2.66]	0.58 [0.13, 2.56]	3.40 [0.98, 11.74]*	1.05 [0.18, 5.93]
Age	2.30 [1.80, 2.94]***	0.93 [0.68, 1.28]	1.09 [0.67, 1.78]	1.78 [1.09, 2.91]*
Depression ^f	1.02 [0.99, 1.05]	1.02 [0.99, 1.06]	1.04 [1.01, 1.08]**	0.98 [0.94, 1.01]
Illicit drug use	1.16 [0.48, 2.84]	2.96 [0.79, 11.10]	1.26 [1.16, 3.45]**	0.37 [0.06, 2.33]
Depression ^f × Illicit Drug Use	N.A. ^g	N.A. ^g	0.85 [0.76, 0.95]**	N.A. ^h

^aReference = no intercourse; ^breference = ≤13 years of age; ^creference = always/often; ^dreference = no pregnancy; ^efemale respondents only; ^fper each 1-unit increase in depressive symptomology; ^gnot available; ^hnot applicable. **p* < .05; ***p* < .01; ****p* < .001.

percentage of youths who had engaged in sexual intercourse (59.4%) or who had sex at age 13 or younger (63.9%) had also used illicit drugs in the last 30 days. A greater percentage of maltreated teens who did not use illicit substances used condoms often or always (68.7%) when compared with those who did use illicit substances (66.4%). A relatively small percentage of teens who had been pregnant had used illicit substances in the last 30 days (15.3%).

Multivariate results

Multiple regression models were calculated for each of the four sexual risk behaviors (having had sexual intercourse,

age at first intercourse, frequency of condom use, and pregnancy). Each model adjusted for sociodemographic characteristics (age, race/ethnicity, and gender where applicable), after which all other variables were entered in blocks. Only female participants were asked if they had been involved in a pregnancy; therefore, the pregnancy model was only run for girls. Results are presented in Table 2 for the final model for each dependent variable.

Recent illicit substance use in older adolescence played little role in the relationship between early-adolescent depressive symptoms and lifetime sexual risk behaviors because early depressive symptoms and recent illicit substance use were not associated with having had intercourse, age at

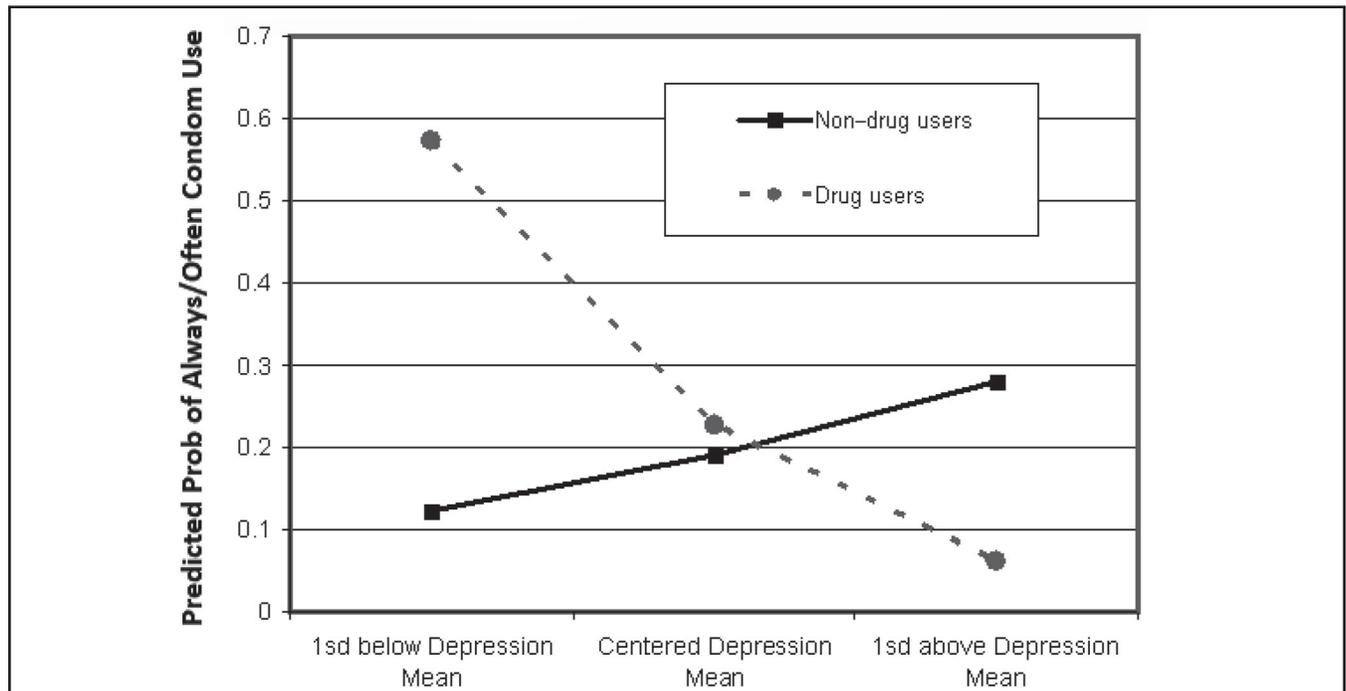


FIGURE 1. Interaction effect of depression and illicit drug use on regular condom use among maltreated adolescents; prob = probability.

first intercourse, or pregnancy. Being older increased the odds of having had sexual intercourse ($OR = 2.30, p < .001$) and having been pregnant ($OR = 1.78, p < .05$). Adolescents who were male ($OR = 2.40, p < .05$) and adolescents who were Black ($OR = 2.24, p < .05$) were more likely to have engaged in sexual intercourse when they were 13 years old or younger.

The most robust findings occurred in the model predicting regular condom use. The only sociodemographic factor related to condom use was ethnicity, with Hispanic youths ($OR = 7.17, p < .01$) and youths who fell into the "other" ethnicity category ($OR = 3.40, p < .05$) being more likely to often or always use condoms than other racial/ethnic groups. A 1-unit increase in depressive symptomatology increased the likelihood of not using condoms by 4% ($OR = 1.04, p < .01$), and teens who recently used illicit drugs were also more likely to never or rarely use contraception during intercourse ($OR = 1.26, p < .01$).

Finally, we examined the interaction effect of early depressive symptoms and recent illicit drug use on all four of the sexual risk outcomes. The interaction effect was only significant in predicting frequency of condom use ($OR = 0.85, p < .001$). See Figure 1 for a graphical depiction of this relationship indicating that, as depressive symptoms increased, substance-using maltreated youths were less likely to often or always use condoms, whereas youths who did not use illicit drugs were more likely to often or always use condoms.

Discussion

This study contributes to the existing research related to depressive symptoms, illicit substance use, and sexual risk behaviors for youths who have experienced adverse childhood events. It extends the literature in these areas by examining the role that depressive symptoms in young adolescence play on lifetime sexual risk behavior. It also examines whether recent illicit substance use moderates this relationship for youths who have been involved with child welfare.

The current study furthers the limited body of research in this area in several ways, including its use of data from NSCAW, the first probability study of children and families referred for child welfare services. The NSCAW data also enabled us to examine the association among depressive symptoms, substance use, and sexual risk behaviors over a 36-month period. These factors have been found to be significant with regard to sexual risk behaviors in other high-risk samples but had only been studied using cross-sectional data among maltreated youths (James et al., 2009; Leslie et al., 2010) or by pooling risk behaviors into a risk index (Hallfors et al., 2005; Paxton et al., 2007; Shrier et al., 2001; Waller et al., 2006). Both of these approaches lack generalizability and the ability to determine specific effects of depressive

symptoms and substance use. Results from this study correspond with findings related to sexual risk behavior in the general population (CDC, 2010) but also indicate that there is some unique phenomenology occurring among child welfare-involved teens who engage in sexual behavior.

As in the general population of teens, about half of all child welfare-involved youths had ever had sexual intercourse, and about three quarters of sexually active youths often or always used condoms during sex (CDC, 2010). High rates of pregnancy found in our research are consistent with previous findings from the NSCAW data (James et al., 2009) and data from other child welfare-involved populations (Courtney and Dworsky, 2006). In our research, older maltreated adolescents were more likely to engage in sexual activity and become pregnant. Black youths and boys were more likely to have sex when they were 13 years old or younger. These trends are all in keeping with national trends for the adolescent population (CDC, 2010).

A much larger percentage of child welfare-involved adolescents had engaged in sexual activity when they were 13 years of age or younger (40.5% vs. 6% nationally) and reported having been pregnant (20.0% vs. 7% nationally) (CDC, 2010; Kost et al., 2010). Although adolescents in this sample had higher rates of depression in early adolescence than the general population (14.4% vs. 5%) (Thapar et al., 2012), depressive symptoms and illicit substance use did not play a significant role in explaining sexual activity, early age at first sexual intercourse, or pregnancy among maltreated youths. This is surprising given the robust findings related to predictors of adolescent sexual risk behavior in the general population.

The existence of these null findings may be because we did not include other contextual factors related to adolescent sexual risk behavior. Recent reports indicate that in depressed adolescents, substance use is linked to sexual behavior in a contextually dependent manner as opposed to through a causal relationship (Shrier et al., 2012). Event-specific conditions should be investigated in the future when examining sexual risk behavior among maltreated youths. As demonstrated by Shrier and colleagues (2012), factors that should be considered include time of day and day of the week when substance use and sexual activity may be more likely to occur (e.g., weekday vs. weekend), affective state before intercourse, dose of substance, and duration of substance use.

Our most robust findings were related to condom use during consensual intercourse. In keeping with national trends, child welfare-involved minority youths were more likely than White youths to use condoms often or always (CDC, 2010). In national studies of adolescent risk behavior, gender plays a significant role in predicting condom use (CDC, 2010). This was not the case with child welfare-involved youths in this study.

Additionally, we detected an unusual finding that the relationship between baseline depressive symptoms and

future illicit substance use decreased the likelihood of lifetime condom use measured at Wave 4. This finding is in stark contrast to the findings of Hallfors et al. (2005), who demonstrated that sexual risk precedes depression, but it is consistent with DiClemente and colleagues (2001), who found that teens with depression have lower rates of condom use. We detected an interaction effect between prior depressive symptoms and substance use during the last 30 days on the likelihood of often or always using condoms; as baseline levels of depressive symptoms increased, substance-using maltreated teens were less likely to often or always use condoms, whereas teens who did not use illicit drugs were more likely to often or always use condoms.

There is literature to support the finding that substance use has a deleterious impact on condom use self-efficacy (Elkington et al., 2010). However, in the absence of substance use, the finding that child welfare-involved teens with early depressive symptoms are more likely to often or always use condoms has not been presented in the literature to date.

We propose that these findings take an initial step toward answering the question, "When, under what conditions, or for whom does early depression result in sexual risk behavior?" In the case of children who have been reported as the victim of maltreatment, depression alone does not result in complex risk behavior. Rather, children who are depressed may eventually resort to sexual risk behavior under conditions where substance use is occurring. This speaks to the deleterious effect that substance use has on adolescent decision making (Guo et al., 2002; Stueve and O'Donnell, 2005; Wells et al., 2004) as well as the commonly cited link between depression and substance use (Armstrong and Costello, 2002; Cohen et al., 2007; King et al., 2004; Pardini et al., 2007). Certainly not all depressed children will resort to using substances, but for those who do, the additive risk behavior associated with use is high.

This finding is particularly salient to children who have been reported for maltreatment because they have a higher risk of depression, substance use, and sexual risk (Aarons et al., 2008; Libby et al., 2007; Parillo et al., 2001). Therefore, early identification of depression and subsequent substance use has the potential to prevent more extreme risk behavior including risky sexual behavior.

Explanations for the finding that previously depressed, non-substance-using, child welfare-involved youths were more likely to often or always use condoms warrant further research. Studies of the general adult population in several countries indicate that condom use during intercourse is associated with depression and suicidal tendencies (Gallup et al., 2002; Morrill et al., 1996; Smit et al., 2006).

Limitations

Results of the present study should be interpreted in light of the following limitations, some of which are related to the

NSCAW study design and others to the decisions made by the authors of the present article. First, NSCAW is a clinical survey that measures psychosocial functioning across multiple domains and does not specifically target depression, substance use, or sexual risk behavior. There were also key sexual risk variables, including number of partners, that were not collected in this study. Because sexual behavior surveys were only given to children ages 11 years or older, the sample focused on a relatively limited age range of adolescents. Despite this, we still determined that age played a role in teen pregnancy and lifetime rates of intercourse.

We intentionally excluded alcohol use in favor of focusing on illicit substances, which further limits our findings. Additionally, the baseline data were collected from 1999 to 2001, making those data 11 to 13 years old. However, the absence of nationwide panel data about the risk and protective factors for illicit substance use and sexual risk behavior among youths involved with the child welfare system warrants investigation of this topic in the only nationally representative sample currently available. Although limited in the choice of outcomes, this study does provide a within-group perspective on depressive symptoms, illicit substance use, and sexual risk behavior in this sample of maltreated youths. Subsequent studies should incorporate stronger measures of sexual risk behaviors, substance use, and depression that are more commonly used in the public health literature.

Implications for interventions with child welfare-involved youths

Similar to findings in the analyses of risk and protective factors for a constellation of health risk behaviors in NSCAW by Leslie and colleagues (2010), our findings reinforce the need for preventive services for child welfare-involved adolescents. The high rates of early first sexual intercourse and pregnancy in this population are particularly concerning given their disproportionality to the general adolescent population. These areas of sexual risk warrant further investigation given that our findings indicate they are unrelated to depressive symptoms and illicit substance use. Identifying predictors of early sexual activity and teen pregnancy is crucial for the development of efficacious prevention programs.

Depressive symptoms, substance use, and sexual risk are major threats to child wellness, the third goal of the child welfare system following safety and permanency (Children's Bureau, 2011). The child welfare system has the potential to serve as a gateway to a host of prevention and treatment services. A primary goal of the coordination of child welfare and specialty services is to ensure that individuals have access to treatment and prevention programs. From a child welfare perspective, integration of services should encourage safety and permanency; from a mental health and substance use treatment perspective, this approach should maximize

the likelihood of providing individuals with the opportunity for recovery and prevention (Barth et al., 2006). A shortage of publicly subsidized programs means that many individuals in need never receive services (Child Welfare League of America, 1997).

Finally, our findings regarding variability of the impact of depressive symptoms on teen condom use suggest that interventions for this population may benefit from a multipronged strategy of addressing mental health and externalized teen risk behaviors. Given that we found depressed teens who used substances to be most likely to engage in sexual risk, prevention of substance use should become a primary focus when working with teens in the child welfare system who have had a history of depression. Furthermore, given that maltreated adolescents with a history of depression were more likely to use condoms if they had not recently used illicit substances, mental health providers need to reassess how they interpret well-being among adolescents. The absence of sexual and drug risk does not necessarily relate to total psychological wellness for teens. Child welfare-involved youths may have underlying mental health needs that are not exhibited through the standard externalized teen risk behaviors related to sex and drugs (James et al., 2009; Leslie et al., 2010).

Attention to addressing the internalizing and externalizing behavior of teens who have interfaced with the child welfare system is crucial. Lack of adequate screening and treatment for this high-risk population increases the likelihood that once they age out of child welfare services they will reappear in other high-risk contexts including the criminal justice system or the homeless population, where treatment is much more difficult to provide.

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