A multi-country study of the violence-related risk factors for early sexual debut and risky sexual behavior in adolescents

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Abstract

Globally, the prevalence of adolescent sexual intercourse and violence is high. However, to date, no study has investigated the association between violence and sexual behavior in a large representative sample of adolescents, while multicountry studies are also lacking. The objective was thus to examine the relationship between being physically attacked and physical fighting with sexual intercourse, multiple sexual partners and non-condom use among adolescents aged 12-15 years from 43 low- and middle-income countries. Cross-sectional data from 127,513 adolescents participating in the Global School-based Student Health Survey 2003-2016 were analyzed. Data on being physically attacked and physical fighting were assessed through self-report. Data on sexual behavior were collected: (i) ever having had intercourse; among those who reported having had intercourse, (ii) multiple ($\geq$2) lifetime sexual partners and (iii) condom use in last sexual intercourse. Data were analyzed using multivariable logistic regression analysis with violence as the exposure and sexual behavior as the outcome, with odds ratios being estimated. Physical attack was dose-dependently and significantly associated with all three sexual behavior outcomes with it being associated with 1.42 (95%CI=1.16-1.74), 2.13 (95%CI=1.39-3.27), and 1.48 (95%CI=1.10-2.00) times higher odds for sexual intercourse, condom non-use, and multiple sex partners, respectively, when the highest category was compared with the lowest (i.e., $\geq$4 times vs. 0 times). As for physical fights, compared to not being in a fight in the past 12 months, being in a fight $\geq$4 times was associated with 2.34 (95%CI=2.03-2.70) and 1.98 (95%CI=1.56-2.52) times higher odds for sexual intercourse and multiple sex partners, respectively. In conclusion, in a large global sample of adolescents, physical attack and physical fight were associated with greater risk of engaging in sexual behavior. Multidimensional government programs and policies addressing violence in young adolescents may lead to reduction in early sexual debut and other risky sexual behavior.

Key Words: Violence, sexual behavior, multi-country, adolescents, epidemiology, low- and middle-income countries

Introduction

Early sexual debut in adolescence, particularly young adolescence, is known to be associated with several negative outcomes including increased risk of suicide attempts (Smith et al., 2019c), a high prevalence of sexually transmitted infections - particularly Chlamydia (Centers for Disease Control and Prevention, 2018), poor mental health in adulthood (Mota, Cox, Katz, Sareen, 2010), and adolescent pregnancy. Importantly, adolescent pregnancy may lead to interruptions in education that may have long lasting negative effects on life trajectories (Klein, 2005), while complications during pregnancy and childbirth are the leading cause of death for 15 to 19-year-old girls especially in low- and middle-income countries (LMICs) (World Health Organization, 2018).

However, despite such negative effects, the prevalence of sexual intercourse among young adolescents is particularly high. Indeed, in a previous multi-country study in 34,674 adolescents aged 12-15 years, it was found that the prevalence of past 12-month sexual intercourse was 11.9% (Smith et al., 2019b). This high prevalence and the discussed literature suggest that early sexual debut in adolescents should be discouraged on a global scale. In order to achieve this goal, correlates of early sexual debut and other risky sexual behavior among the adolescent population should be identified to inform targeted interventions.

One understudied potential correlate is physical violence, defined here as the application of immediate and unlawful physical force; or the act of engaging in physical fights. The prevalence of youth violence is high. For example, globally, the fourth leading cause of death in young people is homicide (10–29 years old) (World Health Organization, 2014), and other country specific data support this statement (Australian Institute of Health and Welfare, 2019; Miniño, 2010; Patton et al., 2009). Importantly, there are differences in prevalence between

countries with the majority of deaths due to homicide occurring in LMICs (World Health Organization, 2014). Moreover, through violence, many more young people are hospitalized owing to injuries. It has also been suggested that in addition to death and injuries, mental and/or emotional health problems, disability, and increased health-risk behaviors are key consequences of violence in young people (World Health Organization, 2019).

A series of studies from the National Longitudinal Study of Adolescent to Adult Health (Add Health) have shown how violence in general may be associated with sexual behavior longitudinally. Specifically, in this nationally representative sample of U.S. adolescents in grades 7 through 12 at baseline, the cohort was followed into young adulthood (Harris, & Udry, 2014). Findings from this study support an association between violence/victimization and early sexual debut. For example, the study found that youth victimized in late adolescence displayed an accelerated trajectory of sexual activity (Warner, & Warner, 2019), while exposure to community violence was associated with earlier sexual debut history, higher number of sexual partners within the previous 12 months, and higher number of total sexual partners (Voisin, Chen, Fullilove, & Jacobson, 2015).

Other studies, all from high income-countries, have found that more extensive violence exposure and cumulative exposure to different kinds of violence were associated with overall unsafe sex, more partners, and inconsistent condom use (Wilson, Woods, Emerson, & Donenberg, 2012), or that adolescent girls who had witnessed or experienced violence were much more likely to engage in risky sexual behavior (Berenson, Wiemann, & McCombs, 2001). It has also previously been suggested that aggression (a potential proxy for physical fighting) is associated with general and sexual risk-taking (Zuckerman, & Kuhlman, 2000). It is possible that violence may be associated with a decline in self-efficacy or self-esteem

(Nygaard, Johansen, Siqveland, Hussain, & Heir, 2017) and this may be associated with a higher risk of risky sexual behavior (Longmore, Manning, Giordano, & Rudolph, 2003).

Although these previous studies have advanced the field, to date, no study has investigated the association between violence and sexual behavior in a large representative sample of adolescents outside the U.S., while multicountry studies are also lacking. Thus, the present study aimed to examine the relationship between physical attack and physical fight (exposures) with sexual intercourse, multiple sexual partners and non-condom use (outcome) among 127,513 boys and girls aged 12-15 years from 43 LMICs. Examining the association between violence and early sexual debut and other risky sexual behaviors in adolescents is important to identify whether violence is a potentially modifiable risk factor for these behaviors, as well as the consequent potentially detrimental impacts on health and wellbeing.

Methods

Publicly available data from the Global School-based Student Health Survey 2003-2016 (GSHS) were analyzed. Details on this survey can be found at http://www.who.int/chp/gshs and http://www.cdc.gov/gshs. Briefly, the GSHS was jointly developed by the WHO and the US Centers for Disease Control and Prevention (CDC), and other UN allies. The core aim of this survey was to assess and quantify risk and protective factors of major non-communicable diseases. The survey draws content from the CDC Youth Risk Behavior Survey (YRBS) for which test-retest reliability has been established (Brener, Collins, Kann, Warren, & Williams, 1995). The survey used a standardized two-stage probability sampling design for the selection process within each participating country. For the first stage, schools were selected with probability proportional to size sampling. The second stage involved the random selection of classrooms which included students aged 13-15 years within each selected

school. All students in the selected classrooms were eligible to participate in the survey regardless of age. Data collection was performed during one regular class period. The questionnaire was translated into the local language in each country and consisted of multiple choice response options; students recorded their response on computer scannable sheets. All GSHS surveys were approved, in each country, by both a national government administration (most often the Ministry of Health or Education) and an institutional review board or ethics committee. Student privacy was protected through anonymous and voluntary participation, and informed consent was obtained as appropriate from the students, parents and/or school officials. Data were weighted for non-response and probability selection. Specifically, a weighting factor was applied to each student record to adjust for non-response and for the varying probabilities of selection. The weight used for estimation in this survey is given by: $W = W1 * W2 * f1 * f2 * f3$ ($W1$ = the inverse of the probability of selecting each school; $W2$ = the inverse of the probability of selecting each classroom; $f1$ = a school-level nonresponse adjustment factor calculated by school size category (small, medium, large). $f2$ = a student-level nonresponse adjustment factor calculated by classroom. $f3$ = a poststratification adjustment factor calculated by sex within grade).

From all publicly available data, we selected all nationally representative datasets that included the variables used in the current analysis. If there were more than two datasets from the same country, we chose the most recent dataset. A total of 43 LMICs were included in the current study. The characteristics of each country or survey are provided in **Table 1**. For the included countries, the survey was conducted between 2003 and 2016.

Sexual behavior

Lifetime sexual intercourse was assessed by the question "Have you ever had sexual intercourse?" with 'yes' and 'no' answer options. Condom use was assessed with the question "The last time you had sexual intercourse, did you or your partner use a condom?" with 'yes' and 'no' answer options. Number of sexual partners was based on the question "During your life, with how many people have you had sexual intercourse?" We considered those with two or more sexual partners to have multiple sexual partners (Smith et al., 2019 a, c). Data on multiple partners were not available from Bangladesh and Kenya.

Physical attack

Students were first provided with the following explanation on physical attacks: "A physical attack occurs when one or more people hit or strike someone, or when one or more people hurt another person with a weapon (such as a stick, knife, or gun). It is not a physical attack when two students of about the same strength or power choose to fight each other." Subsequently, they were asked "During the past 12 months, how many times were you physically attacked?" with answer options 0, 1, 2-3, 4-5, 6-7, 8-9, 10-11, and $\geq$12 times. Those who replied at least once were considered to have been a victim of a physical attack. Data on physical attacks were not collected in Kenya, Swaziland, Uganda, and Zambia.

Physical fight

Physical fight was assessed with the question "During the past 12 months, how many times were you in a physical fight?" with answer options 0, 1, 2-3, 4-5, 6-7, 8-9, 10-11, and $\geq$12 times. Students were provided an explanation that a physical fight occurs when two or more students of about the same strength or power to choose to fight each other. Those who replied at least once were considered to have been involved in a physical fight.

Control variables

Control variables included sex, age, food insecurity (as a proxy of socio-economic status), and alcohol consumption, and these were selected because they were hypothesized to be independently associated with both the exposure (violence) and the outcome (sexual intercourse/ risky sexual behavior) (Foshee, Linder, MacDougall, & Bangdiwala, 2001; O'Keefe, 1998). As in previous studies using the same dataset (Carvalho et al., 2019; Vancampfort, Stubbs, Firth, Van Damme, & Koyanagi, 2018), food insecurity was used as a proxy for socioeconomic status as there were no variables on socioeconomic status in the GSHS. Food insecurity was assessed by the question "During the past 30 days, how often did you go hungry because there was not enough food in your home?" Answer options were categorized as 'never', 'rarely/sometimes', and 'most of the time/always'. Alcohol consumption was defined as having had one drink containing alcohol for at least one day in the past 30 days.

Statistical analysis

Statistical analyses were performed with Stata 14.1 (Stata Corp LP, College station, Texas). The analysis was restricted to those aged 12-15 years as most students were within this age group while information on the exact age outside of this age range was not available. The difference in the country-wise prevalence of sexual intercourse by physical attack or physical fight was tested with Chi-squared tests. We did not conduct country-wise analysis for condom non-use and multiple sex partners as the sample size after restriction to those who ever had sex was very small in the majority of the countries. The associations between physical attack or physical fight (exposures) and sexual intercourse, condom non-use, or multiple sex partners (outcomes) were assessed by multivariable logistic regression analysis.

Due to the small numbers in the extreme categories, variables on physical attack and physical fight were categorized as 0, 1, 2-3, and ≥4 times in the past 12 months for this analysis. Sex-wise analyses were also conducted. The analysis was adjusted for sex, age, food insecurity, alcohol consumption, and country with the exception of the sex-wise analysis, which was not adjusted for sex. Adjustment for country was done by including dummy variables for each country in the model as in previous GSHS publications (McKinnon, Gariépy, Sentenac, Elgar, & 2016; Vancampfort et al., 2018). The analysis on condom non-use and multiple sex partners was restricted to those who ever had sexual intercourse (n=21,885).

All variables were included in the regression analysis as categorical variables with the exception of age (continuous variable). Under ≤1% of the data were missing for all variables used in the analysis with the exception of alcohol consumption (5.8%) and sexual intercourse (12.7%). Complete case analysis was conducted. Sampling weights and the clustered sampling design of the surveys were taken into account. Results from the logistic regression analyses are presented as odds ratios (ORs) with 95% confidence intervals (CIs). In epidemiology, a relative risk of 1.0-1.2 is often considered no associations, 1.2-1.5 weak associations, and >1.5 moderate to strong associations (Monson, 1990). The level of statistical significance was set at $p < 0.05$.

Results

A total of 127,513 adolescents aged 12-15 years were included in the analysis. The mean (SD) age was 13.8 (1.0) years and 50.7% were boys. Overall, 14.7%, 13.1%, and 10.7% of adolescents experienced a physical attack 1, 2-3, and ≥4 times in the past year, respectively. The corresponding figures for physical fights were 13.6%, 8.7%, and 6.2%, respectively. Overall, 12.8% of the adolescents had had sexual intercourse, and among these adolescents,

the prevalence of condom non-use at last sex and lifetime multiple sex partners were 44.2% and 52.0%, respectively. At the country level, the highest prevalence of physical attack, physical fight, sexual intercourse, condom non-use, and multiple sex partners were 71.1% (Samoa), 75.4% (Tuvalu), 55.7% (Samoa), 75.7% (Kiribati), and 69.4% (Samoa), respectively (Table 1). Boys were more likely to engage in violence, have had sexual intercourse, and have multiple sex partners, while non-condom use was more prevalent among those aged 12-13 years as compared to 14-15 years (**Table 2**). Sexual intercourse was significantly more prevalent among those who were attacked or were in a physical fight in the majority of the countries (Appendix **Table S1**).

The prevalence of sexual intercourse, condom non-use, and multiple sex partners increased almost linearly with increasing times attacked in the past year (**Figure 1**). For example, the prevalence of condom non-use increased from 37.2% (0 times) to 56.6% (≥4 times). In the case of physical fights, an increasing trend with increasing number of physical fights was observed for sexual intercourse and multiple sex partners but not for condom use (**Figure 2**). The increase in sexual intercourse was particularly prominent with a 3-fold increase being observed between 0 times (10.0%) and ≥4 times (30.0%). The results of the adjusted analyses are shown in **Table 3**. In the overall sample, physical attack was dose-dependently and significantly associated with all three sexual behavior outcomes with it being associated with 1.42 (95%CI=1.16-1.74), 2.13 (95%CI=1.39-3.27), and 1.48 (95%CI=1.10-2.00) times higher odds for sexual intercourse, condom non-use, and multiple sex partners, respectively when the highest category was compared with the lowest (i.e., ≥4 times vs. 0 times). As for physical fights, significant dose-dependent associations were only observed for sexual intercourse and multiple sex partners. Compared to not being in a fight in the past 12 months, being in a fight ≥4 times was associated with 2.34 (95%CI=2.03-2.70) and 1.98

(95%CI=1.56-2.52) times higher odds for sexual intercourse and multiple sex partners, respectively. Some sex differences by were observed for physical attacks. Specifically, physical attack was only significantly associated with sexual intercourse and multiple sex partners among girls, while it was significantly associated with condom non-use only among boys.

Discussion

In this large transnational study, we found that the prevalence of violence was high with 38.1% and 28.6% of young adolescents experiencing at least one physical attack and physical fight, respectively, in the past 12 months. Overall, 12.8% of the adolescents had engaged in sexual intercourse, and among these adolescents, 44.2% and 52.0% did not use a condom at last sex, and had multiple sex partners, respectively. However, it should be noted that a large between-country variation in the prevalence of violence and sexual behavior was observed in our study. Although the reasons for the between-country difference are unknown, they are likely related to differences in socioeconomic, cultural, and religious factors as well as other factors such as substance use. For example, Muslim countries (e.g., Indonesia, Bangladesh) may be more likely to have lower prevalence of early sexual debut and other risky sexual behavior as these are discouraged, while violence due to alcohol consumption may also be less frequent in this setting. Furthermore, previous studies have shown that adolescents who are exposed to poverty are more likely to engage in risky behaviors than adolescents from households with higher income (Elgar et al., 2015).

In our study, physical attack was dose-dependently and moderately/strongly associated with all three sexual behavior outcomes. As for physical fights, significant dose-dependent moderate to strong associations were only observed for sexual intercourse and multiple sex

partners. These findings support the general hypothesis that exposure to violence is generally associated with risky sexual behavior (including early sexual debut) in adolescents. These findings also support previous work that has shown similar associations in single country studies with small samples and predominantly focusing on girls (Albus et al., 2004; Berenson et al., 2001; Wilson et al., 2012). Thus, the present study adds to these studies by showing that the association holds in transnational studies utilizing large samples and both sexes.

There are several plausible pathways that may explain associations between exposure to violence and sexual behavior. First, it is possible that, in many cases of those who have experienced violence, the first act of sexual intercourse may be involuntary. Indeed, in a study of adolescent girls, it was shown that those who had experienced and those who had witnessed and experienced violence were significantly more likely than those who had neither witnessed nor experienced violence to have had their first sexual encounter before the age of 13 years (Berenson et al., 2001). Second, health risk behaviors have been shown to co-occur in characteristic ways, suggesting that involvement in one health risk behavior is often associated with involvement in multiple health risk behaviors (Albus et al., 2004) owing to predisposition toward health risk behaviors, more generally. Third, engagement in violence may put adolescents in locations where they interact with role models which may be more likely to encourage sexual behavior. Indeed, it has been shown that the sexual norms of peers influence young adolescents' individual attitudes and behaviors (Potard, Courtois, & Rusch, 2008). Fourth, exposure to violence has been shown to be associated with poor mental health in general (Stansfeld et al., 2017), which has also been shown to be associated with risky sexual behavior in adolescents (Wilson et al, 2010). Fifth, exposure to violence may be associated with a decline in self-efficacy or self-esteem (Nygaard et al., 2017) and low levels of self-efficacy and self-esteem are associated with a higher risk of risky sexual behavior

(Longmore et al., 2003). Finally, it may also be in the case of physical fighting that it is also aggression that is associated with early sexual debut rather than or in addition to exposure to violence per se (Zuckerman, & Kuhlman, 2000).

It should be noted that the present study found nuanced findings in relation to exposure to different types of violence. Physical attack was dose-dependently and significantly associated with all three sexual behavior outcomes. As for physical fights, significant dose-dependent associations were only observed for sexual intercourse and multiple sex partners. The exact reasons for differences in the relationships seen between different types of exposure to violence is unknown. However, only a physical attack (which is likely to be related to victimization rather than aggression) was associated with all three sexual behavior outcomes. It may be that a physical attack compared to physical fight has the greatest detriment to an individual's mental health and self-efficacy/ self-esteem and thus subsequently negatively influencing multiple sexual behavior domains. It is possible that a physical attack is a more extreme form of violence than physical fights. However, there is no literature to confirm this hypothesis and future research is needed.

It should also be noted that some sex differences in the present findings were observed. Physical attack appears to be a more detrimental exposure for girls for both early sexual debut and multiple sexual partners, whereas physical fight is detrimental for early sexual debut and condom non-use for both boys and girls. Given the higher rates of sexual violence experienced by girls globally, https://www.who.int/violence_injury_prevention/violence/activities/intimate/en/ this suggests that physical attack may be linked more to non-consensual experiences among girls, while physical fights may not be (especially given that females have lower rates of physical

attacks, early sexual debut and multiple sex partners than boys overall). Future qualitative research in LMICs to understand plausible mechanisms that help describe the varying associations between genders are now warranted.

The large multi-country sample and the investigation of violence with multiple sexual health outcomes are clear strengths of the present study. However, findings from the present study should be interpreted in light of certain limitations. First, the study was cross-sectional in nature and thus the direction of associations cannot be established, longitudinal research examining these relationships is warranted. Second, the study was based on adolescents attending school. Thus, the study results may not be generalizable to adolescents who do not attend school. Third, the violence variable "physical fight" did not identify whether the individual initiated the fight or not. It is possible that different associations may exist between those who initiated a physical fight and those who were involved but did not initiate and sexual behavior. Fourth, adolescents were not provided with a definition of sexual intercourse and it is thus possible that some adolescents may have misinterpreted this question to include other sexual activities (such as mutual masturbation). Fifth, data on non-consensual sexual experiences was not collected and thus could not be accounted for within the statistical models. Next, the mean age of those with missing and no missing values on ever having had sex were similar (13.6 vs. 13.8 years) but there was a higher proportion of males among those who had missing values on this variable compared to females (61% vs. 49%). Thus, this may have introduced some level of self-selection bias in the analysis. Finally, exposure to violence and sexual behaviors were assessed using self-report measures, and this may have introduced reporting bias.

In conclusion, it has previously been shown that increased health-risk behaviors are key consequences of violence in young people. The present study adds to this knowledge by showing that in a large global sample of adolescents, physical attack and physical fight were associated with greater risk of engaging in sexual behavior. Although causality could not be established due to the cross-sectional nature of the data, the mere co-existence of risky sexual behavior and violence may be an unrecognized public health problem as both are associated with adverse health outcomes. Multidimensional government programs and policies addressing violence in young adolescents may lead to reduction in early sexual debut and other risky sexual behavior.

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Figure Legends

Figure 1 Prevalence of sexual intercourse, condom non-use, and multiple sex partners by number of physical attacks in the past year

*Analyses on condom non-use and multiple sex partners were restricted to those who ever had sex.
Data from Kenya, Swaziland, Uganda, and Zambia are not included in the estimates on due to lack of data on physical attacks.
Data from Bangladesh and Kenya are not included in the estimates on multiple sex partners due to lack of data.
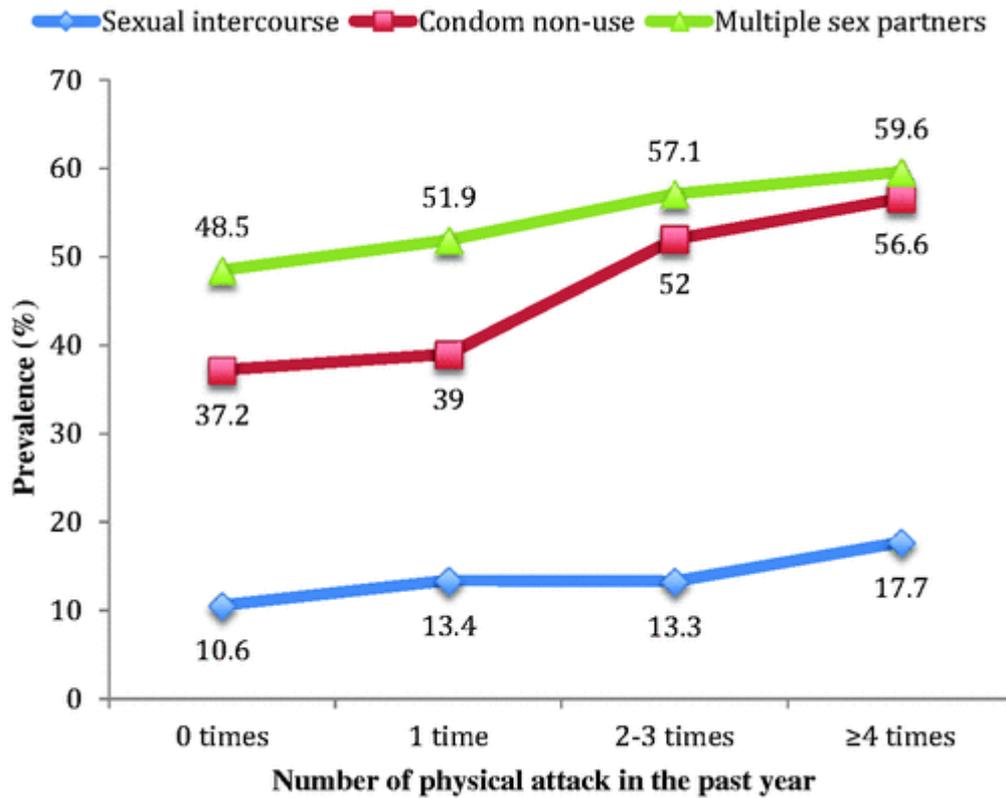
Figure 2 Prevalence of sexual intercourse, condom non-use, and multiple sex partners by number of physical fights in the past year

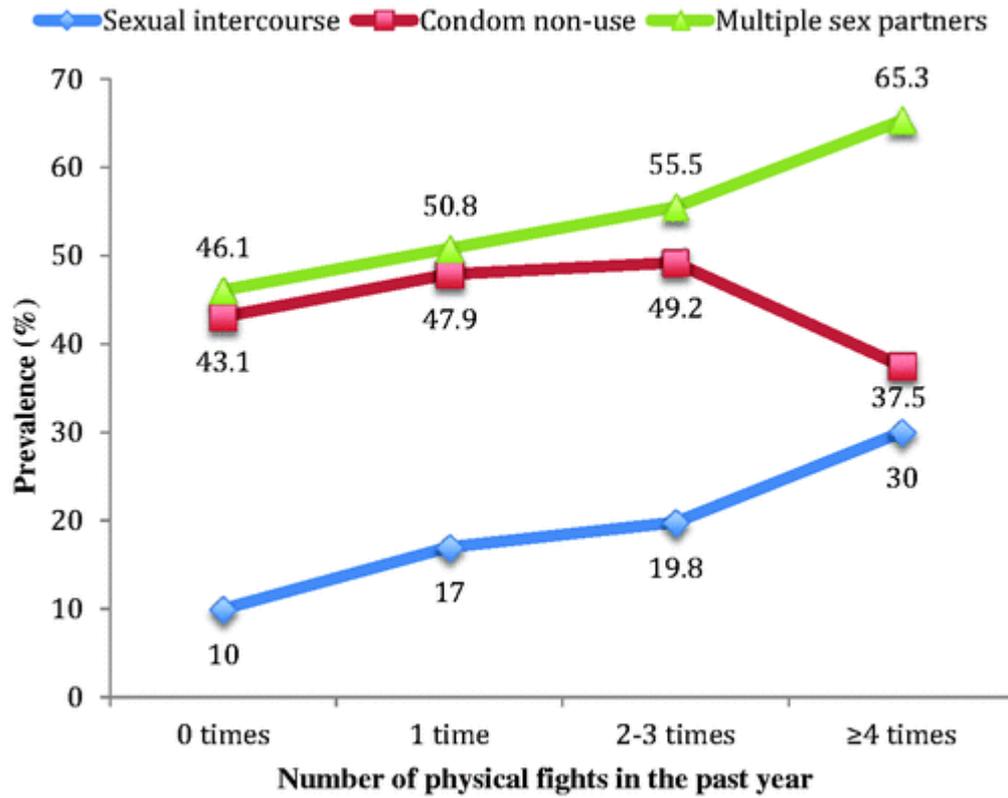*Analyses on condom non-use and multiple sex partners were restricted to those who ever had sex.
Data from Bangladesh and Kenya are not included in the estimates on multiple sex partners due to lack of data.

Tables

Table 1 Characteristics of the survey, and prevalence of physical attack, physical fight, sexual intercourse, condom non-use, and multiple sex partners

Country	Year	Response rate (%)	N[a]	Physical attack[b] (%)	Physical fight[c] (%)	Sexual intercourse (%)	Condom non-use[d] (%)	Multiple sex partners[d] (%)
Antigua & Barbuda	2009	67	1,235	39.9	47.8	36.4	31.6	68.3
Argentina	2012	71	21,528	24.9	34.0	35.5	23.6	55.5
Bangladesh	2014	91	2,753	62.5	21.2	9.8	42.2	NA
Belize	2011	88	1,600	28.0	34.8	21.0	33.6	64.2
Benin	2016	78	717	25.5	30.6	25.4	66.6	61.4
Bolivia	2012	88	2,804	34.8	33.0	20.1	36.6	44.6
Botswana	2005	95	1,397	55.6	47.6	17.2	44.3	52.9
Cambodia	2013	85	1,812	20.5	13.6	13.0	52.4	41.9
Costa Rica	2009	72	2,265	14.0	22.1	18.1	36.0	50.3
Dominica	2009	84	1,310	36.5	38.0	42.0	35.2	66.8
East Timor	2015	79	1,631	41.1	33.7	19.7	50.0	51.3
El Salvador	2013	88	1,615	18.7	25.5	18.8	25.4	51.9
Fiji	2016	79	1,537	34.5	33.7	15.6	48.3	56.9
Ghana	2012	82	1,110	49.4	52.9	29.5	56.3	57.2
Grenada	2008	78	1,299	41.4	37.5	24.4	44.6	60.8
Guatemala	2015	82	3,611	24.2	22.7	14.3	41.2	64.4
Guyana	2010	76	1,973	39.2	38.1	29.5	36.1	58.6
Honduras	2012	79	1,486	20.8	28.4	21.6	37.4	46.4
Indonesia	2015	94	8,806	34.3	25.1	5.4	74.4	59.5
Kenya	2003	84	2,971	NA	49.7	32.9	57.9	NA
Kiribati	2011	85	1,340	10.1	35.7	21.7	75.7	53.9
Laos	2015	70	1,644	19.5	10.2	9.5	37.8	56.1
Macedonia	2007	93	1,550	19.0	29.5	8.8	22.0	39.8
Malawi	2009	94	2,224	37.0	22.9	22.8	35.0	41.3
Malaysia	2012	89	16,273	29.2	30.0	8.1	65.6	57.4

Mauritius	2011	82	2,074	22.9	34.5	22.4	56.8	51.1
Mongolia	2013	88	3,707	30.5	43.7	9.5	51.3	48.6
Mozambique	2015	80	668	36.8	39.4	42.4	26.8	49.3
Namibia	2013	89	1,936	41.1	35.6	35.8	31.4	58.9
Nepal	2015	69	4,616	46.0	39.0	19.4	47.0	55.9
Peru	2010	85	2,359	37.4	36.9	16.8	37.5	48.0
Samoa	2011	79	2,200	71.1	67.8	55.7	42.9	69.4
St. Vincent & the Grenadines	2007	84	1,188	37.0	45.5	27.9	40.9	67.8
St. Lucia	2007	82	1,072	34.4	40.8	23.3	48.3	67.9
Suriname	2009	89	1,046	23.1	20.4	23.6	27.5	51.7
Swaziland	2003	96	6,866	NA	27.7	11.1	55.9	51.8
Tanzania	2014	87	2,615	53.5	32.1	17.8	66.9	49.5
Thailand	2015	89	4,132	29.8	28.4	13.9	35.4	51.8
Tuvalu	2013	90	679	66.8	75.4	15.5	46.5	59.6
Uganda	2003	69	1,904	NA	35.8	20.7	40.7	50.8
Vanuatu	2011	72	852	55.0	51.5	11.2	36.1	40.1
Vietnam	2013	96	1,743	28.1	21.8	3.6	56.4	6.5
Zambia	2004	70	1,365	NA	53.0	37.0	47.2	61.8

[a] Based on sample aged 12-15 years
[b] At least one physical attack in the past 12 months.
[c] At least one physical fight in the past 12 months.
[d] Restricted to those who ever had sex.

Table 2 Prevalence of physical attack, physical fight, sexual intercourse, condom non-use, and multiple sex partners by sex and age

		Physical attack[a]	Physical fight[b]	Sexual intercourse	Condom non-use[c]	Multiple sex partners[c,d]
Sex	Female	31.1	20.1	9.1	44.5	43.2
	Male	45.7	36.6	16.4	44.4	56.1
Age (years)	12-13	41.1	30.6	11.0	50.1	52.1
	14-15	37.1	27.3	13.8	42.5	51.9

[a] At least one physical attack in the past 12 months. Data from Kenya, Swaziland, Uganda, and Zambia are not included due to lack of data.
[b] At least one physical fight in the past 12 months.
[c] Restricted to those who ever had sex.
[d] Data from Bangladesh and Kenya are not included due to lack of data

Table 2 Association of physical attack and physical fight (exposures) with sexual intercourse, condom non-use, and multiple sex partners (outcomes) estimated by multivariable logistic regression

	Sexual intercourse			Condom non-use[a]			Multiple sex partners[a,b]		
	Overall	Boys	Girls	Overall	Boys	Girls	Overall	Boys	Girls
Physical attack[c]									
None	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Once	1.10	1.04	1.24*	0.92	0.94	0.88	1.09	1.06	1.21
	[0.96,1.27]	[0.86,1.27]	[1.05,1.46]	[0.68,1.25]	[0.63,1.40]	[0.58,1.33]	[0.87,1.37]	[0.80,1.39]	[0.77,1.90]
2-3 times	1.19*	1.12	1.34**	1.52*	2.08**	0.71	1.38*	1.29	1.70*
	[1.01,1.41]	[0.89,1.42]	[1.10,1.64]	[1.02,2.26]	[1.26,3.43]	[0.45,1.13]	[1.04,1.84]	[0.92,1.82]	[1.14,2.56]
≥4 times	1.42***	1.29	1.78***	2.13***	2.69***	1.18	1.48**	1.25	2.12**
	[1.16,1.74]	[0.98,1.71]	[1.41,2.23]	[1.39,3.27]	[1.57,4.62]	[0.71,1.98]	[1.10,2.00]	[0.90,1.75]	[1.23,3.68]
Physical fight									
None	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Once	1.31***	1.26**	1.43***	1.17	1.41	0.85	1.11	1.03	1.24
	[1.17,1.46]	[1.08,1.48]	[1.22,1.68]	[0.89,1.54]	[0.98,2.03]	[0.58,1.24]	[0.91,1.37]	[0.79,1.35]	[0.88,1.73]
2-3 times	1.59***	1.63***	1.50***	1.23	1.59	0.73	1.43**	1.43*	1.31
	[1.35,1.87]	[1.32,2.02]	[1.22,1.85]	[0.82,1.85]	[0.96,2.63]	[0.47,1.12]	[1.13,1.81]	[1.05,1.93]	[0.86,2.00]
≥4 times	2.34***	2.42***	2.21***	0.85	0.96	0.76	1.98***	1.76***	2.55***
	[2.03,2.70]	[1.98,2.97]	[1.81,2.71]	[0.64,1.12]	[0.67,1.37]	[0.48,1.20]	[1.56,2.52]	[1.35,2.31]	[1.61,4.03]

Data are odds ratio [95% confidence interval].
[a] Restricted to those who ever had sex.
[b] Data from Bangladesh and Kenya are not included due to lack of data.
[c] Data from Kenya, Swaziland, Uganda, and Zambia are not included due to lack of data.
Models are adjusted for sex, age, food insecurity (as a proxy of socio-economic status), alcohol consumption, and country with the exception of the sex-stratified analysis which is not adjusted for sex.
* p<0.05, ** p<0.01, *** p<0.001