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Article

Intimate partner violence and depression in rural Bangladesh: Accounting for violence severity in a high prevalence setting

Precious Esie^a, Theresa L. Osypuk^b, Sidney R. Schuler^c, Lisa M. Bates^{a,*}^a Department of Epidemiology, Mailman School of Public Health, Columbia University, 722W 168th St, New York, NY 10032, USA^b Division of Epidemiology and Community Health, University of Minnesota, 1300S 2nd St, Minneapolis, MN 55455, USA^c Independent Consultant, USA

ARTICLE INFO

Keywords:

Intimate partner violence
Depression
Bangladesh
Violence severity

ABSTRACT

Intimate partner violence (IPV) against women is highly prevalent globally, and is associated with adverse health outcomes, including depression. Though women living in low- and middle-income countries (LMICs) face a larger burden of IPV, little is known about whether IPV increases the risk of depression among non-pregnant women and in contexts of high prevalence. Within the setting of rural Bangladesh, this study examined the relationship between the severity of marital IPV against women and the risk of depression.

Data were drawn from a nationally-representative study focused on individual and contextual determinants of IPV among married women aged 16–37 years in rural Bangladesh, collected through a multistage, stratified sample in 77 villages in 2014 (n = 3290). Multivariable log-binomial regression models were used to estimate the association between the severity of IPV (operationalized as the frequency of different acts of psychological, physical, and sexual abuse, as well as injury due to IPV) and risk of major depressive episode (MDE) using the Edinburgh Postnatal Depression Scale (EPDS).

One in six women (16.8%) met the criteria for MDE. Past year IPV was endemic; psychological (77.2%) was most common, followed by sexual (58.8%) and physical (44.4%). Nearly a third of women experienced IPV-related injury. There was a positive dose-response relationship between severity of each type of IPV and MDE above the lowest level of exposure. In adjusted models, the highest levels of psychological (RR = 2.27, 95% CI: 1.62, 3.17), physical (RR = 2.44, 95% CI: 1.94, 3.08), and sexual (RR = 1.65, 95% CI: 1.08, 2.52) IPV severity remained significantly associated with MDE, as well as experiencing IPV-related injury (RR = 1.72, 95% CI: 1.23, 2.40).

In rural Bangladesh, the severity of all types of marital IPV against women is strongly related to increased risk of MDE. Results suggest the limited utility of standard dichotomous IPV indicators in high prevalence settings.

1. Background

The World Health Organization (WHO) defines intimate partner violence (IPV) as harmful behaviors in intimate relationships resulting from psychological abuse, physical violence, or sexual coercion (Heise & Garcia-Moreno, 2002). IPV is one of the most common forms of violence against women globally (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006), and women living in low- and middle-income countries (LMICs) face a larger burden compared to women living in high-income countries. A recent WHO report estimates the global lifetime prevalence of physical and/or sexual IPV against women is 30.0%, ranging from 23.2% in high-income regions to 37.7% in the South-East Asia region (WHO, 2013). Bangladesh in particular has one of the

highest rates of lifetime IPV (Garcia-Moreno et al., 2006), with estimates ranging from 55% to 95% of ever married women experiencing any form of IPV (Azziz-Baumgartner et al., 2014; Bangladesh Bureau of Statistics, 2016; Bates, Schuler, Islam, & Islam, 2004).

The range of adverse secondary health outcomes associated with IPV is well-documented in literature reviews. Victims of IPV face higher rates of chronic pain, respiratory conditions, gynecological symptoms, sexually transmitted infections, and HIV (Dillon, Hussain, Loxton, & Rahman, 2013); alcohol abuse and drug abuse (Golding, 1999); and mental health conditions including depression, post-traumatic stress disorder, anxiety, and suicide (Beydoun, Beydoun, Kaufman, Lo, & Zonderman, 2012; Devries et al., 2013; Dillon et al., 2013; Golding, 1999). Depression, an often-researched correlate of exposure to IPV, is

* Corresponding author.

E-mail addresses: pie2104@cumc.columbia.edu (P. Esie), tosypuk@umn.edu (T.L. Osypuk), schulersidney@gmail.com (S.R. Schuler), lb2290@cumc.columbia.edu (L.M. Bates).<https://doi.org/10.1016/j.ssmph.2019.100368>

Received 16 August 2018; Received in revised form 19 December 2018; Accepted 27 January 2019

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also highly prevalent. Globally, depressive disorders are ranked as the largest contributor to years lived with disability, and women have a 42% higher prevalence of depression than men (WHO, 2017). One meta-analysis of studies predominantly in the U.S. suggested that exposure to IPV is associated with a 2- to 3-fold increased risk of major depressive disorder and a 1.5- to 2-fold increased risk of elevated depressive symptoms (Beydoun et al., 2012).

The majority of empirical investigations of the association between IPV exposure and depression are cross-sectional in nature, limiting the ability to establish the causal direction of the relationship. The expectation that IPV causes depression in women is supported by substantial theory and evidence suggesting that exposure to social stressors and/or trauma negatively impacts mental health outcomes, including depression (Aneshensel, 1999; Aneshensel & Phelan, 1999; Horwitz, 2002; Hyde, Mezulis, & Abramson, 2008; Pearlin & Bierman, 2013; Pearlin, Menaghan, Lieberman, & Mullan, 1981; Schwartz & Meyer, 2010; Thoits, 1999; Turner, 2010; Wheaton, 1999). It is also plausible the depression in women could influence IPV exposure (Khalifeh & Dean, 2010; McPherson, Delva, & Cranford, 2007), either through partner selection processes (Devries et al., 2013) or as a result of impairment negatively impacting affect or behavior (Zlotnick, Kohn, Keitner, & Della Grotta, 2000) and subsequently triggering incident IPV (Keenan-Miller, Hammen, & Brennan, 2007).

A 2013 systematic review of 16 longitudinal studies found evidence suggesting a bidirectional relationship: 11 studies observed that IPV is associated with incident depressive symptoms and 4 studies indicated depressive symptoms are associated with incident IPV (Devries et al., 2013). Similarly, a prospective study in 2013 among women in Korea identified a reciprocal relationship between IPV and depression over time (Kim and Lee, 2013). However, all of these studies were conducted in high- or middle-income countries. In the context of the present study, Bangladesh, non-marital partnerships are exceedingly rare and arranged marriages at an early age (before 18) are the norm (Caldwell, 2005; Solotaroff & Pande, 2014; UNICEF, 2014). As a result, a woman's agency in selecting marital partners is highly constrained and thus marriage to a potentially abusive partner is unlikely to be influenced by her mental health unless symptoms are: a) severe and b) manifest at a very young age. Similarly, women experiencing IPV in Bangladesh have very little recourse to leave abusive marriages due to the insurmountable social and economic costs of divorce, including women's limited rights to child custody (Bangladesh Bureau of Statistics, 2017; Rahman, Giedraitis, & Akhtar, 2013; Schuler, Bates, & Islam, 2008). Therefore, in Bangladesh, in contrast to other settings where divorce is more common, an association between depression and subsequent IPV is unlikely to be observed as a result of depressed women being less able to exit an abusive marriage.

Another important but understudied aspect of the relationship between IPV and mental health in settings such as Bangladesh is the degree to which IPV is normative. Much of the psychological research on depression etiology has focused on attributional styles, the propensity of individuals to subjectively interpret events as the result of one's own actions or characteristics or as caused by external forces or persons (Fiske & Taylor, 1991; Heider, 1958). Attributional models of depression and empirical evidence suggest that depressive persons are more likely to make internal (i.e., self-blaming) attributions for negative events (Rubenstein, Freed, Shapero, Fauber, & Alloy, 2016) but the extent to which attributional style is a stable trait in individuals is debated (Bentall & Kaney, 2005). If internal attribution of negative events, and hence the risk for depression, is influenced by environmental cues, an abused woman's perceptions of the normativity of IPV in her community may affect the extent to which the abuse impacts her mental health. For example, substantial research in Bangladesh suggests a high degree of social acceptability of IPV unless it is deemed excessive or "unjustified" (National Institute of Population Research and Training, M.a.A., and ICF International (2009); Schuler & Islam, 2008; Schuler, Lenzi, & Yount, 2011; Yount, Halim, Schuler, & Head, 2013). Therefore,

women who experience a level or type of IPV that is highly normalized in the community may be less likely to attribute it to their own characteristics or behavior which may mitigate the negative secondary effects on mental health.

Perhaps consistent with this hypothesis, several studies in LMICs, where rates of IPV are quite high, have found no significant associations between dichotomous measures of IPV and depression after adjusting for confounders, including in Bangladesh (Islam, Broidy, Baird, & Mazerolle, 2017a; Kabir, Nasreen, & Edhborg, 2014), as well as in Ethiopia (Deyessa et al., 2009), and Tanzania (Rogathi et al., 2017). Variation in the relationship between IPV and depression could be due in part to different analytic approaches (e.g., separate models for IPV types versus simultaneous adjustment) but also to population differences in multiple mediating factors including social support, coping mechanisms, and cultural values (White & Satyen, 2015). Variation in IPV effects on depression has also been attributed to differences in severity (Chang, Shen, & Takeuchi, 2009). In rural Bangladesh, one study found that women who experienced severe forms of marital IPV were more likely to disclose violence compared to women who experienced less severe violence (Naved, Azim, Bhuiya, & Persson, 2006). Naved et al. (2006) suggested women who do not disclose IPV may not consider the violence serious enough, reflecting both acceptance of marital IPV by the women themselves and by the community at large. Understanding of the impact of IPV severity on secondary outcomes such as depression is, however, severely hampered by reliance in the literature overwhelmingly on dichotomous indicators of IPV exposure which collapse women who experience mild and severe IPV into one "exposed" category. Findings of no or minimal effects of IPV on depression using dichotomous IPV measures, which do not reflect variation in severity of acts of abuse or frequency, may therefore mask or underestimate the true effect of IPV on the risk of depression among women facing the most severe levels of violence.

The present study aims to address this gap in the literature by comprehensively characterizing the nature of IPV exposure and estimating its effects on the risk of recent major depressive episode (MDE) among married women in rural Bangladesh, a context in which IPV is both endemic and normative (Naved et al., 2006). For each type of IPV (psychological, physical, and sexual) we operationalize a measure of IPV severity which accounts for both the number of different acts experienced and their frequency, and then estimate the impact on MDE. We also evaluate the impact of injury due to physical or sexual IPV as another metric of violence severity.

2. Methods

2.1. Data collection

Data were drawn from a nationally-representative longitudinal study focused on individual and contextual determinants of IPV risk among women in rural Bangladesh, collected through a multistage, stratified sample of female respondents in 77 villages. To achieve diversity in absolute and relative schooling attainment, a major focus of the original study, districts were stratified into four groups based on the magnitude and direction of girls' versus boys' school attendance. Within each of these strata, rural villages with at least 200 households were randomly selected with probability proportional to size. Within each village sampled, households were randomly selected following a complete household enumeration. Due to the sensitive nature of the interview content, only one individual per household was randomly selected to ensure the safety and confidentiality of participants (Ellsberg, Heise, Pena, Agurto, & Winkvist, 2001; WHO, 2001). Additional details of the original study are described elsewhere (Yount et al., 2016). The present study used data from baseline and follow-up interviews of a subsample of women married 4–12 years regardless of age: "recently" married women. The age range of the attained sample was 16 to 37 years. All participants took part in baseline interviews in 2013. Response rates for

this subsample were 94.7% at baseline in 2013 ($n = 3902$) and 86.3% at follow-up approximately 10 months later in 2014 ($n = 3369$). A total of 3355 (81.8%) recently married respondents completed both waves and are the focus of the present study. The study was approved by the Institutional Review Boards of the International Center for Diarrheal Disease Research, Bangladesh (icddr,b) and FHI 360.

2.2. Outcome

Recent MDE, our outcome of interest, was assessed at baseline and follow-up using a slightly adapted version of the Edinburgh Postnatal Depression Scale (EPDS). The EPDS is a 10-item questionnaire designed to detect the presence of postpartum depression (Cox, Holden, & Sagovsky, 1987), but has been validated for use beyond pregnancy (Cox, Chapman, Murray, & Jones, 1996; Santos et al., 2016), in Bangladesh (Gausia, Fisher, Algin, & Oosthuizen, 2007), and to detect MDE in a general population (Matijasevich et al., 2014). The EPDS questions asked about the presence of depressive symptoms in the past 30 days, with four possible response categories (never = 0, rarely = 1, sometimes = 2, often = 3) for each item. Items included whether the respondent has “been able to laugh and see the funny side of things,” “felt overwhelmed and unable to take care of the household or children,” and “been so unhappy that you have been crying.” The 10 items were aggregated to produce a possible score ranging from 0 to 30. We used the standard cutoff score of greater than 9 (out of 30) as indicative of “major depressive episode.” In non-postnatal mothers, Cox et al. (1996) found this cutoff had a sensitivity of 95% and specificity of 72% for minor or major depression. And in Bangladesh among postnatal women, Gausia et al. (2007) found this cutoff had a sensitivity of 89% and specificity of 87% for minor or major depression.

2.3. Exposures

Recent exposure (since baseline) to marital psychological, physical, and sexual IPV was assessed at follow-up, using seven, ten, and, three items, respectively, each adapted from the Revised Conflict Tactics Scale (Straus, Hamby, Boney-McCoy, & Sugarman, 1996) and the WHO standardized questionnaire on IPV (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2005). These instruments ask about specific behaviors, rather than subjective assessments of abuse, an approach which enhance disclosure and minimizes bias (Ellsberg et al., 2001). For psychological IPV, items included whether a woman’s husband had insulted her or made her feel bad about herself and whether he had threatened to divorce her. For physical IPV, items ranged from whether her husband had slapped or thrown something at her that could hurt her to whether he had used a gun, knife, or other weapon against her. For sexual IPV, women were asked about unwanted sexual intercourse by force or out of fear and about having to engage sexually in ways they found degrading or humiliating. If a woman responded “yes” to any item, she was then asked to report the frequency (1–2 times, 3–5 times, 6–10 times, greater than 10 times) of the act of violence since baseline.

To create the final analytic IPV exposure variables, dichotomized versions were first generated to facilitate comparability with estimates based on this standard approach. Within each of the three categories of IPV, if a woman responded “yes” to any individual act of violence, she was recorded as having been exposed to that type of violence. If a woman experienced psychological, physical, or/and sexual IPV, she was additionally coded as exposed to “any IPV.” Respondents were excluded if they had missing data on any individual IPV item and only “no” responses to remaining items, resulting in 32 observations dropped from the analysis. Second, for each IPV type, a severity score was generated. For each item, a woman received a score of “1” if it occurred 1–2 times, a score of “2” if it occurred 3–5 times, a score of “3” if it occurred 6–10 times, or a score of “4” if it occurred greater than 10 times. Within each type, these individual item scores were summed to create a final severity composite score. Due to differential item numbers across IPV

types, the possible severity score ranges varied: 1 to 28 for physical IPV, 1 to 40 for psychological IPV, and 1 to 12 for sexual IPV. Each of these three composite scores was further categorized: “none” if women had not had recent exposure to IPV, and then “low,” “medium,” and “high” based on tertiles of the non-zero values for each IPV severity score. This approach to characterizing IPV severity is similar to that used in one of the few other examples in the literature (Shamu, Zarowsky, Roelens, Temmerman, & Abrahams, 2016) however the composite scores in the present study incorporate both the number of different acts experienced within each sub-type of IPV, as well as their frequency. An additional indicator of IPV severity, reported injury due to physical or sexual violence, was also examined as part of a three-category variable of no recent physical or sexual violence exposure, recent physical or sexual violence exposure without injury, and recent physical or sexual violence exposure with injury. Due to problems with data collection for the IPV measures, baseline indicators of IPV exposure were not available for this analysis.

2.4. Covariates

Variables theorized to be related to IPV were included in the analysis (Abramsky et al., 2011; Islam, Mazerolle, Broidy, & Baird, 2017b). Potential confounders collected at baseline were: recent MDE, respondent ever witnessing her father hit or beat her mother, age, number of years of education completed by both the respondent and, separately, her husband, and tertiles of household wealth (low, medium, high). Household wealth was derived from the first component of a principle component analysis of items including household amenities, household assets, the respondent’s parents’ schooling attainment and whether the mother worked.

2.5. Data analysis

Overall descriptive statistics were generated for covariates, IPV variables, and the outcome of MDE at follow up (hereafter referred to as ‘MDE’). Next, bivariate associations between all variables and MDE were examined, using Rao-Scott modified chi-squared tests for categorical variables and t-tests for continuous variables. Variables significantly associated with MDE and IPV exposures—age, MDE at baseline, and ever witnessing father hit or beat mother—were included in subsequent models as confounders. Then, log-binomial regression was used to estimate crude and adjusted risk ratios (RR) for the association between severity of IPV and MDE. Four adjusted models were generated, which separately assessed severity of each type of IPV—psychological, physical, and sexual—and injury. P-values were considered significant at $\alpha < 0.05$. All analyses were performed using SAS 9.4 (Cary, NC), and accounted for the complex survey design.

3. Results

This analysis is based on 3290 recently married women with complete data on the outcome of MDE, IPV variables, and covariates. The prevalence of recent IPV in this sample was high—82.7% of women experienced any form of IPV, 44.4% experienced physical IPV, 77.2% experienced psychological IPV, and 58.8% experienced sexual IPV (Table 1). Psychological IPV was dominated by acts of insults (reported by 62.9% of respondents) and intimidation (63.0%). The most common acts of physical IPV were those typically considered “minor,” namely slapping/throwing objects (40.4%). And sexual IPV was mostly comprised of physically forced sexual intercourse (48.9%) and having sexual intercourse due to fear (43.3%). Just under one-third (30.6%) of women experienced injury related to recent physical or sexual IPV, the most common types of injury being pain and bruising/swelling/abrasion. Very few women reported seeing a health provider for injury (5.4%) or needing to but not doing so (5.8%). The frequency of IPV acts was also high—the prevalence of experiencing three or more instances

Table 1
Weighted frequencies of recent^a acts of intimate partner violence (IPV) among married women ages 16–37, rural Bangladesh, 2013–2014 (n = 3290).

	≥1 event		≥3 events	
	n	%	n	%
Any IPV	2693	82.7	2187	67.7
Psychological IPV	2499	77.2	1593	49.9
Insulted or made her feel bad about herself	1994	62.9	1050	34.1
Belittled or humiliated her in front of other people	1037	31.5	539	16.7
Scared or intimidated her on purpose	2071	63.0	1186	36.3
Threatened to hurt her or someone she cares about	332	10.8	162	5.2
Called her ugly or said something else negative about her appearance	255	7.9	141	4.4
Destroyed something belonging to her on purpose	202	6.0	70	2.1
Threatened to take another wife	339	9.8	177	5.2
Threatened to abandon or send her back to her family	378	11.2	204	6.1
Threatened to divorce her	247	7.3	134	4.0
Said she was not able to please him sexually	302	10.0	188	6.6
Count of psychological IPV acts experienced, mean (SE)	2.9 (0.09)			
Physical IPV	1438	44.4	1241	38.2
Slapped or had something thrown at her that could hurt her	1306	40.4	973	29.9
Pushed, shoved, or had hair pulled	628	19.5	450	14.0
Hit with fist or something else that could hurt	331	10.1	235	7.1
Kicked, dragged, or hit repeatedly	339	10.5	251	7.6
Choked or burnt on purpose	142	4.5	95	2.9
Husband threatened to use a gun, knife or other weapon against her	102	3.0	67	2.1
Husband actually used a gun, knife or other weapon against her	63	2.0	41	1.3
Count of physical IPV acts experienced, mean (SE)	2.0 (0.09)			
Sexual IPV	1928	58.8	1259	39.3
Physically forced to have sexual intercourse	1561	48.9	953	30.8
Had sexual intercourse because of fear	1441	43.3	861	26.4
Forced to do something sexual that she found degrading or humiliating	160	4.5	90	2.5
Count of sexual IPV acts experienced, mean (SE)	1.6 (0.02)			
Injury due to physical or sexual IPV	984	30.6	309	9.9
Bruise, swelling or abrasion	559	17.1	181	5.9
Sprain or small cut	101	3.2	39	1.1
Felt physical pain that still hurt the next day	900	27.9	66	2.0
Felt physical pain that kept her from doing her daily work	414	13.3	156	5.1
Lost consciousness from being hit on the head	56	1.7	12	0.3
Seen a health provider due to injury	181	5.4	46	1.2
Needed to see a health provider due to injury but did not see one	191	5.8	54	1.7
Had a broken bone or tooth	10	0.3	1	< 0.1
Count of injury acts experienced, mean (SE)	2.4 (0.12)			

Note: Estimates obtained using complex survey design weights.

^a Recent acts of IPV is defined as having occurred since baseline interviews, conducted approximately 10 months prior.

of recent IPV was 49.9% for psychological, 38.2% for physical, and 39.3% for sexual. The average number of recent IPV acts women experienced was 2.9 psychological acts, 2.0 physical acts, and 1.6 sexual acts, as well as 2.4 acts of injury as a result of physical or sexual violence. Furthermore, Fig. 1 illustrates the multi-dimensionality of IPV and the degree of co-occurrence of its different types. Physical and sexual IPV were each rarely experienced alone, as both were typically accompanied by psychological IPV. In addition, 36.0% of women experienced all three forms of IPV, and 23.5% experienced all three and injury due to physical or sexual IPV.

The prevalence of MDE at follow-up, the outcome of interest, was 16.8% (Table 2). Women with MDE were more likely to be older, have completed slightly less schooling, have husbands who completed less

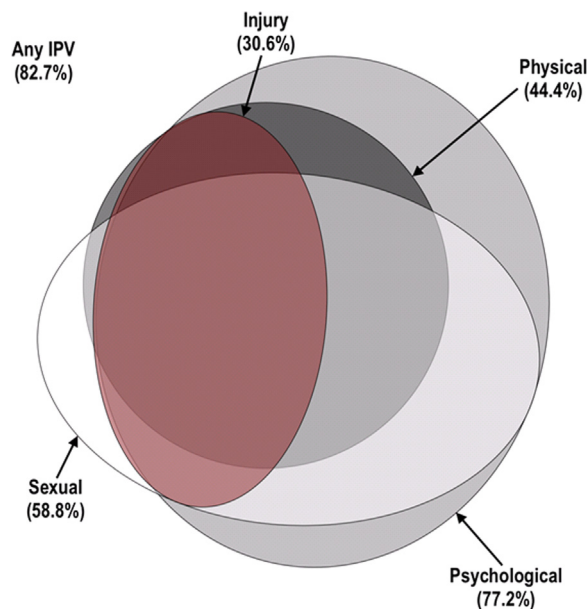


Fig. 1. Weighted area-proportional Venn diagram of recent psychological, physical, and sexual intimate partner violence (IPV) prevalence among married women ages 16–37, rural Bangladesh, 2013–2014 (n = 3290).

schooling, have had MDE at baseline, and have witnessed marital IPV between their parents. They were also more exposed to IPV since the baseline assessment. When measured using the standard dichotomous indicators, physical and psychological IPV were each positively associated in bivariate analyses with MDE, but sexual IPV was not. However, when incorporating levels of severity, all types of IPV were associated with MDE (Table 2). The IPV severity prevalence varied by type overall and by depression status. What is perhaps most remarkable about the patterning of IPV severity is that only at the higher levels was the prevalence consistently greater among women categorized as depressed. For example, in the case of both psychological and sexual IPV, the prevalence of medium IPV severity was the same among “depressed” and “non-depressed” women. This was also the case when comparing physically injurious and non-injurious IPV – only the former was more prevalent among women categorized as depressed (45.2% versus 27.7%). The prevalence of non-injurious IPV was actually lower among depressed women (26.7% versus 37.7%).

Table 3 shows the crude and adjusted relationships between IPV severity and MDE using log-binomial regression models. In each model and for all IPV types, there was no indication of elevated risk of MDE associated with low IPV severity compared to none. However, above this threshold, a pattern emerged—increasing severity of violence, relative to none, corresponded to an increasing risk of MDE. In the adjusted model examining physical IPV severity, the risk of MDE was 1.52 times higher (95% CI: 1.09, 2.12) among those exposed to medium IPV severity, and 2.44 times higher (95% CI: 1.94, 3.08) among those exposed to high IPV severity, compared to experiencing no physical IPV. For the other IPV indicators, only the highest levels of severity were statistically significantly associated with MDE relative to no IPV exposure in adjusted models (psychological IPV RR = 2.27, 95% CI: 1.62, 3.17; sexual IPV RR = 1.65, 95% CI: 1.08, 2.52). In addition, recent sexual or physical IPV that was injurious incurred elevated MDE risk (RR = 1.72, 95% CI: 1.23, 2.40). However, reporting any recent sexual and/or physical IPV but no injury as a result of it was not associated with increased risk of MDE (adjusted RR = 0.89, 95% CI: 0.62, 1.26).

4. Discussion

This study is the first to examine the association between marital

Table 2
Descriptive characteristics of sample overall and by major depressive episode (MDE) status, rural Bangladesh, 2013–2014.

	Total sample (n = 3290)		MDE				P-value
			Yes (n = 530; 16.8%)		No (n = 2760; 83.2%)		
	n	%	n	%	n	%	
Characteristics							
Age, mean (SE)	24.4 (0.11)		24.7 (0.16)		24.4 (0.11)		0.010
Highest class completed, mean (SE)	6.4 (0.23)		6.0 (0.38)		6.5 (0.21)		0.081
Husband highest class completed, mean (SE)	5.6 (0.30)		5.1 (0.53)		5.7 (0.27)		0.120
Household Wealth Index							0.180
Low	1214	33.3	232	37.0	982	32.6	
Medium	1211	33.6	187	34.3	1024	33.4	
High	865	33.1	111	28.7	754	34.0	
Depressive symptoms at baseline	548	18.0	132	26.7	416	16.3	0.001
Ever witnessed father hit or beat mother	470	13.7	100	17.8	370	12.8	0.025
Dichotomous indicators of IPV							
Psychological IPV	2499	77.2	441	83.3	2058	75.9	0.018
Physical IPV	1438	44.4	296	54.7	1142	42.3	< 0.001
Sexual IPV	1928	58.8	339	62.5	1589	58.0	0.201
Any IPV	2693	82.7	467	88.2	2226	81.6	0.008
Severity of IPV exposure^a							
Psychological IPV							< 0.001
None (0)	791	22.8	89	16.7	702	24.1	
Low (1–2)	864	26.2	78	15.4	786	28.4	
Medium (3–5)	843	25.9	130	25.0	713	26.1	
High (5–40)	792	25.0	233	42.8	559	21.4	
Physical IPV							< 0.001
None (0)	1852	55.6	234	45.3	1618	57.7	
Low (1–2)	770	23.5	107	19.3	663	24.3	
Medium (3–4)	306	9.6	65	12.3	241	9.1	
High (5–26)	362	11.3	124	23.1	238	8.9	
Sexual IPV							0.003
None (0)	1362	41.2	191	37.5	1171	42.0	
Low (1–2)	952	28.1	127	23.8	825	29.0	
Medium (3–4)	541	16.4	94	16.7	447	16.3	
High (5–12)	435	14.3	118	22.0	317	12.7	
Injury due to physical or sexual violence							< 0.001
No physical or sexual violence	1114	33.5	141	28.1	973	34.6	
Physical or sexual IPV without injury	1192	35.8	138	26.7	1054	37.7	
Physical or sexual IPV with injury	984	30.6	251	45.2	733	27.7	

Note: IPV = intimate partner violence.

Estimates obtained using complex survey design weights; standard errors shown in parentheses.

^aHousehold wealth was calculated based on the first component scores from principle component analysis of items such as household amenities and household assets.

^a Actual range of IPV scores are in parentheses; possible ranges are: 0–40 (psychological), 0–28 (physical), and 0–12 (sexual).

IPV severity and depression among women in rural Bangladesh, where over five in six married women ages 16 to 37 years had experienced some form of recent IPV. We show that IPV in this setting is not only highly prevalent but also multi-dimensional, as most women experiencing sexual or physical IPV also experienced psychological IPV. Also of note, no study examining the relationship between IPV and depression among women beyond pregnancy has been conducted in the context of Bangladesh. We observed a prevalence of MDE of 16.8% in this community-based sample of young, rural married women in Bangladesh which is relatively high for the region but comparable to several estimates of common mental disorders in the country documented in a recent systematic review (Hossain, Ahmed, Chowdhury, Niessen, & Alam, 2014). Other studies in Bangladesh focused on postpartum women and have documented prevalence estimates of depression ranging from 12% in the rural sub-district of Matlab (Gausia et al., 2011) to 32% in rural parts of the Mymensingh district (Kabir et al., 2014).

We also found, as hypothesized, that all types of IPV are associated with MDE in a dose-response relationship when modeled as severity of IPV exposure. In adjusted models controlling for covariates and baseline MDE, increased severity of IPV corresponded to an increased risk of MDE. The elevated risk of depression was most pronounced for physical IPV and injurious IPV. However, with the exception of physical IPV,

only the highest levels of IPV severity were statistically significantly associated with MDE. These findings suggest that the lowest level of IPV severity, the most prevalent, is not associated with increased risk of depression and that the next level of severity, which we label “medium,” confers a relatively modest increased risk. There are two important implications of these findings, one methodological and one substantive.

First, these findings point to the limited utility of standard dichotomous indicators of IPV exposure (Shamu et al., 2016) which may mask the true impact of IPV on secondary outcomes such as mental disorders. Most importantly, they may obscure the very elevated risks associated with severe levels of IPV. In corresponding adjusted models using dichotomous measures of IPV (results not shown), estimates of MDE in this sample were relatively attenuated: RR = 1.43 (95% CI: 1.08–1.90) for any psychological IPV (versus 2.27 for high severity); RR = 1.47 (95% CI: 1.18–1.84) for any physical IPV (versus 2.44 for high severity); and RR = 1.15 (95% CI: 0.90–1.48) for any sexual IPV (versus 1.65 for high severity). Similarly, the effect estimate for MDE associated with any sexual or physical IPV (RR = 1.27, 95% CI: 0.93, 1.72, results not shown) masks the considerably divergent results based on whether or not the IPV is injurious (RR = 1.72 if yes versus RR = 0.89 if no).

The second implication relates to the interpretation of the dose-response relationship we observed, in particular why IPV at lower levels

Table 3
Risk ratios (RR) and 95% confidence intervals (CI) for association between IPV severity and major depressive episode among married women ages 16–37, rural Bangladesh, 2013–2014.

	Unadjusted models		Adjusted models ^a	
	RR	(95% CI)	RR	(95% CI)
Severity of IPV exposure				
Psychological IPV				
None	1.00	Ref	1.00	Ref
Low	0.80	(0.60–1.07)	0.80	(0.60–1.05)
Medium	1.32	(0.90–1.93)	1.31	(0.89–1.91)
High	2.34	(1.65–3.30) ^{***}	2.27	(1.62–3.17) ^{***}
Physical IPV				
None	1.00	Ref	1.00	Ref
Low	1.01	(0.80–1.28)	1.01	(0.80–1.28)
Medium	1.57	(1.13–2.19) ^{***}	1.52	(1.09–2.12) ^{**}
High	2.50	(1.99–3.15) ^{***}	2.44	(1.94–3.08) ^{***}
Sexual IPV				
None	1.00	Ref	1.00	Ref
Low	0.93	(0.71–1.22)	0.92	(0.71–1.19)
Medium	1.12	(0.84–1.50)	1.13	(0.86–1.49)
High	1.70	(1.10–2.62) [*]	1.65	(1.08–2.52) [*]
Injury due to physical or sexual violence				
No physical or sexual violence	1.00	Ref	1.00	Ref
Physical or sexual IPV without injury	0.89	(0.62–1.27)	0.89	(0.62–1.26)
Physical or sexual IPV with injury	1.76	(1.25–2.48) ^{**}	1.72	(1.23–2.40) ^{**}

Note: IPV = intimate partner violence.

^a Four separate models each adjusted for age, depressive symptoms at baseline, and ever witnessing father hit or beat mother.

*** p < 0.001;

** p < 0.01

* p < 0.05.

of severity is not associated with elevated risk of MDE. Our findings of a gradient association are more or less consistent with the few other studies examining degrees of IPV exposure and depression in LMIC settings (Shamu et al., 2016; Ludermir et al., 2010) though both of these studies focused on the perinatal period and Ludermir et al. (2010) only looked at frequency of psychological IPV. In Zimbabwe, a similarly high IPV prevalence setting, Shamu et al. (2016) found no association between low levels of physical IPV during pregnancy and postnatal depression. In contrast, one study using a sample of Canadian women found that even just one episode of IPV during pregnancy was associated with more than twice the risk of antenatal depression (Miszkurka, Zunzunegui, & Goulet, 2012).

One possible explanation of the finding of no elevated risk of MDE at low levels of IPV may be related to the degree of acceptance of IPV, particularly sexual IPV, among women in this sample. Evidence from Bangladesh suggests beliefs that wife beating in certain scenarios is justified are widespread among both men and women (National Institute of Population Research and Training, 2009). Furthermore, previous research has found that women in Bangladesh living in communities where marital IPV against women is normative were more likely to justify such IPV (Jesmin, 2015). If women who experience a type or level of IPV that is typical in their communities are themselves likely to normalize or justify it, it is possible that this exposure may be less likely to induce psychological distress. This explanation is supported by a study in Ethiopia which failed to find an association between sexual violence (measured dichotomously as ever versus never) and depression. The authors attributed the finding, in a setting where the prevalence of sexual IPV was 60%, to the general acceptance of a man’s entitlement to have sex with his wife regardless of her consent (Deyessa et al., 2009).

Conversely, women exposed to aberrant IPV may be more likely to

experience psychological distress (Calvete, Corral, & Estévez, 2008), especially in contexts such as Bangladesh where options for recourse in an abusive marriage are extremely limited. In addition, and especially pertinent to psychiatric outcomes such as depression, women experiencing atypical IPV may also be at greater risk for attributing the cause of the (non-normative) violence to themselves and/or experiencing shame and stigma which may, in turn, limit disclosure and worsen effects on mental health. Some evidence suggests that IPV-related coping strategies may be both related to the type of IPV experienced (Calvete et al., 2008; Hellmuth, Jaquier, Overstreet, Swan, & Sullivan, 2014) and influence the risk of depressive symptoms (Calvete et al., 2008; Hellmuth et al., 2014; Mitchell & Hodson, 1983). Explaining the IPV-depression gradient in high IPV prevalence settings, and understanding in particular the role of the normative environment, is an important area for future research.

The present study also contributes to the literature by more fully characterizing IPV in an endemic context. Studies have typically analyzed IPV as a dichotomous variable indicating whether or not a woman has experienced either one or more types of violence, rather than as a more complex measure incorporating severity and frequency of violence (Coker, Smith, McKeown, & King, 2000; Islam et al., 2017a; Lövestad, Löve, Vaez, & Krantz, 2017; Meekers, Pallin, & Hutchinson, 2013; Pico-Alfonso et al., 2006). Extensive work to standardize ascertainment of IPV exposure in community-based surveys to maximize disclosure and validity (Garcia-Moreno et al., 2005) has not yet been matched by efforts to create uniform analytic variables from these data beyond the standard dichotomous indicators. As a result, measures of IPV severity are relatively rare and highly variable. For example, Coker et al. characterized IPV by type of violence, using combinations of physical, sexual, or emotional abuse as binary variables, but excluded frequency of violence in their measures (Coker et al., 2000). Ruiz-Pérez et al. similarly characterized physical, sexual, and psychological IPV, and also accounted for frequency, yet derived it by using crude measures of “many times,” “sometimes,” or “never” (Ruiz-Perez, Plazaola-Castano, & del Rio-Lozano, 2007). Others have separately assessed severity of IPV based on individual acts of violence (e.g. slapping as moderate violence, choking as severe violence) and frequency of violence, but have focused on physical or sexual IPV (Garcia-Moreno et al., 2006; Harrykisson, Rickert, & Wiemann, 2002; McFarlane, Parker, Soeken, & Bullock, 1992; Naved et al., 2006; Naved & Persson, 2010), where individual acts may be more readily conceptualized as existing on a continuum of severity.

The approach to more comprehensively characterizing IPV exposure in the present study is based on the frequency of individual acts of each type of IPV as a proxy for severity, rather than an attempt to rank severity of behaviors, in order to be consistent across IPV types. While this approach therefore weights a “slap” and “weapon use” equally, our data suggest that women who experience major acts of physical IPV rarely do not also experience multiple minor acts, and therefore their total count score is reliably elevated. For instance, among women who had a weapon used on them—the most severe act of physical IPV measured—all were placed in the “medium” or “high” physical IPV severity categories. Similarly, the vast majority of women who reported being hit, kicked, choked, or threatened with a weapon wound up categorized as experiencing “high” physical IPV severity. However, this approach cannot differentiate women who experience several instances of minor acts of IPV from those who experience, for example, a combination of a few minor acts and one major act; how such distinctions should be ranked in terms of severity and expected impact on secondary outcomes such as mental health is yet to be determined. We therefore additionally account for whether or not the IPV is injurious in order to capture this critical aspect of severity.

The present study adds to the sparse body of literature examining the association between IPV and depression among non-pregnant women living in LMICs. Our characterization of IPV fills a critical gap in the literature that has to date relied overwhelmingly on dichotomous

measures that do not capture the severity of IPV. The biggest limitation of the current analysis is the cross-sectional ascertainment of IPV and MDE at follow up. Although we were able to control for MDE at baseline, and the recall period for recent IPV is prior to that for MDE, it is still possible that women experiencing recent MDE may be likely to recall IPV exposure differentially. However, the dose-response relationship between IPV severity and risk of MDE, including the lack of association at the lowest level of IPV exposure, suggests that recall bias is not likely to explain the association to a significant degree. Notable strengths of the present study beyond the incorporation of IPV severity include the use of validated, standardized instruments to ascertain IPV and MDE in the context of LMICs, a large sample size affording precise estimates, the use of a population-based non-pregnant sample enhancing generalizability, and our ability to account for key potential confounders including MDE at baseline and witnessing parental IPV.

Results of this study suggest dichotomous measures of IPV may mask important nuances and levels of risk better captured by measures incorporating severity. More work is needed to develop standard approaches to operationalizing severity measures applicable to all types of IPV and to explore the mechanisms underlying the patterns of association with mental health sequelae observed. Potentially fruitful avenues to explore include the role of coping processes in mediating and moderating the relationship between IPV severity and depression, and the influence of community norms related to IPV, especially in settings where violence may be endemic. This study also suggests implications for intervention efforts. A better understanding of the pathways between IPV and mental health may be especially important in endemic LMIC settings where recourse options for women in abusive marriages are limited. In such settings, intervention approaches that can mitigate secondary harms from IPV need to be considered in addition to strategies aimed toward primary prevention. Finally, as interventions to prevent IPV expand and hopefully succeed in shifting norms and reducing prevalence, efforts should be made to monitor for potential unintended negative consequences of worsening mental health among women who continue to be victims. If women who experience IPV in a context in which it is increasingly denormalized undergo more stigmatization and self-blame, intervention strategies will need to include explicit messages and support to mitigate this additional harm.

Acknowledgements

This work was supported by research grant 1R01HD061630-01A1 from the National Institute of Child Health and Development (PI Schuler). The involvement of Precious Esie in this manuscript was also supported, in part, by the Initiative for Maximizing Student Development grant R25GM062454 from the National Institutes of Health.

Ethical statement

This study was approved by the Institutional Review Boards of the International Center for Diarrheal Disease Research, Bangladesh (ICDDR,b) and FHI 360. The authors have no conflicts of interest to report.

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