

Youn Kyoung Kim¹ / Mansoo Yu² / Courtney Cronley³ / Miyoung Yang⁴

Peer victimization, depression, and sexual risk behaviors among high school youth in the United States: a gender-based approach

¹ Louisiana State University, School of Social Work, Baton Rouge, LA, USA, Phone: +225-578-1019, E-mail: ykim@lsu.edu.
<https://orcid.org/0000-0003-3887-2499>.

² University of Missouri, School of Social Work, Department of Public Health, Columbia, MO, USA

³ University of Tennessee Knoxville, College of Social Work, Knoxville, TN, USA

⁴ Louisiana State University, School of Social Work, Baton Rouge, LA, USA

Abstract:

Background and objectives: Little research has examined how different types of peer victimization (i.e. school bullying, cyber-bullying, and physical and sexual dating violence) predict sexual risk behaviors and how depression may mediate the relationship of such behaviors with types of peer victimization. Few works have investigated gender differences in these direct and indirect associations as well. This study, therefore, examined gender differences in the direct and indirect associations among four types of peer victimization, depression, and sexual risk behaviors in United States (US) high school students.

Materials and methods: Data were drawn from the 2015 Youth Risk Behavior System Survey, collected by the U.S. Centers for Disease Control and Prevention. A multigroup path analysis was conducted using a national sample of high school students who reported having ever engaged in sexual intercourse ($n = 5,288$).

Results: All the peer victimization variables positively predicted depressive symptoms for both females and males. The direct effects of physical and sexual dating violence were associated with increased sexual risk behaviors for females and males. However, school-bullying victimization did not significantly predict sexual risk behaviors for either gender. Cyber-bullying victimization significantly predicted increased sexual risk behaviors for males only. Among indirect effects, depression positively mediated the relationship between cyber-bullying victimization and sexual risk behaviors for males only.

Conclusions: Our findings suggest that male adolescents who are victimized may actually be at higher risk of negative outcomes compared to their female adolescent peers. This study highlights the need to pay attention to male victims who may be ashamed to self-identify and difficult to detect in cyber-bullying.

Keywords: cyber-bullying, depression, peer victimization, physical dating violence, school bullying, sexual dating violence, sexual risk behavior

DOI: 10.1515/ijamh-2019-0139

Received: June 23, 2019; **Accepted:** August 29, 2019

Introduction

In the United States (US), approximately one-third of high school students in 2015 reported sexual intercourse during the last 3 months and, of these, 43% did not use a condom, 21% had drunk alcohol or used drugs before sexual intercourse, and 14% did not use any method to prevent pregnancy [1]. These data suggest that many U.S. adolescents may be at increased risk of adverse health outcomes associated with these risky sexual behaviors, such as transmitting diseases and unwanted pregnancy. In fact, half of the 20 million new sexually transmitted diseases (STDs) each year were reported by young people ages 15 through 24 years, and about 230,000 babies were born to girls ages 15 through 19 years old [2], [3].

Prior research has suggested that there are associations between peer victimization, depression and sexual risk behaviors among high school students. Specifically, in a sample of 9th through 12th grade female students, victims of physical and sexual dating violence were associated with increased risk of first intercourse before the age of 15 and pregnancy [4]. Victims of dating violence are associated with a higher number of lifetime sexual partners among both male and female high school students [5]. Being bullied in-person and electronically are associated with sexual risk behaviors such as a higher number of lifetime sexual partners and non-condom use

in both genders [6]. In addition, a considerable body of research has demonstrated the associations between peer victimization and depression. For instance, Klomek and colleagues [7] report that victims of bullying had an increased risk for later depression in a sample of adolescents aged 13 through 18 years of age. This positive association between the two variables is also found in studies using samples of students outside of the US, such as Scottish [8] and British students [9]. Evidence has also suggested that there is a positive association between depression and sexual risk behaviors. Depressive symptoms predict non-condom use at last sex and substance use at last sex among male students, whereas depressive symptoms predict substance use at last sex and a history of STDs among female students [10], [11].

Although the associations between peer victimization, depression and sexual risk behaviors have been demonstrated in previous research, several gaps still exist. First, there is a lack of research testing the multiple types of peer victimization in predicting both depression and sexual risk behaviors. This is important, as the impact of peer victimization on depression and sexual risk behaviors may differ based on the type of peer victimization. Second, scant research has examined the mediating role of depression on the association between the different types of peer victimization and sexual risk behaviors. It is important to examine mediation in designing an intervention or prevention program in order to change outcome variables such as sexual risk behaviors [12]. Third, the understanding of potential gender differences across issues of victimization, mental health and sexual risk behaviors remains limited.

Hence, the aims of this study were to use a national sample of high school students who had ever engaged in sexual intercourse to examine the mediating role of depression on the association between four types of peer victimization (i.e. victims of school bullying, cyber bullying, physical dating violence and sexual dating violence) and sexual risk behaviors (see Figure 1: Conceptual model), and to examine how the mediating effects are different between female and male students. Based on the aforementioned studies, we postulated the following hypotheses: (1) Specific types of peer victimization (victimization relating to school bullying, cyber-bullying, physical dating violence and sexual dating violence) are significantly associated with depression. (2) Specific types of peer victimization are significantly and directly associated with sexual risk behavior. (3) Depression significantly mediates the relationships between each type of peer victimization and sexual risk behavior. (4) There are significant gender differences in the paths from each type of peer victimization to sexual risk behavior.

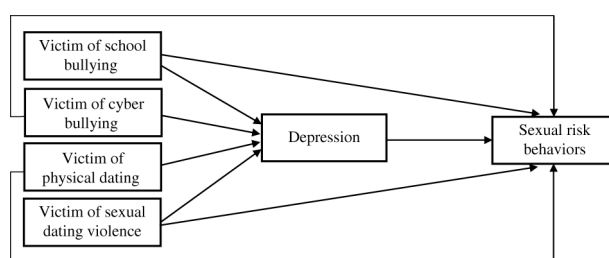


Figure 1: Hypothesized conceptual model.

Materials and methods

Sample

The data used within this study were extracted from the 2015 National Youth Risk Behavior Survey (YRBS), which was conducted by the U.S. Centers for Disease Control and Prevention (CDC) [1]. The YRBS is executed among a sample of high school students in the US and is designed to collate and assess data pertaining to primary behavioral risk and proactive factors. The 2015 nationwide YRBS was performed with a sample consisting of students in grades 9 through 12 who attended both private and public schools. The CDC's Institutional Review Board (IRB) approved the 2015 YRBS [1]. For this current study, another IRB approval was not required because we conducted secondary data analyses without personal identifiers. The YRBS was administered according to a three-stage cluster sample design that was stratified within the Market Data Retrieval database to generate a sample that was deemed representative of high school students in the US [1]. In total, 1,259 primary sampling units (PSUs) were involved in the sampling frame's first phase, which comprised counties, subareas of large counties or clusters of smaller counties that were located in close proximity to one another. These PSUs were subsequently classified into 16 sub-categories in accordance with the status of the metropolitan statistical area (e.g. an urban city) and the ratio of Hispanic and Black students who formed the sample in the respective PSU. Of the 1,259 PSUs that were included in the first research phase, 54 were further sampled with a probability proportionate to the total school enrollment numbers within the PSU. During the second sampling stage,

the 180 schools within the 54 PSUs were sampled. During the third phase, a random sampling of students in grades 9 through 12 was performed for either a mandatory period (e.g. homeroom) or a mandated subject (e.g. English). All students who attended the sample classes were qualified for inclusion in the study.

In total, the study involved 15,624 eligible questionnaires spanning 125 private and public schools. However, the current study focused only on high school students who had ever engaged in sexual intercourse ($n = 5,958$), as sexual risk behaviors including condom use, sex under the influence of alcohol or drugs, and multiple sexual partners – are most relevant for this specific group. After handling missing values, 5,288 students were finally included in this study. Students participated in the YRBS on a voluntary basis and in full agreement with the local processes governing parental authorization. During a standard class period, students were asked to complete a self-administered questionnaire that contained 99 items, and all responses were recorded on a computer-scannable booklet or answer sheet.

Measures

Dependent variables

Sexual risk behavior was a dependent variable. Condom use, sex and alcohol use, and multiple sex partners were used to create the sexual risk behavior variable. First, condom use was based on a self-reported response to the question, “The last time you had sexual intercourse, did you or your partner use a condom?” This variable is a dichotomous variable (0 = no; 1 = yes). For this study, condom use was reverse coded (condom use = 0, no condom use = 1) before we created the composite variable. In addition, *sex and alcohol or drug use* was assessed with the question, “Did you drink alcohol or use drugs before you had sexual intercourse the last time?” This variable is also dichotomous. Furthermore, *multiple sex partners* was assessed with the question, “During the past 3 months, with how many people did you have sexual intercourse (0 = none, 1 = 1 person, 2 = 2 people, 3 = 3 people, 4 = 4 people, 5 = 5 people and 6 = 6 or more people)?” For this study, we changed this variable to a dichotomous variable (0 = less than 2 people, 1 = more than 1 person). Eventually, the dependent variable was created by adding up the three dichotomous variables: (1) no condom use, (2) sex and alcohol or drug use, and (3) multiple sex partners (range = 0–3). The score “0” means a case experienced zero risky sexual behaviors (42.9%); the score “1” means a case experienced one risky sexual behavior (40%); “2” means a case experienced two risky sexual behaviors (13%); and “3” means a case experienced all three risky sexual behaviors (3.6%). Higher scores indicate more risky sexual behaviors.

Independent variables

Past-year victim of school bullying and victim of cyber bullying were based on self-reported responses to the questions: (1) During the past 12 months, have you ever been bullied on school property? (2) During the past 12 months, have you ever been electronically bullied (count such things as being bullied through e-mail, chat rooms, instant messaging websites or texting)? These two variables are dichotomous variables (0 = no, 1 = yes). In addition, past-year victim of physical dating violence and victim of sexual violence were assessed with the following questions: (1) During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose (count such things as being hit, slammed into something or injured with an object or weapon)? (2) During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did not want to do (count such things as kissing, touching or being physically forced to have sexual intercourse)? The two variables related to dating violence were measured on a 6-point Likert scale (1 = did not date, 2 = 0, 3 = 1 time, 4 = 2 or 3 times, 5 = 4 or 5 times, 6 = 6 or more times). These variables were measured on a continuous scale as the frequency, while school bullying and cyber-bullying were both measured dichotomously as the prevalence.

Mediating variable

Depression was measured on a single dichotomous variable based on participants’ response to the question, “During the past 12 months, did you ever feel so sad or hopeless almost every day for 2 weeks or more in a row that you stopped doing some usual activities? (0 = no, 1 = yes).

Statistical analysis

For this study, descriptive and bivariate analyses [chi-squares (χ^2), independent samples *t*-tests, and correlations] were conducted using SPSS Version 24 (IBM, Armonk, NY, USA). We then performed a multigroup path analysis to test the mediational relationships among the variables via Mplus version 7.4 [13]. The descriptive analysis calculated the frequencies and percentages for the categorical variables as well as the mean and standard deviation for the continuous variable. χ^2 -tests were performed to determine differences in specific types of peer victimization and depression according to gender, all of which were categorical variables. An independent samples *t*-test was also conducted to determine a difference in sexual risk behaviors between males and females. Sexual risk behavior was a continuous variable, while gender was a dichotomous variable. In addition, a correlation analysis was performed to determine the direction and strength of the relationships between the variables. This study addressed missing values via listwise deletion, which removed all the data for cases with one or more missing values as the number of cases with missing data was small (less than 5%) and the sample size was large [14]. In our main analysis, we conducted a multigroup path analysis to determine the direct and indirect effects of various types of peer victimization on sexual risk behaviors by mediating depression among female and male students. Specifically, a parameter comparison test was employed to examine gender differences in the paths among the primary study variables.

Results

Descriptive information

As shown in Table 1, the sample was almost evenly split between female (48.1%) and male respondents (51.9%). The proportions of female and male students for each age and racial group were similar. In terms of age, 32.6% of the respondents were 17 years old followed by 16 years old (26.1%), 18 years and older (20.2%), 15 years old (16.2%), and 14 years and younger (4.9%).

Table 1: Demographic characteristics of the sample.

Variable	Total (n = 5,288)	Female (n = 2,544)	Male (n = 2,744)	χ^2 or <i>t</i>
	% (n) or M (SD)	% (n) or M (SD)	% (n) or M (SD)	
Age				
14 years old and younger	4.9 (259)	5.2 (131)	4.7 (128)	
15 years old	16.2 (858)	15.6 (397)	16.8 (461)	
16 years old	26.1 (1,377)	27.6 (702)	24.6 (461)	
17 years old	32.6 (1,722)	33.1 (842)	32.1 (880)	
18 years old and older	20.2 (1,068)	18.6 (472)	21.8 (596)	
Victim of school bullying				
No	78.9 (4,174)	72.9 (1,855)	84.5 (2,319)	106.73**
Yes	21.1 (1,114)	27.1 (689)	15.5 (425)	
Victim of cyber bullying				
No	81.3 (4,297)	71.9 (1,830)	89.9 (2,467)	279.97**
Yes	18.7 (991)	28.1 (714)	10.1 (277)	
Victim of physical dating violence				
0 times	87.2 (46,12)	83.2 (2117)	90.9 (2495)	89.12**
1 time	5.0 (264)	7.1 (181)	3.0 (83)	
2 or 3 times	4.0 (212)	5.5 (140)	2.6 (72)	
4 or 5 times	1.2 (65)	1.7 (43)	0.8 (22)	
6 or more times	2.6 (135)	2.5 (63)	2.6 (72)	
Victim of sexual dating violence				
0 times	88.8 (4694)	82.8 (2106)	94.3 (2,588)	210.27**
1 time	4.2 (223)	7.0 (178)	1.6 (45)	
2 or 3 times	3.7 (197)	6.2 (158)	1.4 (39)	
4 or 5 times	1.2 (65)	1.9 (49)	0.6 (16)	
6 or more times	2.1 (109)	2.1 (53)	2.0 (56)	
Depression				
No	62.4 (3,298)	49.3 (1,253)	74.5 (2,045)	359.26**

Yes	37.6 (1,990)	50.7 (1,291)	25.5 (699)	
Condom use				
No	40.9 (2,165)	46.0 (1,169)	36.3 (996)	50.88**
Yes	59.1 (3,123)	54.0 (1,375)	63.7 (1,748)	
Sex and alcohol or drug use				
No	80.0 (4,229)	82.6 (2,101)	77.6 (2,128)	20.90**
Yes	20.0 (1,059)	17.4 (443)	22.4 (616)	
Multiple sex partners				
Less than 2	83.1 (4,396)	88.5 (2,252)	78.2 (2,144)	101.54**
More than 1	16.9 (892)	11.5 (292)	20.1 (600)	
Sexual risk behaviors (Range 0–3)	0.78 (0.81)	0.75 (0.77)	0.81 (0.85)	–2.59*

* $p < 0.05$, ** $p < 0.001$, SD, standard deviation.

Table 1 also reports results of bivariate tests of differences between male and female adolescents. Results showed several significant differences. Specifically, during the past year, more females than males reported that they had been bullied on school property (27.5% vs. 15.5%) and bullied electronically (28.1% vs. 10.1%). In addition, while 16.8% of females had experiences of being victims of physical dating violence at least one time during the past 12 months, only 9.1% of males had. Likewise, 17.2% of the females in the sample reported that they had been victims of sexual dating violence, but only 5.7% of males reported that they had experienced this. Among the respondents, 50.7% of females indicated experiencing depression, while 25.5% of males indicated this. The percentage of condom use among males (63.7%) was higher than among females (54%), and males (22.4%) had more experience with sex and alcohol use than females (17.4%). Furthermore, 21.5% of males reported that they had had more than one sex partner during the last 3 months compared to 11.5% of females. Males ($M = 0.81$) had higher levels of sexual risk behaviors than females ($M = 0.75$).

Correlations

Table 2 presents the correlations among the victims of school bullying, cyber-bullying, physical dating violence, sexual dating violence, depression and sexual risk behaviors, all of which were separated according to gender. For the males and females, the overall correlations between each specific type of peer victimization, depression and sexual risk behaviors were significantly positive.

Table 2: Correlations ($n = 5,288$).

	1	2	3	4	5	6
1. Victim of school bullying		0.465***	0.144***	0.110***	0.203***	0.058**
2. Victim of cyber bullying	0.541***		0.211***	0.153***	0.240***	0.097***
3. Victim of physical dating violence	0.176***	0.192***		0.439***	0.152***	0.178***
4. Victim of sexual dating violence	0.229***	0.191***	0.421***		0.115***	0.194***
5. Depression	0.262***	0.253***	0.167***	0.192***		0.083***
6. Sexual risk behaviors	0.041*	0.062**	0.165***	0.124***	0.075***	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Males above the diagonal and females below the diagonal. The blank cells are the diagonal line.

Path results for sexual risk behaviors

The results of the multigroup path analysis for sexual risk behaviors are shown in Table 3 along with the standardized regression coefficients. These results showed an excellent model fit [comparative fit index (CFI) = 1, Tucker -Lewis index (TLI) = 1, $\chi^2/df = 697.45$ ($p < 0.001$), root mean square error of approximation (RMSEA) = 0.00, 90% confidence interval (CI) (0.00, 0.00)]. The hypothesized path model explains the nine direct effects on depression and sexual risk behaviors. First, for females, the results showed that seven out of nine direct paths were statistically significant: (1) victim of school bullying to depression ($\beta = 0.152$, $p < 0.001$), (2) victim of cyber-bullying to depression ($\beta = 0.138$, $p < 0.001$), (3) victim of physical dating violence to depression ($\beta = 0.072$, $p < 0.001$), (4) victim of sexual dating violence to depression ($\beta = 0.101$, $p < 0.001$), (5) victim of physical dating violence to sexual risk behaviors ($\beta = 0.131$, $p < 0.001$), (6) victim of sexual dating violence to sexual risk behaviors ($\beta = 0.61$, $p < 0.01$), and (7) depression to sexual risk behaviors ($\beta = 0.41$, $p < 0.05$). Each type of peer victimization variable was positively associated with depression and sexual risk behaviors. However, the direct effects of victim of school bullying and victim of cyber-bullying on sexual risk behaviors were not statistically significant. In addition, for males, the results showed that eight out of nine direct paths were statistically significant: (1) victim of school bullying to depression ($\beta = 0.109$, $p < 0.001$), (2) victim of cyber-bullying to depression ($\beta = 0.165$, $p < 0.001$), (3) victim of physical dating violence to depression ($\beta = 0.084$, $p < 0.001$), (4) victim of sexual dating violence to depression ($\beta = 0.041$, $p < 0.05$), (5) victim of cyber-bullying to sexual risk behaviors ($\beta = 0.045$, $p < 0.05$), (6) victim of physical dating violence to sexual risk behaviors ($\beta = 0.102$, $p < 0.01$), (7) victim of sexual dating violence to sexual risk behavior ($\beta = 0.137$, $p < 0.01$), and (8) depression to sexual risk behaviors ($\beta = 0.041$, $p < 0.05$). Only the direct effect of victim of school bullying on sexual risk behaviors was not significant.

Table 3: Path results for sexual risk behaviors.

Path	Female				Male				Group invariance	
	β (SE)	t	p-Value	R^2	β (SE)	t	p-Value	R^2	t	p-Value
Direct effect										
VSΒ→D	0.152 (0.022)	6.805	0.000		0.109 (0.021)	5.306	0.000		1.886	0.059
VCΒ→D	0.138 (0.022)	6.177	0.000		0.165 (0.022)	7.940	0.000		1.871	0.061
VPDV→D	0.072 (0.021)	3.442	0.001		0.084 (0.021)	4.057	0.000		1.705	0.088
VSDV→D	0.101 (0.021)	4.804	0.000	0.11	0.041 (0.020)	2.005	0.045	0.08	1.817	0.069
VSΒ→SRB	-0.021 (0.024)	-0.908	0.364		-0.001 (0.021)	-0.068	0.946		1.950	0.051
VCΒ→SRB	0.026 (0.024)	1.123	0.261		0.045 (0.022)	2.092	0.036		2.028	0.043
VPDV→SRB	0.131 (0.022)	6.092	0.000		0.102 (0.021)	4.878	0.000		1.863	0.062
VSDV→SRB	0.061 (0.022)	2.779	0.005		0.137 (0.021)	6.672	0.000		1.448	0.147
D→SRB	0.041 (0.021)	1.966	0.049	0.03	0.041 (0.019)	2.100	0.036	0.04	-0.334	0.738
Indirect effect										
VSΒ→D→SRB	0.011 (0.006)	1.886	0.059		0.010 (0.005)	1.950	0.051		0.038	0.970
VCΒ→D→SRB	0.010 (0.005)	1.871	0.061		0.019 (0.009)	2.028	0.043		-0.873	0.383
VPDV→D→SRB	0.003 (0.002)	1.705	0.088		0.004 (0.002)	1.863	0.062		-0.454	0.650
VSDV→D→SRB	0.004 (0.002)	1.817	0.069		0.002 (0.001)	1.449	0.147		0.623	0.533

VSΒ, victim of school bullying; VCΒ, victim of cyber bullying; VPDV, victim of physical dating violence; VSDV, victim of sexual dating violence; D, depression; SRB, sexual risk behaviors.

Furthermore, a parameter comparison test between the two groups demonstrated a significant gender difference only in one direct path out of nine: victim of cyber-bullying to sexual risk behaviors ($t = 2.028$, $p < 0.05$). The impact of cyber-bullying victimization on sexual risk behaviors was significantly different between females and males. For males, the direct effect of cyber-bullying victimization on sexual risk behaviors ($\beta = 0.045$) was greater than females ($\beta = 0.025$). Likewise, as shown in Table 3, a total of four indirect paths were estimated and the results showed that only one indirect effect was significant for males: the indirect effect of cyber-bullying victimization on sexual risk behaviors ($\beta = 0.019$, $p < 0.05$). However, there was no statistically significant group difference in indirect paths between females and males.

Discussion

We undertook this study to understand how experiencing different types of peer victimization affects depression, and how, in turn, this may lead to higher rates of sexual risk behaviors among US high school students. Results supported our first hypothesis in that all forms of bullying (school-bullying, cyber-bullying, physical dating violence and sexual dating violence) significantly predicted a higher likelihood of self-reported depression incidents. The data partially supported our second hypothesis and physical and sexual dating violence both predicted a higher rate of sexual risk behaviors, with the exclusion of school-based and cyber bullying for females and school-based bullying for males. Overall, our results are consistent with prior empirical work [15] suggesting that individuals who experience violence and victimization are more likely to experience mental health distress and to engage in behaviors that are actually harmful to themselves.

This study led to novel findings, as well, though. We found that all types of victimization had an equitable impact on depression. One would expect physical and sexual violence to be associated with greater depression compared to bullying. In fact, school- and cyber-bullying actually appeared to have a stronger relationship with depression compared to physical and sexual violence. Indeed, prior research shows strong associations between all forms of bullying and depression [16]. It is possible that we are seeing these stronger relationships between bullying and depression, compared to physical and sexual dating violence, based on the chronicity of the victimization. It may be that the majority of adolescents who reported physical or sexual dating violence experienced it in isolation or for a brief period of time. In contrast, bullying can occur multiple times per day over weeks and months and even years. In fact, there is related evidence in the child maltreatment literature showing that the *chronicity* of child maltreatment is more harmful than *prevalence* alone.

The fact that bullying did not predict sexual risk behaviors for females may be due to the fact that bullying can lead to social isolation, shyness and fewer social interactions. We are not suggesting that victimization in any way shields female adolescents from sexual risk-taking, only that it does not put them at greater risk for the behavior.

Results also supported the fourth hypothesis, specifically related to gender differences in cyber bullying. Males who reported being victims of cyber-bullying had elevated rates of sexual risk behaviors compared to those who had not been victims; in contrast, cyber-bullying was not significantly related to sexual risk behaviors for females. In fact, prior research does conclude that cyber-bullying is a unique form of bullying with observable gender differences such that adolescent males are more likely to be bullied than adolescent females [17]. The prior research may explain our current findings in that the relative uniqueness of being a victim of cyber-bullying among males may be a proxy indicator for other gender-specific, confounding characteristics that place certain adolescent males at higher risk for sexual risk behavior (e.g. identifying as a sexual minority).

Interestingly, our data only partially supported our third hypothesis regarding the mediating role of depression on the relationship between victimization and engaging in sexual risk behaviors. Specifically, there was one significant indirect path: for adolescent males, depression significantly mediated the positive association between being a victim of cyber-bullying and self-reported sexual risk behaviors. This mediating relationship may further strengthen the argument that adolescent males who are victims of cyber-bullying are uniquely at higher risk for other negative outcomes/behaviors. While our analyses do explain the association between cyber-bullying and increased risky sexual behavior among male adolescents, theories of masculinity, and the shame and stigma associated with male victimization in US culture, may provide some insight into the processes at work. We highly recommend that future research bring more theoretical perspective to the issues such that we can begin to understand the processes at work and where and how to best target prevention and intervention efforts. In general, though, this finding lends empirical support for the argument that school counseling services ought to pay particular attention to male adolescents who are at risk or are victims of cyber-bullying.

In our analyses, we did not find any other statistically significant indirect paths between experiencing victimization and sexual risk behaviors. The lack of an indirect relationship, particularly regarding school bullying, is consistent with results from the direct path analysis in that there was no direct association between the latter and sexual risk behaviors. This lack of association is somewhat reassuring in that it suggests that while school bullying is related to depression, it does not put victims at higher risk of sexual risk behaviors.

Results were somewhat more interesting for the dating violence variables, as the following direct paths were statistically significant: (1) dating violence to depression, (2) dating violence to sexual risk behaviors, and (3) depression to sexual risk behaviors. Hence, dating violence is linked directly to both depression and sexual risk behaviors, and depression is also *independently* associated with sexual risk behaviors. As such, future research may consider testing different processes by which dating violence victimization is associated with an increase in sexual risk behaviors and the extent to which the association is causal. For example, it may be that reduced self-esteem explains the association between the two, as self-esteem has been linked to dating violence victimization [18]. It may also be the case that a clinical assessment of depression using cut-off scores for clinical and non-

clinical depression would have discriminated more sharply between those adolescents who were and were not clinically depressed, producing stronger indirect effects.

Limitations and strengths

The study had several limitations that should be considered when interpreting the results. First, the measure of depression was based on self-report to a single item. Thus, we acknowledge that our measure of depression captured a narrow definition of the construct, primarily as feelings of sadness or hopelessness. However, previous research [17] has operationally defined depression similarly, because these symptoms are the most commonly mentioned symptoms of depression. Secondly, all data were based on self-report, and thus, they may be subject to recall bias and social desirability bias. Some biases may have produced under-estimates of prevalence while others may have produced over-estimates. For example, some male adolescents may have felt social stigma against reporting being victimized, whereas it is possible that some adolescents over-reported their prevalence of depression. Finally, because data are cross-sectional, the mediating models we tested were measures of association rather than true causal relationships. Still, the study has strengths in that it utilizes a large, national data set, has multiple measures of victimization, and has a fairly equitable distribution of male and female respondents.

Conclusions

Overall, our study shows that being a victim of bullying or violence during adolescence is linked directly to an increased risk for depression; and for male adolescents, both are also associated with more frequent sexual risk behaviors. Moreover, for male adolescents who are victims of cyber-bullying specifically, depression mediates the positive correlation between the bullying and sexual risk behaviors. In fact, our data suggest, at a preliminary level, that male adolescents who are victimized may be at elevated risk for negative outcomes compared to their female adolescent peers. In sum, our study provides novel insight into potential gender differences in the ways that experiencing victimization relates to health risk behaviors among adolescents. The findings highlight the need for future research that explores these gender differences in greater detail and helps to inform an evidence base that will inform prevention and intervention efforts.

References

- [1] Kann L, McManus T, Harris WA, Shanklin SL, Flint KH, Hawkins J, et al. Youth risk behavior surveillance – United States, 2015. *MMWR Surveill. Summ.* 2016;65(No. SS-6):1–174.
- [2] Centers for Disease Control and Prevention. Sexually transmitted disease surveillance 2014. Atlanta, GA: U.S. Department of Health and Human Services; 2015.
- [3] Martin JA, Hamilton BE, Osterman MJ, Driscoll AK, Driscoll TJ. Births: final data for 2015. Hyattsville, MD: National Center for Health Statistics; 2017.
- [4] Silverman JG, Raj A, Mucci LA, Hathaway JE. Dating violence against adolescent girls and associated substance use, unhealthy weight control, sexual risk behavior, pregnancy, and suicidality. *J Am Med Assoc.* 2001;286(5):572–9.
- [5] Eaton DK, Davis KS, Barrios L, Brener ND, Noonan RK. Associations of dating violence victimization with lifetime participation, co-occurrence, and early initiation of risk behaviors among U.S. high school students. *J Interpers Violence.* 2007;22(5):585–602.
- [6] Hertz MF, Everett JS, Barrios L, David-Ferdon C, Holt M. Association between bullying victimization and health risk behaviors among high school students in the United States. *J Sch Health.* 2015;85(12):833–42.
- [7] Klomek AB, Kleinman M, Altschuler E, Marrocco F, Amakawa L, Gould MS. Suicidal adolescents' experiences with bullying perpetration and victimization during high school as risk factors for later depression and suicidality. *J Adolesc Health.* 2013;53(1 Suppl):S37–42.
- [8] Sweeting H, Young R, West P, Der G. Peer victimization and depression in early-mid adolescence: a longitudinal study. *Br J Educ Psychol.* 2006;76(Pt 3):577–94.
- [9] Zwierzyńska K, Wolke D, Lereya TS. Peer victimization in childhood and internalizing problems in adolescence: a prospective longitudinal study. *J Abnorm Child Psychol.* 2013;41(2):309–23.
- [10] Lehrer JA, Shrier LA, Gortmaker S, Buka S. Depressive symptoms as a longitudinal predictor of sexual risk behaviors among US middle and high school students. *Pediatrics.* 2006;118(1):189–200.
- [11] Shrier LA, Harris SK, Sternberg M, Beardslee WR. Associations of depression, self-esteem, and substance use with sexual risk among adolescents. *Prev Med.* 2001;33(3):179–89.
- [12] Mackinnon DP. Integrating mediators and moderators in research design. *Res Soc Work Pract.* 2011;21(6):675–81.
- [13] Muthén LK, Muthén BO. *Mplus user's guide*, 8th ed ed. Los Angeles, CA: Muthén & Muthén; 2015.
- [14] Abu-Bader SH. Advanced & multivariate statistical methods in social science research. Chicago, IL: Lyceum Books; 2010.

- [15] Stewart J, Valeri L, Esposito E, Auerbach R. Peer victimization and suicidal thoughts and behaviors in depressed adolescents. *J Abnorm Child Psychol.* 2018;46(3):581–96
- [16] Wang J, Iannotti R, Nansel T. School bullying among adolescents in the United States: physical, verbal, relational, and cyber. *J Adolesc Health.* 2009;45(4):368–75.
- [17] Wang J, Nansel T, Iannotti R. Cyber and traditional bullying: differential association with depression. *J Adolesc Health.* 2011;48(4):415–7.
- [18] Ackard D, Neumark-Sztainer D, Hannan P. Dating violence among a nationally representative sample of adolescent girls and boys: associations with behavioral and mental health. *J Gend Specif Med.* 2003;6(3):39–48.