Intimate Partner Violence and Symptoms of Sexually Transmitted Infections: Are the Women from Low Socio-economic Strata in Bangladesh at Increased Risk

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Abstract

Background There is little research on whether women who are either poor or illiterate and have experienced intimate partner violence (IPV) have a unique risk of sexually transmitted infections (STIs). Most such research concerns families displaced by wars and conflicts.
Purpose Therefore, we aimed to further this important area of inquiry by (1) addressing whether an association exists between experiences of physical and/or sexual IPV within the past year and symptoms of STI and (2) exploring the relationship between low socio-economic status and IPV and the relative roles they play as obstacles to reducing women's risk of STI in a nationally representative sample of Bangladesh.
Method This paper used data from the 2007 Bangladesh Demographic Health Survey. The analyses were based on the responses of 4,195 currently married women. Exposure was determined from women's experiences of physical and sexual IPV within the past year. Genital sores and genital discharge were used as proxy outcome variables of the symptoms of STI. Descriptive statistics and multivariate logistic regression analysis were used in the study.
Results Experience of any physical and/or sexual IPV were associated with genital sores (adjusted odds ratio [AOR]= 1.79; 95 % confidence interval [CI], 1.28–2.51) and genital discharge (AOR 1.90, 95 % CI 1.42–2.53). Severity of physical IPV appeared to have more profound consequences on the outcome measured. Findings also demonstrated that for the risk of STI, women at the nexus of poverty or illiteracy and IPV were not more uniquely disadvantaged.
Conclusions The results suggest that for the risk of STI, the negative effect of having experienced IPV extends across all socio-economic backgrounds and is not limited to women at either at the nexus of poverty or illiteracy and IPV. Findings underscore the calls for protecting women from all forms of physical and sexual violence from their husbands as a part of interventions to reduce the risk of STI.

Keywords Intimate partner violence · STI · Socio-economic status · Bangladesh

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Introduction

Intimate partner violence (IPV), which consists of a range of physical or sexual coercive acts, or both, perpetrated against women by current or former male intimates [1], has emerged as a significant public health concern around the world. There has been increased awareness of the wide range of mental, physical, and reproductive health consequences of IPV [2–5]. An area of specific concern has been the association between IPV and sexually transmitted infections (STIs) [6–8]. There are many mechanisms through which increased IPV could be related to increased risk for STI among women. Abusive men consistently demonstrate increased sexual risk behaviors, e.g., extramarital relations and inconsistent condom use [9, 10]. Thus, the increased likelihood of exposure to STI pathogens from abusive male partners, presents one mechanism for abused women's increased levels of STI [11]. Evidence shows that victims of IPV are less likely to refuse sex [12]; therefore, they may be less likely to negotiate the use of a condom for fear of retribution, which places them at risk of STI [13]. Also,

psychological distress and stress-induced immunosupression resulting from IPV may cause an increase of somatic symptoms including the risk of abnormal genital discharge [14–16].

The association between IPV and STI symptoms has been studied in a range of settings, with different samples, and using a variety of measurements. The majority of studies, however, come from developed country settings [3, 17–20]; there is a dearth of evidence from South Asia. Rapid increases in human immunodeficiency virus (HIV) infection rates among married women in South Asia [20–23], coupled with these women's low levels of sexual risk behavior (e.g., extramarital partnering) [24], illustrate the urgent need to investigate how abusive men pose an STI risk to their female partners. Five studies from South Asia have addressed the link between IPV and symptoms of STI; however, gaps remain in the literature. A recent investigation in Bangladesh revealed that physical IPV only had an independent effect on vaginal irritation with discharge and sexual IPV only had an independent effect on odor with discharge. Interestingly, genital sores or ulcers were not associated with IPV measures [8].

A population-based study in Goa, India, investigated the relationship between IPV and three clinical outcomes of STI (namely, chlamydia, gonorrhoea, and trichomoniasis) and endogenous infections like bacterial vaginosis (BV) [25]. After adjusting for a range of confounders, they found that IPV of any type was not associated with STI outcomes, although IPV was associated with BV. A study based in Uttar Pradesh, India, found that, compared with women whose husbands reported no IPV, those who had experienced both physical and sexual IPV and those who had experienced sexual IPV only had elevated odds of reporting gynecologic symptoms. However, physical IPV alone was not associated with any symptom of gynecologic morbidity [4]. A population-based study in India found that married Indian women experiencing both physical and sexual violence from husbands demonstrated elevated HIV infection prevalence versus those not experiencing IPV. However, physical IPV alone was not associated with the risk of HIV infection [26]. In addition, a study examining HIV and IPV in ten countries did not find a significant association between these two factors in India [27]. Therefore, more stringent analysis is needed for a clearer understanding of the separate and combined influences of IPV and male partner STI on women's STI acquisition for the development of effective prevention programming for this region including Bangladesh where traditional gender paradigms exist, IPV affects 69 % of women during their lifetimes [2], and others are facing substantial IPV and STI epidemics.

Moreover, the relationship between IPV and STI needs to be carefully examined in low socio-economic settings because adverse risky sexual behaviors are more prevalent in those settings [28–30], and such settings have also been associated with an increased risk of IPV [4, 26, 31]. Abused women of low socio-economic status may be at a distinct disadvantage because an increased level of IPV [31] and impaired resources can restrict development, educational opportunities, access to health, allow less reproductive control, and elevate the level of depressive disorders [32] creating a favorable setting for STI. Therefore, a comparative assessment is needed to examine whether poverty and illiteracy, indicators of low socio-economic status which have an independent association with IPV [33] and/or risk of STI [34, 35], plays a role in mediating the association between IPV and risk of STI among women.

Although much literature exits that links IPV to adverse health outcomes, very few studies examines the relative effect of IPV on the health of women who are either poor or illiterate. Most such research has been on families displaced by wars and conflicts [30, 36–38]. In fact, with only a few notable exceptions, almost no research exists that examines the relative effect on women's health of IPV in developing countries on those either at the nexus of household poverty or illiteracy, where the absolute and relative meaning of poverty is likely to be different from that in the developed world. We aimed to further this important area of inquiry by (1) addressing whether an association exists between physical and/or sexual IPV and symptoms of STI and (2) exploring the relationship between low socio-economic status and IPV and the relative roles they play as obstacles to reducing women's risk of STI in a nationally representative sample of Bangladesh.

Methods

Data Sources

The analyses were based on the representative, cross-sectional 2007 Bangladesh Demographic Health Survey (BDHS). The BDHS sample was drawn from Bangladeshi adults residing in private dwellings, measuring indicators of population, health, and nutrition, with special emphasis on maternal and child health. A stratified, multi-stage cluster sample of 361 primary sampling units was constructed (134 in urban areas and227 in rural areas). The primary sampling units were derived from a sampling frame created for the 2001 Bangladeshi census. BDHS uses extensive interviewer training, standardized measurement tools and techniques, an identical core questionnaire, and instrument pretesting to ensure standardization and comparability across diverse sites and time [39].

Of the 11,178 ever-married pregnant/non-pregnant women 15 to 49 years deemed eligible to complete the women's questionnaire on maternal and child health behaviors and outcomes, 10,996 did so (response rate=98.4 %). One

350

Int. J. Behav. Med. (2014) 21:348–357

woman from each household was selected at random for the domestic violence module to answer an additional set of questions regarding IPV perpetrated by her husband. Of 4,489 women eligible to respond to the domestic violence module, only seven had to be excluded owing to lack of privacy (husbands or other respondents were present in the household during the interview period). An additional 15 women were not interviewed for other reasons. In our analyses, we included only currently married women aged 15 to 49 years (*n*=4,195; Fig. 1).

Outcomes

To provide an assessment of STI symptoms, we analyzed genital sores or ulcer and abnormal genital discharge as proxy outcome variables. The 2007 BDHS included questions on self-reported symptoms of STI in the 12 months prior to the survey. Specifically, women were asked "during the last 12 months, have you had a genital sores or ulcer?"; "during the last 12 months, have you had a bad smelling abnormal genital discharge?" Each outcome variables was dichotomized as no or don't know=0, and yes=1.

Exposure

IPV was defined here as violence experienced by women at the hands of their current spouse. In the BDHS, IPV was measured with a shortened and modified version of the Conflict Tactics Scale (CTS-2) [40]. Perpetration of IPV by the woman's husband in the year prior to the survey was assessed via eight survey items. Women who reported that their husband engaged in any of the following seven

behaviors were classified as having experienced physical IPV: (1) pushing, shaking, or throwing an object; (2) slapping; (3) pulling hair or twisting an arm; (4) punching or hitting with a fist or an object; (5) kicking or dragging; (6) choking or burning; or (7) threatening or attacking with a knife or gun. Sexual IPV was assessed by asking the respondent if her husband had physically forced sex when not wanted, or forced other sexual acts when not wanted.

Three exposure variables were defined for this analysis: any physical and/or sexual IPV versus none; exposure to different categories of IPV versus none (defined as exposure to physical IPV only, sexual IPV only, or physical and sexual IPV); and the number of types of physical IPV a woman reported versus none. A composite variable was also created to assess the impact of degree of severity of physical IPV that consisted of items from the less severe and severe sections of the CTS-2 organized into three categories: (1) none, (2) only less severe physical IPV experienced, and (3) severe physical IPV experienced. Less severe physical IPV was defined when women had experienced any of the following behaviors: being "pushed", "shaken", or "slapped". Severe physical IPV was defined when women reported any of the following behaviors: having "an arm twisted", "being burned", "kicked", "hit with a fist or something harmful", or "attacked with weapons".

Covariates

This study included several socioeconomic and demographic variables that have been theoretically and empirically linked to IPV [41, 42] and the risk of STI [10, 29, 43]. Participant's age were categorized as follows: 15–24, 25–34, and 35–49 years of age. Age is included here because several anthropological and empirical studies undertaken in disparate cultures find that age is negatively associated with the experience of IPV [44, 45]. Some of these studies suggest that as a woman's age increases, their social status also increases, and they become less vulnerable to acts of IPV. There is uneven support for a husband's education as a risk factor for experience of IPV [41], therefore, a variable for husband's education was created and husbands were categorized as illiterate or literate. To assess the women's decision-making autonomy, we determined the number of types of family decisions in which a woman participated alone or jointly, including whether to obtain health care for herself, to obtain health care for her child, to make large purchases, to make household purchases, and to visit her relatives [46].

The women's occupations were classified as currently working or not working. Occupations were included here because women who are employed are often assumed to be more empowered economically and, by extension, vis-a-vis their male partners, and thus may be less likely to experience IPV and/or have greater control over their gynecologic
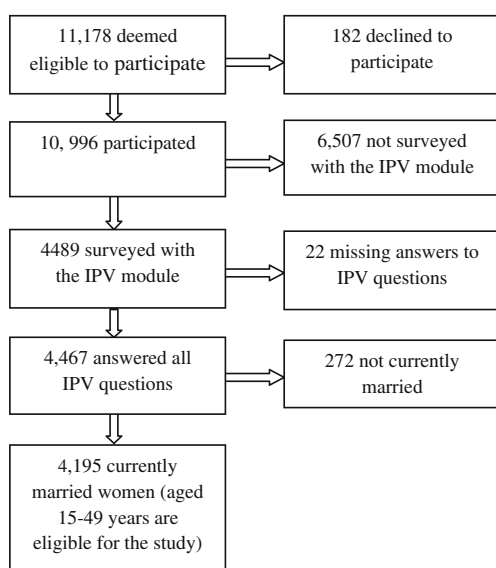

Fig. 1 Selection of the sample

health [44]. Tertiles were used in classifying the total number of household members (2–4, 5–6, 7 or more). Place of residence was categorized as rural or urban. Religion was categorized as Muslim or non-Muslim. Since high fertility has been associated with IPV both as a potentially causal factor [47] as well as an outcome of IPV [48], a variable parity was therefore created and women were categorized as having had none, one, two, or three or more children. Ever having used contraception and knowledge about acquired immunodeficiency syndrome (AIDS) were categorized as yes and no.

Indicators of Socio-economic Status

We focused on two measures of SES: standard of living (hereafter referred to as wealth) and education. The BDHS wealth index was constructed from data on household assets, including ownership of durable goods (such as televisions and bicycles) and dwelling characteristics (such as source of drinking water, sanitation facilities, and construction materials). Each asset was assigned a weight (factor score) generated through principle components analysis, and the resulting asset scores were standardized in relation to a standard normal distribution with a mean of zero and a standard deviation of one [39]. Each household was then assigned a score for each asset, and the scores were summed by household. The sample was then divided into population quintiles; each quintile was designated a rank, from one (poorest) to five (wealthiest), and individuals were ranked according to the total score of the household in which they lived.

In our study, women who live in households that belong to the first wealth quintile are designated as "poor"; women living in households belonging to any other wealth quintile except the first are designated as "not poor". The lowest wealth quintile identifies households that both have the lowest absolute level of wealth and, by virtue of their location in the ranking of households on wealth, are also relatively the poorest. Restricting the concept of "poor" to the very poorest allows us to see more starkly the effect of being both poor and subject to IPV. A binary variable was created to assess the level of the women's education, as illiterate or literate.

Statistical Analysis

Prevalence estimates for experience of past-year physical IPV only, sexual IPV only, both physical and sexual IPV, and any form of IPV were calculated for the total sample of currently married Bangladeshi women and by demographics. Demographic differences in IPV perpetration were assessed by χ^2 analyses; significance for all analyses was set at $p < 0.05$. Analyses were performed using Stata version 11.0 (Stata Corp., College Station, TX, USA). "Svy" commands were used to allow for adjustments for the cluster sampling design, sampling weights and the calculation of standard errors. These commands used Taylor series linearization method to estimate confidence intervals (CI) around prevalence estimates. We created three fully adjusted additive models to analyze each binary outcome variables, with each model containing a different IPV predictor (any vs no IPV; separate effects of physical IPV only, sexual IPV only, and both physical and sexual IPV vs no IPV; degree of severity of physical IPV vs no IPV).

To see whether women either at the nexus of poverty or illiteracy and IPV were unique for the risk of STI, we conducted logistic regression analyses to examine the adjusted association between IPV and genital sores and genital discharge after stratification by educational and wealth level. We entered all the covariates simultaneously into the multiple regression models. The multicollinearity of the variables was checked by examining the variance inflation factors (VIFs), which was <2.0. We estimated the odds ratios (ORs) to assess the strength of the associations and used the 95 % CIs for significance testing.

Human Participation Protection

Data collection procedures for the BDHS were approved by the ORC Macro institution al review board. The protocol of the survey was reviewed and approved by the National Ethics Review Committee of the Bangladesh Ministry of Health and Family Welfare. Before participating in the all participants were asked to provide verbal informed consent after being read a document emphasizing the voluntary nature of this project, outlining potential risks, and explaining that the information gathered would be used to assess health needs and to plan health services. Interviews were conducted under the most private conditions afforded by the environments encountered, and interviewers did not implement the IPV module if confidentiality could not be ensured.

Results

Socio-demographic Profile of the Respondents

More than three-fifths of the respondents (68 %) were 15 to 34 years old, 36 % were illiterate, 12 % had no decision-making autonomy, and 77 % lived in rural areas (Table 1). Approximately 69 % of the sample women had no jobs, 91 % were Muslim, and 30 % had household members size of seven or more.

From the total sample population, 19 % of women belonged to household at the nexus of poverty. About

352

Int.J. Behav. Med. (2014) 21:348–357

Table 1 Descriptive statistics, according to different forms of past-year IPV experienced by currently married women: 2007 Bangladesh Demographic Health Survey (n=4,195)

Characteristic	n (%)	Any IPV % (95 % CI)	Physical IPV only % (95 % CI)	Sexual IPV only % (95 % CI)	Both physical and sexual IPV % (95 % CI)
Age, years					
15–24	1,277 (34)	32 (28–36)	17 (14–19)	7 (5–10)	8 (6–10)
25–34	1,543 (34)	24 (22–27)	14 (12–16)	6 (5–8)	5 (4–6)
35–49	1,375 (32)	14 (12–17)	8 (6–10)	3 (2–4)	3 (2–5)
p Value		<0.001	<0.001	<0.001	<0.001
Education					
Illiterate	1,450 (36)	28 (23–30)	14 (12–16)	5 (4–7)	6 (5–8)
Literate	2,731 (64)	20 (18–26)	12 (11–14)	6 (4–7)	2 (1–4)
Data missing	14				
p Value		0.039	0.049	0.870	0.041
Husband's education					
Illiterate	1,497 (38)	28 (25–31)	15 (13–17)	6 (3–5)	8 (6–9)
Literate	2,690 (62)	21 (19–24)	12 (10–13)	5 (4–7)	4 (3–5)
Data missing	8				
p Value		<0.001	0.0241	0.965	<0.001
Women's decision-making autonomy, no. of aspects[a]					
0	523 (12)	24 (19–30)	11 (8–14)	7 (4–11)	7 (4–9)
1	448(11)	30 (23–37)	15 (11–19)	9 (5–15)	6 (4–10)
2	605 (15)	24 (21–28)	13 (10–16)	5 (3–7)	6 (4–9)
3	793 (19)	26 (22–31)	14 (11–17)	5 (3–7)	7 (5–10)
4	1,825 (43)	21 (19–24)	12 (11–14)	4 (3–6)	4 (3–5)
Data missing	1				
p Value		0.041	0.559	0.144	0.051
Respondent employed					
No	2,967(69)	23 (20–25)	12 (11–14)	4 (3–6)	5 (4–7)
Yes	1,228 (31)	27 (23–30)	14 (11–17)	7 (6–9)	5 (4–7)
p Value		0.0576	0.443	0.023	0.968
Area of residence					
Rural	2,637 (77)	25 (23–28)	13 (12–15)	6 (5–7)	6 (5–7)
Urban	1,558 (23)	20 (18–23)	11 (9–13)	3 (2–5)	5 (4–6)
p Value		0.005	0.126	0.005	0.378
Religion					
Muslims	3,795 (91)	25 (23–27)	13 (12–15)	6 (5–7)	6 (5–7)
Non-Muslims	399 (9)	14 (10–19)	9 (6–13)	2 (1–5)	2 (1–6)
Data missing	1				
p Value		<0.001	0.049	0.035	0.065
Number of children					
0	326 (10)	28 (21–35)	11 (7–16)	10 (5–17)	7 (4–10)
1	778 (20)	29 (24–33)	16 (13–19)	7 (5–9)	6 (4–8)
2	1,029 (23)	26 (22–29)	15 (12–18)	5 (4–7)	5 (4–7)
3+	2,062(47)	20 (18–23)	10 (9–13)	4 (3–6)	5 (4–6)
p Value		0.001	0.005	0.029	0.617
No. o f household members (tertiles)					
2–4	1,683 (36)	27 (24–30)	17 (14–19)	4 (3–6)	6 (5–8)
5–6	1,516 (34)	24 (21–26)	12 (11–14)	5 (4–6)	6 (5–7)
≥7	993 (30)	21 (17–24)	9 (7–11)	7 (5–10)	4 (3–7)
Data missing	3				

Table 1 (continued)

Characteristic	n (%)	Any IPV % (95% CI)	Physical IPV only % (95% CI)	Sexual IPV only % (95% CI)	Both physical and sexual IPV % (95% CI)
p Value		0.006	<0.001	0.064	0.332
Wealth index category					
Poor	742 (19)	62 (58–66)	16 (13–19)	8 (5–10)	9 (6–11)
Non-poor	3,453 (81)	50 (48–53)	12 (11–14)	4 (3–6)	5 (4–6)
p Value		<0.001	0.010	0.023	<0.001
Knowledge about AIDs					
No	1,244 (31)	26 (23.2–29)	13 (11–16)	6 (5–8)	6 (5–8)
Yes	2,951 (69)	23 (21–25)	12 (11–14)	5 (4–6)	5 (4–6)
p Value		0.063	0.479	0.204	0.126
Ever use of contraception					
No	1,815 (44)	22 (19–24)	11 (10–13)	5 (4–7)	5 (4–7)
Yes	2,380 (56)	25 (23–28)	14 (12–16)	6 (5–7)	6 (5–7)
p Value		0.022	0.067	0.342	0.8201
Genital sore					
No	3,946 (94)	23 (21–25)	12 (11–14)	5 (4–6)	5 (5–6)
Yes	248 (6)	36 (29–44)	20 (15–28)	6 (3–11)	9 (5–15)
Data missing	1				
p Value		<0.001	0.006	0.688	0.043
Genital discharge					
No	3,862 (92)	23 (21–25)	12 (11–13)	5 (4–6)	5 (4–6)
Yes	333 (8)	36 (30–42)	20 (15–25)	7 (4–12)	9 (6–13)
p Value		<0.001	<0.001	0.372	0.027
Total	4,195	24	13	5	6

p values refer to differences between groups. Numbers are unweighted; percentages are weighted

IPV intimate partner violence

[a] Aspects of family decisions a woman participated alone or jointly in making

56 % of women had ever used any contraception and 69 % had heard about AIDS (Table 1). Regarding symptoms of STI, 8 % of respondents reported abnormal genital discharge and 6 % of respondents reported genital sores or ulcers (Table 1).

A substantial percentage of women (24 %) reported that they had suffered physical and/or sexual IPV in the year prior to the survey; 13 % indicated that they had experienced only physical IPV, 5 % indicated that they had experienced only sexual IPV, and 6 % indicated that they had experienced both types of IPV (Table 1).

Differential on IPV Victimization with Demographics of Married Bangladeshi Women

The bivariate analyses revealed several significant differences in the prevalence of past-year IPV perpetration across various socio demographic groups (Table 1). Specifically, younger women (those aged 15–24 years) and women belonged to the household at the nexus of poverty were significantly more likely than middle-aged (those aged 25–34 years) or older women (those aged 35–49 years), and non

poor women to report any form of IPV, physical IPV only, sexual IPV only, and both physical and sexual IPV. Reports of any form of IPV, physical IPV only, and sexual IPV only were significantly more frequent among Muslim women.

Higher prevalence rates of any IPV, physical IPV only, and both physical and sexual IPV were identified among illiterate respondents and respondents whose husbands were illiterate. Reports of any form of IPV and physical IPV only were significantly more frequent among women with one child. On the other hand, sexual IPV was more frequent among women who had no child. Women living in smaller household (2–4 persons) were at higher risk for any form of IPV and physical IPV only than among their counterparts (Table 1). In addition, unemployed women were less likely than were employed women to report having experienced sexual IPV alone.

Women participating in at least one aspect of family decision-making and women who had ever used any contraception were more likely than their counterparts to report any form of IPV in the preceding year, but group differences were not significant for the three mutually exclusive categories of violence assessed. Women reporting to have

354

Int. J. Behav. Med. (2014) 21:348–357

genital sores and genital discharge were at higher risk for any form of IPV, physical IPV only, and both physical and sexual IPV. In addition, rural women were more likely than were urban women to report having experienced any IPV and sexual IPV alone (Table 1).

Multivariate Analyses

Association Between IPV with Genital Sores and Genital Discharge

Women who experienced any physical and/or sexual IPV were at increased risk for genital sores (adjusted OR [AOR] 1.79, 95 % CI 1.28–2.51) and genital discharge (AOR 1.90, 95 % CI 1.42–2.53; Model 1, Table 2) in the previous 12 months. Relative to women who reported no experience of IPV, women who reported experiencing physical IPV were more likely to report genital sores (AOR 1.92, 95 % CI 1.23–3.01) and genital discharge (AOR 1.96, 95 % CI 1.39–2.77; Model 2, Table 2). Women who reported both instances of physical and sexual IPV were 2.01 and 2.04 times more likely to report genital sores and genital discharge. The experience of less severe (AOR 1.86, 95 % CI 1.08–3.21) or severe physical IPV (AOR 1.95, 95 % CI 1.23–3.09; Table 2) were found to be associated with genital sores. In addition, significant association was observed between experience of severe physical IPV and genital discharge (AOR 2.22, 95 % CI 1.57–3.13; Model 3, Table 2).

Association Between IPV with Genital Sores and Genital Discharge by Socio-economic Status

Women belonging to the low economic status who had experienced IPV were more likely to report genital discharge (AOR 1.88, 95 % CI 1.41–2.50; Table 3) than the women belonged to the low economic status and did not experience IPV. Non poor women who had experienced IPV were more likely to report genital sores (AOR 1.99, 95 % CI 1.31–3.04) and genital discharge (AOR 1.97, 95 % CI 1.37–2.84; Table 3). Among literate women, experiences of IPV were associated with increased odds of reporting genital sores (AOR 2.02, 95 % CI 1.33–3.06) and genital discharge (AOR 1.97, 95 % CI 1.32–2.93; Table 3). In addition, the odds of reporting genital discharge were significantly higher among those women who experienced IPV and were illiterate (AOR 1.76, 95 % CI 1.14–2.71; Table 3) than those women who did not experience IPV and are illiterate.

Discussion

Findings from this large representative survey indicate that large numbers of married Bangladeshi women experience IPV, with this violence occurring in approximately one in four such households each year. This extremely high prevalence rate is consistent with previous other studies in Bangladesh, including small-scale studies [49, 50] and a WHO multi-country study [2] and illustrates the alarming extent to which majority of Bangladeshi women are exposed to IPV. Furthermore, consistent with prior IPV research conducted in developing nations, including Bangladesh, young women, women with no education, those living in rural areas and women belonging to the poor economic status have a higher risk of IPV than other women [49–51].

This study further provides evidence of an association between experiences of physical IPV and the increased risk of genital sores and genital discharge among currently married Bangladeshi women. Sexual IPV was not found to be associated with any of the outcomes of STI. The lack of significant association may be due to inadequate power because of very low prevalence of sexual IPV compared with physical IPV to examine the relationships. However, evidence shows that, even physically abused women who do not experience sexual violence may engage in risky sexual behaviors because they fear losing their partner [52], or because they are scared or unable to negotiate condom use [13, 53].

The findings of this study demonstrate that women who have experienced both physical and sexual IPV were significantly more likely to report genital sores and genital discharge. Other studies found mixed evidence for an association between physical and/or sexual IPV and the symptoms of STI in the South Asian region [4, 8, 25–27]. The current research expands on those previous studies by using a large national sample from Bangladesh and finding an association between experience of physical and both physical and sexual IPV and the risk of genital sores and genital discharge. Our results indicate that preventing physical and sexual violence by husbands is an important component of reducing the risk of STI among women in Bangladesh.

Another new finding was that severe physical IPV appeared to have more profound consequences on the outcomes that were measured. This is in line with previous observations according to which more victimization predicts higher levels of depressive symptoms [14, 15]. The higher levels of severe depressive symptoms due to severe physical IPV can exhibit multiple unexplained somatic symptoms specifically abnormal genital discharge [54] than those with less severe depression due to less severe physical IPV. Furthermore, the existence of severe depression due to severe physical IPV could mean that patients with symptoms of STI do not seek timely treatment and care, or take precautions to protect their own or other people's sexual health [55].

The findings also demonstrated that for the risk of STI, women either at the nexus of IPV and poverty or illiteracy were not more uniquely disadvantaged. Therefore, it is the

Table 2 Adjusted odds ratios for associations between different forms of past-year IPV experienced and symptoms of STI for currently married women: 2007 Bangladesh Demographic Health Survey (n=4,195)

Measure	Symptoms of STI, AOR (95 % CI)	
	Genital sore	Genital discharge
Model 1		
Any physical and/or sexual IPV		
None	1.00	1.00
Yes	1.79 (1.28–2.51)[b]	1.90 (1.42–2.53)[a]
Model 2		
Form of IPV		
None	1.00	1.00
Physical IPV only	1.92 (1.23–3.01)[b]	1.96 (1.39–2.77)[a]
Sexual IPV only	1.29 (0.64–2.60)	1.61 (0.86–3.00)
Both physical and sexual IPV	2.01 (1.11–3.63)[c]	2.04 (1.28–3.25)[b]
Model 3		
Form of physical IPV		
None	1.00	1.00
Only less severe	1.86 (1.08–3.21)[c]	1.60 (0.98–2.11)
Severe	1.95 (1.23–3.09)[b]	2.22 (1.57–3.13)[a]

Models were adjusted for age, education, husbands education, women's decision-making autonomy, women's occupation, residence, religion, parity, number of household members, wealth index, knowledge about AIDs, and ever use of contraception

AOR adjusted odds ratio, *CI* confidence interval, *IPV* intimate partner violence

[a] $p<0.001$, [b] $p<0.01$, [c] $p<0.05$

experience of IPV per se that disadvantages women, whereas low socio-economic status does not uniquely disadvantage women who experience IPV. In fact, for genital sores, IPV significantly affects women who are "wealthy" or "literate" more than it does women who are "poor" or "illiterate". The importance of this finding therefore needs to be underscored. When the experience of IPV adversely impacts a women's risk of STI, it does so whether the woman is of a low socio-economic status or not. For the risk of STI, the negative effect of having experienced IPV extends across all socio-economic backgrounds and is not limited to women either at the nexus of IPV and poverty or illiteracy.

The results of the current study should be considered in light of several limitations. First, due to the cross-sectional nature of this analysis, temporal order cannot be determined. Longitudinal and qualitative research is needed to clarify the causal and temporal relationships between IPV and sexual risk and sexual health. Second, although the syndromic approach to STI diagnosis such as the assessment currently used is recommended for settings that lack diagnostic facilities [56], the underreporting of STI may have occurred on the basis of not receiving formal STI diagnosis or lack of familiarity with the STI symptoms assessed. Such under-reporting and resulting misclassification

Table 3 Adjusted ORs and 95 % CIs for associations between past-year IPV victimization and symptoms of STI by wealth and educational status of currently married women: 2007 Bangladesh Demographic Health Survey (n=4,195)

Measure	Wealth status[†] AOR (95 % CI)				Educational status [‡] AOR (95 % CI)			
	Poor (n=742)		Not poor (n=3,453)		Illiterate (n=1,450)		Literate (n=2,731)	
	Genital sores	Genital discharge	Genital sores	Genital discharge	Genital sores	Genital discharge	Genital sores	Genital discharge
Any physical and/ or sexual IPV								
None	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.49 (0.93–3.01)	1.88 (1.41–2.50)[a]	1.99 (1.31–3.04)[b]	1.97 (1.37–2.84)[a]	1.53 (0.83–2.82)	1.76 (1.14–2.71)[c]	2.02 (1.33–3.06)[b]	1.97 (1.32–2.93)[b]

Models were adjusted for age, husbands education, women's decision-making autonomy, women's occupation, residence, religion, parity, number of household members, knowledge about AIDs, and ever use of contraception

AOR adjusted odds ratio, *CI* confidence interval, *IPV* intimate partner violence

[†] Adjusted for education

[‡] Adjusted for wealth index

[a] $p<0.001$, [b] $p<0.01$, [c] $p<0.05$

356

Int.J. Behav. Med. (2014) 21:348–357

of STI status may have biased results in the direction of the null, thus underestimating associations of STI and IPV.

Third, the study can be criticized for using an indirect measure of household wealth. However, due to unavailability of reliable and comparable income or consumption data across households of all social classes, an asset-based index is generally considered as a good proxy for household economic status. Finally, because our selection of variables was constrained by the preexisting BDHS data, we were unable to include additional, potentially important variables concerning sexual risk behaviors (e.g., frequency of condom use with wives and extramarital partners), as outcome variables or confounders in the present analyses. However, because the demonstrated associations between IPV and STI symptoms were so strong, it is unlikely that inclusion of such confounders into the model would result in an insignificant link between IPV and STI symptoms.

Conclusions

In conclusion, the current study advances prior work by demonstrating among a large, nationally representative sample that abused women are at increased STI risk based on physical and/or sexual IPV. The results suggest that women who were from low socio-economic strata and had experienced IPV were not unique in their sexual health disadvantages. For the risk of STI, the negative effect of having experienced IPV extends across all socio-economic backgrounds and is not limited to women at the nexus of poverty or illiteracy and IPV. However, future longitudinal studies are needed to investigate the influence of potential mechanisms mediating the relationship between IPV and STI.

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