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Association between domestic violence and HIV serostatus among married and formerly married women in Kenya

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Abstract

The prevalence of both domestic violence (DV) and HIV among Kenyan women is known to be high, but the relationship between them is unknown. Nationally representative cross-sectional data from married and formerly married (MFM) women responding to the Kenya Demographic and Health Survey 2008/2009 were analyzed adjusting for complex survey design. Multivariable logistic regressions were used to assess the covariate-adjusted associations between HIV serostatus and any reported DV as well as four constituent DV measures: physical, emotional, sexual, and aggravated bodily harm, adjusting for co-variables entered into each model using a forward stepwise selection process. Co-variables of *a priori* interest included those representing marriage history, risky sexual behavior, substance use, perceived HIV risk, and socio-demographic characteristics. The prevalence of HIV among MFM women was 10.7% (any DV: 13.1%, no DV: 8.6%); overall prevalence of DV was 43.4%. Among all DV measures, only physical DV was associated with HIV (11.9%; adjusted odds ratio: 2.01, $p < 0.05$). Efforts by the government and women's groups to monitor and improve policies to reduce DV, such as the Sexual Offences Act of 2006, are urgently needed to curb HIV, as are policies that seek to provide DV counseling and treatment to MFM women.

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Keywords

Domestic violence; Epidemiology; HIV/AIDS; Kenya; Women

In Kenya, as in much of Sub-Saharan Africa (SSA), women are disproportionately affected by both HIV (UNAIDS, 2012) and domestic violence (Goo & Harlow, 2012; Jewkes, 2002; Kishor & Johnson, 2004; Koenig, 2003; Wanyoni & Lumumba, 2010). Among Kenyans aged 15-49 years, 8% of women compared to 4% of men report HIV infection (KNBS & ICF Macro, 2010), and higher prevalence of domestic violence among Kenyan women has been previously reported (Abuya, Onsomu, Moore, et al., 2012; Fonck, Leye, Kidula, et al., 2005; Goo & Harlow, 2012; Kishor & Johnson, 2004; Wanyoni & Lumumba, 2010). Despite the high prevalence of both DV and HIV among Kenyan women, the relationship between DV and HIV remains unclear. Although several investigators have observed an association between DV and HIV (Dude, 2011; Jewkes, Dunkle, Nduna, et al., 2010; Shi, Kouyoumdjian, and Dushoff, 2013; Silverman, Decker, Saggurti, et al., 2008), in the largest study on this topic—which incorporated data from 10 developing countries including Kenya—an association was not observed (Harling, Msisha, and Subramanian, 2010). Yet all of these studies are subject to important methodology and context limitations which may in part explain the discrepant findings. In the current study, we have addressed many of the limitations found in the existing literature in order to more accurately assess the relationship between DV and HIV infection among Kenyan women. An accurate understanding of the relationship between DV and HIV is paramount to the development of interventions to address these deeply rooted societal problems, which take a particularly heavy toll among women in Kenya and women throughout SSA.

Intimate Partner Violence (IPV), which includes DV, is the most common form of gender-based violence (García-Moreno, Jansen, Ellsberg, et al., 2006). It is defined as “the range of sexually, psychologically and physically coercive acts used against adult and adolescent women by current or former male intimate partners” (WHO, 1997, p. 5). Experts estimate that in African countries, 25-48% of women will suffer abuse at one point in their lives (Goo & Harlow, 2012; Jewkes, 2002; Kishor & Johnson, 2004; Koenig, 2003; Wanyoni & Lumumba, 2010). Its prevalence in Kenya is established (Abuya et al., 2012; Fonck et al., 2005; Goo & Harlow, 2012; Kishor & Johnson, 2004; Wanyoni & Lumumba, 2010), and Abuya et al. (2012) showed that physical (42%) and sexual (14%) violence toward Kenyan women fell in the middle range of multi-country estimates reported by the World Health Organization, 14-61% and 6-59%, respectively (WHO, 2005). Emotional violence is also rampant (Abuya et al., 2012; Fonck et al., 2005; Goo & Harlow, 2012; Kimuna, 2008).

Physical and sexual violence, including sexual assault within marriage, increase transmission of the virus as tears and lacerations to the vaginal canal enable its invasion of the vaginal epithelia (García-Moreno & Watts, 2000; Kishor et al., 2004; van der Straten, 1998; Wittenberg, Joshi, Thomas, & McCloskey, 2007). Socially, the threat of IPV often impedes open communication regarding disease risk. Women refrain from discussing their husband's risky behaviors, such as extramarital partners or frequenting sex workers (Lary, Maman, Katebalila, McCauley, & Mbwambo, 2004; Lasee & Becker, 1997; Karamagi,

Tumwine, Tylleskar, & Heggenhougen, 2006), and avoid disclosing their own HIV serostatus in fear of accusations of infidelity, abandonment, discrimination, physical and emotional violence, and disruption of family relationships (Antelman, Smith Fawzi, Kaaya, et al. 2001; Gaillard et al., 2002; Medley, García-Moreno, McGill, & Maman, 2004).

Women reporting physical and emotional IPV also reported impaired emotional and social functioning, including depression, helplessness, resignation, and isolation from friends, family, and religious groups (Dietz, Gazmararian, Goodwin, et al., 1997; Wittenberg et al., 2007). Further, IPV has been shown to affect a woman's participation in household decision making, including decisions about her own health; for example, whether to seek skilled healthcare (Antelman, Smith Fawzi, Kaaya, et al. 2001; Dietz, Gazmararian, Goodwin et al., 1997; Dunkle, 2004; Fonck et al., 2005; Gaillard et al., 2002; Goo & Harlow, 2012; Izugbara & Ngilangwa, 2010; Malhotra, Schuler, & Boender, 2002; Maman et al., 2002; Medley et al., 2004; WHO, 2005).

IPV is also associated with increased HIV risk in women because men who abuse their wives exhibit other risky behaviors, including drug abuse and alcohol misuse (Gielen, McDonnell, O'Campo, 2002; Karamagi et al., 2006; Zablotska, 2009), multiple sexual partners (Martin, Kilgallen, Tsui, et al., 1999; Onsomu, Kimani, Abuya, et al., 2013), and lack of condom use (Gielen et al., 2002; Karamagi et al., 2006). Patriarchal cultural pressures that encourage men toward early sexual initiation and multiple sexual partners prior to marriage are also associated with increased incidence of infection (Abuya et al., 2012; Dunkle, 2006; Lary et al., 2004; Silverman et al., 2008). These factors are exacerbated by dominant and controlling men who manipulate their partners (Wang & Rowley, 2007; Wingood & DiClemente, 1998) and increase women's risk of contracting HIV (Decker et al., 2008; Dude, 2011; Silverman et al., 2008).

One of the nine priority areas in the UNAIDS Outcome Framework for 2009-2011 (2009) is to end violence against girls and women, especially because it increases their susceptibility to HIV infection (Andersson et al., 2008; Campbell et al., 2008; García-Moreno & Watts, 2000; Martin & Curtis, 2004; WHO, 2004). Although prevalence varies, many countries acknowledge the association between violence and HIV susceptibility among women. For instance, in eastern and southern Africa, IPV is associated with high risk of HIV infection (Abuya et al., 2012; Dunkle et al., 2004; Fonck et al., 2005; Jewkes, Levin, & Penn-Kekana, 2003; Jewkes, Dunkle, et al., 2010; Karamagi et al., 2006; Kiarie et al., 2006; Lary et al. 2004; Maman et al., 2002; van der Straten et al., 1998).

Additionally, qualitative studies have highlighted the links between HIV/AIDS, gender inequities, and DV as an outcome of the patriarchal nature of African societies and notions of masculinity that emphasize male strength and toughness and perpetuate control of women (Coovadia et al., 2009; Go et al., 2003; Jewkes, Dunkle, et al., 2010). Such norms have led some women to accept and tolerate male dominance to the extent of rationalizing IPV (Izugbara & Ngilangwe, 2010; Lawoko, 2008). For example, researchers found that traditional practices in some rural Kenyan communities could predispose women to higher risk of physical violence (Abuya et al., 2012). The prevalence of violence impedes women's ability to negotiate for safe sex, which often results in low condom use (Abuya et al., 2012;

Andersson et al., 2008; Campbell et al., 2008; García-Moreno & Watts, 2000; Go et al., 2003; Karamagi et al., 2006; WHO, 2004).

Although research has shown that women are at greater risk of HIV infection, particularly in areas where HIV infection is high, prevention messages largely continue to focus on HIV testing, male condom use (Go et al., 2003), treatment of sexually transmitted diseases (STDs), and, most recently, male circumcision and antiretroviral treatment. Notably, interventions have not focused on gender-specific problems nor benefited vulnerable women (Christofides et al., 2010; Wawer et al., 2009).

From the foregoing arguments, research continues to show that gender-based violence, usually an outcome of male dominance, results in high-risk sexual behavior (Dunkle et al., 2004; Gilbert et al., 2000; Jewkes et al., 2003; Jewkes, Dunkle, Nduna, et al., 2006; Wingood & DiClemente, 1998; Zablotska et al., 2009). Women who experience violence in highly unequal relationships have greater chances of contracting HIV (Decker et al., 2008; Dude, 2011; Jewkes & Morrell, 2010; Karamagi et al., 2006; Silverman et al., 2008). Nonetheless, scholars examining HIV and IPV among women in ten developing countries, including Kenya, found no association (Harling et al., 2010). In the current study, we provide further evidence about the association between DV and HIV serostatus among married and formerly married women in Kenya and improve on previous estimates by controlling for possible confounders.

Methods

Data source

Our cross-sectional study used a population-based national sample, the 2008/2009 Kenya Demographic and Health Survey (KDHS-2008/09), with data collected between November 2008 and February 2009. This survey was the second to collect information on HIV serostatus, following the KDHS-2003 (Central Bureau of Statistics; CBS, 2004). Data were limited to a subsample of women aged 15–49 from a merged dataset that considered those who were married ($n=5,041$) or formerly married ($n=863$); of these women, 4,906 (83.1%) responded to questions about DV. Among these married and formerly married women, 2,669 of them agreed to be tested for HIV; among them 442 did not respond to DV questions and were excluded from the final analyses. The total sample of 2,227 (83.4%) were tested for HIV and responded to DV questions, which allowed us to estimate the association between DV and HIV serostatus. Study data were weighted to account for a clustering effect to eliminate over- and underestimation in the standard errors (StataCorp, 2013).

Survey measures

HIV serostatus—National Public Health Laboratory Services personnel were involved in the collection of dried blood spot (DBS) samples, voluntary counseling and testing, and laboratory testing for HIV. All positive samples and a random selection of negative samples (10%) were subjected to further testing at the HIV laboratory of the Kenya Medical Research Institute (KEMRI) using the same procedure. Further analysis by polymerase

chain reaction (PCR) of the deoxyribonucleic acid (DNA) in the same laboratory on 30 discrepant samples were conducted. See KNBS & ICF Macro (2010, pp. 9-10) for a complete description of the HIV procedures and testing. All DBS testing was done in early June 2009.

Domestic violence—Evaluation of DV among married and formerly married women was based on a modified Conflict Tactics Scale (CTS) used in the KDHS-2008/09, which has proven effective in measuring DV across cultures (Strauss, 1990, cited in KNBS & ICF Macro, 2010). Questions were asked to evaluate abuse and coded as no, “0”, or yes, “1”. Common factor analysis was used to group and identify patterns from the various questions while maintaining the needed information with minimal loss.

The factors that mostly explained/measured certain themes based on rotated factor loadings were retained, and named based on the overall theme represented by their constituent items; these themes were named and used for analyses as the study exposures. Dichotomous variables generated from the retained factors explained most of the total variance (40-62%) for each of the four themes identified: (a) physical violence [Push you, shake you, or throw something at you?; Slap you?; Twist your arm or pull your hair?; Punch you with his fist or with something that could hurt you?; and Kick you or drag you or beat you up?];(b) emotional violence [Say or do something to humiliate you in front of others?; Threaten to hurt or harm you or someone close to you?; and Insult you or make you feel bad about yourself?], (c) sexual violence [Physically forced you to have sexual intercourse even when you did not want to?; and Force you to perform any sexual acts you did not want to?]; and (d) violence with aggravated bodily harm (AGBH) [Try to choke you or burn you on purpose?; and Threaten to attack you with a knife, gun, or any other weapon?]. A fifth theme was generated from all of the four variables and named “all forms of violence.” All themes were coded as “0” if respondents indicated that they did not experience violence, and “1” if they did. Weights and correlations between each variable (factor loading) were determined at <0.3 (UCLA IDRE, n.d.).

Socio-demographic factors—The survey captured several partner, personal, social, and demographic characteristics, and since they could have an effect on or explain the association between DV and HIV serostatus, we controlled for them in the final logistic multivariable models. They include: (a) age, measured in five-year increments, and ranging from 15-49 years, considered reproductive age; (b) risky sexual behavior, a variable generated from three questions: were you given or did you receive money/gifts for sex in the past 12 months?; how many individuals have you had sex with other than your husband in the last 12 months?; and was a condom used in the last intercourse?; (c) number of lifetime sexual partners; (d) whether husband consumes alcohol; (e) presence of a sexually transmitted disease, a variable constructed from two questions: have you had a genital sore/ulcer? and genital discharge in the last 12 months?; (f) number of co-wives, coded as no other co-wife or two or more co-wives; (g) education; (h) religion; (i) wealth index, a variable generated from the household's ownership of consumer goods, dwelling characteristics, drinking water source, and toilet facilities, among other socioeconomic characteristics (Gwatkin et al., 2000, cited in KNBS & ICF Macro, 2010); (j) residence; (k)

age at first marriage; (l) occupation; (m) health insurance; and (n) perceived risk of acquiring HIV.

Data analysis

The survey responses and HIV test result datasets were merged. All descriptive, bivariate, univariate, and multivariable data analyses were conducted using Stata/SE 13.1 with a “svyset” command, taking into consideration the weights, strata, cluster, and single unit to attain linearized standard errors. Hence, we accounted for nonindependence within the primary sampling unit and survey nonresponse. Bivariate analyses were used to estimate the prevalence of HIV serostatus. Univariate logistic regression analyses were used to estimate the association between the main outcome measure (HIV serostatus) and independent variables. Multivariate logistic regression analyses were conducted by including variables identified through the forward stepwise regression method and manual inclusion. Univariate (unadjusted) and multivariable (adjusted) analyses are reported using odds ratios (ORs) and 95% confidence intervals (CIs), with study significance set at a two tailed p-value of < 0.05.

Institutional Review Board approval

The current study involved secondary data analysis of the KDHS-2008/2009. Administration of the survey involved multiple organizations, including the Kenya National Bureau of Statistics (KNBS), the MEASURE Demographic and Health Survey (DHS) program at ICF Macro, the United States Agency for International Development (USAID), among others. For the HIV test, the blood specimen collection and analysis protocol was developed by the DHS program, with revisions completed by KEMRI and the Kenya National AIDS Control Council (NACC). It was reviewed and approved by KEMRI Scientific and Ethical Review Committee (KNBS & ICF Macro, 2010). Further human subject review and study oversight were granted by the Winston-Salem State University Institutional Review Board (IRB) under exempt status.

Results

Descriptive statistics

The study included both married and formerly married women aged 15-49 (n=2,227). Overall, HIV prevalence among those who responded to DV questions was 10.67%, which differed between those who were currently married (7.03%), formerly married (34.19%), and both (married and formerly married) women (10.67%). Prevalence of any DV was 44%, 42%, and 43% among these groups of women respectively. Figure 1 reports the various forms of DV among married and formerly married women; ranging from a low of 4% for married women experiencing violence with AGBH to a high of 32% for formerly married women experiencing physical violence. Overall, physical, emotional, sexual, and violence with AGBH were slightly higher among formerly married women with the exception of all forms of violence (see Table 1 and Figure 1).

Bivariate analysis

Of married women who experienced physical violence, 11.9% tested positive for HIV compared to 5.8% ($F_{1, 378} = 14.24, p < 0.001$) among those who did not experience physical

violence. Also, 11.2% of married women who experienced sexual violence tested positive for HIV compared to 6.7% ($F_{1, 378} = 3.83, p < 0.05$) among those who did not experience sexual violence. Overall, 10.6% of married women experiencing all forms of violence tested positive for HIV compared to 5.2% ($F_{1, 378} = 6.22, p < 0.05$) among those who did not. For formerly married women, 20.5% who reported previous sexual violence tested positive for HIV compared to 33.8% ($F_{1, 190} = 5.01, p < 0.05$) of those who did not experience sexual violence. For married and formerly married women who experienced physical violence, 14.8% tested positive for HIV compared to 8.7% ($F_{1, 379} = 5.76, p < 0.05$) among those who did not (see Table 2).

Certain characteristics entered into the final model through stepwise forward multivariate analysis and manual selection method were associated with HIV serostatus. The following were not associated; age at first marriage, husband's alcohol consumption, and education - selected by stepwise forward multivariate method, and health insurance status, wealth index, and age, which were selected manually and added back in the final model. These variables have been identified as relevant in previous studies of DV and HIV serostatus (Decker, Miller, Kapur, et al., 2008; Decker, Seage, Hemenway, et al., 2009; Dude, 2011; Gielen et al., 2002; Jewkes, Dunkle, Nduna, et al., 2006; Jewkes, Dunkle, Nduna, et al., 2010; Maman et al., 2002; Shi et al., 2013; Silverman et al., 2008).

Association between HIV serostatus and domestic violence

Unadjusted results—Table 3 presents unadjusted (crude) odds ratios (ORs) in a univariate logistic regression model of the association between DV and HIV serostatus. Among married women, the OR for HIV infection was higher among those who experienced physical violence compared to those who did not 2.42 ($p < 0.001$). The ORs were also higher among married women who experienced sexual violence and all forms of violence compared to those who did not 1.66 ($p < 0.05$) and 1.83 ($p < 0.01$) respectively. Among formerly married women, the OR for HIV infection among those who experienced sexual violence compared to those who did not was 0.42 ($p < 0.05$).

Among married women, the OR for HIV infection among those with risky sexual behavior compared to those without was 0.25 ($p < 0.001$). Married women reporting two, three, and four or more lifetime sexual partners compared to those who reported only one lifetime sexual partner had increased ORs for HIV infection: 1.77 ($p < 0.05$), 1.73 ($p < 0.001$), and 1.48 ($p < 0.001$), respectively. Similarly, among married women, the OR for HIV infection among those whose husbands had two or more other wives compared to those who were the only wife was 2.8 ($p < 0.001$).

Among married women aged 20-24, 35-39, and 45-49 compared to those aged 15-19, the ORs for HIV infection were 0.28 ($p < 0.01$), 0.76 ($p < 0.05$), and 0.79 ($p < 0.01$), respectively. Among formerly married women aged between age groups 20-24 and 45-49 compared to those aged 15-19, the ORs for HIV infection were higher with more than 8.12 ($p < 0.001$). Among married Muslims, the OR for HIV infection compared to those affiliated with Protestant religions was 0.65 ($p < 0.05$). The OR for HIV infection was 0.39 ($p < 0.01$) among formerly married Muslims. Among married women, the OR for HIV infection

among those who perceived themselves to have a small risk of acquiring HIV compared to those who perceived themselves to have no risk at all was 0.42 ($p < 0.05$).

Adjusted results—After controlling for socio-demographic, partner, and personal characteristics, statistically significant associations were observed between HIV serostatus and DV (see Table 4). Among married women, the OR for HIV infection was higher among those who experienced physical violence compared to those who did not 2.01 ($p < 0.05$). In modeling the association between physical violence and HIV serostatus among married women, other covariates that had statistically associations with HIV serostatus were risky sexual behaviors, number lifetime sexual partners (three and four or more), number of co-wives, age, religion (Muslim), and age at first marriage (> 14 years).

Of the married women in the study experiencing all forms of violence (44%), the OR for HIV infection among those with risky sexual behaviors compared to those without was 0.21 ($p < 0.001$). Among married women who experienced physical violence, the OR for HIV infection was higher among those who had two or more co-wives compared to those without co-wives was 2.6 ($p < 0.001$). Among married women experiencing various types of violence, those who indicated that they had previously had two, three, or four or more lifetime sexual partners had higher ORs for HIV infection ranging from 1.49 ($p < 0.01$) to 1.93 ($p < 0.05$) compared to those who reported only one lifetime sexual partner.

Among married women who experienced physical violence, the ORs for HIV infection among those aged 20-24 (21%) and 45-49 (10%) compared to those aged 15-19 was 0.18 ($p < 0.01$) and 0.68 ($p < 0.001$) respectively. Furthermore, among women experiencing physical violence, higher OR for HIV infection among those who were aged > 14 (10%) at first marriage compared to those who were aged ≤ 14 was 1.72 ($p < 0.01$). Among women experiencing all forms of violence, the OR for HIV infection was 1.76 ($p < 0.001$). Among married Muslims (8%), the ORs for HIV infection among those experiencing various types of abuse compared to those affiliated to Protestants religions ranged between 0.52 to 0.56 ($p < 0.05$).

Discussion

Researchers sought to evaluate the association between domestic violence and HIV serostatus among married and formerly married women in Kenya. This objective was motivated by contradictory findings in the literature on the association between IPV and HIV/AIDS in different contexts, including Kenya (Harling et al., 2010); and methodological issues (Shi et al., 2013), that demanded re-examination. Establishing the pathways by which violence may both be a marker for and directly facilitate HIV infection among women should inform prevention and treatment strategies (Abuya et al., 2012; Decker, Miller, Kapur, et al., 2008; Dunkle, 2004; Fonck et al., 2005; Goo & Harlow, 2012; Jewkes et al., 2003; Maman et al., 2002; Martin & Curtis, 2004; Silverman et al., 2008; van der Straten, 1998). Compared to other studies that examined the association between DV and HIV infection (Decker, Miller, Kapur, et al., 2008; Decker, Seage, Hemenway, et al., 2009; Dude, 2011; Gielen et al., 2002; Jewkes, Dunkle, et al., 2006; Jewkes, Dunkle, et al., 2010;

Maman et al., 2002; Shi et al., 2013; Silverman et al., 2008; van der Straten et al., 1998), our study controlled for most of the identified confounders.

Overall, we found HIV prevalence among those who responded to DV questions to be 10.67%, this was higher than the 8% reported for women aged 15-49 by the KDHS 2008/2009 (KNBS & ICF Macro, 2010). The prevalence of DV was 44%, 42%, and 43% among married and formerly married women and women who have been both, respectively, which confirms the findings of Abuya et al. (2012); Fonck et al. (2005); Goo and Harlow (2012); Kishor et al. (2004); Wanyoni and Lumumba (2010), who established the continued prevalence of IPV in Kenya. The finding that 42% of formerly married women have experience DV is consistent with a study by Abuya et al. (2012) that established the prevalence of physical violence at 42% based on the 2003 KDHS. Given that our study used the 2008/2009 KDHS, we see no significant change in the prevalence of physical violence against formerly married women in Kenya. It falls within the middle range of the 14-61% reported in a 2005 WHO multi-country study on women's health and DV.

We found that married women who experienced physical violence had 2.01 ($p < 0.05$) times the odds of testing positive for HIV compared to those who did not experience physical violence. This finding corroborates the work of scholars in the last decade who have reported associations between partner violence and high risk of HIV infection in eastern and southern Africa (Abuya et al., 2012; Dunkle et al., 2004; Fonck et al., 2005; Jewkes et al., 2003; Jewkes, Dunkle, et al., 2010; Karamagi et al., 2006; Kiarie et al., 2006; Lary et al 2004; Maman et al., 2002; van der Straten et al., 1998). Therefore, the need to implement the UNAIDS Outcome Framework for 2009-2011 priority to end violence against girls and women is urgent (UNAIDS, 2009). Emotional violence, sexual violence, violence with AGBH, and all forms of violence were not observed to have any significant association with HIV serostatus. However, except for emotional violence, they had higher ORs of HIV infection compared to those who did not experience any DV. Another explanation for lack of significance for other forms of DV can be due to the small sample size as observed from the confidence intervals.

Aside from DV, other factors that increased the likelihood of testing positive for HIV among married women included number of lifetime sexual partners, number of co-wives, and age at first marriage. These factors, including risky sexual behaviors and age, have been associated with increased risk of infection, not only among women, but also among men, who then spread the disease to their female partners (Martin, Kilgallen, Tsui, et al., 1999). However, our study found that married women aged 20-49 who experienced physical violence had less risk (OR: 0.18 to 0.7) of testing positive for HIV compared to their counterparts aged 15-19. With regard to age at first marriage, the study found that women who were aged 14 when first married and experienced physical violence had 1.72 ($p < 0.01$) times the odds of testing positive for HIV compared to those aged 25. Overall, these findings implicate marriage as a risk factor for contracting HIV and age at first marriage with contracting the virus later in life.

The patriarchal nature of African society is known to support a notion of masculinity that perpetuates control of women by their male partners (Coovadia et al., 2009). In many

African societies, including Kenya, women are expected to accept and to tolerate male dominance to the extent of rationalizing severe forms, such as domestic violence (Izugbara & Ngilangwa, 2010; Lawoko, 2008). Furthermore, age differences in sexual partnerships have long been associated with increased risk of intergenerational HIV transmission (Gregson, Nyamukapa, Garnett, et al., 2002), especially between older men and younger women (Longfield, Glick, Waithaka, et al., 2004), in part, because older men have had time to acquire sexually transmitted infections from other partners (Kelly, Gray, Sewankambo, et al., 2003). Younger women are also likely to be economically dependent on their often older partners and unlikely to leave a sexually risky or abusive relationship (Luke, 2003). Younger wives experiencing DV are unlikely to ask their husbands about their HIV status and other previous or current sexual partners, leaving them more vulnerable to infection (Sa & Larsen, 2007).

Our study may be limited by the survey on which it is based. Since our measurements of the variables are restricted to one time point, we could not assess the relationship between DV and HIV serostatus over time. Our findings are also limited to Kenya and cannot be generalized to other SSA countries. While the instrument was found sensitive to cultural differences and effective in measuring DV (Strauss, 1990, cited in KNBS & ICF Macro, 2010), self-response might have led to underreporting. Since our data was limited to women who responded to DV questions and agreed to be tested for HIV; a large percentage of women who respond to DV questions were not considered in the final analyses. This raises questions about differences between women who experienced DV and tested for HIV vs. those who experienced DV and were not tested for HIV.

Cultural expectations and norms in the context of most African countries, including Kenya, could have led some respondents to think that some forms of violence are acceptable and not “actual domestic violence.” Furthermore, the survey did not capture timeline for violence, which could have caused recall bias, leading to nondifferential misclassification of the exposure (DV) and possibly biasing the findings toward the null (Birkett, 1992; Dosemeci, Wacholder, & Lubin, 1990). However, these married and formerly married women would probably identify most of these forms as DV and respond appropriately, reducing the possibility of nondifferential misclassification. Potential recall bias by HIV serostatus could have been possible among women who were aware of being HIV positive at the time of the survey. These women, especially those who were formerly married may have been more likely to report a history of violence than women who had not tested HIV positive previously. This could explain the high HIV prevalence rates for various types of DV among formerly married women that ranged between 15.4 - 30.5%.

Overall, our findings have significant policy implications for women's health outcomes in Kenya. They call for increasing the level of awareness, protection, and subsequent empowerment of women. Articles 3, 7, and 10 (Domestic Violence and Sexual Violence) of the Sexual Offenses Act (No. 3 of 2006, rev.2007) address domestic violence (Kenya Law Reports and the Government of Kenya, 2009). The adoption of effective and concrete measures to combat domestic and sexual violence against women, sensitization of society as a whole on these issues, prosecution of perpetrators, and provision of assistance and protection to victims are some of the measures proposed.

The importance of women's protection and empowerment is premised on consistent findings from prior studies and the current study, which show that violence, particularly physical abuse, makes women susceptible to HIV infection and other sexually transmitted diseases (Abuya et al., 2012; Decker, Miller, Kapur, et al., 2008; Dunkle, 2004; Fonck et al., 2005; Jewkes et al., 2003; Maman et al., 2002; Martin & Curtis, 2004; Silverman et al., 2008; van der Straten, 1998). Our study argues strongly for the immediate implementation of the proposals in the Sexual Offences Act of 2006.

In Kenya, services for victims of gender-based violence have been provided mainly by non-state actors. The Kenyan government should be more involved and develop nationwide emergency shelters to provide accommodation, medical care, and counseling services for victims of gender-based violence (Federation of Women Lawyers; FIDA, 2011). They are essential because many women are economically and emotionally dependent on their abusers (FIDA, 2011; Luke, 2003). Our study supports this notion and reiterates the need to implement the UNAIDS (2009) critical priority to end violence against girls and women, especially to protect young women from early marriage, which we found increases their risk for testing positive for HIV later in life compared to those who married when they were aged 25. One plausible explanation is that such young women are more likely to be economically dependent on their older partners, which prevents them from leaving what are often sexually risky and abusive relationships.

Additionally, both men and women in marital relationships should be sensitized about ways to protect themselves against HIV infection. In particular, younger women who experience domestic violence and are afraid to ask their husbands about their previous or current sexual partners and HIV status are more vulnerable to infection (Sa & Larsen, 2007). Also, economic empowerment and micro-financing programs for women in countries like Kenya will go a long way toward making women less dependent on men and more able to make informed choices when faced with circumstances that threaten their sexual and personal health.

This study adds to the body of literature associating IPV and HIV serostatus by critically examining numerous risk factors. Women responding to questions about IPV were categorized as married and formerly married to provide finer distinction on life status and a more nuanced analysis; however, for formerly married women, the sample (n=292) was not sufficient to allow multiple logistic regression analysis. A major innovation of our study was the examination of different components of DV (physical, emotional, sexual, violence with AGBH, and all forms of violence) which could contribute to the literature on intimate partner violence. Our study did associate physical violence and HIV serostatus among married women. Because of the high prevalence of HIV (all forms of violence) among formerly married women (28.1%); which could be explained by the fact that their husbands might have died from HIV, prospective studies should be conducted to identify the silent factors of domestic violence that were not captured by the national survey among this vulnerable group. Such study findings can be used to develop interventions targeting formerly married women. These high HIV prevalence for various DVs; physical (30.5%), emotional (27.7%), sexual (20.5%), violence with AGBH (15.4%), and all forms of violence (28.1%) have never been reported before.

By virtue of their life status, formerly married women who are HIV positive may experience triple jeopardy: the disease, alienation, and stigma. Emotionally, these women need support to achieve better health outcomes. Studies show that women who report IPV also report impaired emotional and social functioning, including depression, helplessness, resignation, and isolation from friends, family, and religious groups (Dietz, 1997; Wittenberg, 2007). Broad community-based initiatives to deal with the underlying gender norms and social attitudes about HIV/AIDS and DV against women must accompany individually focused initiatives to create a safer and more comfortable environment for women. Given the prevalence of HIV among married and formerly married women experiencing IPV, initiatives that support them toward healthy lifestyles should be encouraged through policies that enable tailored counseling and medication services.

Only an end to violence against women can promote their physical, social, and emotional integrity. Curbing IPV will enable them to make optimal decisions about their life and health, including safeguards against sexually transmitted diseases including HIV, so their contributions to society can flourish.

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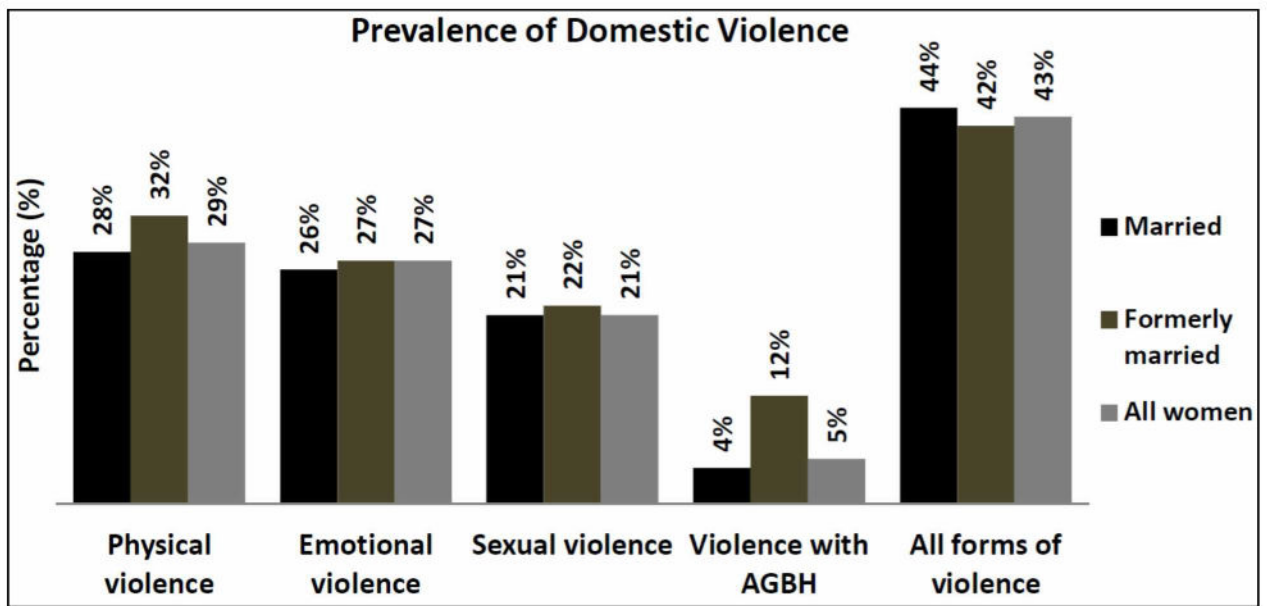


Figure 1. Percentage of domestic violence among married and formerly married women agreeing to be tested for HIV in Kenya, KDHS 2008/2009
 AGBH: aggravated bodily harm

Table 1

Study population characteristics, KDHS 2008/2009

Study Characteristics	Married		Formerly married		Married and formerly married	
	n	%	n	%	n	%
HIV serostatus (n=2,227)						
Negative	1789	93	203	66	1992	89
Positive [§]	146	7	89	34	235	11
Physical violence (n=2,224)						
No	1370	72	186	68	1556	71
Yes	563	28	105	32	668	29
Emotional violence (n=2,226)						
No	1442	74	201	73	1643	73
Yes	493	26	90	27	583	27
Sexual violence (n=2,225)						
No	1567	79	219	78	1786	79
Yes	366	21	73	22	439	21
Violence with AGBH^β (n=2,224)						
No	1861	96	253	88	2114	95
Yes	72	4	38	12	110	5
All forms of violence (n=2,227)						
No	1106	56	153	58	1259	57
Yes	829	44	139	42	968	43
Risky sexual behavior (n=2,224)						
No	1825	95	152	51	1977	89
Yes	107	5	140	49	247	11
Number of lifetime sexual partners (n=2,221)						
One	901	43	61	22	962	40
Two	566	32	84	28	650	31
Three	279	16	75	27	354	17
Four or more	183	9	72	23	255	11
Husband consumes alcohol (n=2,224)						

Study Characteristics	Married		Formerly married		Married and formerly married	
	n	%	n	%	n	%
No	1290	65	134	42	1424	62
Yes	643	35	157	58	800	38
Sexually transmitted diseases (n=2,226)						
No STDs	1799	94	267	92	2066	94
STDs Present	135	6	25	8	160	6
Number of co-wives (n=1,934)						
No other wife	1645	88	-	-	1645	88
Two or more	289	12	-	-	289	12
Education (n=2,227)						
Less than primary/none	348	11	48	11	396	11
Primary	1059	59	171	63	1230	60
Secondary	393	24	58	22	451	23
Higher/college/graduate	135	6	15	4	150	6
Age (n=2,227)						
15-19	93	3	3	1	96	3
20-24	427	21	41	14	468	20
25-29	435	26	42	16	477	24
30-34	361	19	60	19	421	19
35-39	266	13	48	12	314	13
40-44	184	10	44	20	228	11
45-49	169	9	54	19	223	10
Religion (n=2,226)						
Protestant	1140	66	171	67	1311	67
Roman catholic	380	22	76	24	456	22
Muslim	343	8	37	7	380	8
Other religions	71	3	8	2	79	3
Wealth index (n=2,227)						
Poorest	448	19	64	20	512	19
Poorer	311	17	59	19	370	17
Middle	317	17	49	18	366	18

Study Characteristics	Married		Formerly married		Married and formerly married	
	n	%	n	%	n	%
Richer	362	20	45	18	407	20
Richest	497	26	75	25	572	26
Residence (n=2,227)						
Urban	519	23	80	25	599	24
Rural	1416	77	212	75	1628	76
Age at first marriage (n=2,227)						
25	196	9	31	15	227	10
20-24	562	31	82	27	644	30
15-19	973	50	146	47	1119	50
14	204	10	33	11	237	10
Occupation (n=2,222)						
Not working	754	34	57	18	811	32
Teaching and professional	381	19	63	22	444	20
Agriculture-self employed	478	29	77	29	555	29
Sales	124	7	24	9	148	7
Other occupations	194	10	70	22	264	12
Health insurance (n=2,226)						
No	1800	92	284	97	2084	92
Yes	134	8	8	3	142	8
Perceived risk of acquiring HIV (n=2,214)						
No risk at all	159	8	26	7	185	8
Small risk	705	33	106	40	811	34
Moderate risk	725	41	93	31	818	40
Great risk	336	18	64	21	400	18

§ Exact HIV prevalence: married women (7.03%), formerly married women (34.19%), and married and formerly married women (10.67%)

β AGBHI: aggravated bodily harm

Table 2
Bivariate analysis, number and percentage of the association between HIV serostatus and domestic violence, KDHS 2008/2009

	Married women			
	Negative (n)	Positive (n)	HIV Prevalence	p-value
Physical violence	n=1,933			
No	1291	79	5.8	$X^2 (n=1933, df=378) = 14.25^{***}$
Yes	496	67	11.9	
Emotional violence	n=1,935			
No	1347	95	6.6	$X^2 (n=1935, df=378) = 0.88^{NS}$
Yes	442	51	10.3	
Sexual violence	n=1,933			
No	1462	105	6.7	$X^2 (n=1933, df=378) = 3.83^*$
Yes	325	41	11.2	
Violence with AGBH^β	n=1,933			
No	1724	137	7.4	$X^2 (n=1933, df=378) = 1.53^{NS}$
Yes	63	9	12.5	
All forms of violence	n=1,935			
No	1048	58	5.2	$X^2 (n=1935, df=378) = 6.22^*$
Yes	741	88	10.6	
	Formerly married women			
Physical violence	n=291			
No	130	56	30.1	$X^2 (n=291, df=189) = 0.4^{NS}$
Yes	73	32	30.5	
Emotional violence	n=291			
No	138	63	31.3	$X^2 (n=291, df=189) = 0.87^{NS}$
Yes	65	25	27.7	
Sexual violence	n=292			
No	145	74	33.8	$X^2 (n=292, df=190) = 5.01^*$
Yes	58	15	20.5	
Violence with AGBH^β	n=291			
No	171	82	33.4	$X^2 (n=291, df=189) = 1.92^{NS}$
Yes	32	6	15.4	
All forms of violence	n=292			
No	103	50	32.7	$X^2 (n=292, df=190) = 1.97^{NS}$
Yes	100	39	28.1	
	Married and formerly married women			
Physical violence	n=2,224			

Married and formerly married women				
No	1421	135	8.7	χ^2 (n=2224, df=379) = 5.76*
Yes	569	99	14.8	
Emotional violence	n=2,226			
No	1485	158	9.6	χ^2 (n=2226, df=379) = 0.02 ^{NS}
Yes	507	76	13	
Sexual violence	n=2,225			
No	1607	179	10	χ^2 (n=2225, df=379) = 0.19 ^{NS}
Yes	383	56	12.8	
Violence with AGBH^β	n=2,224			
No	1895	219	10.4	χ^2 (n=2224, df=379) = 1.04 ^{NS}
Yes	95	15	13.6	
All forms of violence	n=2,227			
No	1151	108	8.6	χ^2 (n=2227, df=379) = 0.68 ^{NS}
Yes	841	127	13.1	

* p < 0.05;

** p < 0.01;

*** p < 0.001;

^{NS} not significant

^βAGBH: aggravated bodily harm

Table 3
Unadjusted odds ratios and 95% confidence intervals of HIV serostatus and domestic violence among married and formerly married women in Kenya, in a univariate logistic regression model, KDHS-2008/2009

HIV Serostatus	Married women		Formerly married women	
	ORs	95% CI	ORs	95% CI
Physical abuse	n=1,933		n=291	
No	1 Ref		1 Ref	
Yes	2.42***	1.51 3.87	0.78 NS	0.36 1.69
Emotional abuse	n=1,935		n=291	
No	1 Ref		1 Ref	
Yes	1.24 NS	0.79 1.95	0.69 NS	0.31 1.52
Sexual abuse	n=1,933		n=292	
No	1 Ref		1 Ref	
Yes	1.66*	0.99 2.77	0.42*	0.19 0.91
Violence with AGBHβ	n=1,933		n=291	
No	1 Ref		1 Ref	
Yes	1.68 NS	0.73 3.88	0.46 NS	0.15 1.42
All forms of violence	n=1,935		n=292	
No	1 Ref		1 Ref	
Yes	1.83**	1.13 2.96	0.6 NS	0.29 1.24

* p < 0.05;

** p < 0.01;

*** p < 0.001;

NS not significant

1 Ref: Reference Category | ORs: Odds Ratios | CIs: Confidence Intervals

β AGBH: aggravated bodily harm

Table 4
Adjusted odds ratios and 95% confidence intervals of HIV serostatus and domestic violence among married women in Kenya, in a multivariable logistic regression model, KDHS-2008/2009

	Physical violence [§]		Emotional violence [§]		Sexual violence [§]		Violence with AGBH ^{§§}		All forms of violence [§]	
	ORs	95% CI	ORs	95% CI	ORs	95% CI	ORs	95% CI	ORs	95% CI
HIV Serostatus										
Domestic violence										
No	1 Ref		1 Ref		1 Ref		1 Ref		1 Ref	
Yes	2.01*	1.12 3.6	0.93 ^{NS}	0.55 1.58	1.14 ^{NS}	0.63 2.07	1.15 ^{NS}	0.41 3.23	1.37 ^{NS}	0.78 2.4
Risky sexual behavior										
No	1 Ref		1 Ref		1 Ref		1 Ref		1 Ref	
Yes	0.2***	0.1 0.41	0.21***	0.1 0.42	0.21***	0.1 0.42	0.21***	0.1 0.42	0.21***	0.1 0.43
Number of lifetime sexual partners										
One	1 Ref		1 Ref		1 Ref		1 Ref		1 Ref	
Two	1.86 ^{NS}	0.99 3.51	1.94*	1.04 3.61	1.9*	1 3.61	1.93*	1.04 3.59	1.87 ^{NS}	0.99 3.52
Three	1.56*	1.06 2.28	1.64**	1.14 2.35	1.62**	1.13 2.34	1.63**	1.14 2.35	1.59*	1.09 2.31
Four or more	1.49**	1.13 1.98	1.52**	1.16 1.99	1.5**	1.14 1.98	1.52**	1.16 1.98	1.49**	1.13 1.96
Number of co-wives										
No other wife	1 Ref		1 Ref		1 Ref		1 Ref		1 Ref	
Two or more	2.6***	1.46 4.61	2.68***	1.53 4.69	2.68***	1.53 4.69	2.67***	1.52 4.69	2.67***	1.52 4.68
Age										
15-19	1 Ref		1 Ref		1 Ref		1 Ref		1 Ref	
20-24	0.18**	0.06 0.53	0.18**	0.06 0.54	0.18**	0.06 0.54	0.18**	0.06 0.53	0.18**	0.06 0.52
25-29	0.57*	0.35 0.93	0.59*	0.37 0.93	0.58*	0.37 0.93	0.58*	0.37 0.93	0.58*	0.36 0.93
30-34	0.58**	0.4 0.83	0.59**	0.41 0.84	0.59**	0.41 0.84	0.59**	0.41 0.84	0.58**	0.41 0.83
35-39	0.62***	0.47 0.83	0.63***	0.48 0.83	0.63***	0.48 0.83	0.63***	0.48 0.83	0.63***	0.48 0.83
40-44	0.7**	0.54 0.89	0.7**	0.55 0.89	0.7**	0.55 0.88	0.7**	0.55 0.88	0.69**	0.54 0.88
45-49	0.68***	0.55 0.86	0.69***	0.55 0.86	0.69***	0.55 0.86	0.69***	0.55 0.86	0.68***	0.55 0.85
Religion										
Protestant	1 Ref		1 Ref		1 Ref		1 Ref		1 Ref	

HIV Serostatus	Physical violence [§]		Emotional violence [§]		Sexual violence [§]		Violence with AGBH [§]		All forms of violence [§]	
	ORs	95% CI	ORs	95% CI	ORs	95% CI	ORs	95% CI	ORs	95% CI
Roman catholic	0.73 ^{NS}	0.39 1.37	0.73 ^{NS}	0.39 1.36	0.73 ^{NS}	0.39 1.36	0.73 ^{NS}	0.39 1.36	0.72 ^{NS}	0.39 1.35
Muslim	0.56 [*]	0.34 0.91	0.52 [*]	0.32 0.86	0.53 [*]	0.32 0.87	0.52 [*]	0.32 0.86	0.53 [*]	0.32 0.87
Other religions	0.7 ^{NS}	0.37 1.34	0.7 ^{NS}	0.38 1.28	0.69 ^{NS}	0.37 1.28	0.69 ^{NS}	0.37 1.27	0.69 ^{NS}	0.37 1.29
Age at first marriage										
25	1 Ref		1 Ref		1 Ref		1 Ref		1 Ref	
20-24	1.6 ^{NS}	0.6 4.28	1.71 ^{NS}	0.62 4.68	1.67 ^{NS}	0.61 4.56	1.69 ^{NS}	0.62 4.67	1.61 ^{NS}	0.59 4.4
15-19	1.09 ^{NS}	0.63 1.87	1.18 ^{NS}	0.68 2.06	1.16 ^{NS}	0.67 2.04	1.17 ^{NS}	0.67 2.05	1.13 ^{NS}	0.65 1.96
14	1.72 ^{**}	1.13 2.61	1.81 ^{**}	1.17 2.82	1.79 ^{**}	1.16 2.77	1.81 ^{**}	1.16 2.81	1.76 ^{**}	1.15 2.69

n=1,927;

* p < 0.05;

** p < 0.01;

*** p < 0.001;

^{NS} not significant

1 Ref: Reference Category | ORs: Odds Ratios | CIs: Confidence Intervals

[§] Other variables controlled for but were non-significant: husband alcohol consumption, sexually transmitted diseases, education, wealth index, residence, occupation, health insurance, and perceived risk of acquiring HIV

^β AGBH: aggravated bodily harm

Note: Formerly married women did not respond to the question, does your husband/partner have other wives or does he live with other women as if married?