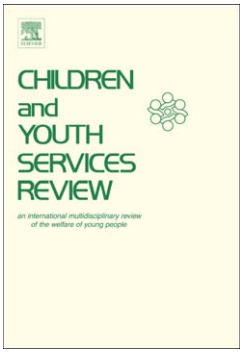

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PII: S0190-7409(14)00272-2
DOI: doi: 10.1016/j.childyouth.2014.07.023
Reference: CYSR 2504

To appear in: *Children and Youth Services Review*

Received date: 3 December 2013
Revised date: 29 July 2014
Accepted date: 30 July 2014

Please cite this article as: Joppa, M.C., Rizzo, C.J., Brown, L.K., Hadley, W., Dattadeen, J.-A., Donenberg, G. & DiClemente, R., Internalizing Symptoms and Safe Sex Intentions among Adolescents in Mental Health Treatment: Personal Factors as Mediators, *Children and Youth Services Review* (2014), doi: 10.1016/j.childyouth.2014.07.023

Internalizing Symptoms and Safe Sex Intentions among Adolescents in Mental Health Treatment: Personal Factors as Mediators

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This research was supported by grants from the National Institute of Mental Health (R01 MH63008 and T32 MH078788) to Rhode Island Hospital (P.I. Larry K. Brown, M.D.) and the Lifespan/Tufts/Brown Center for AIDS Research.

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Abstract

Little is known about why some adolescents with internalizing symptoms engage in sexual behaviors that increase their risk for HIV. This study tested a mediation model of internalizing symptoms and safe sex intentions among adolescents receiving mental health treatment. Self-efficacy for HIV prevention, HIV knowledge, and worry about HIV were hypothesized to mediate associations between internalizing symptoms and safe sex intentions among sexually active and non-active adolescents receiving mental health treatment (N = 893, M age = 14.9). Significant indirect effects from internalizing symptoms to safe sex intentions varied according sexual experience: for sexually non-active adolescents, HIV worry and knowledge mediated this link, whereas for sexually active adolescents, HIV self-efficacy was the significant mediator. Increasing both HIV knowledge and self-efficacy for HIV prevention are important targets for HIV prevention with adolescents with internalizing symptoms, and careful attention should be paid towards targeting these interventions to sexually experienced and inexperienced youth.

Keywords: Internalizing Symptoms, Adolescents, Sexual Risk, HIV Prevention

Internalizing Symptoms and Safe Sex Intentions among Adolescents in Mental Health Treatment: Personal Factors as Mediators

Many young people engage in sexual risk behaviors that can result in unintended health outcomes such as human immunodeficiency virus (HIV) infection (CDC, 2011). In fact, youth under age 29 accounted for 39% of new HIV diagnoses in 2009 despite comprising only 21% of the population (CDC, 2011). Previous research supports the importance of identifying psychosocial correlates of risky sexual behavior among youth across individual, relational, family, peer, and societal levels (see DiClemente et al., 2008, for a review). At the individual level, prior work suggests that mental health symptoms play an important role in the development of sexual risk behaviors (Brown, Danovsky, Lourie, DiClemente, & Ponton, 1997; Brown et al., 2010; Donenberg, Emerson, Bryant, Wilson, & Weber-Shifrin, 2001; Lehrer, Shrier, Gortmaker, & Buka, 2006). This risk extends across diagnostic categories. As shown in previous work with a large sample of adolescents in mental health treatment, youth with a psychiatric disorder were more likely to engage in sexual risk behaviors than those without a diagnosis (Brown et al., 2010), and functional impairment was associated with increased risky sexual behavior (Hadley et al., in press). Findings linking externalizing disorders and sexual risk-taking in adolescents are robust (Brown et al., 2010; Lescano, Brown, Miller, & Puster, 2007). However, prior results are mixed regarding the relationship between internalizing symptoms (i.e., symptoms of depression and anxiety) and sexual risk behavior (e.g., Brown et al., 2006; Donenberg et al., 2001). The goal of this project was to better understand the complicated relationship between depression and anxiety and safe sex intentions. We focused on symptoms of generalized anxiety disorder (GAD) and major depressive disorder (MDD), as the mechanisms

linking these disorders to sexual risk behavior are less well documented than those for bipolar disorder (Stewart et al., 2012) and posttraumatic stress disorder (Miller, 1999).

Among youth with mental health problems, depression and anxiety represent the most common form of psychopathology affecting children and adolescents (Costello et al., 1996; Last, Perrin, Hersen, & Kazdin, 1996). Depressive disorders/symptoms have been found to be linked to sexual activity or risk-taking among youth in the community (Brown et al., 2006; Lehrer et al., 2006; Mazzaferro et al., 2006; Ramrakha, Caspi, Dickson, Moffitt, & Paul, 2000; Seth et al., 2011) and in psychiatric care (Abrantes et al., 2006; Brown et al, 2010; Mulatu, Leonard, Godette, & Fulmore, 2008; Starr, Donenberg, & Emerson, 2012; Udell, Donenberg, & Emerson, 2011). Links have also been found among symptoms of anxiety in adolescence and sexual risk-taking (Abrantes et al., 2006; Stiffman, Dore, Earls, & Cunningham, 1992). However, other studies have not found symptoms of either depression or anxiety to contribute to sexual risk behaviors (Donenberg et al., 2001; Hallfors, Waller, Bauer, Ford, & Halpern, 2005). Despite the frequency of depression and anxiety symptoms among youth, little is known about why some adolescents with symptoms of anxiety or depression are at greater sexual risk and others are not. Mixed findings in the literature may reflect, in part, a lack of research on the linkages between depression and anxiety symptoms, personal attitudes related to HIV, and sexual behavior.

A number of health behavior frameworks have been based on social cognitive theory (Bandura, 1986), which emphasizes personal attributes related to sexual behavior that may predispose adolescents to sexual risk. For example, according to the health belief model (HBM; Maiman & Becker, 1974), the likelihood that a young person will choose to use a condom is based on their own perceived susceptibility and severity of the negative consequences of not

using a condom (e.g., contracting HIV), as well as the perceived benefits of and barriers to condom use, and their own self-efficacy. We set out to examine three HIV-related personal attributes we believe may be affected by symptoms of anxiety and depression and might mediate the relationship between internalizing symptoms and safe sex intentions: worry about HIV, self-efficacy for HIV prevention, and HIV knowledge. These hypothesized mediators have previously been identified as individual-level predictors of adolescent sexual risk (DiClemente et al., 2008). First, adolescents who are struggling with anxious or depressive symptoms may have an impaired ability to assess risk and feel invulnerable to, or less worried about, HIV (Brown et al., 1997) because they are focused on other stressors. Consequently, their perception of the severity of the consequences of unsafe sex or their own susceptibility to these consequences may be impaired, and thus their intentions to engage in safer sexual behaviors may not be as robust. However, it is also possible that feelings of anxiety or rumination about perceived negative consequences may lead adolescents to feel more worry about contracting HIV and therefore more intentions to have safe sex. In both cases, we hypothesize that depressed/anxious adolescents develop HIV-related personal attributes (worry about HIV) which then impact intentions to practice safe sex.

Next, self-efficacy for HIV prevention refers to how capable an individual feels he or she is to be able to talk to sexual partners about delaying sexual intercourse or using condoms. Self-efficacy is a key component of sexual risk behavior, and of intentions to have safe sex (Jemmott et al., 1992; Lescano et al., 2007s; van Empelen et al., 2003). Furthermore, communication with sexual partners is associated with safer sexual practices among adolescents (Tschann & Adler, 1997; Whitaker, Miller, May, & Levin, 1999). Communicating with partners about difficult topics like condom use is a new and often difficult skill for adolescents (Crosby et al., 2003; Hutchinson

& Cooney, 1998; Whitaker et al., 1999), and depressed/anxious adolescents may have particular difficulty communicating assertively with partners (Brown et al., 1997). They may therefore be particularly vulnerable to feeling less efficacious in negotiating safer sexual practices.

Finally, lack of knowledge about HIV is another possible mediator of sexual risk-taking among young people with symptoms of depression and anxiety. Depression and anxiety symptoms often co-occur with disorders that can impede learning, such as attention-deficit/hyperactivity disorder (ADHD) and reading disability (RD), which can impair these youths' ability to acquire new knowledge (Fristad, Topolsky, Weller, & Weller, 1992; Willcutt & Pennington, 2000). If depressed/anxious adolescents are not aware of the health consequences of HIV or how the virus is transmitted, they may be less inclined to take steps to protect themselves in sexual situations. Indeed, lack of knowledge about HIV is associated with sexual risk-taking among young people with symptoms of anxiety and depression (McKinnon, 1996). Conversely, anxiety symptoms may make youth more likely to seek out and retain information about bad things that might happen to them, such as contracting HIV, which in turn fuels their intention not to have sex to avoid this consequence.

To date, no study has examined how theoretically driven mechanisms link depression and anxiety symptoms to safe sex *intentions*. Intentions are indicators of how likely an adolescent is to engage in safer sexual behaviors, and can be measured among both sexually active and abstinent adolescents. Safe sex intentions are associated with engaging in safer sexual behaviors (Fishbein, 1989), including among youth with mental health symptoms (Auslander et al., 2002; Donenberg et al., 2005). It is important to specifically explore how personal attributes related to HIV may mediate links between internalizing symptoms and safe sex intentions. While it is also possible

to conceptualize HIV worry, self-efficacy, and knowledge as moderators of the effects of anxiety and depressive symptoms on safe sex intentions, we believe that there are not simply group differences in terms of these personal attributes: rather, each of these potential mediators represents a theoretically- and empirically-supported pathway by which mental health may affect young people's intentions to take sexual risks.

Moreover, pathways linking internalizing symptoms, psychosocial mediators, and sexual behavior may differ according to participants' history of prior sexual activity. Teens with internalizing symptoms who are not sexually active may report low knowledge and self-efficacy for HIV prevention because they lack experience acquiring relevant skills and information, but report decreased worry about HIV because they are not yet sexually active; whereas teens with symptoms of anxiety and/or depression who are sexually active may report more worry about HIV but more knowledge and self-efficacy given their prior sexual experiences. Safe sex intentions are based on salient prior experiences for sexually active teens, whereas teens who are not yet sexually active lack experience in the context about which they are asked to describe their intentions.

Hypotheses

The objective of the present study was to test a mediation model of depression and anxiety symptoms and intentions to have safe sex among adolescents receiving mental health treatment. We tested the model separately for sexually active adolescents and for adolescents who were not yet sexually active. Consistent with health behavior theories and prior research, we hypothesized that self-efficacy, HIV knowledge, and worry about HIV would mediate

associations between depression and anxiety symptoms and intentions to have safe sex for both the sexually active and non-active groups. While these HIV-related attributes could also be conceptualized as moderators of the association between internalizing symptoms and HIV, we believe that the hypothesized mediators actually account for, rather than simply affect, this connection. Specifically, we hypothesized that more internalizing symptoms may lead to more HIV knowledge and more worry about HIV, which would in turn be associated with greater intentions to have safe sex. We also hypothesized that more internalizing symptoms would be related to less self-efficacy about HIV prevention and thus lower intentions to have safe sex. We made no specific predictions regarding differences between sexually active and non-active groups regarding mediational pathways from internalizing symptoms to safe sex intentions, given that previous research has not distinguished between these two groups. Understanding safe sex intentions through the mechanisms linking them to depression and anxiety symptoms will provide clinically relevant information to help reduce HIV risk in this vulnerable population of young people.

Methods

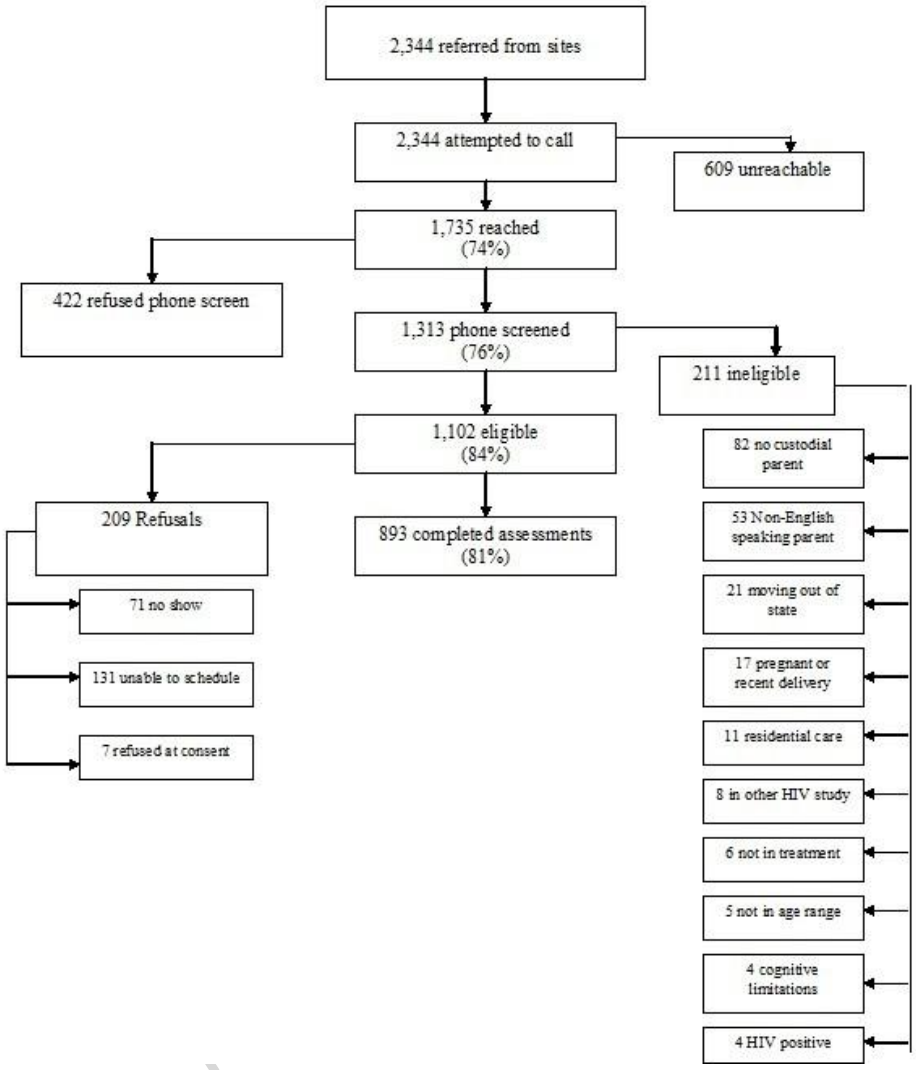
Participants

Data from the current study are from the baseline assessment of Project STYLE (Brown et al., 2014; Donenberg, Brown, Hadley, Kapungu, & Lescano, 2012), a study testing the efficacy of an HIV prevention program for adolescents in mental health treatment. The study was conducted in three US cities (Atlanta, GA, Chicago, IL and Providence, RI). Participants were recruited from outpatient and inpatient mental health settings. Project STYLE received a total of 2344 referral forms from clinicians, discharge coordinators, and self-referrals (Brown et al.,

2010). Approximately 50% of the referrals were from inpatient psychiatric treatment facilities. Of 1102 adolescents who met eligibility criteria, 893 (81%) gave consent and completed baseline assessments. Reasons for non-enrollment included lack of interest in a research program, not having enough time, and a current family crisis due to recent adolescent hospitalization. For study details, see previously published descriptions of the project (Brown et al., 2010; Brown et al., 2014); for recruitment and retention data, see Figure 1.

Adolescents (ages 13 -18 years) were eligible to participate if they were receiving mental health treatment and had an adult caregiver who had been living with the teen for the past three months. Adolescents were excluded if they were HIV infected, currently pregnant or had given birth within the past 90 days, or had a history of sexually aggressive behavior.

Figure 1. Project STYLE Consort.



Procedures

All procedures were approved by the Institutional Review Boards at each study location. For adolescents under the age of 18, both adolescent assent and parental consent were obtained. Consent was obtained for 18 year old adolescents. All enrolled adolescents completed a 60-90

minute audio computer-assisted self-interview (ACASI) on a laptop computer and were compensated $50 for completing the baseline assessment.

Measures

Adolescents reported on their age, gender, and race. For the present study, race was coded as White (1) or non-White (0).

An *internalizing symptom composite* (ISC) was generated using the Computerized Diagnostic Interview Schedule for Children (C-DISC-IV) to serve as a measure of the number of internalizing symptoms each participant endorsed. The C-DISC-IV is a structured audio computer-assisted diagnostic interview that screens for a full range of DSM-IV diagnoses (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The Present State Youth version was used with variable timelines for each diagnosis and for specific symptoms. Reliability and validity of the C-DISC are acceptable and represent the gold standard in the field (Shaffer et al., 2000). The following scales from the CDISC were assessed: Major Depressive Disorder (MDD), Generalized Anxiety Disorder (GAD), Post-traumatic Stress Disorder (PTSD), Mania, Hypomania, Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD). For the present study, preliminary analyses at the bivariate level of associations among internalizing symptoms (GAD, MDD, PTSD) and the primary outcome variable, safe sex intentions, indicated that PTSD symptoms were not significantly associated with safe sex intentions. PTSD was thus dropped from further analyses and not included in the ISC. The symptom counts for MDD and GAD were highly correlated at the bivariate level ($r = .62$, $p < .001$). Next, structural equation models were tested separately for GAD and MDD symptoms, and no differences were found in the paths of interest in the models. Thus, GAD and MDD symptom counts were combined into an ISC score in order

to extend the range of possible scores in the predictor variable in the primary analyses. The ISC was created by adding symptom counts that were generated for MDD and GAD (Range = 0-31).

The HIV Knowledge scale is comprised of 26 items answered "True" or "False" (Brown et al., 1997) which assess routes of transmission, information on testing, and common myths about HIV. Correct responses are summed to create a total score with higher scores indicative of greater HIV knowledge ($\alpha = .97$ for the study sample).

Worry about HIV was examined by a single item ("I feel nervous about HIV/AIDS). Response options included 3 = yes, 2 = sort of, and 1 = no. Higher scores indicate greater worry about HIV.

The Self-efficacy for HIV Prevention scale (Lawrance, Levy, & Rubinson, 1990), $\alpha = .89$ for study sample, assesses beliefs about engaging in HIV preventive behaviors and is comprised of 12 items. The measure includes items such as "How sure are you that you could tell your partner no?" or "How sure are you that you could ask a pharmacist where condoms are?" Answer options ranged from 1 = "I couldn't do it" to 4 = "very sure I could", with higher scores indicating greater self-efficacy for engaging in HIV prevention behaviors.

The Adolescent Risk Behavior Assessment (ARBA) (Donenberg et al., 2001) is designed to assess adolescent self-reported sexual and drug use behaviors (Dowling-Guyer et al., 1994; Needle et al., 1995; Weatherby et al., 1994) and has shown adequate test-retest reliability (Vanable et al., 2009). The ARBA employs a skip structure so that questions initially answered in the negative are not followed by more detailed questions. Sexual intercourse was defined as: "when a man inserts his penis into a woman's vagina" (vaginal intercourse) and "when you put

your penis in someone else's anus or butt, or that person puts his penis in your anus or butt" (anal intercourse). A history of vaginal or anal sexual activity was used to differentiate the sample into the sexually active or non-active group because these behaviors incur the greatest risk for HIV transmission. The outcome variable in the present study was participants' intentions to practice safe sex in the next 90 days. This definition of "safe sex" was provided to participants:

> These next questions are about safer sex. There are many ways to be safe when it comes to having sex. You can choose not to have any sexual activity (sometimes called abstaining from sex). Or you can do things like kissing, hugging, or touching your partner intimately instead of having sex (or going all the way), or using a condom every time you have vaginal, anal or oral sex. You're practicing safer sex as long as you do any of those things--no sexual activity, intimately touching your partner instead of having sex (going all the way), or using a condom every time you have vaginal, anal or oral sex.

All participants were asked to keep this description in mind and respond to a single item about safe sex intentions, which asked "In the next 3 months, how likely do you think it is that you will practice safe sex?" Response options ranged from 1 (very sure I won't) to 4 (very sure I will).

Data Analytic Strategy

Structural equation modeling (SEM) using Mplus 5.0 (Muthén & Muthén, 2007) was used to test the direct and mediated associations of depression and anxiety symptoms and personal factors on safe sex intentions. SEM is an accurate and efficient method for testing mediational models (Hoyle & Smith, 1994; Baron & Kenny, 1986) and well-suited to examine multiple mediators (Shadish & Sweeney, 1991). The sample was stratified by previous sexual experience, and separate models were run for each stratum. As preliminary analyses showed that separate models for GAD and MDD symptoms produced very similar results, these symptoms

were combined into the ISC score. Thus, two models were fit to the sample, one for participants who were not yet sexually active and one for those who reported previous sexual activity. Gender, race and age were included as control variables in both models.

The models (Figures 2 and 3) were parameterized such that intentions to have safe sex were regressed on HIV self-efficacy, HIV knowledge, worry about HIV/AIDS and the ISC. The hypothesized mediators (HIV self-efficacy, HIV knowledge, and worry) were also regressed on the ISC. Age, gender, and race were also entered as exogenous predictors of all of the other variables in the models. Because the hypothesized mediators were thought to be related, these measures were allowed to correlate with one another. The models used maximum likelihood estimation. Robust standard errors for direct and indirect effects depicted in the model were estimated using resampling methods (MacKinnon, Lockwood, & Williams, 2004). Both models were tested with and without the direct path from internalizing symptoms to safe sex intentions. This direct effect was non-significant in the model for non-sexually active youth, b = .02 (.01); z = 1.53, p = .13, 95% CI [-.00, .03], and for sexually active youth, b = -.01 (.01); z = -1.79, p = .07, 95% CI [-.02, -.00]. Thus, results are presented for the models including only indirect effects from internalizing symptoms to safe sex intentions, which permitted the assessment of model fit. Model fit indices included chi-square, root mean square error of approximation (RMSEA) and comparative fit index (CFI).

The average percentage of missing data on the variables included in the models was 3.9% (range = 0.7% - 9.2%). We used a series of independent samples *t*-tests and chi-square analyses to explore patterns of missingness among the primary variables of interest and found some differences between participants with missing values and those with complete data. Because

these data were from the baseline assessment, most missing data were at the item level, with few participants missing data for scales. For HIV prevention self-efficacy, participants were more likely to be missing data if they were younger, male, had never had sex, had fewer internalizing symptoms, and lower safe sex intentions. Participants were more likely to be missing data on the HIV worry item if they had fewer internalizing symptoms, and more likely to be missing data on the outcome variable, safe sex intentions, if they had never had sex or identified as Hispanic. Our data appeared to be primarily missing at random (MAR) and missing completely at random (MCAR); therefore, we used the Mplus software because it produces unbiased parameter estimates with data that are both MAR and MCAR (Little & Rubin, 2002) using full information maximum likelihood (FIML) estimation.

Results

Background Characteristics

Of the total baseline adolescent sample (N = 893), 56% were female, and participants ranged from 13 to 18 years old (M = 14.91, SD = 1.33). Racial composition of the sample was 67% African American/Black/Haitian, 30% White, 1% Native Hawaiian/Pacific Islander, 1% Asian, and 1% American Indian/Alaskan Native. Ethnic composition was 11% Hispanic/Latino. Household income was $30,000/ year or less for 62% of the participating families. Approximately 30% of participating adolescents had been psychiatrically hospitalized in the past 3 months. A history of vaginal or anal sex was reported by 55% of the sample (N = 490).

Table 1. Demographics and estimated means by sexual activity status

	Not Sexually Active[a]		Sexually Active[b]		
Variable	Est.	SE	Est.	SE	
Gender (N, %)					t = -2.32, p < .05
Male	158	47.9%	152	39.3%	
Female	172	52.1%	235	60.7%	
Race (N, %)					t = 1.83, p > .05
White	117	62.1%	115	68.8%	
All other ethnicities	192	37.9%	254	31.2%	
Age	14.33	.06	15.29	.06	t = -10.49, p < .001
ISC	10.02	.35	10.76	.34	t = -1.52, p > .05
HIV Self-Efficacy	38.57	.49	42.13	.34	t = -6.96, p < .001
Knowledge	11.11	.22	13.01	.17	t = -6.97, p < .001
Worry about HIV/AIDS	2.29	.04	2.34	.04	t = -.91, p > .05
Safe Sex Intentions	2.56	.07	3.46	.04	t = -11.69, p < .001

Note. [a]N = 398; [b]N = 490. Est. = estimated mean; SE = standard error.

Descriptive Information

Mean differences are listed in Table 1. Sexually active adolescents were more likely to be female and were older, on average. Sexually active adolescents also reported greater self-efficacy for HIV prevention, more HIV knowledge, and greater intentions to have safe sex. There were no differences in the number of internalizing symptoms between the two groups.

Pearson bivariate correlation analyses for variables included in the models were conducted separately for sexually active versus abstinent adolescents. Results are shown in Tables 2. For sexually non-active adolescents, results showed statistically significant associations between gender (0 = male, 1 = female) and internalizing symptoms and self-efficacy for HIV prevention. Race (0 = non-White, 1 = White) was associated with internalizing symptoms and HIV knowledge. Older age was associated with more internalizing symptoms, self-efficacy, and knowledge and less worry about HIV. Internalizing symptoms were positively associated with HIV knowledge and safe-sex intentions. Self-efficacy for HIV prevention and HIV knowledge were positively related to one another and to safe sex-intentions, and worry about HIV is negatively related to safe-sex intentions.

Table 2. Bivariate Correlations Among Key Variables For Sexually Active and Non-Active Participants

	1.	2.	3.	4.	5.	6.	7.	8.
1. Gender	-	-.08	.01	.18**	.16**	-.04	.07	.11
2. Race	.16**	-	.24**	.21**	-.03	.34**	-.25**	-.09
3. Age	-.05	.17**	-	.15**	.17**	.32**	-.16**	.12*
4. ISC	.30**	.22**	.03	-	-.06	.22**	.10	.12*
5. Self-Eff	-.09	-.12*	.12*	-.29**	-	.24**	-.00	.23**
6. Knowledge	.13**	.31**	.19**	.12**	.09	-	-.24**	.18**
7. Worry	-.03	-.25**	-.06	.02	-.03	-.24**	-	.13*
8. Safe Sex Int	-.07	-.13*	.05	-.18**	.28**	.01	.06	-

Note. ** $p < .01$. * $p < .05$. † $p < .10$. Numbers below the diagonal are correlations for sexually active youth; correlations for non-active youth are above the diagonal. Ns range from 274-395. Internalizing = internalizing symptoms. Self-Eff = Self-Efficacy for HIV Prevention. Knowledge

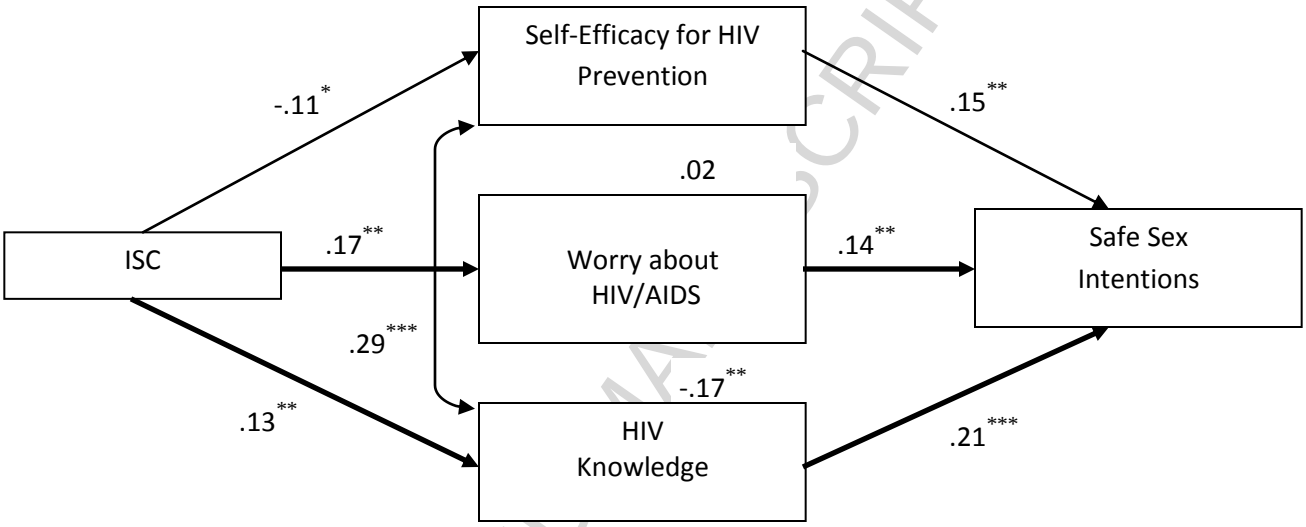
= HIV Knowledge. Worry = worry about HIV. Safe Sex Int = intentions to have safe sex in the next 3 months.

For sexually active adolescences, results suggest that being female was associated with more internalizing symptoms and HIV knowledge. White racial identity was associated with more internalizing symptoms and HIV knowledge, and negatively associated with HIV self-efficacy, worry about HIV/AIDS and safe-sex intentions. Being older was associated with more self-efficacy to prevent HIV and more HIV knowledge. Internalizing symptoms were positively related to HIV knowledge, and negatively associated with HIV self-efficacy and intentions to have safe sex. Self-efficacy for HIV prevention was positively associated with intentions to have safe sex, whereas HIV knowledge was not associated with safe sex intentions. Of note, while internalizing symptoms were associated with greater intentions to have safe sex among sexually non-active youth and lower intentions to have safe sex among sexually active youth at the bivariate level, these associations were non-significant at the multivariate level when we tested the direct path from internalizing symptoms to safe sex intentions in the final models.

Structural Equation Model for Sexually Non-Active Adolescents

The model for adolescents who report no previous sexual activity is depicted in Figure 2. We report standardized (β) coefficients in the figure, and unstandardized (b) coefficients in the text below for each examined pathway. The model provided good fit to the data (χ^2= 2.32, p > .05; RMSEA = .06; CFI = .99). Internalizing symptoms were related to self-efficacy for HIV prevention, b = -.13 (.07); z = -1.98, p < .05, 95% CI [-.24, -.02], worry about HIV/AIDS, b = .02 (.01); z = 3.23, p < .01, 95% CI [.01, .03], and HIV knowledge, b = .08 (.03); z = 2.72, p < .01, 95% CI [.03, .13]. HIV self-efficacy, b = .02 (.01); z = 2.59, p = .01, 95% CI [.01, .04], worry about HIV/AIDS, b = .23 (.09); z = 2.59, p = .01, 95% CI [.08, .37], and HIV knowledge, b = .07 (.02); z = 3.58, p < .001, 95% CI [.04, .10] were each related to safe sex intentions.

Figure 2. Model for sexually non-active adolescents.



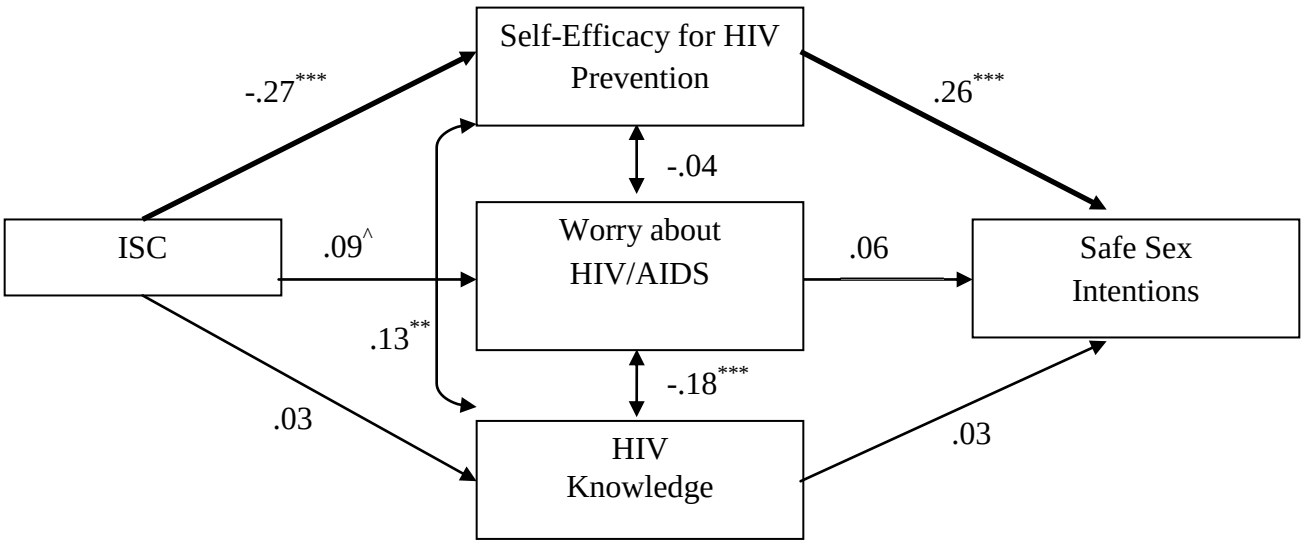
Note. Age, race and gender were included in the models as exogenous predictors of each of the other variables. For simplicity, these paths are not shown.

The indirect effect of internalizing symptoms on safe sex intentions through HIV knowledge was significant, b = .01 (.00); z = 2.17, p < .05, 95% CI [.00, .01]. The indirect effect of internalizing symptoms on safe sex intentions through worry about HIV/AIDS was also significant, b = .01 (.00); z = 2.02, p < .05, 95% CI [.00, .01]. Although there were significant paths from the ISC to self-efficacy and from self-efficacy to safe sex intentions as reported above, we did not find a significant indirect effect of internalizing symptoms on safe sex intentions via self-efficacy for HIV prevention, b = -.00 (.00), z = -1.58, p > .05, 95% CI [-.01, .00].

Structural Equation Model for Sexually Active Adolescents

The model for adolescents who reported previous sexual activity is depicted in Figure 3. The model provides good fit to the data (chi-square = 3.20, p = .07, RMSEA = .07, CFI = .99). Internalizing symptoms were related to HIV self-efficacy, b = -.24 (.04); z = -5.75, p < .001, 95% CI [-.30, -.17], and to worry about HIV/AIDS at the trend level, b = .01 (.01); z = .90, p = .058, 95% CI [.00, .02]. We did not find a significant association between internalizing symptoms and HIV knowledge, b = .02 (.02); z = .64, p > .05, 95% CI [-.02, .06]. Safe sex intentions and HIV self-efficacy were related, b = .04 (.01); z = 5.61, p < .001, 95% CI [.03, .05]. Safe sex intentions were not significantly associated with HIV knowledge, b = .01 (.01); z = .54, p > .05, 95% CI [.-.01, .02], or with worry about HIV/AIDS, b = .06 (.05); z = 1.20, p > .05, 95% CI [.-.02, .14]. The indirect effect of internalizing symptoms on safe sex intentions through HIV self-efficacy is significant, b = -.01 (.00); z = -4.00, p < .001, 95% CI [-.01, -.01]. We found no significant indirect effect for internalizing symptoms on safe sex intentions via worry about HIV/AIDS, b = .00 (.00); z = 1.02, p > .05, 95% CI [.00, .00], or through HIV knowledge, b = .00 (.00); z = .41, p > .05, 95% CI [.00, .00].

Figure 3. Model for sexually active adolescents.



Note. Age, race and gender were included in the models as exogenous predictors of each of the other variables. For simplicity, these paths are not shown.

Discussion

This study extends prior work by shedding light on the mechanisms that link depression and anxiety symptoms and intentions to have safe sex in adolescence (e.g., Brown et al., 2006). Elucidating these potentially mediated pathways is a vital step in advancing the field as prior research has been largely mixed. This study suggests that the inconsistent findings reported in the literature may be due, in part, to the indirect nature of the relation between depression and anxiety symptoms and sexual risk, as well as lack of attention paid to separating youth with prior sexual experience from those without.

Our findings suggest that a history of sexual activity is an important factor to consider when examining safe sex intentions. At the bivariate level, more depression and anxiety symptoms are associated with greater intentions to have safe sex for youth who were not yet sexually active, but with lower intentions to have safe sex for sexually active youth. This difference may reflect the distinct mediating pathways between youth with and without sexual experience. As hypothesized, HIV prevention self-efficacy, worry about HIV/AIDS and HIV knowledge each mediate the associations between depression and anxiety symptoms and intentions to have safe sex, but the mediators differed according to participants' history of prior sexual activity. Results indicate that greater depression and anxiety symptoms may protect against sexual risk through greater HIV knowledge prior to the onset of sexual activity. Without firsthand experience of sexual activity, adolescents who are experiencing symptoms of anxiety or depression may be driven by curiosity or concern to seek out information related to safe sex and

HIV transmission. This may further consolidates their commitment to safe sex, through either abstaining from sex or negotiating condom use if they decide to have sex.

These results also support our hypothesis regarding a link between more depression and anxiety symptoms, more worry about HIV and greater intentions to have safe sex, but only for sexually non-active adolescents. Indeed, as previous authors have suggested (Brown et al., 1997), adolescents with depression and anxiety symptoms may feel more nervous about HIV/AIDS, increasing their motivation to have safe sex and even planning to remain abstinent for the foreseeable future (Silver & Bauman, 2006). After sexual initiation, however, HIV knowledge and worry no longer play a significant role in safe sex intentions. Instead, more depression and anxiety symptoms are associated with lower intentions to have safe sex via reductions in self-efficacy to prevent HIV. Adolescents who have prior sexual experience and feel anxious or depressed may reflect on their difficulties with being sexually assertive and feel ineffective about ensuring safe sex. Having firsthand knowledge of the sexual context on which to base their intentions, they may base these intentions on their perception of their own ability to use *skills*, such as acquiring condoms, communicating with a partner about sexual history or setting sexual limits, rather than on HIV-related feelings or cognitions, such as worry or knowledge. In other words, thoughts and feelings may be more salient for young people with internalizing symptoms before they become sexually active, whereas self-efficacy for HIV-preventative behaviors are more salient for sexually active youth.

Clinical Implications

These findings have important clinical implications for interventions and services for adolescents. The present results suggest that personal attitudes, including knowledge, worry and self-efficacy related to HIV, are important targets for HIV prevention programming aimed at adolescents with internalizing (depression and anxiety) symptoms. It is important to note that the significant indirect effects in our models suggest that the association between internalizing symptoms and safe sex intentions goes beyond possible group differences in HIV-related attitudes:. The present results provide evidence for mediational models which, when tested longitudinally, could provide a clear mechanism for intervention with youth you report internalizing symptoms and may be at risk for risky sexual behavior.

It is also important to acknowledge different mechanisms for sexually active and non-active adolescents when designing interventions. Notably, more depression and anxiety symptoms are associated with fewer intentions to have safe sex for sexually active adolescents, but with greater intentions to have safe sex for sexually non-active young people. For adolescents who are already sexually active and have symptoms of anxiety or depression, increasing skills (e.g., condom negotiation) and self-efficacy may be most salient, for example by teaching and role-playing assertive condom negotiation skills. However, increasing knowledge and concern about personal vulnerability to HIV by providing factual information on HIV and its transmission may be most effective for increasing safe sex intentions among non-active adolescents with depression and anxiety symptoms. For example, prior research has shown that adolescents who are not yet sexually active have less knowledge about HIV than their sexually active peers (Silver & Bauman, 2006).

Limitations

This study has several limitations. These data are cross-sectional and thus causal effects cannot be inferred. However, SEM provides a framework for understanding conceptual model relationships (Hoyle & Smith, 1994), providing insight into mediational processes which could subsequently be tested longitudinally (MacKinnon, 2008). In other words, we predict that temporal causal associations will exist from internalizing symptoms, to HIV attitudes, to safe sex intentions, and began testing this prediction by evaluating the cross-sectional model as an important first step in the present study. The fit of our model and significant indirect paths provide promising evidence that we may find similar associations when we examine the model over time. However, it is important to acknowledge that we have not established temporal precedence and therefore cannot infer directionality in the present model. It is possible that, for example, worrying about HIV could cause a young person to endorse more symptoms of anxiety, or planning to abstain from sex could make an individual feel more efficacious about prevention HIV.

The present sample is diverse in terms of race and gender. Although gender and race were included as control variables in the model, the model was not examined separately for male and female adolescents or for adolescents from different ethnic backgrounds. All of the measures in this study are self-reports. However, these data were collected using ACASI, a reliable method for collecting information about behavior related to sensitive topics (Weinhardt et al., 1998). It is also important to note that the participants comprise a clinical sample of adolescents receiving mental health treatment, which is appropriate given the current study's focus on depression and anxiety symptomatology. Although our sample is from the largest study of sexual risk among youth in mental health treatment and was quite diverse, it consisted of young people who

enrolled to participate in an HIV prevention intervention in three urban locations and may not generalize to all youth who receive mental health services.

In the present study, "safe sex" was defined as either abstaining from intercourse or using a condom. Therefore, participants may have endorsed an intention to have safe sex because they did not believe they would have the opportunity to engage in sexual activity with a partner in the next three months, because they were committed to practicing abstinence for the next three months, or because they intended to use a condom every time they had intercourse in the next three months. These possibilities limit our ability to draw conclusions about the specific thought processes underlying our mediation model for adolescents with anxious and depressive symptoms. For example, a depressed young person might intend to practice safe sex because he or she doubts that there will be an opportunity to have sex. However, we know that teens with internalizing symptoms are prone to sexual risk-taking (e.g., Brown et al., 2006), and our results do suggest that HIV-related personal attitudes are associated with safe sex intentions. We did not control for perceived sexual opportunity in the next three months because from an HIV prevention standpoint, abstinence and consistent condom use both reduce risk, regardless of why a teen is abstinent or chooses to use protection. In addition, while single-item measures of psychosocial variables can be as reliable and valid as multiple-item scales (see Zimmerman et al., 2006), it is possible that using single items to assess HIV worry and safe sex intentions may limit our findings.

The present analyses of depression and anxiety symptoms are limited to symptoms of MDD and GAD. PTSD was not examined in this study as the data revealed no significant link between PTSD symptoms and intentions for sex. This finding was somewhat unexpected since

prior research has found traumatic events, such as peer sexual coercion, to be associated with increased risky sexual behavior in adolescence (Young, Furman, & Jones, 2012). However, other studies have shown no association between PTSD and sexual HIV risk behaviors (Stiffman et al., 1992; Marshall et al., 2013) among adults. It may be that PTSD confers risk for sexual activity in the context of interpersonal trauma rather than other forms of trauma. Future research is needed to examine the intricacies of these relationships. Relatedly, links between intentions to have safe sex and symptoms of other internalizing disorders, such as panic disorder and social anxiety, may prove quite different than those observed here. Finally, co-occurring externalizing symptoms or other factors such as substance use and coping styles may impact the sexual risk behavior of adolescents with depression and anxiety symptoms and were not examined in this study, as they have been the focus of previous research (Brown et al., 2010).

Conclusions and Future Study

In sum, this study adds to the literature on the links between depression and anxiety symptoms and sexual risk among adolescents by elucidating the mechanisms that connect anxiety/depression symptoms and intentions for safe sex among adolescents in mental health treatment. Future research could extend the model tested in the present study to include other psychosocial factors, such as peer and family norms (Donenberg & Pao, 2005), as well as examine the impact of other depression and anxiety symptoms and/or comorbidity. In addition, examining longitudinal associations will further clarify the links among internalizing symptoms, personal factors, safe sex intentions and actual sexual risk behaviors.

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Highlights

- Adolescents receiving mental health treatment are at increased risk for HIV.
- We test a mediation model linking internalizing symptoms and safe sex intentions.
- HIV worry and HIV knowledge mediate this link for teens who have not had sex.
- HIV prevention self-efficacy mediates the link for teens who have already had sex.
- Our results inform HIV prevention for teens with anxious and depressive symptoms.