


Article

Childhood Adversity, Impulsivity, and HIV Knowledge as Predictors of Sexual Risk Outcomes in At-Risk Female Youth

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Abstract: Sexual risk behavior in adolescence can lead to adverse health consequences, particularly for female youth. Most interventions focus on imparting knowledge about the consequences of such behaviors, even though little research has examined whether increasing such knowledge results in desired behavioral changes. Further, individual factors such as impulsivity and childhood adversity might moderate this relationship. We examined associations between HIV knowledge and sexual risk behavior and condom use efficacy in a sample of 122 at-risk females, aged 13–18. HIV knowledge was unrelated to sexual risk behavior, but positively related to condom use efficacy. Impulsivity and childhood adversity had direct effects, with no interaction effects. Increasing HIV knowledge may play an important role in promoting proximal predictors of safer sex practices.

Keywords: HIV knowledge; condom use efficacy; sexual risk behavior; adolescent; females; adverse childhood experiences; impulsivity

1. Introduction

Although sexual behavior is considered to be a normative aspect of youth development [1], engagement in sexual risk behaviors such as unprotected sexual intercourse can have adverse long-term consequences, including contraction of HIV and other sexually transmitted infections (STIs) and unintended pregnancies. Youth between the ages of 15 and 24 account for 1 in 5 new HIV infections and half of the 20 million new STIs diagnosed annually in the United States (US), even though they comprise only a quarter of the sexually active population [2]. They are also the least likely age group to be aware of their HIV status [3]. In fact, 51% of HIV-positive youth are unaware of their HIV status, highlighting the importance of research focused on effective, youth-specific HIV prevention and intervention efforts. Although the majority of new HIV infections among youth occur in gay and bisexual males, female youth comprise 13% of new HIV infections diagnosed each year in the US and have been a historically overlooked group in HIV research and prevention efforts [4].

Among female youth under age 25 who test positive for HIV, approximately 85% contract the virus through heterosexual intercourse [3]. When compared to their male counterparts, female youth and young women are significantly more likely to contract HIV through heterosexual sex due to (a) biological susceptibility linked with important differences in their mucosal immunology [5] and (b) socio-cultural factors, including unequal distribution of power when negotiating safe-sex practices (particularly with older male partners) and gender-based violence [6,7]. In addition to being at increased risk for HIV infection, female youth and young women often bear disproportionate health consequences related to sexual risk behavior, including pelvic inflammatory disease linked with ectopic

pregnancy, infertility, and chronic pelvic pain [8], and unintended pregnancy [9]. Given female youths' elevated susceptibility for HIV and STI contraction and increased risk for serious health consequences, it is important to identify risk and protective factors that can be targeted in prevention programming to improve their sexual health outcomes.

Although cognitive behavior skills training approaches have been efficacious in reducing HIV risk behavior [10], there is ongoing debate regarding which aspects of this training (e.g., increasing HIV knowledge, teaching behavioral change techniques, role-playing safe sex practices with a partner) are most effective at reducing sexual risk behaviors [11]. A primary focus of cognitive behavioral interventions is to increase individual knowledge related to the consequences of sexual risk behavior and the efficacy (or lack thereof) of various methods for reducing HIV/STI risk (e.g., condom use, birth control pill). Little research, however, has examined if improving HIV knowledge, in particular, is associated with lower rates of sexual risk behavior and greater condom use efficacy. This is a critical step in advancing our understanding of whether knowledge-based interventions are effective, especially in populations who are under-served and at higher risk of HIV/STI contraction, such as female youth involved in the juvenile justice system or receiving social service system supports. Further, considering that both early adversity [12–14] and impulsivity [15] have been linked to disproportionately high rates of engagement in sexual risk behavior, it is important to test if the potential protective effects of HIV knowledge remain significant regardless of the levels of these risk factors.

Our study analyzed data from a sample of female youth who were either involved in the juvenile justice system or were receiving social support services through local community agencies and schools, to examine the association between HIV knowledge and sexual risk behavior and condom use efficacy. We also tested whether the potential protective effects of HIV knowledge were moderated by early adversity and impulsivity.

1.1. HIV Knowledge as a Predictor of Sexual Risk Behavior

Promoting knowledge of safe sexual practices, including HIV knowledge, has been central to successful HIV prevention and sexual health promotion efforts among youth [16,17]. In a review of HIV/AIDS knowledge measures, Hughes and Admiraal [16] pointed to the troubling lack of psychometrically sound measures of HIV knowledge, identifying the general HIV/AIDS knowledge questionnaire developed by Carey, Morrison-Beedy, and Johnson [18] as a reliable and valid measure. A shortened version of this measure (HIV-KQ) was subsequently developed and tested to minimize respondent burden, demonstrating strong levels of internal consistency and test-retest reliability [19]. Nevertheless, this measure has not been widely used and no study to date has examined its relation to sexual risk behaviors, especially among under-studied female youth at risk (e.g., those involved in the juvenile justice system). Of the few studies that have examined the association between the HIV-KQ measure and sexual risk behaviors in female youth, the findings have been inconsistent. For instance, Morrison-Beedy, Carey, Feng, and Tu [20] examined this association among a sample of 102 sexually active emerging adult women (ages 18–21) who were recruited primarily from family planning agencies. HIV knowledge was assessed at baseline, and young women were asked to complete daily diary cards indicating their engagement in sexual activity for 12 weeks. Results indicated that greater HIV knowledge was prospectively associated with protected vaginal intercourse. In contrast, using cross-sectional data from a predominantly low-income sample of 1658 African American male and female youth, Swenson et al. [21] found that increased HIV knowledge was associated with fewer safe sex acts, even after controlling for socio-demographic and psychological constructs. Given these conflicting findings and the dearth of research on the link between HIV knowledge and sexual risk behavior among female youth at risk, we used a psychometrically valid measure of HIV knowledge to examine its association with sexual risk behaviors (e.g., unprotected intercourse, intercourse with multiple partners) and condom use efficacy among female youth who were involved in the juvenile justice system or receiving services from local agencies.

1.2. HIV Knowledge as a Predictor of Condom Use Efficacy

In addition to determining the direct effect of HIV knowledge on engagement in sexual risk behavior, it is also important to understand the impact of increased HIV knowledge on known predictors of protective sexual behavior among females. One such predictor, condom use efficacy, which reflects the degree to which an individual believes that they have the ability to use a condom during sexual intercourse even in the face of contextual challenges (e.g., partner refusal; unequal sexual decision-making power in relationships), has been linked with consistent condom use in both youth and adults [22–24]. French and Holland [25], for instance, found increased condom use efficacy to be positively associated with increased condom use consistency among undergraduate students. Further, they found that condom negotiation strategies (e.g., withholding sex, direct request, use of seduction) mediated the relationship between condom use efficacy and condom use consistency. This finding suggests that increased condom use efficacy leads to increased confidence in one's ability to use strategies to convince an unwilling or resistant partner to use a condom and, thus, more engagement in protective sexual behavior overall.

Understanding ways to improve engagement in consistent condom use is particularly salient considering that only 54% of sexually active youth in the US report using condoms during their last intercourse [26]. This trend is even more concerning for female youth, with only 46.9% of female youth reporting condom use at the time of their last sexual encounter (compared to 61.3% of male youth). Research has shown that female youth often face unique challenges when negotiating condom use such as unequal power dynamics in relationships with men (e.g., partner coercion or refusal to use a condom) and gender-based violence that limit their ability to use condoms [27,28]. Thus, improving female youths' self-efficacy to negotiate condom use may play a critical role in reducing negative sexual health outcomes.

Identifying antecedents of condom use efficacy is a critical step in developing effective interventions aimed at improving sexual health outcomes, particularly for female youth. Social Cognitive Theory posits that knowledge of risks to sexual health is an important precondition for behavior change, underscoring the idea that individuals are unlikely to be motivated to change established patterns of behavior if they are unaware of their risk for HIV contraction and the associated health consequences [29]. Although accurate HIV knowledge could be an important precondition for behavior change, little research has examined the relationship between HIV knowledge and known predictors of protective sexual behavior such as condom use efficacy, particularly among female youth [30]. Prior research with samples of sexually active adult women [31] and early adolescents from rural backgrounds [30] has found that condom use knowledge is positively linked to condom use self-efficacy. However, these findings warrant replication because the measures used to assess condom use knowledge in these past studies demonstrated low reliability [30].

1.3. Adverse Childhood Experiences (ACEs) and Sexual Risk Behavior

In addition to examining the direct effects of HIV knowledge on sexual risk behavior and condom use efficacy, it is also important to test whether other well-established risk factors such as early adversity and impulsivity may moderate these effects. Female youth who have a history of experiencing child maltreatment or early adversity are at greater risk for engaging in sexual risk behavior compared to female youth without such early adverse experiences [14]. For example, in a large nationally representative sample of young adult women, Hahm, Lee, Ozonoff, and Van Wert [12] found a significant cumulative relationship between increased exposure to multiple types of maltreatment and increased risk for STI diagnosis, early sexual contact, and trading sex for money. Further, research focused on ACEs, a cumulative measure of childhood abuse, neglect, and household dysfunction [32], has documented similar findings, linking ACEs with a variety of health-risking behaviors [33], including sexual risk behaviors such as early sexual debut, considering oneself at risk for HIV, and having had 30 or more sexual partners [31]. Some groups of female youth, such as females involved in the juvenile justice system, have been shown to be at particular risk for sexual risk behavior, as they have

higher rates of exposure to early adversity, trauma, and multiple trauma types when compared to female youth in the general population [34–36]. Not surprisingly, they demonstrate disproportionately high rates of sexual risk behavior when compared to females not involved in the justice system [37]. One limitation of ACEs research, thus far, has been its primary reliance on the retrospective accounts from adults, presenting concerns related to accuracy of adult recall [38]. However, retrospective recall is less likely to be an issue among younger participants, such as those included in this study. Understanding whether the potential effects of HIV knowledge on sexual risk behavior and condom use efficacy are moderated by early adversity will provide critical information about the utility of knowledge-based interventions for youth who have experienced ACEs.

1.4. Impulsivity and Sexual Risk Behavior

Impulsivity, defined as, “a tendency to make quick decisions without devoting much thought to the associated consequences,” is a strong predictor of sexual risk behaviors among youth [39,40]. Meta-analytic studies also document a small, yet consistently significant, relationship between impulsivity and sexual risk behavior during adolescence [15]. Further, this association was moderated by gender such that the association was more robust among female samples (average effect of $r = 0.16$ for males and $r = 0.24$ for females) [15]. Although there is evidence to suggest that high levels of impulsivity may negatively impact treatment effectiveness for reducing other risk behaviors such as substance use [41,42], little research has examined how impulsivity may impact a youth’s ability to benefit from HIV knowledge. To better understand whether interventions that target HIV knowledge can reduce sexual risk behavior for all youth, even those with elevated impulsivity, it is important to test if the potential effects of HIV knowledge on sexual risk behavior and condom use efficacy are moderated by impulsivity.

1.5. Current Study

This study uses a community sample of female youth who were either involved with the juvenile justice system or receiving social supports through local community agencies and schools to address the following research questions: (a) Is HIV knowledge significantly associated with sexual risk behavior among this sample of female youth, controlling for the effects of age, ACEs, and impulsivity? (b) Is HIV knowledge significantly associated with self-reported condom use efficacy among female youth who report having a romantic partner, controlling for the effects of age, ACEs, and impulsivity? and (c) Are any identified associations between HIV knowledge and sexual risk and condom use efficacy moderated by ACEs or impulsivity? We hypothesized that greater accuracy of HIV knowledge would be negatively related to sexual risk behavior and positively associated with condom use efficacy. Additionally, we expected that ACEs and impulsivity would moderate the association between HIV knowledge and sexual risk behavior such that the protective effects of HIV knowledge would be weaker for female youth with higher impulsivity or higher ACEs scores.

2. Materials and Methods

2.1. Participants

The sample included 122 female youth who were part of a randomized controlled trial of a social and relationship skill-based intervention called the “Safe, Healthy, Adolescent Relationships and Peers (SHARP)” intervention ([ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT02420548) identifier: NCT02420548). The intervention included two components: (1) a caregiver parenting group that met weekly for 90-min for four months, focused on increasing parenting skills, and (2) a life coach component where trained and supported skills coaches met individually with youth weekly for 60 min over the same four-month period to build the youth’s social skills and peer/partner relationship skills. Analyses in this study used the baseline data, collected prior to the random assignment of participants to the intervention or control condition. Mean age of youth at baseline was 15.4 years ($SD = 1.48$), with slightly less than two-thirds (62.8%; $n = 76$) recruited

from the Department of Youth Services (DYS), and the remaining from schools and community agencies serving female youth in Lane County, Oregon. Fliers were distributed to local schools, community service organizations, and the department of youth services. Families were invited to contact the study team to learn more and to sign up for participation. A study team member then contacted the family by phone to describe the study, and if families were interested in participating, a home visit was scheduled.

We collected youth's age and other demographic information such as family income, parents' level of completed education, and family structure (single parent versus two-parent households) from self-report from caregivers. Additionally, youth were asked to report their own racial and ethnic identity. The majority of the sample comprised youth who were non-Hispanic Whites (62.3%), with the remainder reporting to be Biracial or Multiracial (13.1%), Hispanic or Latina White (8.2%), African American/Black (7.4%), Asian American (2.5%), Native American (2.5%), and Pacific Islander (1.6%). Approximately 2.5% of participants did not report or declined to provide their race or ethnicity. Caregivers' report of highest level of education completed indicated that 10% of caregivers had not graduated from high school, 18.3% had a high school diploma or GED, 20.8% had attended some college, 17.5% had an associate's or technical degree, and 33.4% had a bachelor's degree or higher. In addition, approximately one-third of the sample reported annual earnings under \$USD 20,000, one third reported annual earnings between USD 20,000 and USD 39,999, and the remaining third reported annual earnings of USD 40,000 or higher. The majority of youth were cared for by their biological parent(s) (77.7%), and the remaining youth were raised by relatives (7.5%), foster parents (5%), or adoptive parents (9.9%). Study inclusion criteria included: female youth between the ages of 13–18, living with a primary caregiver in a Pacific Northwest county within an hour of the research site, and caregiver and youth proficiency in English or Spanish. Participant assent and caregiver informed consent were individually obtained in-person during the home visit prior to study participation. The study protocol was approved by the institutional review board at the university where this research was conducted. If either the youth or the caregiver did not wish to participate, they were not enrolled in the study. Youth and caregivers separately completed all measures on tablet computers provided to them by trained research interviewers during in-person interviews.

2.2. Measures

HIV-Knowledge Questionnaire (HIV-KQ-18). Participants' factual knowledge about HIV and HIV prevention was assessed using the 18-item HIV knowledge questionnaire [19]. Response options included 'True', 'False', or 'Don't Know'. Correct responses received a score of 1, incorrect were scored as 0, and partial credit (0.5 points) was given for the 'Don't know' responses. Total scores ranged from 0–18 ($\alpha = 0.89$), with youth answering an average of 9 items correctly, $M = 8.96$, $SD = 5.04$.

Adverse Childhood Experiences Screening Tool (ACE-ST). The ACE-ST is a shortened version of the original ACEs measure developed by Felitti et al. [32], consists of 10 items that measure childhood exposure to abuse (e.g., physical, sexual, and emotional), neglect (e.g., physical and emotional), and household dysfunction (e.g., parental divorce, substance abuse, mental illness, incarceration, or exposure to domestic violence). The ACE-ST has been found to demonstrate adequate internal consistency and good construct validity [43]. For instance, Wingenfeld [44] examined the psychometric properties of the ACE-ST in a German sample, finding evidence for good internal reliability ($\alpha = 0.76$) and concurrent validity ($r = 0.84$) between the ACEs screening tool and another validated self-report measure of early adversity, the Childhood Trauma Questionnaire (CTQ). In this study, youth were asked to read each ACE item, and then tally and sum the number of ACEs to which they had been exposed, ranging from 0 (no ACEs) to 10 (had experienced all 10 forms of early adversity captured in this measure), and provide their total ACE score. The mean ACE score for our sample was 3.08 ($SD = 2.33$), indicating that, on average, youth had experienced about 3 ACEs (e.g., physical/emotional/sexual abuse, divorce) during their lifetime.

Barratt Impulsiveness Scale (BIS-11). Impulsivity was assessed using the BIS-11 scale [45] which includes 30 items (e.g., “I do things without thinking”) rated on a four-point Likert scale (1 = Rarely/Never to 4 = Almost Always/Always), with higher scores indicating greater impulsivity. The BIS-11 is a widely used, psychometrically sound, self-report instrument used to assess the construct of impulsivity [46]. Five items from the original scale were dropped because they focused on job security, residence changes, and trip planning that are more relevant for adults and are typically under the control of the parent rather than youth. We used the total score from the remaining 25 items in our models ($\alpha = 0.75$).

Sexual Risk Behavior. Youth completed the Sexual Experiences Survey [47], which served as our outcome measure of the youths’ experiences with sexual activity and health-risking sexual behavior. The Sexual Experiences Survey was developed to measure sexual risk-taking among youth. Capaldi and colleagues [47] included items in this measure only if they demonstrated adequate internal consistency ($\alpha > 0.60$) and convergence with other indicators designed to capture the same construct (factor loading for a one-factor solution was 0.30 or higher). In our study, we standardized and averaged 8 items of sexual risk behaviors from this survey to compute a Sexual Risk Behavior Index [48], which has demonstrated adequate internal reliability in other samples of female youth ($\alpha = 0.67$). The index includes the following 8 items: engagement in any sexual activity, use of safe sex practices, number of partners, number of sexual partners, frequency of kissing, touching above the waist, touching below the waist, and being pressured to go further sexually. The sexual risk behavior index demonstrated high internal reliability in our sample ($\alpha = 0.89$).

Condom use efficacy. Condom use efficacy was assessed only among youth who reported having a romantic partner (currently or in the past 6 months), using a four-item subscale from the Sexual Health Questionnaire [49]. The items focused on condom knowledge and ease of use (e.g., having a condom if having sex, ease of use, believing that condoms are good protection), and were assessed on a four-point Likert scale (*strongly disagree* to *strongly agree*). The scores were averaged to create a composite ($\alpha = 0.72$), with higher scores representing greater efficacy using condoms.

Age. The youth’s age was collected using her self-report at the baseline assessment.

2.3. Analytic Approach

We used Pearson’s r correlation statistic and t-tests to evaluate the significance of bivariate associations. For our final models, we used ordinary least squares (OLS) regression with full information maximum likelihood to account for missing data, and robust standard errors to account for any violations of normality. Our models predicting condom use efficacy focused only on the subsample with a romantic partner ($n = 67$). All analyses were conducted using STATA 16.0 (StataCorp, College Station, TX, USA).

3. Results

3.1. Bivariate Associations

Bivariate correlations and means and standard deviations are reported in Table 1. Age and impulsivity were significantly associated with HIV knowledge, with older youth reporting greater HIV knowledge than younger youth ($r = 0.30, p < 0.001$), and those with higher impulsivity scores demonstrating less accurate HIV knowledge as compared to their counterparts with lower scores on impulsivity ($r = -0.21, p = 0.02$). ACEs scores were not significantly related to HIV knowledge ($r = -0.00, p = 0.96$), but were positively associated with sexual risk behavior ($r = 0.31, p < 0.001$). HIV knowledge was significantly and positively associated with sexual risk behavior ($r = 0.24, p = 0.008$). It was also significantly and positively associated with condom use efficacy ($r = 0.34, p = 0.01$) among the sub-sample who had a romantic partner (currently, or within the past 6 months).

Table 1. Mean (SD) and Correlations between Study Variables.

Variable Name		1	2	3	4	5	6
1	Age (in years)	—					
2	Impulsivity (BIS-11)	−0.06	—				
3	ACE score	0.10	0.14	—			
4	HIV-K	0.30 ***	−0.21 *	−0.003	—		
5	Sexual risk	0.52 ***	0.16 †	0.31 ***	0.24 **	—	
6	Condom use efficacy ^a	0.02	0.11	−0.02	0.34 *	−0.27 †	—
Mean (SD); Range		15.40 (1.48); 13.02–18.09	57.55 (8.23); 35–88	3.08 (2.33); 0–10	0.69 (0.16); 0.25–1.00	0.01 (0.73); −0.81–2.10	3.18 (0.58); 1.5–4.0

Note. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$. ^a Condom use efficacy was only assessed for participants who reported being in a romantic relationship in the past 6 months ($n = 67$). BIS-11 = Barratt Impulsiveness Scale; ACE = Adverse Childhood Experiences; HIV-K = HIV Knowledge.

3.2. Regression Analysis

To test our first hypothesis, we examined whether HIV knowledge was significantly associated with sexual risk behavior, accounting for the effects of age, ACEs, and impulsivity. HIV knowledge was positively associated with sexual risk behavior, but the effect was not significant at $p < 0.05$, $B (SE) = 0.65 (0.33)$, $\beta = 0.14$, $p = 0.05$. All the covariates (age, ACEs, and impulsivity) were significantly and positively associated with sexual risk behavior (see Table 2). Including age as a covariate resulted in a reduction in significance of the effect of HIV knowledge on sexual risk behavior from $\beta = 0.29$ to $\beta = 0.14$ ($p = 0.05$). Overall, our model explained 33% of variance in sexual risk behavior, of which HIV knowledge accounted for 6%.

Table 2. Unstandardized Regression Coefficients and Standard Errors Associated with Model Pathways.

Predictor Variable	Outcome Variables	
	Sexual Risk ($n = 121$)	Condom Use Efficacy ($n = 67$)
HIV Knowledge	0.65 (0.33), $p = 0.05$	1.68 (0.42), $p < 0.001$
Covariates		
Age (in years)	0.23 (0.04), $p < 0.001$	−0.01 (0.05), $p = 0.80$
Impulsivity (BIS-11)	0.02 (0.01), $p < 0.05$	0.02 (0.01), $p < 0.05$
ACE score	0.07 (0.03), $p < 0.01$	−0.02 (0.03), $p = 0.57$

Our second hypothesis examined whether HIV knowledge was associated with self-reported condom use efficacy among the sub-set of participants ($n = 67$) who had a romantic partner (currently or in past 6 months). Accounting for the effects of age, ACEs, and impulsivity, greater HIV knowledge was associated with higher condom use efficacy among youth in a romantic relationship, $B (SE) = 1.68 (0.42)$, $\beta = 0.41$, $p < 0.001$. HIV knowledge alone explained 12% of variance in the condom use efficacy outcome variable.

Our third set of analyses tested whether the associations between HIV knowledge with sexual risk behavior and condom use efficacy were moderated by ACEs or impulsivity. We did not detect a significant moderating effect for either ACEs or impulsivity. This suggests that regardless of level of impulsivity or history of ACEs, youth who scored higher on HIV knowledge also reported greater condom use efficacy.

4. Discussion

This study examined the associations between HIV knowledge and outcomes of sexual risk behavior and condom use efficacy in a sample of female youth who were either involved with the juvenile justice system or receiving social supports through local community agencies and schools.

We also tested the role of impulsivity and ACEs as potential moderators of the associations between HIV knowledge and sexual risk behavior and condom use efficacy. Contrary to our first hypothesis of finding a protective effect of HIV knowledge on sexual risk behavior, we found a trend-level positive association between HIV knowledge and sexual risk behavior. In support of our second hypothesis, we found a significant positive association between HIV knowledge and condom use efficacy, indicating that among youth who were in romantic relationships, those who reported higher levels of HIV knowledge also reported greater confidence in their ability to use a condom as compared to those who reported low levels of HIV knowledge. Finally, our third hypothesis, that impulsivity and exposure to early adversity would moderate the relationships between HIV knowledge study outcomes, was not supported. Nevertheless, impulsivity and ACEs had independent effects on the outcomes.

Given the cross-sectional nature of our data, the positive bivariate association observed between HIV knowledge and sexual risk behavior could indicate that youth who were engaging in more sexual risk behaviors were also more likely to get exposed to HIV knowledge through health center visits or other information sources. Accounting for the effects of the covariates, in particular, age, the association between HIV knowledge and sexual risk behavior was no longer significant. This reduction in significance may have been attributable to our small sample size, although similar findings have been reported by others using cross-sectional data [21,50,51]. For instance, using a large, cross-sectional sample of 648 low-income African American youth, Swenson et al. [21] reported a negative association between HIV knowledge and proportion of safe sex acts, controlling for age.

There are several possible reasons for the pattern of association we identified between HIV knowledge and sexual risk behaviors. First, it is plausible that female youth who are more sexually experienced may have had greater opportunity to acquire HIV knowledge through interactions with health care professionals (e.g., medical visits sought out for gynecological care, birth control acquisition, or STI treatment), exposure to interventions targeting sexually active youth, and/or through their experience negotiating and seeking out relevant information related to their own sexuality. Individuals in our sample were all receiving social services at the time of the baseline assessment, and it is quite likely that sexual and reproductive health information was provided as part of these services. Given the cross-sectional nature of this study, it is difficult to ascertain if youth with greater HIV knowledge are engaging in more sexual risk behaviors, or those who are more sexually experienced are being exposed to or seeking out sexual health information, including HIV knowledge. It may also be the case that this finding is unique to our sample and may not be generalizable to female youth who are not involved in social service systems.

Regardless of their level of HIV knowledge, female youth may still find it difficult to engage in safe sex given traditional gender norms and gender-related inequities that grant more power to males in making important decisions in relationships (e.g., whether or not to use a condom) [52,53]. Females with histories of intimate partner or dating violence may be at even greater risk for unsafe sex given the relational power dynamics [27,54–56]. As such, prevention and intervention efforts should recognize the need for contextually informed strategies that recognize the barriers that female youth might face in implementing acquired HIV knowledge.

Some studies suggest that HIV knowledge may be insufficient as a standalone intervention [57–60]. A recent review of experimental designs aimed at isolating mechanisms of intervention effects on sexual risk behavior outcomes failed to find a significant mediational role of HIV knowledge [61], suggesting that even when interventions are able to increase HIV knowledge, that by itself does not lead to a reduction in sexual risk behaviors. Future research should prioritize focusing on how HIV knowledge may work in tandem with other intervention components (e.g., improving motivation, behavioral skills, or perceived risks) in reducing engagement in sexual risk behaviors. For instance, Fisher et al. [58] found that AIDS prevention information was not directly associated with increased protective sexual behavior among female youth, but, rather, the effects were indirect, mediated through behavioral skills. A meta-analysis of HIV-prevention interventions similarly found that information was positively associated with reduced sexual risk behavior only when accompanied by active training

in behavioral strategies [57]. Finally, Newcomb and Mustanski [59] also found no association between HIV knowledge and sexual risk behavior among 143 men who had sex with men, but did document a significant positive relationship between HIV knowledge and more accurate risk appraisals of engagement in unprotected anal sex which may serve as a protective effect. Taken together, although HIV knowledge may not be efficacious as a standalone intervention for youth populations at risk for sexual risk behavior, it may play an important, albeit indirect, role in bolstering other components of behavior change.

HIV Knowledge and Condom Use Efficacy

Although HIV knowledge was not associated with lower rates of sexual risk behavior, we did find that among female youth who had a romantic partner (currently or in the past 6 months), HIV knowledge was significantly and positively related to condom use efficacy. Similar results have been reported in a sample of 465 rural, African American youth (56% female) between the ages of 10 and 14 years old [30]. However, the HIV knowledge measure used in prior studies has had low internal consistency ($\alpha > 0.46$). To our knowledge, ours is the first study to document the relationship between HIV knowledge and condom use efficacy among female youth at risk using a psychometrically sound measure of HIV knowledge. This finding further supports the idea that, although HIV knowledge may not play a direct role in influencing behavior change, it may act as an important antecedent to known predictors of protective sexual behavior such as condom use efficacy.

Contrary to our predictions, we did not detect a moderating effect of impulsivity on the associations between HIV knowledge and outcomes of sexual risk behavior and condom use efficacy. This suggests that the associations of HIV knowledge observed in this sample remained significant regardless of individual differences in levels of impulsivity. Consistent with prior studies [62,63], impulsivity was positively associated with sexual risk behavior. Thus, although impulsivity is an important risk factor for sexual risk involvement, it does not appear to moderate the potential influence of HIV knowledge on sexual risk behaviors or condom use efficacy in this sample of female youth. It is possible that impulsivity may moderate the effects of other variables (e.g., safe sex intentions, condom use efficacy) on sexual risk behaviors. For instance, impulsive youth may demonstrate a greater disconnect between intentions and behavior, exhibiting the efficacy and intentions to use condoms, but still engage in unprotected sex due to low impulse control. Moshier, Ewen, and Otto [64] observed this disconnect with adults in treatment for opioid use, finding that multiple facets of impulsivity moderated the relationship between desire to quit and engaging in substance use, such that the protective effect of intentions to abstain from drug use was significant only in case of less-impulsive individuals in their sample. Future research should examine the moderating role of impulsivity on various targets of intervention aimed at reducing sexual risk behavior to further elucidate how to improve intervention specificity for youth with impulse control difficulties.

Additionally, our hypothesis that ACEs would moderate the associations between HIV knowledge with sexual risk and condom use efficacy was not supported. Although we did find that female youth with higher ACE scores were more likely to engage in sexual risk behavior, the effects of HIV knowledge on sexual risk behavior and condom use efficacy did not vary based on exposure to early adversity. Similar to impulsivity, it is possible that ACEs may, instead, moderate associations between more direct precursors of protective sexual decision-making such as intentions to use condoms or condom use efficacy. For instance, prior research has shown early adversity to be linked with emotion regulation difficulties [65] and increased negative urgency or the tendency to act impulsively as a means to cope with negative affective states [66]. It is plausible that such emotion regulation difficulties may make it difficult for youth from adverse backgrounds to commit to intentions to engage in protective sexual behavior in the face of strong affective states [67]. Identifying how exposure to early adversity may weaken the effects of known protective factors would help improve treatment specificity, particularly for female youth who are receiving social services. Thus, future research should examine ACEs as a moderator of other known predictors of protective sexual behavior.

5. Limitations

These findings should be interpreted in light of the following limitations. First, our results are based on a relatively small sample of female youth who were receiving social or community services, and majority of whom were White, which may limit our ability to detect small effects and reduces the generalizability of our findings. Further, given the cross-sectional nature of our data, we are unable to make inferences regarding the directionality of effects. Third, the findings are based on self-report data and, as such, are not immune to issues of recall bias. Prior studies using the ACE-ST have reported issues of recall bias, similar issues may have been present in our measurement. Additionally, because our sample ranged from 13–18 years, it is possible that the ACE score in our sample might have been lower as compared to other studies, as additional adverse childhood events could occur in the few years remaining in childhood for some participants. Fourth, one of our outcomes, condom use efficacy, was assessed only among youth who reported having a romantic partner (currently or in the past 6 months), which further reduced our sample size when testing the association of this outcome with HIV knowledge. Further, condom use efficacy was not assessed in case of casual sex partners. Finally, our sexual risk behavior index, like other measures used with younger populations (e.g., Hennessy, Bleakley, Fishbein, & Jordan [68]) included aspects of sexual involvement (e.g., kissing, touching above/below the waist) that youth are more likely to endorse but are not necessarily indicators of adverse forms of sexual risk behavior. As such, it is possible that the effect of HIV knowledge may be stronger in case of more serious and specific forms of sexual risk behaviors (e.g., unprotected sex).

6. Implications for Prevention, Intervention, and Future Research

Despite these limitations, this is the first study to examine associations between HIV knowledge (a common target of HIV prevention interventions) with sexual risk behavior and condom use efficacy using a psychometrically sound measure of HIV knowledge and a sample of at-risk female youth, the majority of whom were involved in the juvenile justice system. Adding to a growing body of evidence, our findings show that HIV knowledge by itself may not be related to safer sexual behaviors among female youth at risk, but it could influence proximal predictors of safer sex practices such as condom use efficacy. HIV knowledge dissemination might be optimally paired with behavioral skills training in therapeutic or treatment settings for adolescents, including juvenile justice settings, or other short-term residential placement settings. Our findings need to be replicated using longitudinal study designs and larger samples that include both males and female participants. Future research should also examine if HIV knowledge interventions, when delivered in combination with behavioral skill training and motivational components, can have a protective effect on sexual risk behaviors among youth [57]. Further, although we did not find moderating effects of early adversity and impulsivity, these variables had main effects on sexual risk behavior, in the expected direction. It would be useful to replicate this finding in a larger sample and test if ACEs or impulsivity moderate the effects of HIV knowledge on specific sexual risk behavior outcomes, such as consistency of condom use. Future prevention programming with youth populations at risk should also screen for and attend to these risk factors (i.e., effects of early adversity, impulsivity), in addition to the typical behavioral skills training and educational components.

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References

1. Tolman, D.L.; McClelland, S.I. Normative Sexuality Development in Adolescence: A Decade in Review, 2000–2009. *J. Res. Adolesc.* **2011**, *21*, 242–255. [CrossRef]
2. Centers for Disease Control and Prevention. Sexual Risk Behaviors: HIV, STD, and Teen Pregnancy Prevention. 2020. Available online: <https://www.cdc.gov/healthyyouth/sexualbehaviors/> (accessed on 18 February 2021).
3. Centers for Disease Control and Prevention. HIV and Youth. 2018. Available online: <https://www.cdc.gov/hiv/group/age/youth/index.html> (accessed on 18 February 2021).
4. Higgins, J.A.; Hoffman, S.; Dworkin, S.L. Rethinking gender, heterosexual men, and women’s vulnerability to HIV/AIDS. *Am. J. Public Health* **2010**, *100*, 435–445. [CrossRef] [PubMed]
5. Yi, T.J.; Shannon, B.; Prodger, J.; McKinnon, L.; Kaul, R. Genital immunology and HIV susceptibility in young women. *Am. J. Reprod. Immunol.* **2012**, *69*, 74–79. [CrossRef] [PubMed]
6. Li, Y.; Marshall, C.M.; Rees, H.C.; Nunez, A.; Ezeanolue, E.E.; Ehiri, J.E. Intimate partner violence and HIV infection among women: A systematic review and meta-analysis. *J. Int. AIDS Soc.* **2014**, *17*, 18845. [CrossRef]
7. Morrison-Beedy, D.; Xia, Y.; Passmore, D. Sexual risk factors for partner age discordance in adolescent girls and their male partners. *J. Clin. Nurs.* **2013**, *22*, 3289–3299. [CrossRef] [PubMed]
8. Centers for Disease Control and Prevention. Reported STDs in the United States. 2018. Available online: <https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/std-trends-508.pdf> (accessed on 18 February 2021).
9. Kearney, M.S.; Levine, P. *Explaining Recent Trends in the U.S. Teen Birth Rate*; National Bureau of Economic Research: Massachusetts, UK, 2012.
10. Copenhaver, M.M.; Johnson, B.T.; Lee, I.-C.; Harman, J.J.; Carey, M.P.; SHARP Research Team. Behavioral HIV risk reduction among people who inject drugs: Meta-analytic evidence of efficacy. *J. Subst. Abuse. Treat.* **2006**, *31*, 163–171. [CrossRef] [PubMed]
11. Protogerou, C.; Johnson, B.T. Factors Underlying the Success of Behavioral HIV-Prevention Interventions for Adolescents: A Meta-Review. *AIDS Behav.* **2014**, *18*, 1847–1863. [CrossRef]
12. Hahm, H.C.; Lee, Y.; Ozonoff, A.; Van Wert, M.J. The Impact of Multiple Types of Child Maltreatment on Subsequent Risk Behaviors among Women during the Transition from Adolescence to Young Adulthood. *J. Youth Adolesc.* **2010**, *39*, 528–540. [CrossRef]
13. Hillis, S.D.; Anda, R.F.; Felitti, V.J.; Marchbanks, P.A. Adverse Childhood Experiences and Sexual Risk Behaviors in Women: A Retrospective Cohort Study. *Fam. Plan. Perspect.* **2001**, *33*, 206–211. [CrossRef]
14. Wilson, H.W.; Widom, C.S. An examination of risky sexual behavior and HIV in victims of child abuse and neglect: A 30-year follow-up. *Health Psychol.* **2008**, *27*, 149–158. [CrossRef]
15. Dir, A.L.; Coskunpinar, A.; Cyders, M.A. A meta-analytic review of the relationship between adolescent risky sexual behavior and impulsivity across gender, age, and race. *Clin. Psychol. Rev.* **2014**, *34*, 551–562. [CrossRef] [PubMed]
16. Hughes, A.K.; Admiraal, K.R. A Systematic Review of HIV/AIDS Knowledge Measures. *Res. Soc. Work Pract.* **2011**, *22*, 313–322. [CrossRef]
17. Widman, L.; Evans, R.; Javidi, H.; Choukas-Bradley, S. Assessment of Parent-Based Interventions for Adolescent Sexual Health: A Systematic Review and Meta-Analysis. *JAMA Pediatr.* **2019**, *173*, 866–877. [CrossRef] [PubMed]
18. Carey, M.P.; Morrison-Beedy, D.; Johnson, B.T. The HIV-Knowledge Questionnaire: Development and Evaluation of a Reliable, Valid, and Practical Self-Administered Questionnaire. *AIDS Behav.* **1997**, *1*, 61–74. [CrossRef]

19. Carey, M.P.; Schroder, K.E.E. Development and Psychometric Evaluation of the Brief HIV Knowledge Questionnaire (HIV-KQ-18). *AIDS Educ. Prev.* **2002**, *14*, 172–182. [\[CrossRef\]](#)
20. Morrison-Beedy, D.; Carey, M.P.; Feng, C.; Tu, X.M. Predicting sexual risk behaviors among adolescent and young women using a prospective diary method. *Res. Nurs. Health* **2008**, *31*, 329–340. [\[CrossRef\]](#) [\[PubMed\]](#)
21. Swenson, R.R.; Rizzo, C.J.; Brown, L.K.; Venable, P.A.; Carey, M.P.; Valois, R.F.; DiClemente, R.J.; Romer, D. HIV Knowledge and Its Contribution to Sexual Health Behaviors of Low-Income African American Adolescents. *J. Natl. Med. Assoc.* **2010**, *102*, 1173–1182. [\[CrossRef\]](#)
22. Baele, J.; Dusseldorp, E.; Maes, S. Condom use self-efficacy: Effect on intended and actual condom use in adolescents. *J. Adolesc. Health* **2001**, *28*, 421–431. [\[CrossRef\]](#)
23. Casey, M.K.; Timmermann, L.; Allen, M.; Krahn, S.; Turkiewicz, K.L. Response and Self-Efficacy of Condom Use: A Meta-Analysis of this Important Element of AIDS Education and Prevention. *South. Commun. J.* **2009**, *74*, 57–78. [\[CrossRef\]](#)
24. O’Leary, A.; Jemmott, L.S.; Jemmott, J.B. Mediation analysis of an effective sexual risk-reduction intervention for women: The importance of self-efficacy. *Health Psychol.* **2008**, *27* (Suppl. 2), S180–S184. [\[CrossRef\]](#)
25. French, S.E.; Holland, K.J. Condom negotiation strategies as a mediator of the relationship between self-efficacy and condom use. *J. Sex Res.* **2013**, *50*, 48–59. [\[CrossRef\]](#) [\[PubMed\]](#)
26. Kann, L.; McManus, T.; Harris, W.A.; Shanklin, S.L.; Flint, K.H.; Queen, B.; Lowry, R.; Chyen, D.; Whittle, L.; Thornton, J.; et al. Youth Risk Behavior Surveillance—United States, 2017. *MMWR Surveill. Summ.* **2018**, *67*, 1–114. [\[CrossRef\]](#) [\[PubMed\]](#)
27. Teitelman, A.M.; Ratcliffe, S.J.; Dichter, M.E.; Sullivan, C.M. Recent and Past Intimate Partner Abuse and HIV Risk among Young Women. *J. Obstet. Gynecol. Neonatal Nurs.* **2008**, *37*, 219–227. [\[CrossRef\]](#) [\[PubMed\]](#)
28. Teitelman, A.M.; Tennille, J.; Bohinski, J.M.; Jemmott, L.S.; Jemmott, J.B., III. Unwanted unprotected sex: Condom coercion by male partners and self-silencing of condom negotiation among adolescent girls. *Adv. Nurs. Sci.* **2011**, *34*, 243–259. [\[CrossRef\]](#) [\[PubMed\]](#)
29. Bandura, A. Social cognitive theory and exercise of control over HIV infection. In *Preventing AIDS*; DiClemente, R.J., Peterson, J.L., Eds.; Springer: Boston, MA, USA, 1994; pp. 25–59. [\[CrossRef\]](#)
30. Ritchwood, T.D.; Penn, D.; Peasant, C.; Albritton, T.; Corbie-Smith, G. Condom use self-efficacy among younger rural adolescents: The influence of parent-teen communication, and knowledge of and attitudes toward condoms. *J. Early Adolesc.* **2017**, *37*, 267–283. [\[CrossRef\]](#)
31. Lindberg, C.E. Knowledge, Self-Efficacy, Coping, and Condom Use Among Urban Women. *J. Assoc. Nurses AIDS Care* **2000**, *11*, 80–90. [\[CrossRef\]](#)
32. Felitti, V.J.; Anda, R.F.; Nordenberg, D.; Williamson, D.F.; Spitz, A.M.; Edwards, V.; Koss, M.P.; Marks, J.S. Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults: The Adverse Childhood Experiences (ACE) Study. *Am. J. Prev. Med.* **1998**, *14*, 245–258. [\[CrossRef\]](#)
33. Bellis, M.A.; Lowey, H.; Leckenby, N.; Hughes, K.; Harrison, D. Adverse childhood experiences: Retrospective study to determine their impact on adult health behaviours and health outcomes in a UK population. *J. Public Health* **2014**, *36*, 81–91. [\[CrossRef\]](#)
34. Abram, K.M.; Teplin, L.A.; Charles, D.R.; Longworth, S.L.; McClelland, G.M.; Dulcan, M.K. Posttraumatic Stress Disorder and Trauma in Youth in Juvenile Detention. *Arch. Gen. Psychiatry* **2004**, *61*, 403–410. [\[CrossRef\]](#)
35. Baglivio, M.T.; Epps, N.; Swartz, K.; Huq, M.S.; Sheer, A.; Hardt, N.S. The prevalence of adverse childhood experiences (ACE) in the lives of juvenile offenders. *J. Juv. Justice* **2014**, *3*, 1–17.
36. Dierkhising, C.B.; Ko, S.J.; Woods-Jaeger, B.; Briggs, E.C.; Lee, R.; Pynoos, R.S. Trauma histories among justice-involved youth: Findings from the National Child Traumatic Stress Network. *Eur. J. Psychotraumatol.* **2013**, *4*, 20274. [\[CrossRef\]](#)
37. Leve, L.D.; Van Ryzin, M.J.; Chamberlain, P. Sexual Risk Behavior and STI Contraction among Young Women with Prior Juvenile Justice Involvement. *J. HIV/AIDS Soc. Serv.* **2015**, *14*, 171–187. [\[CrossRef\]](#) [\[PubMed\]](#)
38. Colman, I.; Kingsbury, M.; Garad, Y.; Zeng, Y.; Naicker, K.; Patten, S.B.; Jones, P.B.; Wild, T.C.; Thompson, A.H. Consistency in adult reporting of adverse childhood experiences. *Psychol. Med.* **2015**, *46*, 543–549. [\[CrossRef\]](#) [\[PubMed\]](#)
39. Khurana, A.; Romer, D.; Betancourt, L.M.; Brodsky, N.L.; Giannetta, J.M.; Hurt, H. Early adolescent sexual debut: The mediating role of working memory ability, sensation seeking, and impulsivity. *Dev. Psychol.* **2012**, *48*, 1416–1428. [\[CrossRef\]](#)

40. Khurana, A.; Romer, D.; Betancourt, L.M.; Brodsky, N.L.; Giannetta, J.M.; Hurt, H. Stronger Working Memory Reduces Sexual Risk Taking in Adolescents, Even after Controlling for Parental Influences. *Child Dev.* **2015**, *86*, 1125–1141. [CrossRef] [PubMed]
41. Stevens, L.; Verdejo-García, A.; Goudriaan, A.E.; Roeyers, H.; Dom, G.; Vanderplasschen, W. Impulsivity as a vulnerability factor for poor addiction treatment outcomes: A review of neurocognitive findings among individuals with substance use disorders. *J. Subst. Abus. Treat.* **2014**, *47*, 58–72. [CrossRef] [PubMed]
42. Stanger, C.; Ryan, S.R.; Fu, H.; Landes, R.D.; Jones, B.A.; Bickel, W.K.; Budney, A.J. Delay discounting predicts adolescent substance abuse treatment outcome. *Exp. Clin. Psychopharmacol.* **2012**, *20*, 205–212. [CrossRef] [PubMed]
43. Meinck, F.; Steinert, J. Measuring and Monitoring the Prevalence of Child Maltreatment in the Community: An Overview of Measures. 2015. Available online: https://www.researchgate.net/profile/Franziska_Meinck/publication/326261578_Overview_of_child_abuse_measures_conducted_for_a_WHO_consultancy_-_not_published/links/5b424235a6fdccbcf90da599/Overview-of-child-abuse-measures-conducted-for-a-WHO-consultancy-not-published.pdf (accessed on 18 February 2021).
44. Wingenfeld, K.; Schäfer, I.; Terfehr, K.; Grabski, H.; Driessen, M.; Grabe, H.; Löwe, B.; Spitzer, C. The reliable, valid and economic assessment of early traumatization: First psychometric characteristics of the German version of the Adverse Childhood Experiences Questionnaire (ACE). *Psychother. Psychosom. Med. Psychol.* **2010**, *61*, e10–e14. [CrossRef]
45. Patton, J.H.; Stanford, M.S.; Barratt, E.S. Factor structure of the Barratt impulsiveness scale. *J. Clin. Psychol.* **1995**, *51*, 768–774. [CrossRef]
46. Stanford, M.S.; Mathias, C.W.; Dougherty, D.M.; Lake, S.L.; Anderson, N.E.; Patton, J.H. Fifty years of the Barratt Impulsiveness Scale: An update and review. *Pers. Individ. Differ.* **2009**, *47*, 385–395. [CrossRef]
47. Capaldi, D.M.; Stoolmiller, M.; Clark, S.; Owen, L.D. Heterosexual risk behaviors in at-risk young men from early adolescence to young adulthood: Prevalence, prediction, and association with STD contraction. *Dev. Psychol.* **2002**, *38*, 394–406. [CrossRef] [PubMed]
48. Kim, H.K.; Pears, K.C.; Leve, L.D.; Chamberlain, P.C.; Smith, D.K. Intervention Effects on Health-Risking Sexual Behavior Among Girls in Foster Care: The Role of Placement Disruption and Tobacco and Marijuana Use. *J. Child Adolesc. Subst. Abus.* **2013**, *22*, 370–387. [CrossRef]
49. Hensel, D.J.; Fortenberry, J.D. A Multidimensional Model of Sexual Health and Sexual and Prevention Behavior Among Adolescent Women. *J. Adolesc. Health* **2013**, *52*, 219–227. [CrossRef] [PubMed]
50. Hoehn, E.F.; Fitzgerald, M.R.; Bhatt, S.R.; Robinson, V.M.; Lippe, J.E.; Reed, J.L. Do Adolescents with Higher Knowledge of HIV Have Lower Sexual Risk Behaviors? *Pediatr. Emerg. Care* **2016**, *32*, 846–850. [CrossRef] [PubMed]
51. Johnston, C.; Marshall, B.; Qi, J.; Zonneveld, C.; Kerr, T.; Montaner, J.; Wood, E. HIV knowledge and perceptions of risk in a young, urban, drug-using population. *Public Health* **2011**, *125*, 791–794. [CrossRef] [PubMed]
52. Raiford, J.L.; Seth, P.; DiClemente, R.J. What Girls Won't Do for Love: Human Immunodeficiency Virus/Sexually Transmitted Infections Risk Among Young African-American Women Driven by a Relationship Imperative. *J. Adolesc. Health* **2013**, *52*, 566–571. [CrossRef] [PubMed]
53. Wingood, G.M.; DiClemente, R.J. Application of the Theory of Gender and Power to Examine HIV-Related Exposures, Risk Factors, and Effective Interventions for Women. *Health Educ. Behav.* **2000**, *27*, 539–565. [CrossRef]
54. Minton, H.A.M.; Mittal, M.; Elder, H.; Carey, M.P. Relationship Factors and Condom Use Among Women with a History of Intimate Partner Violence. *AIDS Behav.* **2015**, *20*, 225–234. [CrossRef] [PubMed]
55. Mittal, M.; Senn, T.E.; Carey, M.P. Intimate Partner Violence and Condom Use Among Women: Does the Information–Motivation–Behavioral Skills Model Explain Sexual Risk Behavior? *AIDS Behav.* **2012**, *16*, 1011–1019. [CrossRef]
56. Shorey, R.C.; Fite, P.J.; Choi, H.J.; Cohen, J.R.; Stuart, G.L.; Temple, J.R. Dating Violence and Substance Use as Longitudinal Predictors of Adolescents' Risky Sexual Behavior. *Prev. Sci.* **2015**, *16*, 853–861. [CrossRef]
57. Albarracín, D.; Gillette, J.C.; Earl, A.N.; Glasman, L.R.; Durantini, M.R.; Ho, M.-H. A Test of Major Assumptions About Behavior Change: A Comprehensive Look at the Effects of Passive and Active HIV-Prevention Interventions Since the Beginning of the Epidemic. *Psychol. Bull.* **2005**, *131*, 856–897. [CrossRef] [PubMed]

58. Fisher, W.A.; Williams, S.S.; Fisher, J.D.; Malloy, T.E. Understanding AIDS Risk Behavior among Sexually Active Urban Adolescents: An Empirical Test of the Information–Motivation–Behavioral Skills Model. *AIDS Behav.* **1999**, *3*, 13–23. [[CrossRef](#)]
59. Newcomb, M.E.; Mustanski, B. Cognitive influences on sexual risk and risk appraisals in men who have sex with men. *Health Psychol.* **2014**, *33*, 690–698. [[CrossRef](#)] [[PubMed](#)]
60. Scott-Sheldon, L.A.J.; Carey, M.P.; Venable, P.A.; Senn, T.E.; Coury-Doniger, P.; Urban, M.A. Predicting Condom Use among STD Clinic Patients Using the Information–Motivation–Behavioral Skills (IMB) Model. *J. Health Psychol.* **2010**, *15*, 1093–1102. [[CrossRef](#)] [[PubMed](#)]
61. Huebner, D.M.; Perry, N.S. Do Behavioral Scientists Really Understand HIV-Related Sexual Risk Behavior? A Systematic Review of Longitudinal and Experimental Studies Predicting Sexual Behavior. *Arch. Sex. Behav.* **2015**, *44*, 1915–1936. [[CrossRef](#)] [[PubMed](#)]
62. Curry, I.; Luk, J.W.; Trim, R.S.; Hopfer, C.J.; Hewitt, J.K.; Stallings, M.C.; Brown, S.A.; Wall, T.L. Impulsivity Dimensions and Risky Sex Behaviors in an At-Risk Young Adult Sample. *Arch. Sex. Behav.* **2017**, *47*, 529–536. [[CrossRef](#)]
63. Pack, R.P.; Crosby, R.A.; Lawrence, J.S.S. Associations Between Adolescents’ Sexual Risk Behavior and Scores on Six Psychometric Scales: Impulsivity Predicts Risk. *J. HIV/AIDS Prev. Educ. Adolesc. Child.* **2001**, *4*, 33–47. [[CrossRef](#)]
64. Moshier, S.J.; Ewen, M.; Otto, M.W. Impulsivity as a moderator of the intention-behavior relationship for illicit drug use in patients undergoing treatment. *Addict. Behav.* **2013**, *38*, 1651–1655. [[CrossRef](#)]
65. Dvir, Y.; Ford, J.D.; Hill, M.; Frazier, J.A. Childhood Maltreatment, Emotional Dysregulation, and Psychiatric Comorbidities. *Harv. Rev. Psychiatry* **2014**, *22*, 149–161. [[CrossRef](#)]
66. Shin, S.H.; McDonald, S.E.; Conley, D. Profiles of adverse childhood experiences and impulsivity. *Child Abus. Negl.* **2018**, *85*, 118–126. [[CrossRef](#)] [[PubMed](#)]
67. Espeleta, H.C.; Brett, E.I.; Ridings, L.E.; Leavens, E.L.; Mullins, L.L. Childhood adversity and adult health-risk behaviors: Examining the roles of emotion dysregulation and urgency. *Child Abus. Negl.* **2018**, *82*, 92–101. [[CrossRef](#)] [[PubMed](#)]
68. Hennessy, M.; Bleakley, A.; Fishbein, M.; Jordan, A. Validating an Index of Adolescent Sexual Behavior Using Psychosocial Theory and Social Trait Correlates. *AIDS Behav.* **2008**, *12*, 321–331. [[CrossRef](#)] [[PubMed](#)]

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