A lifetime experience of violence and adverse reproductive outcomes: Findings from population surveys in India

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Summary Intimate partner violence (IPV) is a global public health issue that threatens the reproductive health of women. Despite a growing demand for research on the potential threat of IPV in relation to adverse reproductive outcomes, there have been no population-based studies of India. The current study analyzed the National Family Health Survey 3, which contained detailed information on types of violence in relation to the single question of pregnancy outcomes. The dataset was used to assess the association between a lifetime experience of IPV and terminated pregnancies among married Indian women. Multiple logistic regression analysis was then used to assess the association between these variables, controlling for socio-demographic characteristics. Results showed that 39.6% of Indian women have experienced violence by their husbands, while 18.3% of women have terminated a pregnancy during their lifetimes. The odds ratio of a terminated pregnancy among women who had experienced any type of partner violence was 1.62 (95% CI (confidence interval) = 1.51-1.73). All combinations of violence except a combination of emotional and sexual violence were associated with an increased risk of a terminated pregnancy. These results suggest that prevention of IPV would reduce the high incidence of terminated pregnancies, thus improving maternal health in India.

Keywords: Intimate partner violence, terminated pregnancy, India, national sample

1. Introduction

Over the past decades, intimate partner violence (IPV) has been globally recognized as a serious public health issue that threatens the health and rights of women. Its prevalence has been shown to range from 15% to 71% worldwide (*1*). IPV usually refers to "any behavior within an intimate relationship that causes physical, psychological, or sexual harm to those in the relationship" (*2*). It often occurs among people of lower economic status, lower educational attainment, and those who are young (*2-4*). Health issues for women in relation to IPV include injuries, chronic pain syndrome, and substance abuse, depression, and suicide attempts (*2,5*).

Increasing evidence points to an association between IPV and several reproductive health outcomes: low-birth-weight (*6*), sexually transmitted infections such as HIV/AIDS (*2,7*), less frequent contraceptive use (*8*), and adverse pregnancy outcomes (*9-13*).

Recent evidence has suggested the importance of IPV prevention to reduce the incidence of terminated pregnancies (*11-13*). A terminated pregnancy was deemed to be any pregnancy that was miscarried (spontaneous abortion), aborted, or ended in a stillbirth. Although there is the possibility that termination of a pregnancy may influence the way a husband treats his wife, the existence of violence underlying termination of a pregnancy is an important issue that should be investigated and acknowledged in societal and clinical settings.

However, evidence supporting an association between IPV and adverse pregnancy outcomes has been limited by the scope of the studies being either hospital- or community-based in India. India is estimated to have 39 stillbirths per 1,000 births and 6 million induced abortions annually (*14-16*). Despite government

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efforts to permit legal abortion in a broad range of circumstances, illegal abortions carried out by non-qualified health providers and those based on the sex of the infant account for 90% of abortions and are believed to be responsible for 12-20% of all maternal deaths in India (*14-16*). Therefore, causes and risk factors must soon be identified so that policymakers can improve maternal morbidity and mortality in India.

The present study aimed to determine the association between IPV and pregnancy termination using a national sample of Indian women from the National Family Health Survey (NFHS). This dataset was used to investigate the relationship between women's reports of a lifetime experience of physical, sexual, and emotional IPV and having terminated a pregnancy among a national sample of married Indian women.

2. Materials and Methods

2.1. *Data*

Data for the present study were from NFHS-3. The survey, conducted between November 2005 and August 2006, included a domestic violence module that provided detailed information on violence. The survey featured a nationwide sample designed to provide indicators on fertility, family welfare, and health at national and state levels and was conducted by the Ministry of Health and Family Welfare, Government of India in collaboration with the International Institute for Population Sciences (IIPS) and Macro International, Maryland, USA. The NFHS covered all of the states of India using a multi-stage sampling method. Further details on the sampling design and selection method are described elsewhere (*17,18*).

2.2. *Participants*

In NFHS-3, the questionnaire consisted of two parts: a women's questionnaire that investigated women's socio-demographic status, maternal health, contraceptive use, and other aspects and a domestic violence module that asked about a lifetime experience of violence. The women's questionnaire was given to women aged 15-49. As a safety precaution, however, only one woman per household was asked to complete the domestic violence module. Additionally, the questionnaire was not administered in cases where privacy could not be ensured. Of the 124,385 women responding to the women's questionnaire, 83,703 were selected to answer the domestic violence module. The module covered 67% of the entire NFHS-3 sample in the women's questionnaire.

Women were included in this study if they were: 1) de jure residents of India; 2) currently married; 3) had data available on both IPV and pregnancy termination. Ultimately, this study had 63,473 participants.

2.3. *Measurements*

The questionnaires for each state were prepared in the principal language of the state and English. In NFHS-3, a question asked whether respondents had ever attempted to terminate a pregnancy resulting in a non-live birth. Types of non-live births were not distinguished. Experience of domestic violence was approached comprehensively using the Domestic Violence Module. This module adopted the shortened and modified version of the Conflict Tactics Scale (*19*). Three types of IPV were measured: physical, sexual, and emotional. Physical and sexual violence were measured using a set of questions and categorized as follows: 1) slapping; 2) twisting of the arm or pulling of hair; 3) pushing, shaking, or throwing something at the respondent; 4) punching; 5) kicking, dragging, or beating; 6) choking or burning; 7) threatening with a weapon; 8) forcing the respondent to have sex; and 9) forcing the respondent to perform degrading sexual acts. Women responding "yes" to any type from 1) to 7) were considered to have experienced physical violence and those who answered "yes" to 8) to 9) were considered to have experienced sexual violence. Emotional violence was assessed by whether a husband had ever subjected the respondent to: 1) humiliation; 2) threats to harm the respondent or someone close to her; and 3) insults. Respondents answering "yes" to any of these were regarded as having been emotionally abused. The scale of internal consistency in this study was measured by Cronbach's alpha and was 0.82.

To identify the impact of types of violence on pregnancy termination, violence was assessed through a variety of categories other than that of "any experience of violence," including: 1) only physical violence; 2) only sexual violence; 3) only emotional violence, 4) a combination of physical and sexual violence; 5) a combination of physical and emotional violence; 6) a combination of sexual and emotional violence; and 7) all types of violence. The categories were mutually exclusive.

In addition to a history of violence and terminated pregnancies, socio-demographic characteristics were selected based on previous studies to examine any association with IPV and terminated pregnancies. These characteristics included age (classified as 15-24, 25-34, and 35-49), the respondent and partner's education (none, primary, secondary, and higher, with the additional classification of 'unknown' for partner's education), place of residence (urban or rural), religion (Hindu, Muslim, and other), standard of living index (classified based on household assets, according to three quintiles, as low, medium, and high based on household assets), type of caste or tribe (scheduled caste, scheduled tribe, other backward classes, and none) and parity (number of live-born children) (none, 1-2, 3-4, and ≥ 5).

2.4. *Statistical analysis*

To account for complexity of the survey design, all analysis was done using Stata ver.9 (StataCorp, College Station, Texas). In this analysis, sampling weight was considered for selection probability and non-response rates and for primary sampling units and strata. Since only one woman per household was selected for the domestic violence module, domestic violence weights were used instead of sampling weights.

In this study, the independent variable was having experienced any type of IPV while the dependent variable was any termination of a pregnancy. Socio-demographic characteristics and experiences with IPV were first cross-tabulated and then a chi-squared test was performed to estimate the simple association of these variables. The significance level was set at less than 0.05. Next, the association between IPV and a terminated pregnancy was assessed using the adjusted odds ratio (AOR) according to multiple logistic regression analysis with a 95% confidence interval (95% CI). All socio-demographic characteristics were considered to be confounding variables.

Since there were few missing data for each variable in relation to the total number of responses, these missing data were believed to have little influence on outcomes. Thus, a limited number of responses with missing data were excluded from the calculations. Responses missing data on the respondent's education ($n = 4$), partner's education ($n = 110$), religion ($n = 82$), caste or tribe ($n = 2,321$), and standard of living index ($n = 1,430$) were excluded from the total of 63,473. Due to overlap of missing data among the respondents, the ultimate sample size for the analysis was 59,674 women.

2.5. *Ethical considerations*

Survey procedures and protocols for NFHS-3 were reviewed and approved by the ORC Macro Institutional Review Board and the International Institute for Population Sciences. Interviewers obtained informed consent from each respondent before the interview. For the Domestic Violence Module, special training was provided to every interviewer to ensure the respondent's privacy and confidentiality.

This study is based on secondary data analysis. Permission for the use of data was obtained from ORC Macro, Inc. in July 2008.

3. Results

3.1. *Socio-demographic factors and IPV patterns in NFHS-3*

Of the total of 59,674 female respondents, most were aged 35-49 (38.8%), categorized as having a high standard of living (41.0%), and belonged to a backward class (40.7%) (Table 1). As regards experiences with IPV, 39.6% of respondents reported having experienced IPV. Increases in the respondent and partner's education and standard of living were associated with less IPV. Increased parity was associated with an increase in IPV. Furthermore, IPV was more prevalent among Muslim women than Hindu women.

3.2. *Likelihood of a terminated pregnancy and its association with IPV according to NFHS-3*

According to this study, 18.3% of Indian women had terminated a pregnancy during their lifetime (Table 2). Women who had been exposed to any form of IPV (22.2%) were more likely to have terminated a pregnancy. Multiple logistic regression analysis showed that having terminated a pregnancy remained significant among these abused women even after controlling for socio-demographic factors (AOR = 1.62, 95% CI 1.51-1.73) (Table 3). A similar result was also obtained when controlling for different forms of violence and socio-demographics. Exposure to all forms of violence, with the exception of a combination of sexual and emotional violence, increased the odds ratio of having terminated a pregnancy (only physical: AOR = 1.55, 95% CI 1.42-1.68; only sexual: AOR = 1.63, 95% CI 1.30-2.05; only emotional: AOR = 1.22, 95% CI 1.00-1.49; physical and sexual violence: AOR = 2.23, 95% CI 1.91-2.60; physical and emotional violence: AOR = 1.52, 95% CI 1.35-1.70; all types of violence: AOR = 2.07, 95% CI 1.78-2.42). The standard of living index was the only covariate not associated with a terminated pregnancy.

4. Discussion

The current results revealed a clear association between IPV and having terminated a pregnancy among the Indian population. Indian women who had experienced partner violence were more likely to have terminated a pregnancy. Although IPV was more prevalent among the most disadvantaged, the association between IPV and termination of a pregnancy was observed through the entire population, irrespective of standard of living.

The main characteristic of NFHS-3 is the association of each combination of violence with termination of a pregnancy. With the exception of the combination of sexual and emotional violence, there was a statistically significant association between all forms of partner violence and terminated pregnancies among Indian women. Plausible explanations of these findings are that women tend to lose autonomy over their sexual lives, regardless of their standard of living, so they experience more unwanted pregnancies (*11,20,21*) and lose reproductive control (*8,22,23*) in addition to the direct physical harm that they suffer in abusive relationships.

Table 1. Sociodemographic factors and intimate partner violence (IPV) patterns among Indian women according to NFHS-3

Sociodemographic characteristics	n (%)	No IPV (%)	Any IPV (%)	p-value
Total	59,674 (100.0)	38,943 (60.4)	20,731 (39.6)	
Age				
15-24	11,672 (23.0)	7,787 (63.6)	3,885 (36.4)	< 0.001
25-34	25,947 (38.2)	16,759 (59.3)	9,188 (40.7)	
35-49	22,055 (38.8)	14,397 (59.6)	7,658 (40.4)	
Residence				
Urban	26,461 (31.2)	18,402 (68.1)	8,059 (31.9)	< 0.001
Rural	33,213 (68.8)	20,541 (56.9)	12,672 (43.1)	
Maternal education				
No education	23,502 (48.2)	12,705 (50.7)	10,797 (49.3)	< 0.001
Primary	9,142 (15.1)	5,520 (58.2)	3,622 (41.8)	
Secondary	21,733 (30.9)	16,050 (71.6)	5,683 (28.4)	
Higher	5,297 (5.7)	4,668 (87.5)	629 (12.5)	
Partner's education				
No education	13,315 (26.7)	7,127 (49.9)	6,188 (50.1)	< 0.001
Primary	9,418 (16.5)	5,305 (52.8)	4,113 (47.2)	
Secondary	28,107 (44.9)	19,316 (64.9)	8,791 (35.1)	
Higher	8,509 (11.4)	7,033 (78.8)	1,476 (21.2)	
Unknown	325 (0.6)	162 (51.3)	163 (48.7)	
Religion				
Hindu	45,730 (83.1)	29,620 (60.5)	16,110 (39.5)	< 0.001
Muslim	6,370 (11.5)	3,784 (56.0)	2,586 (44.0)	
Other	7,574 (5.34)	5,539 (67.7)	2,035 (32.3)	
Standard of living index				
Low	12,679 (25.6)	6,497 (47.4)	6,182 (52.6)	< 0.001
Medium	19,236 (33.5)	11,503 (56.1)	7,733 (43.9)	
High	27,759 (41.0)	20,943 (72.0)	6,816 (28.0)	
Caste or tribe				
Scheduled caste	10,549 (19.2)	5,842 (51.5)	4,707 (48.5)	< 0.001
Scheduled tribe	8,036 (8.5)	5,243 (53.4)	2,793 (46.6)	
Other backward classes	19,777 (40.7)	12,393 (59.7)	7,384 (40.3)	
Other	21,312 (31.6)	15,465 (68.6)	5,847 (31.4)	
Parity				
0	4,894 (9.1)	3,740 (71.8)	1,154 (28.2)	< 0.001
1-2	26,196 (39.1)	18,695 (67.1)	7,501 (32.9)	
3-4	19,753 (33.1)	11,930 (56.9)	7,823 (43.1)	
≥ 5	8,831 (18.8)	4,578 (47.1)	4,253 (52.9)	

Table 2. Prevalence of pregnancy termination and its association with IPV by type according to NFHS-3

Type of violence	National (n = 59,674)
	Terminated pregnancy n (%)
Total	10,835 (18.3)
No violence (*Ref.*)	6,010 (15.8)
Any type of violence[†]	4,825 (22.2)***
Only physical[†]	2,302 (21.5)***
Only sexual[†]	185 (21.7)**
Only emotional[†]	298 (18.2)
Physical and sexual[†]	496 (27.8)***
Physical and emotional[†]	958 (20.9)***
Sexual and emotional[†]	38 (19.4)
All types[†]	548 (26.1)***

[†] Compared to no violence; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The association was greater for a combination of physical and sexual violence and all types of violence than for physical or emotional violence alone or the combination of physical and emotional violence. This may be because physical and sexual violence are directly associated with physical injuries and/or unwanted pregnancy. However, the combination of sexual and emotional violence was the only type that was not associated with a terminated pregnancy. This result has to be considered carefully because very few respondents answered "yes" to the questions on sexual and emotional violence (*n* = 156, data not shown). When the association between having terminated a pregnancy and sexual violence alone and emotional violence alone are taken into account, the likelihood appears to be so few people reported a combination of sexual and emotional violence such that there was no apparent association with pregnancy outcomes.

Indirect abuse such as emotional violence was also related to pregnancy loss in this study. Psychological stress has been discussed as a possible factor for spontaneous abortion, both directly and indirectly through substance abuse such as smoking (*24-26*). In spite of this, few reports have examined links between emotional or psychological violence and miscarriage or stillbirth in comparison to those investigating the effects of physical or sexual violence. Measuring emotional violence is a difficult task, especially in a male-dominated culture where a husband's abuse or control

Table 3. Adjusted odds ratio (AOR) for the association between pregnancy termination and IPV according to NFHS-3

Type of violence	National (*n* = 59,674)
	Terminated pregnancy AOR (95% CI)
Violence	
No violence	1.00
Only physical	1.55 (1.42-1.68)***
Only sexual	1.63 (1.30-2.05)***
Only emotional	1.22 (1.00-1.49)*
Physical and sexual	2.23 (1.91-2.60)***
Physical and emotional	1.52 (1.35-1.70)***
Sexual and emotional	1.39 (0.79-2.44)
All types	2.07 (1.78-2.42)***
Any type of violence†	1.62 (1.51-1.73)***,a
Age	
15-24	1.00
25-34	1.60 (1.46-1.75)***
35-49	1.41 (1.27-1.57)***
Residence	
Urban	1.00
Rural	0.89 (0.82-0.97)**
Maternal education	
No education	1.00
Primary	1.14 (1.04-1.26)**
Secondary	1.04 (0.94-1.14)
Higher	0.94 (0.79-1.11)
Partner's education	
No education	1.00
Primary	1.06 (0.96-1.17)
Secondary	1.19 (1.08-1.31)***
Higher	1.46 (1.26-1.70)***
Other	1.28 (0.90-1.82)
Religion	
Hindu	1.00
Muslim	1.11 (0.99-1.26)
Other	0.82 (0.72-0.94)**
Standard of living index	
Low	1.00
Medium	1.00 (0.92-1.09)
High	1.06 (0.96-1.18)
Caste or tribe	
Scheduled caste	1.00
Scheduled tribe	0.77 (0.66-0.89)***
Other backward classes	1.09 (0.99-1.19)
Other	1.04 (0.94-1.15)
Parity	
0	1.00
1-2	1.20 (1.05-1.37)**
3-4	1.06 (0.92-1.22)
≥ 5	1.22 (1.04-1.43)*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; † due to multicollinearity, this test was undertaken independently from other types of violence; a not associated with the living index.

of his wife is socially acceptable. Lack of a validated measure is a further complication. However, evidence from a study in Africa indicated that emotional violence was closely associated with recurrent fetal loss (*12*), which supports the current findings. Thus, the current study has provided valuable information on emotional violence and its association with reproductive health**.**

Maternal age and partner's education were significantly associated with termination of a pregnancy; and the risk of advanced age can be explained by its close association with spontaneous abortion and stillbirths (*27-29*), induced abortion in order to limit family size or spacing (*16*), or merely the time that passes with aging. That said, ambiguity in the classification of termination of a pregnancy in NFHS-3 hampered identification of reproductive outcomes related to the high educational level of a partner. Further discussion of socio-demographic characteristics is not possible due to the nature of NFHS-3 data.

A number of risk factors and determinants of IPV have been reported worldwide (*1-4,30-32*). The current findings were in accordance with well-known risk factors, such as better education for both men and women and being financially better off. Additionally, the relationship between higher parity and increased violence is presumed to exist because stresses related to having a number of children cause more partner abuse or because partner abuse could be a factor that leads to having a number of children (*1*). The social and economic issues relating to termination of a pregnancy in Indian culture must be studied further to elucidate new strategies to reduce the termination of pregnancies, especially among educated and wealthier women.

The current study had several limitations. First, the cross-sectional nature of this study made chronological assessment difficult, so the causal relationship between IPV and termination of a pregnancy could not be determined. Therefore, termination of a pregnancy might have induced violence by the husband. In addition, this analysis lacks a timeframe in relation to having experienced IPV and termination of a pregnancy. The survey asked about having experienced IPV and termination of a pregnancy without asking about exact dates so the causal relationship between IPV and termination of a pregnancy cannot be determined. The two possible scenarios are that a terminated pregnancy might have induced violence by the husband or that the violence occurred independently of pregnancy termination. Due to this limitation, this study found a clear association between IPV and termination of a pregnancy, but these events were only associated over the lifetime of the respondent. This needs to be considered when interpreting the current results, although the fact that they agree with the results of previous studies indicates that a causal relationship like that posited here is likely to exist.

Another limitation is underreporting and recall bias of having experienced violence and birth outcomes due to the sensitivity of the topic and retrospective nature of the survey. Even though the Cronbach's alpha for questions about violence was 0.82 and therefore questions asking about having experienced violence were considered internally consistent, some components of IPV that are specific to the Indian context might have been underestimated. Furthermore, insufficient categorization of types of terminated pregnancies in NFHS-3 prevented the collection of more precise data on individual associations between IPV and each type

of terminated pregnancy.

Recall bias could have dominated, especially as women distinguished the type of violence they had experienced. However, the domestic violence module adopted the Conflict Tactics Scale, which is oriented to behavior and avoids emotional or cognitive appraisal of violent behavior by asking about specific acts of violence such as "slapping" or "kicking" instead of having experienced violence in general. Moreover, interviewers were specifically trained to probe for answers with detailed information about experiences with IPV in a private and confidential setting to ensure that respondents were able to recall all IPV they had experienced. To ascertain pregnancy outcomes, each woman was asked about her reproductive history *via* a birth index so that complete birth histories could be obtained. To some extent, these efforts should eliminate variation and enhance recall by respondents.

Despite these limitations, a strength of this study is the fact that it utilized a wealth of large population-based data according to the NFHS, which covered all states in India. To the extent known, this is the first analysis of a population-based study dealing with partner violence and its relationship to pregnancy outcomes in India.

In conclusion, this study confirmed that Indian women who had been exposed to IPV were more likely to have terminated a pregnancy than those who were not. This finding reflects the delay in political and social support for maternal health in India. To protect women from violence and prevent unwarranted termination of a pregnancy, healthcare providers need to intervene by screening for and dealing with violence, and greater accessibility to health care and use of contraceptives are also needed. Empowering women by improving education and social support would also enhance their self-esteem and better equip them to take on challenging circumstances (*3*). Moreover, involvement of husbands, by education or counseling, is critical to reducing IPV against their wives as they are the perpetrators of violence.

Acknowledgements

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