

# Premarital mental disorders and physical violence in marriage: cross-national study of married couples

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## Background

Mental disorders may increase the risk of physical violence among married couples.

## Aims

To estimate associations between premarital mental disorders and marital violence in a cross-national sample of married couples.

## Method

A total of 1821 married couples (3642 individuals) from 11 countries were interviewed as part of the World Health Organization's World Mental Health Survey Initiative. Sixteen mental disorders with onset prior to marriage were examined as predictors of marital violence reported by either spouse.

## Results

Any physical violence was reported by one or both spouses in 20% of couples, and was associated with husbands' externalising disorders (OR = 1.7, 95% CI 1.2–2.3). Overall, the population attributable risk for marital violence related to premarital mental disorders was estimated to be 17.2%.

## Conclusions

Husbands' externalising disorders had a modest but consistent association with marital violence across diverse countries. This finding has implications for the development of targeted interventions to reduce risk of marital violence.

## Declaration of interest

R.C.K. has been a consultant for AstraZeneca, Analysis Group, Bristol-Myers Squibb, Cerner-Galt Associates, Eli Lilly, GlaxoSmithKline, HealthCore, Health Dialog, Integrated Benefits Institute, John Snow, Kaiser Permanente, Matria, Mensante, Merck, Ortho-McNeil Janssen Scientific Affairs, Pfizer, Primary Care Network, Research Triangle Institute, Sanofi-Aventis Groupe, Shire US, SRA International, Takeda Global Research and Development, Transcept Pharmaceuticals and Wyeth-Ayerst; has served on advisory boards for Appliance Computing II, Eli Lilly, Mindsite, Ortho-McNeil Janssen Scientific Affairs, Plus One Health Management and Wyeth-Ayerst; and has had research support for his epidemiological studies from Analysis Group, Bristol-Myers Squibb, Eli Lilly, EPI-Q, GlaxoSmithKline, Johnson & Johnson Pharmaceuticals, Ortho-McNeil Janssen Scientific Affairs, Pfizer, Sanofi-Aventis Group and Shire US.

Mental disorders are associated with both perpetration of and victimisation by physical violence in marital relationships (marital violence).<sup>1</sup> Although studies have generally been concerned with presumed mental health consequences of violence,<sup>2–4</sup> a growing body of evidence suggests that physical violence perpetration and victimisation in marital relationships may be partly a consequence of pre-existing mental disorders.<sup>5–7</sup> Longitudinal studies of violence perpetration in intimate relationships have found a higher prevalence of substance misuse, depression, conduct disorder and attention-deficit hyperactivity disorder (ADHD) prior to the start of the relationship than in the general population.<sup>5,6,8,9</sup> Similarly, in a few studies being the victim of violence is associated with a higher prevalence of mood and anxiety disorders.<sup>1,7,10</sup> These studies tend to focus on single disorders such as conduct disorder or depression among smaller samples, and do not generally address the co-occurrence of multiple mental disorders.

We examined associations between premarital mental disorders and the occurrence of marital violence in a cross-national epidemiologic sample of married and cohabiting couples interviewed in the World Mental Health (WMH) surveys. Our study has four unique features. First, the sample consisted of couples, of which both members answered an identical set of questions about their own perpetration of and victimisation by physical violence in their current marriage or marriage-like relationship. To our knowledge this is the only population-based study which combines reports of violence from both members

of spousal pairs, offering potentially more accurate prevalence estimates of marital violence compared with individual self-reports. Second, both members of each couple completed the same detailed assessment of mental disorders. These data allow for examination of whether spousal characteristics, including history of mental disorders, modify the associations of an individual's premarital mental disorders with risk of marital violence. Third, the psychiatric assessment covered a broad range of psychiatric disorders. Some associations of specific mental disorders with marital violence might have been overestimated in previous studies that did not include or adjust for co-occurring disorders. Understanding which particular mental disorders or class of disorders may be associated with vulnerability for physical violence victimisation and perpetration could inform clinical screening and safety assessments. Fourth, the study included representative samples from a diverse set of 11 high-, middle- and low-income countries, providing an opportunity to examine whether associations between mental disorders and marital violence are unique to high-income countries, where the bulk of previous research on marital violence has been conducted. Although the prevalence of physical violence in marriages varies significantly around the globe, if mental disorders contribute to marital violence risk through similar pathways we would expect the association of marital violence with premarital mental disorders to be relatively consistent. Identifying whether the contribution of premarital mental disorders to marital violence, found in studies of Western countries,<sup>5,8</sup> is similar across diverse

countries including non-Western settings is important for guiding international efforts to prevent marital violence.

## Method

Out of the 11 WMH countries that included a couples sample in their country-specific survey, five were classified by the World Bank as high income (Belgium, France, Italy, Spain, USA), three as upper-middle income (Brazil, Bulgaria, Lebanon) and three as low or lower-middle income (China, Nigeria, India); the total sample size was  $n=8766$  (Table 1).<sup>11</sup> Surveys took place in multistage clustered area probability household samples representative of specific regions (Brazil, India, China) or the entire nation (the remaining countries). Respondents were interviewed face to face in their homes by trained lay interviewers, who explained the purposes of the survey and made

it clear that participation was voluntary, that respondents could decide not to answer any questions and that responses would be treated as confidential. These recruitment and consent procedures were approved by local human subjects research and ethics committees monitoring the study in each country. A more detailed discussion of WMH training, quality control and survey implementation is presented elsewhere.<sup>12</sup>

A supplemental 'couples sample' was incorporated into the survey design for each of these countries in which full interviews were conducted with both the initial respondent and the respondent's current spouse or cohabiting partner. A total of 1821 heterosexual couples were interviewed. The vast majority of these couples (95%) were married. The remaining couples reported that they were 'living with someone in a marriage-like relationship' but were not married (for simplicity, we hereinafter refer to all couples as 'married'). Given the highly sensitive nature of questions asked in the survey, a certificate of confidentiality was

**Table 1** Sample characteristics categorised by World Bank income level<sup>a</sup>

Survey	Sample characteristics <sup>b</sup>	Field dates	Age Years	Sample size (part 2) $n^c$	Response rate <sup>d</sup> %	Couples sample size <sup>e</sup> , $n$
<i>High-income countries</i>						
Belgium ESEMeD	Stratified multistage clustered probability sample of individuals residing in households from the national register of Belgium residents. NR	2001–2	18+	336	50.6	27
France ESEMeD	Stratified multistage clustered sample of working telephone numbers merged with a reverse directory (for listed numbers). Initial recruitment was by telephone, with supplemental in-person recruitment in households with listed numbers. NR	2001–2	18+	173	45.9	10
Italy ESEMeD	Stratified multistage clustered probability sample of individuals from municipality resident registries. NR	2001–2	18+	371	71.3	27
Spain ESEMeD	Stratified multistage clustered area probability sample of household residents. NR	2001–2	18+	403	78.6	35
USA NCS-R	Stratified multistage clustered area probability sample of household residents. NR	2002–3	18+	1607	70.9	350
<i>Upper-middle-income countries</i>						
Brazil Sao Paulo Megacity	Stratified multistage clustered area probability sample of household residents in the São Paulo metropolitan area	2005–7	18+	1848	81.3	197
Bulgaria NSHS	Stratified multistage clustered area probability sample of household residents. NR	2003–7	18+	1154	72	437
Lebanon LEBANON	Stratified multistage clustered area probability sample of household residents. NR	2002–3	18+	482	70	159
<i>Low- and lower-middle income countries</i>						
China Shenzhen	Stratified multistage clustered area probability sample of household residents and temporary residents in the Shenzhen area	2006–7	18+	1014	80	106
India WMHI	Stratified multistage clustered area probability sample of household residents in Pondicherry region. NR	2003–5	18+	302	98.8	79
Nigeria NSMHW	Stratified multistage clustered area probability sample of households in 21 of the 36 states in the country, representing 57% of the national population. The surveys were conducted in Yoruba, Igbo, Hausa and Efik languages	2002–3	18+	1076	79.3	394
Total				8766		1821
Weighted average response rate					74.1	
<p>ESEMeD, European Study of the Epidemiology of Mental Disorders; LEBANON, Lebanese Evaluation of the Burden of Ailments and Needs of the Nation; NCS-R, US National Comorbidity Survey Replication; NR, nationally representative; NSHS, National Survey of Health and Stress; NSMHW, Nigerian Survey of Mental Health and Wellbeing; WMHI, World Mental Health India.</p> <p>a. The World Bank. Data. The World Bank, 2011 (<a href="http://data.worldbank.org/country">http://data.worldbank.org/country</a>).</p> <p>b. Most World Mental Health (WMH) surveys are based on stratified multistage clustered area probability household samples in which samples of areas equivalent to counties or municipalities in the USA were selected in the first stage followed by one or more subsequent stages of geographic sampling (e.g. towns within counties, blocks within towns, households within blocks) to arrive at a sample of households, in each of which a listing of household members was created and one or two people were selected from this listing to be interviewed. No substitution was allowed when the originally sampled household resident could not be interviewed. These household samples were selected from census area data in all countries other than France (where telephone directories were used to select households). Several WMH surveys (Belgium and Italy) used municipal resident registries to select respondents without listing households. Eight of the 11 surveys are based on nationally representative (NR) household samples.</p> <p>c. The sample comprised part 2 respondents who were currently married or cohabiting, and answered the questions about family violence.</p> <p>d. Response rate is calculated as the ratio of the number of households in which an interview was completed to the number of households originally sampled, excluding from the denominator households known not to be eligible either because of being vacant at the time of initial contact or because the residents were unable to speak the designated languages of the survey.</p> <p>e. The number of couples in each country sample.</p>						

obtained to protect the data from subpoena, and every effort was made for interviews to be conducted in private. The proportion of interviews conducted when the respondent's spouse was present in the room for most of the interview varied by country, from 2.4% in China to 38% in India. Regardless of whether the spouse was present, in each case the respondents were presented with the list of violent behaviours in booklet form and asked whether they had ever experienced any of them. The spouse, if present, was asked not to look at the booklet or to sit behind the respondent. Interviewers were trained to assess for emotional distress following completion of the survey and to follow specific protocols for connecting participants to appropriate clinical services. In addition, owing to the length of the survey, its administration was extended over more than 1 day in some instances, as interviewers were trained to gauge respondent fatigue. Country-specific response rates ranged from 45.9% (France) to 98.8% (India). The weighted (by sample size) average response rate was 74.1%.

The interview was divided into two parts. Part 1 assessed core disorders and was completed by all respondents. Part 2 assessed additional disorders and numerous correlates, and was completed by 100% of respondents who met criteria for any part 1 disorder plus a probability subsample of other part 1 respondents. To reduce the possibility of recall bias, disorders defined as beginning in childhood (ADHD, conduct disorder, oppositional defiant disorder, separation anxiety disorder) were assessed only among respondents in the age range 18–44 years. The part 1 samples were weighted to adjust for differential probabilities of selection and residual discrepancies between sample and census on socio-demographic and geographic variables, to approximate population distributions in each country. The part 2 samples were additionally weighted to adjust for undersampling of part 1 respondents without part 1 disorders. A more detailed discussion of WMH sampling and weighting is presented elsewhere.<sup>12</sup>

### Diagnostic assessment

Diagnoses were based on version 3.0 of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI),<sup>13</sup> a fully structured lay-administered interview that generates diagnoses according to both ICD-10 and DSM-IV criteria (DSM-IV criteria were used here). Translation and back-translation followed standard WHO procedures.<sup>14</sup> The 16 lifetime diagnoses included ten internalising disorders: mood disorders (bipolar type 1/2 or subthreshold disorder, major depressive episode, dysthymia) and anxiety disorders (agoraphobia with or without panic disorder, generalised anxiety disorder, panic disorder with or without agoraphobia, post-traumatic stress disorder, separation anxiety disorder, social phobia, specific phobia). The six externalising disorders included disruptive behaviour disorders (ADHD, conduct disorder, intermittent explosive disorder; oppositional defiant disorder) and substance use disorders (alcohol misuse with or without dependence, drug misuse with or without dependence). Masked clinical reappraisal interviews found good concordance between DSM-IV diagnoses based on the CIDI,<sup>15</sup> and those based on the Structured Clinical Interview for DSM-IV.<sup>16,17</sup> Organic exclusions but not diagnostic hierarchy rules were used in making diagnoses. The CIDI included retrospective disorder age-at-onset reports based on a specific question sequence that has been shown experimentally to improve recall accuracy.<sup>15</sup> Premarital onset of mental disorders was defined as having a disorder with age at onset less than the age at which respondents reported starting to live with their current partner in a marriage-like relationship or marrying the current spouse (i.e. age at current marriage).

### Physical violence measures

Physical violence in the respondent's current marriage was assessed using questions based on the modified Conflict Tactics Scale.<sup>18</sup> Respondents were provided with a list of specific violent actions in written form in the respondent booklet and asked whether any of these actions ever occurred in the context of their current marital relationship. Physical violence was defined for respondents as 'pushed, grabbed or shoved, threw something, slapped or hit'. The question was phrased: 'People handle disagreements in many different ways. Over the course of your relationship, how often have you ever done any of these things on this list to your current spouse/partner – often, sometimes, rarely or never?' A report other than 'never', 'don't know' or 'refused' was coded as having ever experienced physical violence perpetration in the current marriage. Physical violence victimisation in the current marriage used the same examples, phrased as 'how often has your current spouse/partner done any of these things to you?' Answering positively to either the victimisation or perpetration items was coded as having experienced 'any' physical violence in current marriage; those responding positively to only perpetration or only victimisation items were coded as 'perpetration only' and 'victimisation only'; those responding they had both perpetrated violence and been victimised were coded as 'both perpetrator and victim'.

The terms 'intimate partner violence' and 'domestic violence' refer to a broad range of physical, sexual and emotional abuse among intimate partners (including dating relationships). In these analyses, 'any marital violence' refers specifically to physical violence in marital and marriage-like relationships as reported by either spouse/partner in the couple. Spouse reports of violence were added to respondents who reported no violence. For instance, if a respondent reported no violence, but their spouse reported perpetration, the respondent was coded as 'victim only'.

### Sociodemographic measures

Additional demographic items included in analyses were age, age at start of current marriage or cohabiting relationship, years married or living together in current relationship and educational attainment.

### Statistical analysis

Prevalence estimates for marital violence were calculated separately for men and women within each country (online Table DS1) and for all 11 countries together. In the couples sample, marital violence was considered present if reported by either member of a couple. Assortative mating by premarital psychiatric disorders was examined in logistic regression models in which the presence (prior to marriage) of any internalising or any externalising disorder in one spouse was examined as a predictor of the presence (prior to marriage) of disorder in the other spouse. Logistic regression models were used to estimate associations between premarital onset psychiatric disorders and violence in the current marriage. Sixteen internalising and externalising disorders were examined as predictors of marital violence. In a preliminary model building stage, the best-fitting model, using Akaike information criteria and Bayes information criteria, was one that included binary variables for presence of any internalising and any externalising disorder. Statistical adjustments were included for country, age at start of current marriage, age at start of marriage squared, years in the marriage and education (both husband's and wife's). These models were used in simulations to estimate population attributable risk proportions, i.e. the proportion of cases of marital violence attributable to mental disorders based on the assumption that the model represents

**Table 2** Prevalence of marital violence ever in current marriage as reported by either spouse in the 11 World Mental Health survey countries with couples samples

Violence report	Women (n = 1821)		Men (n = 1821)		Total	
	n	Weighted % (s.e.)	n	Weighted % (s.e.)	n	Weighted % (s.e.)
Any marital violence	404	19.8 (1.1)	404	20.2 (1.1)	808	20.0 (0.9)
Both perpetrator and victim	174	8.1 (0.7)	171	8.1 (0.7)	345	8.1 (0.6)
Perpetrator only	85	4.8 (0.7)	158	7.3 (0.6)	243	6.1 (0.5)
Victim only	145	6.9 (0.7)	75	4.8 (0.7)	220	5.8 (0.5)
Total sample	1821		1821		3642	

causal relationships. In addition, to assess cross-national variations, the best-fitting model was re-run including interaction terms between country income level (dummy variables distinguishing high-, lower-middle- and low-income countries) and the measures of mental disorders in predicting marital violence. Country income level was used instead of separate dummy predictor variables for each country because of the small sample sizes in some surveys.

## Results

### Prevalence of physical violence in current marriage

In 80% of couples both spouses reported that there was no marital violence. For the majority of couples in which any violence was reported (65%), violence was denied by one spouse. Reports of physical violence in the current marriage by either spouse are presented in Table 2. When discordant reports were adjusted by taking the response of the spouse who endorsed any marital violence as the true response, the prevalence in the couples sample with combined reports was 20.0% compared with the prevalence based on individual reports of 13.6% (comparison tables available from the authors on request). Among couples who reported marital violence, only 1 in 4 agreed on the spouses' respective roles in the violence, i.e. who had perpetrated it and who had been the victim. We therefore focused analyses on any marital violence as reported by either spouse.

### Premarital mental disorders and marital violence

Table 3 shows associations between specific individual disorders and any marital violence, with separate models for men and women. Of 16 disorders, 10 had odds ratios greater than 1 for women, but only one – intermittent explosive disorder – was statistically significant. Similarly, for men, 11 of 16 disorders had odds ratio estimates greater than 1, with only alcohol misuse (with or without dependence) reaching statistical significance. It is noteworthy that agoraphobia and dysthymia had significant negative associations with marital violence.

Given the high co-occurrence of mental disorders, multiple models were tested that included counts of the number of disorders and dummy variables for type of disorder. The best-fitting model included binary variables for any externalising or any internalising premarital mental disorder (Table 4). Statistical adjustments were included for age at start of current marriage, years in the marriage, education and country. When we examined predictors of any marital violence, odds ratios for externalising and internalising disorders were greater than 1 for both men and women, indicating higher risk of marital violence, but only one predictor reached statistical significance – premarital externalising disorders significantly predicted marital violence among men (OR=1.7, 95% CI 1.2–2.3). Male premarital externalising disorders were significantly related to two subtypes

of marital violence: cases where both spouses were perpetrators (OR=1.9, 95% CI 1.2–3.1) and cases where only the man was the perpetrator (OR=2.2, 95% CI 1.4–3.5). Female premarital internalising disorders were significantly related to being in a relationship in which both spouses were perpetrators of violence (OR=1.6, 95% CI 1.0–2.4).

### Spousal concordance for premarital mental disorders

Premarital mental disorders may also be associated with marital violence because of spousal selection. For instance, an association between women's internalising disorders and marital violence might arise from a tendency for women with internalising disorders to marry men with externalising disorders, even in the absence of a direct effect of internalising disorders on marital violence. To investigate this possibility, logistic regression models were specified in the couples sample to estimate associations between husbands' and wives' premarital internalising and externalising disorders, with statistical controls for number of years in the relationship, country, education and age at start of the relationship. Results demonstrated homotypic assortment for both internalising and externalising disorders: women with internalising disorders were more likely to be married to men with internalising disorders (OR=1.5, 95% CI 1.1–2.2) and women

**Table 3** Disorders predicting any marital violence in couples sample: separate models for men and women

	Women Odds ratio (95% CI)	Men Odds ratio (95% CI)
ADHD	1.3 (0.7–2.3)	0.6 (0.4–1.1)
Agoraphobia	0.9 (0.4–2.1)	0.2 (0.0–1.0)*
Alcohol misuse	0.7 (0.3–1.6)	2.0 (1.4–3.0)*
Bipolar disorder	2.1 (0.9–4.8)	1.3 (0.6–2.6)
Conduct disorder	1.2 (0.6–2.3)	1.3 (0.8–2.4)
Drug misuse	2.4 (0.7–8.7)	0.8 (0.5–1.3)
Dysthymia	1.1 (0.7–1.7)	0.4 (0.1–1.0)*
GAD	1.1 (0.6–1.7)	1.1 (0.4–3.1)
IED	1.4 (1.0–2.1)*	1.3 (0.8–2.2)
MDE	1.1 (0.8–1.6)	1.2 (0.8–1.8)
ODD	0.9 (0.5–1.7)	1.4 (0.8–2.3)
Panic disorder	0.8 (0.5–1.2)	1.1 (0.6–2.2)
PTSD	1.1 (0.6–1.8)	1.1 (0.6–2.2)
SAD/ASA	0.9 (0.6–1.4)	1.2 (0.7–2.0)
Social phobia	1.1 (0.7–1.6)	0.6 (0.4–1.0)
Specific phobia	1.0 (0.7–1.5)	1.1 (0.7–1.6)

ADHD, attention-deficit hyperactivity disorder; ASA, adult separation anxiety; GAD, generalised anxiety disorder; IED, intermittent explosive disorder; MDE, major depressive episode; ODD, oppositional defiant disorder; PTSD, post-traumatic stress disorder; SAD, separation anxiety disorder.  
\* $P < 0.05$ .



**Table 4** Odds ratios from multivariate models predicting any marital violence for men and women, as reported by either spouse

	Women				Men			
	OR (95% CI)	Test for joint significance of both disorder variables			OR (95% CI)	Test for joint significance of both disorder variables		
		Wald $\chi^2$	d.f.	P		Wald $\chi^2$	d.f.	P
Any marital violence								
Any disorder		3.2	2	0.1989	12.3	2	0.0021	
Any externalising	1.2 (0.9–1.7)				1.7 (1.2–2.3)*			
Any internalising	1.2 (0.9–1.6)				1.1 (0.8–1.5)			
Both perpetrator and victim								
Any disorder		7.5	2	0.024	6.9	2	0.0313	
Any externalising	1.4 (0.8–2.2)				1.9 (1.2–3.1)*			
Any internalising	1.6 (1.0–2.4)*				1.2 (0.8–1.9)			
Perpetrator only								
Any disorder		3.1	2	0.2098	14.6	2	0.0007	
Any externalising	1.2 (0.7–2.2)				2.2 (1.4–3.5)*			
Any internalising	0.6 (0.3–1.1)				1.1 (0.7–1.9)			
Victim only								
Any disorder		2.7	2	0.2564	0.8	2	0.6604	
Any externalising	0.8 (0.4–1.6)				1.0 (0.5–2.0)			
Any internalising	1.4 (0.9–2.0)				0.8 (0.5–1.3)			

\* $P < 0.05$ .

with externalising disorders more likely to be married to men with externalising disorders (OR = 2.2, 95% CI 1.4–3.4) (full results available from the authors on request).

### Premarital mental disorders and marital violence

To account for the potential confounding by marital selection, associations between premarital mental disorders and marital violence were examined in a data-set in which each couple was represented by a single observation. Premarital externalising and internalising disorders in each spouse were examined as predictors of any marital violence, with statistical adjustment for age at start of marriage (both husband's and wife's), years in the marriage, husband's and wife's education, and country (Table 5). All four odds ratios were greater than 1, indicating a higher risk of marital violence among couples with any disorder, but only one – that for husband's externalising disorders – reached statistical significance. To test whether specific combinations of spousal premarital disorders were associated with risk of marital violence over and above the associations shown in Table 5, a series of models with statistical interactions between husband and wife disorders were specified. Fit indices showed that none of the interaction models was superior to the main effects model. The latter model was used to estimate population attributable risk proportions of marital violence associated with mental disorders (Table 5). Across all 11 countries, 17.2% of cases of marital violence were attributable to premarital mental disorders, with men's externalising disorders accounting for over half of that proportion (9.5%). Mental

disorders accounted for similar proportions of marital violence in high/middle- and low-income countries (17.4% and 15.4% respectively).

### Cross-national variations

Statistical interactions between mental disorders and country income level in the prediction of physical violence in marital relationships were tested to examine whether the associations observed in the pooled data-set differed systematically across countries. The global test for all eight interactions (four measures of mental disorders crossed with two dummy variables for country income level) between mental disorders and the outcome was not significant ( $\chi^2(8) = 8.5$ ,  $P = 0.38$ ). Furthermore, three of the four interactions of individual mental disorder measures with country income level were insignificant ( $\chi^2 = 0.92$ – $0.24$ ,  $P = 0.63$ – $0.89$ ). The remaining interaction, husbands' internalising disorders with country income level, was significant ( $\chi^2 = 7.0$ ,  $P = 0.031$ ), with the odds ratios associated with husbands' internalising disorders being 1.0 (95% CI 0.7–1.4) in high-income countries, 2.1 (95% CI 1.3–3.6) in middle-income countries and 1.5 (95% CI 0.9–2.7) in low-income countries. However, the insignificant global test suggests that this one significant component test could have occurred by chance.

### Discussion

Results of this study should be interpreted in the light of several limitations, including the reliance on retrospective self-reports.

**Table 5** Multivariate models predicting any violence in the couples sample

Premarital mental disorder	OR (95% CI) <sup>a</sup>	Population attributable risk		
		High/middle-income countries, %	Low-income countries, %	All countries, %
All disorders		17.40	15.40	17.20
Husband's externalising	1.7 (1.3–2.1)*	9.20	7.80	9.50
Wife's externalising	1.3 (0.9–1.7)	3.30	0.30	2.00
Husband's internalising	1.1 (0.9–1.4)	0.70	4.00	1.60
Wife's internalising	1.2 (1–1.6)	4.80	3.70	4.80

a. Controls for country, age at start of relationship (both husband and wife), age at start of relationship squared, years in the relationship, husband's and wife's education.  
\* $P < 0.05$ .

Respondents may have forgotten events or made errors in the timing of events. Inaccuracies are especially likely in reported ages at onset of psychiatric disorder.<sup>19</sup> The distributions of age at onset reported in other studies using these data are consistent with distributions found in prospective studies,<sup>20,21</sup> suggesting that recall bias might not have had a significant role in this regard. Moreover, systematic reviews on the use of retrospective surveys have revealed that despite the limitations mentioned above, participants in retrospective studies are able to recall experiences from as far back as childhood and adolescence with sufficient precision to provide accurate and useful information.<sup>22,23</sup> In addition, the survey was structured to assist respondents in recalling age at onset using the timing of other significant events in their lives. A second significant limitation is that the assessment of violence in this survey focused solely on physical violence, and did not include sexual violence or emotional abuse, and thus does not provide a comprehensive assessment of intimate partner violence. Future studies should investigate whether the patterns identified here apply to other forms of intimate partner violence. Third, epidemiological surveys have limited capacity to differentiate between physical violence victimisation and perpetration; most respondents report both, and perpetration is likely to be underreported.<sup>24</sup> The analyses thus focused on 'any marital violence' as reported by either spouse, which may better reflect the risk of being in a marital or marriage-like relationship in which physical violence occurs. Fourth, the survey did not include length of time in the relationship prior to marriage (95% of the couples were married), which may have resulted in overcounting premarital onset of mental disorders (some disorders might have actually started after the start of the current relationship but prior to actual marriage). Fifth, data collection on a limited number of childhood disorders was limited to participants aged 18–44 years, which does introduce a bias. Since this was done systematically across surveys by design, missing values on these disorders for the older age cohorts only introduce a small bias owing to the absence of an adult ADHD measure. Comparison of results in the 44 years and under age range with those in the over-44 group suggested that such bias was small. Finally, the presence of the spouse in the room during the interview may also have contributed to underreporting of marital violence. As noted earlier in the description of survey methods, every effort was made to ensure private responses to the violence-related questions through use of a respondent booklet rather than reading out the list of violent behaviours to the respondent. In countries such as India where the percentage of spouses present during interview was high, the reporting of marital violence was still substantial, although likely to be an underestimate.

These limitations notwithstanding, this study has four notable strengths. First, the sample comprised population samples from a diverse set of countries assessed for marital violence and mental disorders with the same survey instrument. This cross-national study expands the scope of previous research on mental health and marital violence, which has been largely confined to high-income Western countries. Second, this representative sample offers the opportunity to calculate population attributable risk proportions to estimate the contribution of premarital mental disorders to risk of physical violence in marriage. Third, only premarital disorders were examined as predictors of marital violence, excluding disorders that might have occurred later as a result of violence during the marriage. Finally, data on both members of married couples allowed for combination of spousal reports in the assessment of marital violence and statistical adjustment for spousal mental disorders.

## Discordance in reporting

Discordance between spouses in reporting marital violence was substantial. In three-quarters of the couples in which one member reported physical violence, reports were discordant on either the presence of any violence at all or the role of each spouse in the violence. Combining reports of both spouses raised the estimated prevalence of marital violence in the sample by more than 50%, from 13.1% to 20%. Although the higher estimate derived from combining reports of both spouses is probably closer to the true prevalence of marital violence, it is likely that it remains an underestimate for three reasons. First, both members of couples, including victims, might have reasons to avoid disclosure of violence in the relationship because of social undesirability.<sup>25</sup> Second, the marital violence measure was limited to acts of physical violence, and did not include sexual violence or emotional abuse. Third, since the sample was representative of current marriages, marriages of short duration were under-represented. If marital violence is associated with divorce, then the sample of current marriages is likely to have proportionally fewer marriages with marital violence. Fourth, the presence of a spouse or family member in some of the interviews might also contribute to underreporting. The predictors for discordance in reporting of violence including demographic characteristics, history of mental disorder and presence of spouse during interview merit further study.

Having the mental health histories of both spouses enabled us to examine the possibility of confounding by marital selection through statistical adjustment for spousal premarital mental disorders.<sup>26,27</sup> This approach distinguished between the wife's and the husband's mental health histories in predicting marital violence, and highlighted an important gender difference in the contribution of premarital mental disorders to marital violence. Analysis of the couples data suggests that the primary contribution of premarital mental disorders to physical violence in marriage is through the husband's externalising disorders. It has also been suggested that the impact of mental disorders on violence in one partner might depend on mental disorders in the other partner. For instance, people with externalising disorders might be at higher risk if married to a partner with an externalising disorder rather than a partner with no disorder or an internalising disorder.<sup>28</sup> Marriages between men with externalising disorders and women with internalising disorders may be at particularly high risk of marital violence.<sup>29</sup> If either of these hypothetical synergies between disorders were true, we should expect to find statistical interactions between disorders in spouses, which we did not. This suggests that the influence of male externalising disorder on risk of marital violence is of similar magnitude regardless of the history of mental health problems in the spouse.

## Pathways to violence

One potential pathway connecting externalising disorders and marital violence is suggested by research on family violence and the intergenerational continuity of violence. Childhood exposure to family violence (including childhood physical and sexual abuse as well as exposure to interparental violence) is associated with violence in adult relationships,<sup>30–32</sup> and childhood exposure to family violence is associated with increased risk of early onset of mental disorders.<sup>1,30,33–38</sup> It is important to note, however, that associations of childhood adverse experiences with adolescent and adult mental disorders are not specific to externalising disorders. Internalising disorders in women make a much smaller contribution to the risk of marital violence. Although the association with wife's internalising disorders remains in the

couples sample, this is barely significant and not large (the population attributable risk proportion is smaller than that for male externalising disorders, 4.8% compared with 9.5%). Calculation of population attributable risk involves simulations that assume that the model represents causal relationships, and thus must be interpreted cautiously as a gross estimate of attributable risk. The apparent variations in population attributable risk proportions suggest that the mechanisms underlying how premarital mental disorders contribute to marital violence vary by type of disorder and gender, and that targeted interventions should be investigated.

Although some of the externalising disorders do include history of fighting as part of the determination for presence of the disorder (i.e. aggressive behaviour such as occurs with conduct or oppositional defiant disorder), in the disorder-specific analyses (Table 3) the associations of conduct and oppositional defiant disorder with marital violence were not statistically significant. The relationship between early-onset disruptive, impulsive and/or aggressive behaviours associated with externalising disorders and any marital violence may reflect the known co-occurrence of multiple forms of violence victimisation and perpetration among individuals. Studies have also suggested that the contribution of mental disorders to violent behaviour in general is not as strong as previously assumed.<sup>39</sup>

### Violence reduction strategies

The association between externalising disorders and marital violence suggests that early identification and treatment of externalising disorders among males in school, clinical and community-based settings might be an important strategy to reduce risk of subsequent marital violence. Second, a related strategy for reducing risk of marital violence might involve working with alcohol treatment programmes to engage their clients in skills building and counselling to address and reduce violence in their relationships. It is important to note in this regard that although there was no apparent distinction between the impact of substance use disorders and that of other externalising disorders (e.g. conduct disorder) on marital violence once adjustments for co-occurrence were included, these conditions are behaviourally quite distinct and may require tailored treatment approaches. Identification and treatment of internalising disorders, although important, is less likely to result in significant reductions in marital violence.

### Implications of the study

These findings point to a modest but consistent contribution of mental disorders to risk of marital violence across diverse countries, even after accounting for variation in prevalence of both mental disorders and marital violence, with three key implications. First, some cases of physical violence in marital relationships appear to be related to premarital mental disorders; thus identification of and intervention with men with externalising disorders, in particular in adolescence and early adulthood, may be one strategy for preventing at least some marital violence. Second, the consistency of the attributable risk for any marital violence that is associated with husbands' externalising disorders across these varied national settings suggests that, at least for this subset of disorders, there is likely to be a common pathway whereby early disruptive and impulsive behaviour patterns continue into adult intimate relationships. However, the third implication of these findings for violence prevention is that the contribution of premarital mental disorders to risk of marital violence is modest, suggesting that a number of

other factors contribute to the complex aetiology of violence in intimate relationships, including unequal power dynamics, gender inequity and social norms regarding violence within relationships. Based on these findings, targeted mental health interventions for individuals at risk of physical violence in their intimate relationships should be considered one strategy among many for the prevention of marital violence, which affects large numbers of men and women around the globe.

In summary, husbands' externalising disorders appear to be the primary mental health component contributing to risk of marital violence across both lower- and higher-income countries after accounting for other mental disorders and marital selection. This finding has implications for the development of targeted interventions to reduce risk of marital violence. Premarital mental disorders appear to be less predictive of marital violence risk for women compared with men. The mechanisms through which male externalising disorders may increase risk of marital violence and explanations for the gender difference merit further study. Although these findings do support exploring the role of early mental health interventions in addressing subsequent risk of physical violence in marital relationships, the overall global impact on marital violence prevention may be limited.

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