Domestic Violence and Women's Health in India: Evidence from Health Survey[1]

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Abstract

This paper examines the effect of domestic violence on the health of ever-married women of reproductive age group in India. Micro-level National Family Health Survey (NFHS-III) data for the year 2005-06 has been used in the study. We employ disease, body mass index, under nutrition level and anemia as the measures of health and physical, emotional and sexual forms of domestic violence are used as indicators of domestic violence at both national and state levels. We find that domestic violence has negative impact on the overall women's health and nutritional status. However, national level results are not consistent with that of the states level. Based on the findings, we argue that the issue of domestic violence should be addressed in national and state level health policies and programmes.

Key words: Domestic violence, health, prevalence rate
JEL Classification: I00, I12, J12 and J16

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Domestic Violence and Women's Health in India

I. Introduction

Over two decades, domestic violence against women has become a matter of serious concern in both developed and developing countries. It is an act, which is not only an issue of human right but also of economic development as violence of any kind has a detrimental impact on the economy of a country through increased health burdens, disability, medical costs, and loss of labour costs[2] (Campbell, 2002; Laserman et al, 1996). Furthermore, there is another economic cost in the form of low productivity as a significant share of working population faces violence against them by their male partner or the family members. And this economic cost becomes too much when it is added with the poor health consequences of domestic violence (Fanslow et al, 1997; NCPC, 1996; Laurence and Spalter-Roth, 1996). Besides, violence against women has its adverse impact not only on women and their child's health but it also reduces their freedom of choice; henceby, following Sen's (1970) capability approach, denying right to develop. Domestic violence has not only a moral and intrinsic perspective but also the instrumental health benefits are intruded with it (Ackerson and Subramanian 2008).

World Health Organization (WHO, 2007) reports that the proportion of women who had ever experienced physical or sexual violence or both by an intimate partner ranged from 15% to 71%, with the majority between 29% and 62%. In India, one incident of violence translates into the women losing seven working days. In the United States, total loss adds up to 12.6 billion dollars annually and Australia loses 6.3 billion dollars per year. In addition to this, other social costs like unwanted fertility and contraceptive use, increased rates of HIV and other sexually transmitted infections (STIs), increase in infant and child mortality, children's no access to immunization and other health care related public health consequences are also involved with the incidences of domestic violence.

Violence against women can be of different types and of different magnitude (measured in terms of its effect on victim's physical, mental and emotional health) also. According to National Family Health Surveys (NFHS-III) for India 2005-06, domestic violence against women is defined as an act involving physical and sexual violence for all women by anyone or spousal physical, sexual, and emotional violence for ever-married women or combination of both. Spousal violence is found that the most common form of violence against women and a significant proportion of ever married women in the age group of 15-49 usually are more vulnerable to this kind of violence (which includes physical sexual or emotional violence). Uneducated women are more vulnerable to face violence against them as compared to the educated (46 % of uneducated ever experienced violence against them as compared to only 12 of the educated one) (Koenig et al, 2003). After education, drinking habit of male partner is the most profound reason for violence (Koenig et al, 2003). In contrast to this even in the United States, it has been reported that 85% of all violent crime experienced by women are the cases of intimate partner violence, compared to 3% of violent crimes experienced by men.

[2] Here it important to mention that the effect of a woman's employment on her risk of spousal violence is conditioned by the employment status of her partner and also labour force participation plays an important role on domestic violence Macmillan, and Gartner (1999) i.e. Economically dependent women are generally found to be more vulnerable to violence.

Motivated by Sen's argument of development and WHO findings, this paper is an effort to study the impact of domestic violence on the health condition of ever married women of reproductive age groups. Contribution of the present paper is based on the fact that to our knowledge there is no specific study to the subject which has employed a range of health and domestic violence indicators, specifically in Indian context. For this we use individual level National Family Health Survey (NFHS-III) data. Moreover, paper tries to look into the state level dynamics also to find out the variation at the state level (states taken for the study are Punjab, Rajasthan, Uttar Pradesh (UP afterwards), Bihar, Assam, West Bengal (WB hereafter), Orissa, Madhya Pradesh (MP hereafter), Gujarat, Maharashtra, Andhra Pradesh (AP hereafter), Karnataka, Kerala and Tamil Nadu) which will have its policy implications in making programmes to downsize and finally bring this heinous crime to an end and divert the human resources in productive purpose. This study will also help non-governmental organizations (NGOs) to frame plans to handle this problem both at the national level and the state level.

Rest of the paper is organized as follows. Section II presents a brief review of the literature related to the study. Women's health and domestic violence profiles are discussed in section III. Empirical strategy is described in section IV and Data used for the analysis is discussed in section V. In section VI, estimation results are presented and finally, paper will be concluded with summary and discussion on findings in section VII.

II. Review of Literature

This section presents review of some of the literature on the issue of domestic violence and its impact on women health. This will help us in finding the gap in the study to form the research problem. Siegel, et al. (1999) looked in the issue of domestic violence in a different pattern. They screened women who went to the pediatrician for well-child visits without their partners. A positive response to any of the six screening questions prompted a referral to an in-house social worker who then linked women to other services. Nearly a third of the women disclosed a history of injury by a partner some time in their lives and 16% reported abuse within the past two years. Forty percent of these women were abused in their most recent pregnancy. The study shows the efficacy of screening for domestic violence in a pediatric practice.

Increased education, higher socioeconomic status, non-Muslim religion, and extended family residence are associated with lower risks of violence (Koenig et al., 2003). The study also reveals that in the more culturally conservative area, higher individual-level women' autonomy and short-term membership in savings and credit groups were both associated with significantly elevated risks of violence, and community-level variables were not related to violence and vice versa. Naved and Persson (2005) studied the factors associated to domestic violence in rural and urban setup of Bangladesh. Multilevel analysis of the study reveals that in residential areas, dowry or other demands in marriage and a history of abuse of the husband's mother by his father increases the risk of violence. Better spousal communication and husband's education beyond the tenth grade reduces the risk of violence. It was also revealed that in the urban area, women's being younger than their husband and participating in savings and credit groups increased the risk of abuse, whereas husband's education beyond the sixth grade had a protective effect.

Gershenson et al. (1989) study the association between domestic violence and low age pregnancy. Improvement in the social power relationship is required not only to stop spousal violence but also to improve (reduction) the population growth and lowering of HIV infection AIDS like diseases (Caroline and Richters, 1999).

Persistent fearfulness is synonymous with heightened anxiety, itself a form of mental disorder (Langner, 1962). High level of fear for future violence among women, whose partners had initiated the violence or who had subjected them to forced sex or women who felt that their own use of violence, would result in disastrous consequences for them (DeMaris and Swinford, 1996). Effect of a woman's employment on her risk of spousal violence is conditioned by the employment status of her partner to some extent; these effects reflect efforts by men to coercively control their female partners (Macmillan and Gartner, 1999; Jejeebhoy, 1998a). Employment not only as an indicator of having access to economic resources, and the explicit or assumed mechanism linking unemployment to violence is either the stress that a lack of resources places on marriages or women's economic dependency but it also has crucial symbolic importance for identities, self- esteem, and mental health (Gecas, 1989; Kohn & Schooler, 1983). But this changes when the authoritative power of the men is supposed to at stake (Jejeebhoy, 1998b). Explaining the relation of domestic violence with malnutrition of women and children in India Ackerson and Subramanian (2008) findings indicate that reducing domestic violence is important not only from a moral and intrinsic perspective but also because of the instrumental health benefits likely to accrue. Whereas, Agarwal (1997); Panda and Agarwal (2005) provide evidence in support of inverse relation of property right and material violence among women.

III. Women's Health and Domestic Violence Profile

This section presents the discussion on women's domestic violence profile, their health profile and exploratory relationship between incidences of domestic violence and women's health.

Women's Domestic Violence Profile

About 40% of ever married women of age group 15-49 have experienced at least one of the forms of spousal violence i.e. physical or sexual or emotional (see table 1). In addition, physical violence is the most common form of violence covering 36% of ever married women of the above said age group. Further, 16% have ever experienced emotional violence, whereas 10% report having sexual violence with them.

Presence of state wise variation in incidences of domestic violence in 14 major states of the country can also be seen from table 1. It has been observed that maximum incidences related to domestic violence (about 63%) are reported in Bihar, Rajasthan stood second (51%) followed by Madhya Pradesh (50%) and Uttar Pradesh (47%). Interestingly, these 4 states are considered as the BIMARU states[3]. Kerala (20.5%) has least percentage of women victims of domestic violence followed by Kernataka (21.7%). However, as far as women's victimization of domestic violence is concerned, none of the major states is good performer as the proportion range varies from 22.5% to as high as 63%.

[3] BIMARU is an acronym coined by taking the first letter of four northern Indian states: Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh. Several studies, including those by the UN have shown that BIMARU states have been instrumental in the retraction of the GDP growth of India (http://en.wikipedia.org/wiki/BIMARU)

Table 1: % distribution of prevalence of domestic violence for ever married women of age 15-49

States	Physical violence	Emotional violence	Sexual violence	Physical and/or emotional and/or sexual
Punjab	25.34	10.94	7.00	27.82
Rajasthan	41.61	23.25	20.31	51.03
Uttar Pradesh	43.65	16.42	9.44	47.06
Bihar	57.73	21.41	20.50	63.14
Assam	38.49	15.27	14.85	43.66
West Bengal	33.53	12.63	21.51	42.33
Orissa	34.31	19.65	14.57	41.58
Madhya Pradesh	45.44	22.35	10.94	50.32
Gujarat	26.49	18.69	7.61	34.73
Maharashtra	30.40	17.46	2.11	33.01
Andhra Pradesh	35.14	13.24	4.17	36.88
Karnataka	19.57	8.35	4.08	21.71
Kerala	16.08	10.28	4.84	20.52
Tamil Nadu	42.15	16.54	3.14	44.33
All India	35.92	15.98	10.03	40.44

Women's Health Profile

Result presented in Table 2, reveals that among ever married Indian women of age 15-49 years prevalence rate of at least one of the tuberculosis (TB hereafter), diabetes, asthma and thyroid/goitre diseases is about 4%. It also suggests that the proportion of women with at least one of the disease (TB, diabetes, asthma and thyroid) varies between 2.6% in Rajasthan to 6.3% in West Bengal, with Kerala as an exception where this value is very high (13.4%). This could be attributed to over-reporting of diseases in Kerala.

Table 2: % distribution of prevalence of diseases among ever married women of age 15-49

States	Diseases	Underweight	Anemia
Punjab	2.88	14.11	38.84
Rajasthan	2.60	33.63	53.56
Uttar Pradesh	2.72	35.29	52.17
Bihar	4.38	43.34	68.68
Assam	3.25	36.13	70.24
West Bengal	6.32	37.63	63.2
Orissa	3.55	41.41	62.27
Madhya Pradesh	2.58	39.73	58.77
Gujarat	3.55	32.45	57.22
Maharashtra	3.24	32.37	48.72
Andhra Pradesh	4.22	30.92	62.33
Karnataka	2.76	31.61	51.61
Kerala	13.44	12.55	31.43
Tamil Nadu	5.05	23.46	53.34
All India	3.97	33.16	54.39

Further, the state-wise profile of underweight women suggests that Bihar is on the top with 43% underweight women. Orissa comes one step down with 41%, whereas, in this sense Kerala is the best performer where only 13% women are underweight. Other states with percentage of underweight women higher than all India (33%) are MP (40%), WB (38%), Assam (36%), UP (35%) and Rajasthan (34%). These are the poor states of the country also. Percentage of women who are underweight ranges from 13% to 43%.

Anemia column of the same table suggests that in India, about 54% ever-married women of age group 15-49 are anemic. At state level, this percentage is highest in Assam (70%), followed by Bihar (about 69%), WB (63%), AP and Orissa (about 62%). Here, again in Kerala, the proportion of women with anemia is little higher than 31%, which is the least among states considered. Further, Table 2 indicates that out of these 14 major states, 7 has percentage of women suffering from anemia is above all India figures.

Exploring relation between women's health and domestic violence profile

Table 3 reports the percentage distribution of incidences of physical, emotional, sexual and any form of the domestic violence for the ever married women, according to their health profile. It suggests that the proportion of ever married 15-49 age group women who have a disease and have ever experienced any kind of violence is maximum for TB (52%), followed by asthma (51%) and minimum for thyroid and diabetes (about 39%).

Table 3: Women's health and domestic violence profile

Health indicators	Physical violence	Emotional violence	Sexual violence	Physical and/or Emotional and/or Sexual
Tuberculosis	49.22	21.71	16.03	51.95
Diabetes	33.15	15.32	9.98	38.86
Asthma	45.87	22.01	15.18	50.76
Thyroid/Goiter	32.62	15.79	13.24	38.79
One or more of the above	39.72	18.90	12.62	44.42
Nutritional status				
Underweight	41.86	18.74	12.55	46.70
Normal	35.69	15.78	10.04	40.31
Overweight	24.62	11.05	5.28	28.71
Anemia level				
Severe	38.50	18.77	10.41	42.83
Moderate	39.09	17.20	10.74	43.24
Mild	37.77	16.54	11.37	42.78
No anemia	34.01	15.37	9.14	38.48

Again, out of all women who suffer from TB, about half of them are victim of physical violence; nearly one-fourth suffers emotional violence and around one-sixth experiences sexual violence. Similar is the case with women suffering from asthma. About one-third of all asthmatic women have ever experienced physical violence, one-sixth emotional violence and one-tenth sexual violence. Overall, 40% of the women with a disease are victim of physical violence, about 19% of emotional and 13% of sexual violence. This means that women mostly suffer from physical violence, followed by emotional and sexual violence.

Further, Table suggests that majority of the underweight and severe or moderate anemic women have mostly experienced physical followed by emotional and sexual forms of violence. This analysis suggests for existence of some kind of relationships between prevalence of domestic violence and risks of diseases but do not reveal much on the magnitude and direction of the relationship.

IV. Estimation Strategy

In order to see the effect of domestic violence on the health outcomes of women, in this section we will describe the methodology. We have identified four outcomes of health and malnutrition among ever-married women of age group 15-49 years. These are the presence or absence of any of the disease like, tuberculosis, asthma, diabetes and thyroid/goitre; body mass index (BMI hereafter); level of malnutrition (underweight, normal and overweight) and presence of anemia. The key explanatory variables of interest are whether respondent is ever a subject of violence (physical violence, emotional violence, sexual violence or any kind of violence). Other control variables used in the model are residence, age, educational level, social group, religion, region, employment, number of child below 5 years of age and regional dummies. We test the significance of effect of different forms of domestic violence on different health and malnutrition variables. Econometric model is specified as follows:

$$H_{ij} = \alpha_{ij} + \beta_{ij} D_j + \gamma_{ij} X + \varepsilon_{ij}, \quad i = 1,2,3,4 \quad and \quad j = 1,2,3,4 \quad \text{..(1)}$$

where $H_{ij}\,(i = 1,2,3,4;\ j = 1,2,3,4)$ stands for ith health indicator with jth indicator of domestic violence, $D_j\,(j = 1,2,3,4)$ represents jth indicator of domestic violence, $X's$ are the exogenous variables and ε_{ij} are the independently and identically distributed (i.i.d) error terms for ith health indicator with jth indicator of domestic violence. We use only one indicator of domestic violence in one specification to avoid any kind of collinearity issue and this will lead to four different models.

To capture the effect of the above four health indicators, we will be using three types of dependent variables: continuous (body mass index or Quetelet's index), dichotomous (whether suffering from any diseases, whether anemic) and ordered (underweight, normal and overweight) and consequently, we employ three estimation procedures to estimate equation (1). These are ordinary least squares (OLS), logistic regression model (Green 2003; Amemiya 1981) and ordered probit models (Long, 1997). A total of 4 models have been estimated for all India level with 4 different indicators of health and malnutrition among ever married women of age 15-49 as dependent variable and all the four dummies for domestic violence as explanatory variables along with other socio-economic factors. As per our objective we estimate same specification at all India and state level. The definitions and forms of the variables used in the analysis are report in Table 4.

Estimation results for all India analysis is reported in Table 5 and state-wise empirical estimations are put in Table 6, 7, 8 and 9. For the sake of convenience, we report coefficients for OLS and ordered probit but odds ratios (OR hereafter) for logistic regressions, standard errors, R-squared and number of observations for each equation only for the domestic violence variables.[4]

V. Data

The study is based on third round of National Family Health Survey (NFHS), a nationally representative cross-sectional data collected in 2005-06. This round provides information on fertility, family planning, infant and child mortality, reproductive and child health, Anthropometric measures, nutritional status of women and children, anemia level, the quality of health and family welfare services, socioeconomic conditions, knowledge about diseases like tuberculosis, diabetes, asthma and thyroid etc. Also, a module of questions is asked on

[4] However, full results can be obtained from the corresponding author on request

domestic violence as a part of the women's questionnaire. Interviews were conducted with 124,385 women of age group 15-49 from all 29 states of the Indian Territory. Due to security, privacy, ever-married and other restrictions; we end up with 69,484 observations.

Table 4: Definition and descriptive statistics of the variables used in the analysis

Characteristics/Variables	Definitions	%	mean	SD	min	max
Dependent Variables						
Disease	1 if suffering from at least one of the diseases: TB, diabetes, asthma, thyroid	3.8	-	-	0	1
BMI	Body mass index		20.71	4.00	12.13	59.62
Underweight	If BMI<18.5	33.16	-	-	0	1
Normal	If BMI≥18.5- ≤24.99	52.96	-	-	0	1
Overweight	If BMI ≥25.0	13.88	-	-	0	1
Anemia	1 if suffer from anemia	54.39	-	-	0	1
Explanatory variables: Domestic Violence						
Physical Violence	1 if a woman ever experienced physical violence	35.92	-	-	0	1
Sexual Violence	1 if a woman ever experienced sexual violence	15.98	-	-	0	1
Emotional Violence	1 if a woman ever experienced emotional violence	10.03	-	-	0	1
Domestic Violence	1 if a woman ever experienced any of the physical, sexual or emotional violence	40.44	-	-	0	1
Other explanatory variables						
Age: 15-19	1 if age of women ≥15-≤19 years	5.67	-	-	0	1
Age: 20-34 (Reference)	1 if age of women ≥20-≤34 years	58.44	-	-	0	1
Age: 35-49	1 if age of women ≥35-≤49 years	35.89	-	-	0	1
Urban	1 if urban	31.20	-	-	0	1
Education						
Illiterate (reference group)	1 if no education	48.31	-	-	0	1
Below Primary	1 if incomplete or completed primary education	15.32	-	-	0	1
Below Secondary	1 if incomplete or completed secondary education	30.49	-	-	0	1
Higher	1 if higher education	5.87	-	-	0	1
Social Group: Caste						
Scheduled Caste	1 if caste is Scheduled Caste	20.12	-	-	0	1
Scheduled Tribe	1 if caste is Scheduled Tribe	8.93	-	-	0	1
Other Backward Caste	1 if caste is Other Backward Caste	40.26	-	-	0	1
General (reference)	1 if caste is other than SC, ST and OBC	30.69	-	-	0	1
Religion						
Hindu (reference)	1 if Religion is Hindu	81.72	-	-	0	1
Muslim	1 if Religion is Muslim	12.76	-	-	0	1
Christian	1 if Religion is Christian	2.44	-	-	0	1
Other religion	1 if other religion*	3.18	-	-	0	1
Ever employment	1 if ever employment	27.42	-	-	0	1
No. of child below 5 year	No. of children below 5 years of age	-	0.77	0.95	0	9

Note: includes Sikh, Buddha, Jain, Jewish, Parsi/Zoroastrian, no Religion, Donyi Polo & Other

NFHS-III collected information on the different types of violence e.g. physical (slapping; twisting arm or pulling hair; pushing or shaking or throwing something at her; punching with fist or with something that could hurt; kicking, dragging or beating up; choking or burning on purpose and/or threaten or attacking with knife, gun or any other weapon), sexual (physically force to have sexual intercourse with partner even when she did not want to, and force to perform any sexual acts she did not want to) and emotional (saying something to humiliate in

front of others; threaten to hurt or harm or someone closer to the respondent and insult her or make her feel bad about herself).[5]

VI. Estimation Results

Effect of domestic violence on presence of disease

Estimation result indicates that the incidences of physical violence are significantly and positively related with the presence of at least one of the four diseases (TB, Diabetes, Asthma and Thyroid) (see table 5). Results clearly show that at all India level, for ever-married victim women of age group 15-49 years the likelihood of being suffered by a disease increases by about 35% if violence is physical or emotional and 42% in case of sexual violence. Overall, the odds of being suffer of diseases increases by about 35% if a woman is a victim of any form of domestic violence. Thus, it is suggestive that domestic violence has negative impact on the women's health at all India level.

Table 5. Impact of domestic violence on women's health: all India

Methods	Logistic Regression	OLS	Ordered probit	Logistic regression
	Disease	BMI	Underweight/normal/ overweight	Anemia
Physical Violence				
Odds Ratio/coefficient	1.347***	-0.324***	-0.087***	0.963
Standard error	0.076	0.038	0.013	0.023
Pseudo R^2	0.053	0.209	0.088	0.031
No. of observations	63536	63742	63742	60628
Emotional Violence				
Odds Ratio/coefficient	1.347***	-0.29***	-0.082***	0.976
Standard error	0.093	0.047	0.016	0.029
Pseudo R^2	0.053	0.208	0.075	0.031
No. of observations	63536	63742	63742	60628
Sexual Violence				
Odds Ratio/coefficient	1.419***	-0.245***	-0.084***	0.973
Standard error	0.121	0.055	0.021	0.037
Pseudo R^2	0.053	0.208	0.087	0.031
No. of observations	63536	63742	63742	60628
Domestic Violence				
Odds Ratio/coefficient	1.344***	-0.289***	-0.078***	0.968
Standard error	0.074	0.038	0.013	0.022
Pseudo R^2	0.053	0.208	0.088	0.031
No. of observations	63536	63742	63742	60628

Note: all models are adjusted for age, location of the household, religion, caste, educational status, employment status, number of children under 5 years of age, and state dummies. Also, in all the models standard errors adjusted for clustering on caseid. ***, ** and * indicates significance at 1%, 5% and 10% level of significance.

However, the result is not consistent for all the major 14 states in India. We can observe that the effect of any violence is found to be significant for Rajasthan (OR: 1.638), UP (OR: 1.377), Assam (OR: 2.087), Orissa (OR: 1.621), AP (OR: 1.42) only. For rest of the major states association between women's health and domestic violence is not significant. It is not consistent for individual types of domestic violence also. While physical violence

[5] since spousal violence is the most common form of domestic violence for ever married women of age group 15-49 and here the analysis is based only on basis of violence committed by current or most recent husband, domestic violence and spousal violence are treated as same and interchangeably used throughout the paper.

significantly increases the risk of disease in UP (OR: 1.44), WB (OR: 1.395), Orissa (OR: 1.785) and Andhra Pradesh (OR: 1.54); emotional violence for Punjab (OR: 2.00), Assam(OR: 2.04), WB (OR: 2.37), and sexual violence increases the likelihood of these diseases in the states of WB (OR: 1.443), MP (OR: 2.137) and AP (OR:3.47). There are some states like Bihar, Gujarat, Maharastra, Karnataka, Kerala and Tamil Nadu with OR greater than one but none of the forms of DV shows significant effect below 10% level of significance. However, the significant relationship between domestic violence and health in these states can not be ruled out in any other specifications.

Effects of domestic violence on nutritional status

Now, we turn to see the effect of DV on different measures of nutritional status of women. The adjusted OLS and ordered probit regression results reported in Table 5 suggest for the negative and significant effect of domestic violence on the body mass index (BMI) and underweight condition of women.

Compared to women who never experienced any kind of violence, the BMI of those who experienced physical, emotional, sexual or any type of violence is found to be lower by 0.32, 0.29, 0.24 and 0.29 units. Similarly, any kind of DV increases the risk of being underweight. This clearly suggests that DV is significantly associated with chronic malnutrition among women at all India level.

However, picture is not similar to all India for all the major 14 states. For example, Table 7 suggests that ever-experienced DV has significant negative effect on the BMI of the women only for states like UP, Assam, Orissa, AP, Karnataka and Kerala. Physical violence is consistently significant for all the major states except Punjab, Rajasthan, Bihar, WB and MP states. Ironically, Rajasthan, Bihar, and MP are BIMARU states. The effect of emotional violence than physical violence is significant in less number of states. The relationship is found negative for the states of Assam, Orissa, Maharashtra and all the south Indian states in the list. The effect of sexual violence on BMI of women is significant and negative for the states of Assam, Orissa, Maharashtra, AP, Karnataka and Kerala.

If we interpret ordered probit results for underweight variable presented in Table 8 we find that DV is associated with higher risk of underweight in the states of UP, Assam, Orissa, Gujarat, AP, Karnataka and Kerala only. The result is not significant for the remaining states. Again, while physical violence shows negative and significant effect on increasing nutritional level among women in UP, Assam, Gujarat, AP, Karnataka, Kerala and Tamil Nadu; emotional violence increases the risk of underweight in Rajasthan, Assam, Orissa, and all other south Indian states. Negative and significant effect of sexual violence on higher level of nutritional status is found in the states of Rajasthan, Assam, WB, Gujarat, Karnataka and Kerala.

Effects of domestic violence on anemia

At all India level, the effect of none of the form of DV is turned significant on the presence of anemia (see table 5 and 9). However, in state-wise analysis, for this measure of health, the effect of DV is significant for some of the states. For example, in Assam, Maharashtra, AP and Tamil Nadu, the incidences of DV in any form are found to increase the risk of anemia. However, only few states are vulnerable to the physical violence (Assam, Gujarat, Maharashtra, AP and Tamil Nadu), emotional violence (UP, AP and Kerala) and sexual violence (MP) where likelihood of being suffered from anemia is higher for those who ever experienced these kinds of violence as compared to those who never.

Table 6. Impact of domestic violence on presence of any of the TB, asthma, diabetes and thyroid in women in 14 major states

	Dependent variable: Disease													
	Punjab	Rajasthan	UP	Bihar	Assam	WB	Orissa	MP	Gujarat	Maharashtra	AP	Karnataka	Kerala	TN
Physical Violence														
OR	0.879	1.404	1.44**	1.477	1.547	1.395*	1.785**	1.439	1.089	0.972	1.542**	1.244	1.304	1.327
Standard Error	0.295	0.365	0.252	0.375	0.505	0.250	0.421	0.393	0.296	0.204	0.302	0.370	0.239	0.248
Pseudo R^2	0.051	0.041	0.028	0.037	0.029	0.037	0.060	0.085	0.048	0.027	0.051	0.088	0.027	0.059
No. of Observations	1729	2007	6056	1917	1559	3401	2326	3643	2090	4979	4111	3046	1676	3718
Emotional Violence														
OR	2.001*	1.605	1.02	1.351	2.042**	2.37***	1.338	1.349	1.422	1.133	1.447	1.126	1.097	0.837
Standard Error	0.726	0.463	0.244	0.364	0.701	0.493	0.365	0.382	0.400	0.277	0.372	0.420	0.238	0.201
Pseudo R^2	0.057	0.043	0.024	0.035	0.034	0.047	0.053	0.084	0.050	0.027	0.048	0.088	0.026	0.058
No. of Observations	1729	2007	6056	1917	1559	3401	2326	3643	2090	4979	4111	3046	1676	3718
Sexual Violence														
OR	1.753	1.426	0.976	1.019	1.533	1.443**	1.14	2.137**	1.066	2.033	3.47***	1.27	0.922	1.058
Standard Error	0.902	0.434	0.299	0.292	0.604	0.270	0.374	0.698	0.473	1.021	1.171	0.648	0.301	0.492
Pseudo R^2	0.053	0.040	0.024	0.034	0.027	0.037	0.052	0.090	0.048	0.029	0.058	0.088	0.025	0.057
No. of Observations	1729	2007	6056	1917	1559	3401	2326	3643	2090	4979	4111	3046	1676	3718
Domestic Violence														
OR	1.077	1.638*	1.377*	1.28	2.087**	1.229	1.621**	1.529	1.416	1.015	1.42*	1.398	1.216	1.354
Standard Error	0.336	0.443	0.243	0.327	0.666	0.211	0.375	0.406	0.349	0.210	0.274	0.376	0.206	0.251
Pseudo R^2	0.050	0.044	0.027	0.035	0.037	0.036	0.058	0.086	0.051	0.027	0.049	0.089	0.026	0.060
No. of Observations	1729	2007	6056	1917	1559	3401	2326	3643	2090	4979	4111	3046	1676	3718

Note: all models are adjusted for age, location of the household, religion, caste, educational status, employment status, and number of children under 5 years of age. Also, in all the models standard errors adjusted for clustering on caseid. ***, ** and * indicates significance at 1%, 5% and 10% level of significance.

Table 7. Impact of domestic violence on women's body mass index in 14 major states

Dependent variable: Body mass index														
	Punjab	Rajasthan	UP	Bihar	Assam	WB	Orissa	MP	Gujarat	Maharashtra	AP	Karnataka	Kerala	TN
Physical violence														
Coefficient	-0.343	-0.036	-0.417***	-0.131	-0.451***	-0.091	-0.242**	-0.146	-0.415**	-0.296**	-0.462***	-0.473***	-0.54**	-0.291*
Standard Error	0.248	0.147	0.097	0.134	0.156	0.143	0.122	0.115	0.201	0.145	0.152	0.182	0.271	0.168
R^2	0.167	0.105	0.139	0.117	0.177	0.246	0.189	0.159	0.229	0.192	0.203	0.185	0.081	0.180
No. of Observations	1845	2222	5948	2052	1664	3534	2472	3787	2184	4688	4087	2963	1771	3744
Emotional violence														
Coefficient	-0.202	-0.194	-0.072	-0.212	-0.41**	-0.027	-0.406***	-0.16	-0.02	-0.295*	-0.647***	-0.493**	-0.88***	-0.56***
Standard Error	0.343	0.159	0.123	0.154	0.206	0.195	0.140	0.129	0.232	0.174	0.183	0.245	0.305	0.208
R^2	0.167	0.106	0.136	0.118	0.175	0.246	0.191	0.159	0.228	0.192	0.203	0.184	0.083	0.181
No. of Observations	1845	2222	5948	2052	1664	3534	2472	3787	2184	4688	4087	2963	1771	3744
Sexual Violence														
Coefficient	-0.341	-0.234	-0.151	-0.235	-0.579***	0.223	-0.566***	-0.235	-0.684**	-0.58	-0.581**	-0.689*	-0.713*	0.033
Standard Error	0.430	0.162	0.147	0.155	0.191	0.165	0.148	0.179	0.307	0.361	0.278	0.382	0.433	0.418
R^2	0.167	0.106	0.136	0.118	0.177	0.247	0.192	0.159	0.229	0.192	0.201	0.184	0.080	0.179
No. of Observations	1845	2222	5948	2052	1664	3534	2472	3787	2184	4688	4087	2963	1771	3744
Domestic Violence														
Coefficient	-0.26	0.016	-0.391***	-0.129	-0.572***	0.031	-0.346***	-0.151	-0.255	-0.211	-0.465***	-0.523***	-0.534**	-0.253
Standard Error	0.241	0.143	0.098	0.137	0.156	0.141	0.117	0.114	0.190	0.142	0.150	0.174	0.245	0.167
R^2	0.167	0.105	0.139	0.117	0.180	0.246	0.191	0.159	0.228	0.192	0.203	0.185	0.082	0.180
No. of Observations	1845	2222	5948	2052	1664	3534	2472	3787	2184	4688	4087	2963	1771	3744

Note: all models are adjusted for age, location of the household, religion, caste, educational status, employment status, and number of children under 5 years of age. Also, in all the models standard errors adjusted for clustering on caseid. ***, ** and * indicates significance at 1%, 5% and 10% level of significance.

Table 8. Impact of domestic violence on women's nutritional status in 14 major states

Dependent variable: Nutritional status														
	Punjab	Rajasthan	UP	Bihar	Assam	WB	Orissa	MP	Gujarat	Maharashtra	AP	Karnataka	Kerala	TN
Physical Violence														
Coefficient	-0.087	-0.005	-0.106***	-0.026	-0.221***	-0.017	-0.077	-0.042	-0.155***	-0.061	-0.105**	-0.135**	-0.132*	-0.077*
Standard Error	0.064	0.052	0.035	0.060	0.064	0.052	0.054	0.048	0.058	0.045	0.047	0.054	0.078	0.046
Pseudo R^2	0.076	0.042	0.053	0.047	0.074	0.102	0.079	0.054	0.105	0.084	0.092	0.075	0.041	0.084
No. of Observations	1845	2222	5948	2052	1664	3534	2472	3787	2184	4688	4087	2963	1771	3744
Emotional Violence														
Coefficient	-0.053	-0.1*	-0.044	-0.025	-0.252***	-0.059	-0.169***	-0.031	0	-0.056	-0.136**	-0.123*	-0.213**	-0.148**
Standard Error	0.088	0.060	0.045	0.069	0.088	0.072	0.063	0.055	0.065	0.054	0.061	0.075	0.090	0.060
Pseudo R^2	0.073	0.040	0.041	0.036	0.060	0.078	0.068	0.045	0.088	0.066	0.074	0.061	0.034	0.075
No. of Observations	1845	2222	5948	2052	1664	3534	2472	3787	2184	4688	4087	2963	1771	3744
Sexual Violence														
Coefficient	-0.044	-0.11*	-0.036	-0.032	-0.232***	0.038	-0.233***	-0.111	-0.155*	-0.189	-0.145	-0.312***	-0.219*	-0.045
Standard Error	0.112	0.062	0.057	0.072	0.086	0.057	0.072	0.076	0.094	0.128	0.096	0.108	0.129	0.119
Pseudo R^2	0.076	0.043	0.052	0.047	0.072	0.102	0.081	0.055	0.104	0.084	0.091	0.075	0.041	0.083
No. of Observations	1845	2222	5948	2052	1664	3534	2472	3787	2184	4688	4087	2963	1771	3744
Domestic violence														
Coefficient	-0.06	0.003	-0.093***	-0.028	-0.246***	0.001	-0.123**	-0.036	-0.096*	-0.035	-0.103**	-0.148***	-0.12*	-0.075
Standard Error	0.062	0.051	0.035	0.061	0.064	0.049	0.051	0.047	0.054	0.044	0.046	0.052	0.070	0.046
Pseudo R^2	0.076	0.042	0.053	0.047	0.075	0.102	0.080	0.054	0.104	0.083	0.092	0.075	0.041	0.084
No. of Observations	1845	2222	5948	2052	1664	3534	2472	3787	2184	4688	4087	2963	1771	3744

Note: all models are adjusted for age, location of the household, religion, caste, educational status, employment status, and number of children under 5 years of age. Also, in all the models standard errors adjusted for clustering on caseid. ***, ** and * indicates significance at 1%, 5% and 10% level of significance.

Table 9. Impact of domestic violence on presence of anemia among women in 14 major states

Dependent variable: Anemia														
States	Punjab	Rajasthan	UP	Bihar	Assam	WB	Orissa	MP	Gujarat	Maharashtra	AP	Karnataka	Kerala	TN
Physical Violence														
Odds Ratio	0.894	0.982	0.954	0.937	0.683***	0.943	0.997	0.942	0.808**	1.167*	1.156*	0.98	0.816	0.827**
Standard Error	0.067	0.051	0.035	0.058	0.063	0.050	0.051	0.046	0.055	0.046	0.046	0.057	0.081	0.046
Pseudo R^2	0.015	0.023	0.008	0.009	0.038	0.018	0.035	0.042	0.024	0.014	0.015	0.006	0.016	0.018
No. of Observations	1807	2220	5791	2017	1656	3429	2439	3787	2169	4527	3968	2862	1751	3705
Emotional Violence														
Odds Ratio	0.982	1.124	0.771***	0.982	0.86	0.994	0.944	1.025	0.976	1.102	1.371***	0.914	0.676**	0.856
Standard Error	0.156	0.118	0.063	0.129	0.146	0.128	0.107	0.102	0.112	0.107	0.164	0.126	0.113	0.091
Pseudo R^2	0.015	0.023	0.009	0.009	0.034	0.018	0.035	0.042	0.023	0.013	0.016	0.006	0.017	0.017
No. of Observations	1807	2220	5791	2017	1656	3429	2439	3787	2169	4527	3968	2862	1751	3705
Sexual Violence														
Odds Ratio	0.895	1.045	1.007	0.858	0.849	1.12	0.968	0.763**	0.789	0.837	1.316	0.752	0.929	1.035
Standard Error	0.175	0.115	0.101	0.116	0.150	0.115	0.124	0.099	0.135	0.212	0.264	0.147	0.224	0.219
Pseudo R^2	0.015	0.023	0.007	0.009	0.034	0.018	0.035	0.043	0.023	0.013	0.014	0.007	0.015	0.016
No. of Observations	1807	2220	5791	2017	1656	3429	2439	3787	2169	4527	3968	2862	1751	3705
Domestic Violence														
Odds Ratio	0.959	0.931	0.952	0.889	0.711***	0.999	0.966	0.936	0.865	1.173**	1.179*	0.976	0.829	0.831**
Standard Error	0.107	0.084	0.058	0.101	0.092	0.088	0.089	0.079	0.083	0.093	0.100	0.091	0.106	0.068
Pseudo R^2	0.015	0.023	0.008	0.009	0.038	0.018	0.035	0.042	0.023	0.014	0.015	0.006	0.016	0.018
No. of Observations	1807	2220	5791	2017	1656	3429	2439	3787	2169	4527	3968	2862	1751	3705

Note: all models are adjusted for age, location of the household, religion, caste, educational status, employment status, and number of children under 5 years of age. Also, in all the models standard errors adjusted for clustering on caseid. ***, ** and * indicates significance at 1%, 5% and 10% level of significance.

VII. Concluding observations

Despite of accelerated growth in last 15 years, India is far behind many countries in the world with low human development index (HDI). Even within India many states show poor economic performances coupled with low literacy rate, high mortality rates and other capability measures not upto the mark. Women's health, in particular of those in their reproductive age limits is crucial for child's health, education and sustainable human development.

Following Sen's capability approach, the effects of domestic violence on health conditions of ever-married women of age group 15-49 have been examined in the paper. We use logistic and ordered probit procedure in addition to ordinary least squares method of estimations. Our analysis shows that domestic violence is an important determinant of health among ever-married women of age group 15-49. However, results for all the health indicators are not consistent at all India level. Also, we find that some forms of domestic violence show significant effect on the indicators of health for some states and not for others. In this way, results are mixed. However, wherever, found significant domestic violence in any form has a negative effect on women's health performances.

Though the paper has a significant contribution in elaborating the relationship between domestic violence and its health implications, it is not free from certain limitations. One, as our analysis is forced to restrict only for diseases like TB, asthma, diabetes and thyroid due to non-availability of information about other diseases, it may not be exact mirror images of women's health and therefore, may not reveal the complete story. Second, as NFHS-III is a cross-sectional survey the mechanism through which domestic violence affects health status of ever married women in reproductive age group could not be stated here and for that we need longitudinal data. In spite of all these limitations, the results are encouraging and have larger policy implications as spousal or domestic violence is not only violation of human rights but it is also associated with serious public health consequences. Therefore, this issue must be addressed in health policies and programmes aimed at maternal and women's health at national and state levels.

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