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Adverse Childhood Experiences and HIV Sexual Risk-Taking Behaviors Among Young Adults in Malawi

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Abstract

Adverse childhood experiences (ACEs) exhibit a dose–response association with poor health outcomes in adulthood, including HIV. In this analysis, we explored the relationship between ACEs and HIV sexual risk-taking behaviors among young adults in Malawi. We analyzed responses from sexually active 19- to 24-year-old males and females ($n = 610$) participating in the Malawi Violence Against Children Survey. We tested the association between respondents' exposure to six ACEs (having experienced emotional, physical, or sexual violence; witnessing intimate partner violence or an attack in the community; one or both parents died) and infrequent condom use in the past year and multiple sexual partners in the past year. We used logistic regression to test the association between ACEs and these sexual risk-taking behaviors. A majority (82%) of respondents reported at least 1 ACE, and 29% reported 3+ ACEs. We found positive unadjusted associations between the number of ACEs (1–2 and 3+ vs. none) and both outcomes. In adjusted models, we found positive associations between the number of ACEs and infrequent condom use (adjusted odds ratio [aOR]: 2.7, 95% confidence interval [CI]: [1.0, 7.8]; aOR: 3.7, CI: [1.3, 11.1]). Among young adults in Malawi, exposure to ACEs is positively associated, in a dose–response fashion, with engaging in some sexual risk-taking behaviors. HIV prevention efforts in Malawi may benefit from prioritizing programs and policies aimed at preventing and responding to violence against children.

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Authors' Note

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

Declaration of Conflicting Interests

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Keywords

child abuse; domestic violence and cultural contexts; domestic violence; violence exposure

Introduction

Background

Violence, including physical, emotional, or sexual abuse, is experienced by children worldwide, with devastating consequences. Globally, an estimated one billion children are exposed to some form of violence each year (Hillis, Mercy, Amobi, & Kress, 2016). More specifically, an estimated 23% of children experience physical abuse, 37% experience emotional abuse, and 8% of boys and 18% of girls experience sexual abuse (Stoltenborgh, Bakermans-Kranenburg, Alink, & van Ijzendoorn, 2015). Children often experience more than one form of violence. In Tanzania, for example, more than 80% of adolescent males and females aged 13 to 24 years who experienced sexual abuse as a child also experienced physical violence (UNICEF Tanzania, Centers for Disease Control and Prevention [CDC] & Muhimbili University, 2012). There is growing evidence regarding the negative impact of adverse childhood experiences (ACEs) on a range of health outcomes in adulthood, with evidence to suggest this is a dose–response relationship (Brown et al., 2009; Felitti et al., 1998; Hillis, Anda, Felitti, & Marchbanks, 2001; Hillis, Anda, Felitti, Nordenberg, & Marchbanks, 2000). In this analysis, ACEs include having experienced emotional, physical, or sexual violence; witnessing intimate partner violence (IPV) or an attack in the community; and the death of one or both parents. Evidence suggests that as the number of ACEs increases, so does the risk of poor health outcomes related to mental health (Bellis, Lowey, Leckenby, Hughes, & Harrison, 2014; Reisner, Falb, & Mimiaga, 2011), infectious diseases including HIV (Hillis et al., 2001; Reisner et al., 2011), chronic disease (Felitti et al., 1998), and reproductive health (Hillis et al., 2004; Ramiro, Madrid, & Brown, 2010). In Malawi, the focus of this research, there is limited evidence regarding the prevalence and consequences of ACEs.

Study Context

Malawi is a landlocked country in southeastern Africa, bordered by Zambia, Tanzania, and Mozambique with a population of 18.5 million that is primarily rural (83.7%), Christian (82.6%), and young (67.0% of the population < 24 years; Central Intelligence Agency, 2017). Malawi is one of the poorest countries in the world, ranked 170 of 188 countries and territories on the Human Development Index (United Nations Development Programme, 2015) and more than half of the population lives below the poverty line (Central Intelligence Agency, 2017).

In Malawi, HIV is a serious public health problem. The general HIV prevalence among adults aged 15 to 49 years is 10.0%, but is higher for females (12.4%) than for males (7.5%; CDC, 2016) and HIV/AIDS is a leading cause of premature death among adults in Malawi (Institute of Health Metrics and Evaluation, 2010). Young adults, who may engage in sexual behaviors that expose them to HIV are particularly vulnerable (United Nations Programme on HIV/AIDS [UNAIDS], 2012). In generalized epidemics, including in Malawi, HIV

transmission is predominantly through heterosexual intercourse (Chin, Sato & Mann, 1990; Gisselquist, Potterat, Brody & Vachon, 2003; N'Galy, 1988). Particularly in this context, specific sexual risk behaviors, including inconsistent condom use in nonmonogamous relationships, having multiple and/or concurrent sexual partners may put individuals at greater risk of HIV (UNAIDS, 2012). In Malawi, the HIV prevalence of those engaging in HIV high risk behaviors is higher than the HIV prevalence of those not engaging in these behaviors (National Statistical Office & ICF Macro, 2011). Substantial funding and programming has been invested in preventing and addressing these behaviors (UNAIDS, 2014).

Literature Review

Adverse experiences in childhood, including experiencing physical and sexual abuse, have been positively associated with sexual risk behaviors and HIV infection. In an analysis of data from 48,526 adults interviewed in the 2011 Behavioral Risk Factor Surveillance System survey conducted in the United States, Campbell, Walker, and Egede (2016) found that as ACE scores increased, so did the odds of HIV risk behaviors, from an adjusted odds ratio (aOR) of 1.94 (95% confidence interval [CI]: [1.22, 3.06]) with an ACE score of 1 to 4.34 (95% CI: [2.78, 6.76]) with an ACE score of 4. Similarly, in an analysis of a nationally representative sample of 13,274 U.S. men, Reisner et al. (2011) found that each childhood violence incident was associated with elevated odds of HIV infection. ACEs have also been found to be associated with sexual risk behaviors in non-U.S. settings. Dunkle et al. (2004), in a cross-sectional study conducted among 1366 women attending antenatal clinics in South Africa, found a correlation between child sexual assault and increased sexual risk behaviors. However, they found no independent effect on HIV serostatus (Dunkle et al., 2004). Finally, Reza et al. (2009), in an analysis of data from a nationally representative sample of 1,242 Swaziland girls and young women aged 13 to 24 years, found that those who reported childhood sexual violence had an increased odds of reporting a sexually transmitted infection compared with those who did not report childhood sexual violence (aOR: 3.69, 95% CI: [1.78, 7.66]). The majority of this research has focused on the association between childhood sexual violence and HIV rather than looking at ACEs and the dose–response effect of adverse experiences in childhood on HIV risk. Likewise, there is limited evidence from Africa exploring the association between ACEs and sexual risk-taking behavior as a young adult. We are not aware of any population-based studies examining these associations in Malawi. Thus, the objective of this study was to examine the association between exposure to adverse experiences in childhood (having experienced emotional, physical, or sexual violence; witnessing IPV or an attack in the community; one or both parents died) with young men and women's sexual risk-taking behaviors that put them at greater risk of HIV as young adults.

Method

Design

The Malawi Violence Against Children and Young People Survey, or Malawi VACS, was a nationally representative, cross-sectional, household survey of young adults aged 13 to 24 years conducted September–October, 2013 (Ministry of Gender, Children, Disability and

Social Welfare of the Republic of Malawi, United Nations Children’s Fund [UNICEF], The Center for Social Research at the University of Malawi, and the CDC, 2014). The Malawi VACS was a collaboration between the Malawi Ministry of Gender, Children, Disability and Social Welfare; the Malawi VACS Multi-Sectoral Task Force; the UNICEF; the Center for Social Research of the University of Malawi; and the U.S. CDC.

Participant Recruitment

The survey used a four-stage cluster sample survey design and a split sample approach; the survey was conducted in different enumeration areas for males and females. The split sample approach was used to protect the confidentiality of the respondents by reducing the chance that a perpetrator of a sexual assault and the victim of that assault would both be interviewed. The survey was administered in either Chichewa or Tumbuka by trained, local field staff. Interviews took an average of 45 min to complete, though some were much longer depending on the participant’s history of violence and questionnaire skip patterns. A total of 1,133 males and 1,029 females aged 13 to 24 years living in selected households completed the individual questionnaire. The combined household and individual response rate was 83.4% for males and 84.4% for females. The current analysis focuses on the responses from 610 sexually active 19- to 24-year-old males ($n = 244$) and females ($n = 366$). Respondents were considered sexually active if they reported having sex in the past 12 months, and to temporally separate measures of sexual risk behaviors from ACEs experienced before age 18 years, we only included respondents aged 19 to 24 years in this analysis.

Ethical Procedures

The Malawi VACS was reviewed and approved by the Malawian National Commission for Science and Technology Ethical Review Board and CDC’s Institutional Review Board (IRB) (Ministry of Gender, Children, Disability and Social Welfare of the Republic of Malawi, UNICEF, The Center for Social Research at the University of Malawi, and the CDC, 2014). Ethical protections were emphasized in all aspects of the design and implementation of the study. For example, training for the interviewers was specific to violence research. In addition, to support the development of rapport and trust with the respondents, the study team selected interviewers who looked physically young, had experience with collecting data on sensitive health issues, and spoke the local languages.

All respondents provided verbal consent. For dependent respondents (those below 18 years of age who were not emancipated minors or living in a child-headed household), interviewers first obtained the permission of the parent or primary caregiver before speaking with the eligible respondents. As adapted from the World Health Organization (WHO) guidelines on ethics and safety in studies of violence against women (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2005), only the selected respondents knew the survey contained sensitive questions on violence. To all other community members, including parents or primary caregivers, the survey was presented as a study of young people’s health, educational, and life experiences. After an eligible respondent was randomly selected and privacy was guaranteed, a sex-matched interviewer read the contents of a verbal assent or consent form. The assent/consent form informed the respondents about the specific topics

covered in the survey (including violence), highlighted that the information the respondent shared was confidential, and emphasized the voluntary nature of the study. Field staff offered direct referrals for psychosocial counseling to those respondents who needed and wanted help for past or current experiences of violence. The counselors would meet with respondents up to 5 times in a safe location and would also make referrals for additional services (e.g., legal and medical).

Data Analysis

The outcome variables for this analysis were the respondent's engagement in sexual risk-taking behaviors—no or infrequent condom use with partners other than a spouse in the past 12 months (yes/no) and multiple sexual partners in the past 12 months (yes/no) (Figure 1). Exposure to ACEs was similar to ACEs measured in the Adverse Childhood Experiences International Questionnaire (ACE-IQ), although some ACEs included in the ACE-IQ, such as living with family members who were substance abusers, mentally ill, or suicidal, or who were imprisoned, were not collected in the Malawi VACS. Specific ACEs included in this analyses were whether or not the respondent reported, before age 18 years, experiencing sexual abuse, physical violence, or emotional violence; witnessing IPV; or witnessing an attack in the community, or was orphaned (one or both parents died) (Figure 1). We created a summative scale for cumulative ACEs, categorized as none, one or two, or three or more ACEs. Demographic characteristics included age in years, whether the respondent was currently married, whether the respondent completed or attended secondary school or higher, and whether he or she ever begged in the street. Social characteristics included whether the respondent felt very close to his or her biological mother and father, or whether he or she reported talking with friends often about important things.

We first estimated the weighted prevalence of sexual risk-taking behaviors and ACEs before age 18 years among sexually active 19- to 24-year-old males and females, combined and stratified by sex. We then examined the associations between ACEs and sexual risk behaviors using logistic regression. We explored whether demographic or social characteristics influenced the association between ACEs and sexual risk behavior through either confounding or interaction. The adjusted models included all variables significantly associated with both the exposure and the outcome and any statistically significant interaction terms. While we did not find a statistically significant interaction between the respondent's sex and ACEs, the small number of young women reporting infrequent condom use with partners other than a spouse and the small number of women reporting multiple sexual partners may have limited our ability to detect an interaction. We therefore present here the results for males and females in a combined model, an approach consistent with research examining ACES and HIV risk-taking behaviors in other contexts (Bellis, Hughes, et al., 2014; Bellis, Lowey, et al., 2014; Ramiro et al., 2010; Stoltenborgh et al., 2015). We included current marital status as a covariate in the model for multiple sex partners only. Condom use is very rare in marriage in Malawi (98% of respondents in our sample who were currently married reported sometimes or never using a condom with their spouse), and as current marital status was used to construct the outcome variable no or infrequent condom use with a partner other than a spouse, it was not included as a covariate in that model. All

analyses accounted for the complex survey design, and SAS 9.3 (2011) was used for all analyses.

Results

On average, the sexually active 19- to 24-year-old males and females in our sample were 22 years old. Over half (56%) of the young men and more than three fourths (88%) of the young women were currently married. More young men (33%) than young women (21%) reported completing or attending secondary school or higher, and 9% of the young men and 16% of the young women reported begging for alms in the street at some point in their life (Table 1). More young men than young women talked with their friends about important things (47% vs. 28%), felt very close to their biological mother (85% vs. 78%), and felt very close to their biological father (63% vs. 48%). Young adults in Malawi reported high levels of exposure to the six ACEs examined in this study. For young men, prevalence for exposure to ACEs ranged from 12% for sexual abuse to 69% for physical violence, and for young women, from 18% for sexual abuse to 40% for physical violence. Compared with young women, young men experienced higher prevalence of emotional violence as a child (30% vs. 19%) and witnessing an attack in their community (36% vs. 26%). The prevalence of witnessing IPV (36% vs. 32%) and being orphaned as a child (29% vs. 25%) were similar for young men and young women (Table 1). Only 18% of respondents (10% of young men and 23% of young women) reported no ACEs. The majority of respondents experienced multiple ACEs, with 52% of young men and 53% of young women exposed to 1 to 2 ACEs, and 38% of young men and 24% of young women exposed to 3+ ACEs (Table 1). Thirty-one percent of young men and 9% of young women reported no or infrequent condom use with a partner other than a spouse in the past 12 months, and 20% of young men and 2% of young women reported having multiple sexual partners in the past 12 months (Table 1).

Individual ACEs and Sexual Risk-Taking Behaviors

The prevalence of sexual risk behaviors among sexually active young adults experiencing each of the six ACEs is presented in Table 2. In general, the lowest prevalence of these risk-taking behaviors was reported for those witnessing an attack in the community and higher prevalence of these behaviors was reported for those who experienced sexual, physical, or emotional violence (Table 2).

Multiple ACEs and Infrequent Condom Use

When we created a summative scale of ACEs, 5% of those experiencing no ACEs reported infrequent condom use in the past 12 months, compared with 17% of those experiencing 1 to 2 ACEs, and 25% of those experiencing 3+ ACEs (Table 3). In logistic regression analyses, the ORs for infrequent condom use increased in a dose-response fashion, from 3.6 (95% CI: [1.3, 10.2]) for those with 1 to 2 ACEs, to 5.9 (95% CI: [2.1, 17.0]) for those with 3+ ACEs, compared with those reporting no ACEs. When we included variables significantly associated with both ACEs and infrequent condom use in an adjusted model, the adjusted ORs were 2.7 (95% CI: [1.0, 7.7]) and 3.7 (95% CI: 1.3, 11.1) for exposure to 1 to 2 ACEs and 3+ ACEs, respectively. In the adjusted model, we found increased odds for infrequent

condom use among males compared with females (aOR: 3.6, 95% CI: [1.9, 7.1]) and for those who had completed or attended secondary school (aOR: 1.8, 95% CI: [1.0, 3.4]).

Multiple ACEs and Multiple Sex Partners

Four percent of those experiencing no ACEs reported multiple sex partners in the past 12 months, compared with 6% of those experiencing 1 to 2 ACEs, and 18% of those experiencing 3+ ACEs (Table 4). The ORs for multiple sexual partners in an unadjusted logistic regression model increased, from 1.3 (95% CI: [0.4, 4.1]) for those with 1 to 2 ACEs, to 4.8 (95% CI: [1.5, 15.3]) for those with 3+ ACEs, compared with those reporting no ACEs. The aORs for having multiple sex partners in the past 12 months were 0.6 (95% CI: [0.2, 2.3]) and 1.8 (95% CI: [0.6, 5.9]) for exposure to 1 to 2 ACEs and 3+ ACEs, respectively, and were not statistically significant. In the adjusted model, we found higher adjusted odds for having multiple sexual partners among males compared with females (aOR: 7.7, 95% CI: [3.0, 19.4]) and a lower adjusted odds among those that were currently married, compared with those who were not married (aOR: 0.2, 95% CI: [0.1, 0.5]), and for those who were very close to their biological mother, compared with those who were not close (aOR: 0.3, 95% CI: [0.2, 0.7]) (Table 4).

Discussion

Adverse experiences in childhood, including various forms of violence, are highly prevalent among young adults in Malawi. Ninety percent of young men and 77% of young women report experiencing one or more ACEs before age 18 years. Exposure to multiple forms of violence is common, with over one in three young men and nearly one in four young women in Malawi reporting three or more ACEs. In addition, while both young men and young women reported engaging in sexual risk behaviors associated with HIV, these behaviors were more common among young men than young women. As these analyses demonstrate, experiencing adverse experiences in childhood is positively associated, in a dose-response fashion, with sexual risk behaviors, including infrequent condom use in the past 12 months.

While there is limited evidence on the prevalence of ACEs in other Sub-Saharan African contexts (Oladeji, Makanjuola, & Gureje, 2010), exposure to ACEs in Malawi is higher than reported in other non-African settings (Bellis, Hughes, et al., 2014). For example, in a recent survey of 10,696 young adults aged 18 to 25 years in eight eastern European countries, 53% reported at least one ACE, a prevalence similar to recent studies in the United States (Campbell et al., 2016) and the United Kingdom (Bellis, Lowey, et al., 2014), where 55% and 47% of adult respondents, respectively, reported at least one ACE. In the Philippines, a lower-middle income country, 75% of respondents reported experiencing at least one ACE (Ramiro et al., 2010). Despite measuring fewer ACEs in the current study (6 items vs. 10 or 11 items in other surveys), a higher prevalence of young adults in Malawi (82%) reported experiencing at least one ACE. Our results also indicated positive associations between ACEs and HIV-related sexual risk behaviors, specifically infrequent condom use, which is consistent with research in the United States (Campbell et al., 2016; Hillis et al., 2001), Europe (Bellis, Hughes, et al., 2014; Bellis, Lowey, et al., 2014), and the Philippines (Ramiro et al., 2010).

In our study, young men reported higher prevalence of sexual risk behaviors than young women, a result consistent with other research from Sub-Saharan Africa (Shisana et al., 2014). In adjusted models, males had higher adjusted odds, compared with females, of infrequent condom use in the past 12 months (aOR: 3.6, 95% CI: [1.9, 7.1]) and multiple sexual partners in the past 12 months (aOR: 7.7, 95% CI: [3.0, 19.4]). In Malawi, the prevalence of HIV in young women aged 15 to 24 (5.3%) is higher than it is for young men in the same age group (3.7%) (National Statistical Office & ICF Macro, 2011). As the epidemic in Malawi is predominantly attributed to heterosexual transmission, reducing sexual risk-taking behaviors among both young men and young women is key to interrupting HIV transmission. For that reason, the results presented here highlight the importance of prevention of violence against all children as a key HIV prevention strategy in Malawi.

This study found that males and females with higher education attainment were more likely to report no or infrequent condom use. There is mixed support of this in the literature. For example, a study in four African cities (Yaounde, Cameroon; Cotonou, Benin; Ndola, Zambia; and Kisumu, Kenya) found that education attainment was associated with higher condom use (Lagarde et al., 2001). A retrospective study from eastern and Southern Africa (Kenya, Malawi, Tanzania and Zambia) found that education had a “risk-decreasing effect” in areas of higher globalization, while in less globalized and more rural regions education may be a booster for sexual networks and sexual risk behaviors, including infrequent condom use (Van Stam, Michielsen, Stroeken, & Zijlstra, 2014). As Malawi is one of the least developed countries in the world (UNDP, 2015), the impact of globalization and development may be at play in this counter-intuitive association. Ultimately, more research needs to be done in Malawi on the relationship between education and condom use.

This study has some limitations. The cross-sectional design of the study limits our ability to determine the temporality of the associations we examined. In this analysis, the outcomes were risk behaviors associated with HIV, not confirmatory tests for HIV infections. This limitation may be addressed in future VACS, scheduled to be conducted in other countries in Sub-Saharan Africa, which will include HIV testing. In addition, our measure of ACEs did not capture some ACEs such as living with family members who were substance abusers, mentally ill, or suicidal, or who were imprisoned, that have been included in ACEs analyses in different contexts (Campbell et al., 2016). Thus, it is possible that the prevalence of ACEs measured here is an under-representation of the burden of ACEs experienced by children in Malawi. Finally, we do not have data to evaluate the diverse mechanisms, including physiological, psychological, social, or cultural mechanisms, by which ACEs may impact sexual risk behaviors among young adults in Malawi. Research suggests, however, that early life stress, including experiences of violence and witnessing violence, may lead to differences in the structure and physiology of the brain that may adversely affect risk-taking behaviors and the ability to form long-term attachments later in life (Anda et al., 2006).

Conclusion and Implications

Cumulative experiences of violence place young adults at risk of HIV through engaging in sexual risk-taking behaviors. Considering the high general HIV prevalence among adults in Malawi, preventing adverse events in childhood, including physical, emotional, and sexual

violence, could represent a critical strategy for HIV prevention. Furthermore, our findings suggest that there is a strong justification for continuing to prioritize vulnerable children in prevention and response programming. The findings also emphasize the need for a targeted approach for boys to protect both their health and the health of their future female sexual partners. There is growing evidence on what works to prevent adverse experiences in childhood, particularly experiences of violence. INSPIRE (WHO, 2016), a technical package that summarizes recommendations for preventing violence against children, may be used to inform programs and policies aimed at reducing violence and adverse events among children in Malawi and elsewhere. Our findings, and the INSPIRE technical package, also align with the goals of two ambitious global partnerships: DREAMS, a partnership to reduce HIV infections among adolescent girls and young women in 10 Sub-Saharan African countries, including Malawi; and the Global Partnership to End Violence Against Children, which aims to provide vision and guidance for the world's governments to meet Sustainable Development Goal 16.2—"end abuse, exploitation, trafficking, and all forms of violence against and torture of children" (End Violence: A Global Partnership to End Violence Against Children). Notably, the evidence-informed interventions delivered through DREAMS in Malawi, particularly interventions focused on postviolence care, parenting and caregiver programs, and mobilizing communities to value norms that protect adolescent girls and young women (DREAMS Innovation Challenge), are closely aligned with INSPIRE (WHO, 2016) and the Global Partnership's recommended strategies to end violence against children. This alignment may reflect both the growing recognition of the impact of adverse experiences in childhood on the risk of adverse health outcomes, particularly HIV, in Sub-Saharan African contexts such as Malawi, and the urgency for rapidly accelerating investment in effective, sustainable, and scalable strategies to prevent such violence.

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HIV Sexual Risk-Taking Behaviors:

Infrequent condom use: The respondent reported no or infrequent condom use with a partner or partners other than spouse in the past 12 months.

Multiple sex partners: The respondent reported having multiple sexual partners in the past 12 months.

Adverse Childhood Experiences (ACEs):

Childhood Sexual Abuse: The respondent reported experiencing, before age 18: unwanted touching in a sexual way, such as unwanted touching, kissing, grabbing, or fondling; unwanted attempted sex in which the perpetrator used physical coercion or pressure but did not succeed in completing sex; pressured sex in which the respondent was pressured in a non-physical way to have sex against his or her will and sex occurred; or physically forced sex in which he or she was physically forced to have sex against his or her will.

Childhood Physical Violence: The respondent reported, before age 18, being punched, kicked, whipped, beaten with an object, choked, smothered, burned intentionally, having someone try to drown him or her, or used or threatened to use a knife, gun or other weapon against him or her. This violence may have been perpetrated by a parent, adult caregiver, other adult relative, other adult in the community, a peer, or by an intimate partner.

Childhood Emotional Violence: The respondent was told as a child by his or her parents or caregivers he or she was not loved, that they wished the respondent had never been born, or the respondent was ridiculed or put down.

Witnessed IPV in childhood: The respondent reported seeing or hearing, before age 18, a parent punched, kicked or beaten up by the other parent, or their boyfriend or girlfriend.

Witnessed attack in the community: The respondent reported, before age 18, seeing someone get attacked outside of his home or family environment.

Orphaned: One or both of the respondent's parents died before the respondent was age 18.

Figure 1.
Measures of HIV sexual risk-taking behaviors and adverse childhood experiences.

Table 1.Characteristics of Sexually Active Males ($n = 244$) and Females ($n = 366$) Aged 19 to 24 Years, Malawi.

	Combined			Males			Females		
	(<i>n</i>)	%	95% CI	(<i>n</i>)	%	95% CI	(<i>n</i>)	%	95% CI
Adverse childhood experiences (ACEs) before age 18 years									
Any childhood sexual abuse	(102/610)	15.6	[12.2, 19.0]	(32/244)	12.0	[6.8, 17.2]	(70/366)	17.8	[13.4, 22.2]
Any childhood physical violence	(331/610)	50.5	[43.3, 57.7]	(167/244)	68.6	[61.4, 75.7]	(164/366)	39.5	[31.1, 47.9]
Any childhood emotional violence	(158/608)	22.8	[17.2, 28.4]	(75/242)	29.7	[23.1, 36.3]	(83/366)	18.6	[11.3, 25.8]
Ever witnessed IPV in childhood	(194/602)	33.1	[28.3, 37.8]	(86/240)	35.7	[27.9, 43.4]	(108/362)	31.5	[25.4, 37.5]
Witnessed attack in the community	(202/610)	29.8	[24.9, 34.7]	(98/244)	36.0	[28.1, 43.9]	(104/366)	26.0	[19.8, 32.3]
Orphaned	(175/595)	26.6	[21.4, 31.8]	(77/239)	28.6	[19.8, 37.3]	(98/356)	25.3	[18.8, 31.8]
Exposure to multiple ACES before age 18 years									
None	(103/610)	18.1	[13.4, 22.8]	(27/244)	10.0	[5.4, 14.7]	(76/366)	23.0	[16.6, 29.4]
One or two	(312/610)	53.0	[48.4, 57.6]	(120/244)	52.2	[45.8, 58.6]	(192/366)	53.4	[47.1, 59.8]
Three or more	(195/610)	28.9	[23.4, 34.5]	(97/244)	37.8	[31.7, 43.9]	(98/366)	23.6	[16.4, 30.7]
HIV sexual risk behaviors									
No or infrequent condom use with partners other than spouse (past 12 months)	(107/605)	17.2	[12.2, 22.2]	(68/241)	30.5	[22.4, 38.5]	(39/364)	9.1	[4.7, 13.6]
Multiple sex partners (past 12 months)	(60/610)	9.0	[5.7, 12.3]	(49/244)	19.8	[13.7, 25.8]	(11/366)	2.4 ^a	[0.2, 4.6]
Demographic characteristics									
Age in years (mean)	610	21.6	[21.4, 21.7]	244	21.6	[21.3, 21.8]	366	21.6	[21.4, 21.8]
Currently married	(466/610)	76.1	[69.9, 82.3]	(150/244)	56.4	[47.8, 65.0]	(316/366)	88.1	[82.8, 93.4]
Ever pregnant		(N/A)			N/A		(328/366)	89.7	[85.4, 93.9]
Completed or attended secondary school or higher	(185/610)	25.2	[19.4, 31.0]	(94/244)	32.9	[22.5, 43.4]	(91/366)	20.5	[13.9, 27.0]
Begged in the street	(80/610)	13.0	[8.5, 17.4]	(26/244)	8.8	[3.9, 13.7]	(54/366)	15.5	[9.3, 21.7]
Social characteristics									
Talks with friends	(207/608)	34.8	[29.1, 40.5]	(112/244)	46.6	[37.7, 55.5]	(95/364)	27.6	[21.4, 33.7]
Close with mother (1 = yes)	(474/610)	80.3	[75.8, 84.9]	(189/244)	84.8	[79.7, 89.9]	(285/366)	77.6	[71.2, 84.0]
Close with father (1 = yes)	(344/610)	53.8	[47.4, 60.1]	(152/244)	63.1	[56.2, 70.0]	(192/366)	48.1	[39.1, 57.1]

Note. CI = confidence interval; IPV = intimate partner violence.

^aCoefficient of variation >0.30, estimate should be interpreted with caution.

Table 2.

Exposure to Individual ACEs and HIV Risk Behaviors Among Sexually Active Males and Females Aged 19 to 24 Years, Malawi ($N = 605$).

	Infrequent Condom Use With Partners Other Than Spouse in the Past 12 Months				Multiple Sex Partners Past 12 Months			
	(<i>n</i>)	%	OR	95% CI	(<i>n</i>)	%	OR	95% CI
Exposure to ACEs before age 18 years ^a								
Any childhood sexual abuse	(27/101)	23.7	1.6	[0.7, 3.7]	(16/102)	14.1 ^b	1.9	[0.8, 4.3]
Any childhood physical violence	(67/329)	21.1	1.8	[1.0, 3.2]	(42/331)	12.8	2.8	[1.2, 6.3]
Any childhood emotional violence	(32/156)	24.1	1.8	[1.0, 3.3]	(22/158)	18.9	3.7	[1.7, 8.0]
Ever witnessed IPV in childhood	(42/194)	23.0	1.8	[0.9, 3.3]	(28/194)	16.4	3.5	[1.7, 7.1]
Ever witnessed attack in the community	(40/200)	15.7	0.9	[0.5, 1.6]	(23/202)	8.4	0.9	[0.4, 1.9]
Orphaned	(41/174)	27.3	2.3	[1.2, 4.2]	(19/175)	9.9	1.1	[0.5, 2.4]

Note. ACE = adverse childhood experiences; CI = confidence interval; IPV = intimate partner violence.

^aReference category is those not experiencing this ACE.

^bCoefficient of variation >0.30, estimate should be interpreted with caution.

Table 3.

Exposure to Multiple ACEs and Infrequent Condom Use in the Last 12 Months Among Sexually Active Males and Females Aged 19 to 24 Years, Malawi.

	Infrequent Condom Use With Partners Other Than Spouse in the Past 12 Months (<i>N</i> = 605)					
	Unadjusted Models				Adjusted Model ^a	
	(n)	%	OR	95% CI	aOR	95% CI
Exposure to ACEs						
None	(8/102)	5.3 ^b	Ref		Ref	
One or Two	(54/310)	17.0	3.6	[1.3, 10.2]	2.7	[1.0, 7.7]
Three or more	(45/193)	25.0	5.9	[2.1, 17.0]	3.7	[1.3, 11.1]
Demographic characteristics						
Male	(68/241)	30.5	4.4	[2.3, 8.4]	3.6	[1.9, 7.1]
Age in years			0.8	[0.7, 1.0]		
Completed or attended secondary school or higher	(45/183)	27.5	2.4	[1.3, 4.3]	1.8	[1.0, 3.4]
Ever beg for alms	(18/80)	11.8 ^b	0.6	[0.3, 1.4]		
Social characteristics						
Talks with friends	(52/205)	28.1	3.0	[1.7, 5.3]		
Close with mother (1 =yes)	(79/471)	16.3	0.7	[0.4, 1.4]		
Close with father (1 =yes)	(61/342)	19.8	1.5	[0.9, 2.5]		

Note. ACE = adverse childhood experiences; OR = odds ratio; aOR = adjusted OR; CI = confidence interval.

^aAdjusted model includes variables significantly ($p < .05$) associated with both the exposure (ACEs) and the outcome (infrequent condom use in the last 12 months).

^bCoefficient of variation >0.30 , estimate should be interpreted with caution.

Table 4.

Exposure to Multiple ACEs and Multiple Sexual Partners in the Past 12 Months Among Sexually Active Males and Females Aged 19 to 24 Years, Malawi.

	Multiple Sex Partners Past 12 Months (N = 610)					
	Unadjusted Models				Adjusted Model ^a	
	(n)	%	OR	95% CI	aOR	95% CI
Exposure to ACEs						
None	(8/103)	4.4 ^b	Ref		Ref	
One or Two	(21/312)	5.6	1.3	[0.4, 4.1]	0.6	[0.2, 2.3]
Three or more	(31/195)	18.1	4.8	[1.5, 15.3]	1.8	[0.6, 5.9]
Demographic characteristics						
Male	(49/244)	19.8	9.9	[3.7, 26.7]	7.7	[3.0, 19.4]
Age in years			0.8	[0.6, 0.9]		
Currently married	(23/466)	3.7	0.1	[0.1, 0.2]	0.2	[0.1, 0.5]
Completed or attended secondary school or higher	(23/185)	12.1	1.6	[0.8, 3.2]		
Ever beg for alms	(8/80)	6.5 ^b	0.7	[0.2, 2.0]		
Social characteristics						
Talks with friends	(26/207)	11.8	1.7	[0.8, 3.4]		
Close with mother (1 =yes)	(41/474)	7.5	0.5	[0.2, 0.9]	0.3	[0.2, 0.7]
Close with father (1 =yes)	(31/344)	8.6	0.9	[0.5, 1.7]		

Note. ACE = adverse childhood experiences; OR = odds ratio; aOR = adjusted OR; CI = confidence interval.

^aAdjusted model includes variables significantly ($p < .05$) associated with both the exposure (ACEs) and the outcome (multiple sex partners in the last 12 months).

^bCoefficient of variation >0.30, estimate should be interpreted with caution.