Women's Employment and its Association with Intimate Partner Violence during Pregnancy in India: Improved Bargaining or Male Backlash?

Poushaly Talukdar[1*], Chander Shekhar[2]

[*1]PhD Research Fellow, Department of Population and Development, International Institute for Population Sciences, Mumbai-400088. Email: poushaly53@iipsindia.ac.in; ORCID: 0000-0002-6497-4571 (*Corresponding author*)
[2]Professor & Head, Department of Fertility & Social Demography, International Institute for Population Sciences, Mumbai-400088. Email: shekharc@iipsindia.ac.in; ORCID: 0000-0002-6090-8470

Abstract

Purpose

Pregnancy increases a woman's vulnerability to intimate partner violence (IPV) due to stressors like son preference, unintended pregnancy, women's acceptance of IPV and partner's alcohol abuse. While women's employment is widely viewed as a pathway to greater empowerment, it may contradict normative gender expectations, provoking male backlash in India.

Methods

Our study uses a sample of 58,993 ever-pregnant women from the National Family Health Survey data (NFHS-5,2019–21) to examine the nature of the association between a woman's employment status and the experience of physical IPV during pregnancy in India. We used linear probability model (LPM) to assess the linear association. To address reverse causality, we employed a two-stage residual inclusion (2SRI) model, instrumenting women's employment with the cluster average female employment status.

Results

LPM estimates indicated a modest positive relationship (β = 0.013, CI 0.007-0.019, p<0.001), but women's employment was endogenous. After accounting for endogeneity, our findings revealed that employed women had a higher probability of reporting IPV during pregnancy in India (M.E. = 0.033, CI 0.012-0.053, p<0.001), supporting the male backlash theory. Affluence (M.E.= -0.011, CI -0.020--0.002, p<0.05) and higher household decision-making agency (M.E.=-0.024, CI -0.032--0.016, p<0.001) were among the protective factors.

Conclusion

Hence, considering employment as having a non-unidirectional relationship with IPV during pregnancy would improve the predictive power of the factors associated with the reproductive health of women in India.

Keywords: Intimate Partner Violence, Pregnancy, Women's Employment, Endogeneity, Instrumental Variable.

Introduction

The World Health Organisation (WHO) defines intimate partner violence (IPV) as a woman's self-reported experience of physical and/or sexual violence, perpetrated by a current or former husband or male intimate partner (WHO,2023). Violence against women encompasses multiple forms of abuse, including physical aggression, sexual and reproductive coercion, such as forcing the woman into any nonconsenting sexual act or interference with reproductive health-related decisions (Campbell, 2002; Krug et al., 2002a; Garcia-Moreno et al., 2005; García-Moreno et al., 2013; Grace & Anderson, 2018). Emotional or psychological violence in the form of verbal abuse, threats and humiliation remains less frequently discussed despite its substantial complications. (Jewkes, 2010).

Lifetime exposure to IPV against women remains high globally, with WHO 2023 estimates indicating a lifetime global prevalence at 25.8% and 31.9% in Central and Southern Asia (WHO,2023). Importantly, IPV does not cease during pregnancy. An early multi-country study reported the prevalence of violence during pregnancy ranging from 2% in high-income settings to 13% in Sub-Saharan Africa (Devries et al., 2010). More recent evidence based on Demographic and Health Surveys (DHS) data from 57 lower middle income countries (LMICs) indicates a substantial variability across regions, ranging from 1.1% to 17.6% (Simon et al., 2025).

Intimate partner violence is widely recognised as a violation of human rights and a global public health crisis by the WHO resulting in adverse chronic maternal and child health implications (Krug et al., 2002b; *WHO Intimate Partner Violence during Pregnancy Information Sheet. 2011.*, n.d.; McQuigg, 2015). Physical assaults during pregnancy, including strangulation, head injuries and abdominal trauma, are linked to obstetric complications, such as preterm delivery, abortions or miscarriage (S. J. Jejeebhoy, 1998; Jose et al., 2025; Krywko et al., 2025). In addition to this, IPV during pregnancy leads to chronic psychological impairment, including an increased risk of hypertension, post-traumatic stress disorder (PTSD), depression, anxiety and suicidal ideation (Agarwal et al., n.d.; Bacchus et al., 2018; Bonomi et al., 2007; Da Thi Tran et al., 2022; Golding, 1999; McCauley et al., 1995).

According to the intrahousehold bargaining theories, women's access to education, ease of labour market opportunities, asset ownership, and external societal support (family, community and state legal infrastructure), improve their bargaining position and increase their ability to exit abusive relationships (Manser & Brown, 1980; McElroy & Horney, 1981). Studies across developed and developing economies have shown evidence consistent with the 'protective effect' of women's employment (Gibson-Davis et al., 2005; Pal, n.d.; Lenze & Klasen, 2017a). On the contrary, in developing countries like India, where divorce is viewed as a social stigma and state support mechanisms are weak, women may remain in abusive relationships, irrespective of the incidence or intensity of abuse (M. Bhattacharya et al., 2011). In such cultural settings, men are expected to be primary breadwinners and women's entry into the labour market or higher relative earnings of the wife is often perceived as a challenge to male authority, provoking violent responses, termed as the "male backlash". Violence may also arise from the perpetrator's need for an emotional frustration release (expressive violence) or as an instrument to control their partner's

behaviour (instrumental violence), (Tauchen et al., 1991; Chin, 2012; Caridad Bueno & Henderson, 2017; Bhalotra et al., 2021; Kjelsrud & Sjurgard, 2022; Williams et al., 2024).

Economic affluence is generally considered protective against the risk of violence. However, an ethnographic study from rural Karnataka in India found that women from relatively wealthier households were at a higher risk of violence, where husband and in-laws were driven by the intention to demand additional dowry, while a higher parity of male children was protective against violence (Bloch & Rao, 2002). Women's employment in India has also been frequently associated with a higher risk of spousal violence consistent with the male backlash theory (Dalal, 2011a; Jeyaseelan et al., 2007; Kimuna et al., 2013; Rocca et al., 2009). For example, qualitative evidence from urban slum settings in Mumbai and Bangalore found that women's involvement in paid work, particularly in households facing economic stress or male job loss, intensified the perpetration of IPV, including pregnancy .

The National Family Health Survey (NFHS) reports a national average of 3.12% of ever-pregnant women experiencing physical violence during pregnancy. However, regional-level evidence reveals a different picture. For example, a population-based study from Odisha, West Bengal and Jharkhand reported markedly higher levels of physical (7%), sexual (10%) and psychological violence (30%) during pregnancy with limited variation between these states (Babu & Kar, 2012).

A substantial body of literature documents IPV in India and views women's labour market participation as a linear pathway to empowerment. However, the specific association between women's employment status and IPV experienced during pregnancy calls for empirical attention. By moving beyond a simplified, unidirectional understanding of this association, we hypothesise that the relationship is not unidirectional and potentially endogenous in nature The goal of the paper is to assess the nature of relationship, whether woman's employment status in India is a opportunity of exit (greater bargaining) or a threat to higher risk of physical intimate partner violence during pregnancy (male backlash).

Methodology

Data source

This study uses data from the most recent round of the National Family Health Survey (NFHS -5, 2019-21), the Indian DHS. One of the largest population representative dataset, the NFHS-5 covers 636,699 households, 724,115 women (aged 15 to 49 years) and 101,839 men (aged 15 to 54 years) across 29 states and 7 union territories with majority of the data available at the subnational level for 707 districts. This survey provides population representative data on demographic, household and socio-economic characteristics, gender attitudes and norms and healthcare utilisation behaviour in India. It uses a stratified two stage sampling method where the primary sampling units (PSUs) were villages in rural areas and Census Enumeration Blocks in urban areas.

Study participants

Our study sample specifically focuses on ever-pregnant women aged 18 to 49 years (married/partner/ever in a union) who have been interviewed for the domestic violence module. All the statistical analyses in this paper have used appropriate domestic violence module sampling weights. The eligible respondents were those who have reported to have been ever pregnant in the NFHS survey and this included those (a) who were pregnant at the time of the survey, (b) who had already given birth, or (c) ever terminated a pregnancy or have had pregnancies ending in miscarriage, abortion or stillbirth. After recoding and cleaning for missing values or ineligible respondents, our final weighted study sample included a total of 58,993 ever pregnant women.

Dependent variable

NFHS asks one woman from every household : "Has anyone ever hit, slapped, kicked, or done anything else to hurt you physically while you were pregnant?" This measures the prevalence

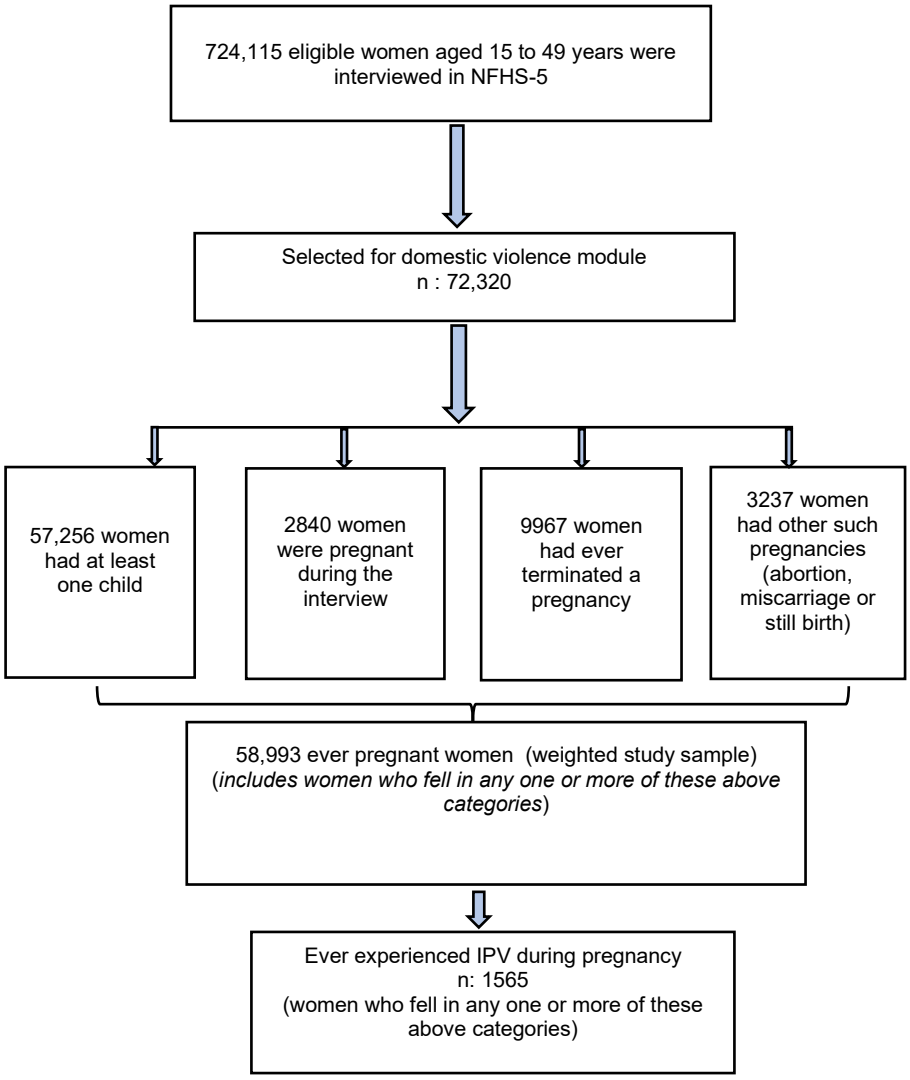

Fig 1: Schematic Representation of study participant selection for IPV during pregnancy using data from the NFHS-5, 2019–21

of physical violence during any of her pregnancies. This is followed by asking who inflicted the physical abuse on her : "Who has done any of these things to physically hurt you while you were pregnant?" This estimate includes physical abuse from various individuals including father or stepfather, siblings, relatives, friends, employer, teacher, police, religious leader, strangers and others. Our study is focused on the experience of "intimate partner" violence that includes, current husband/partner, former husband/partner and current/former boyfriend. After restricting the sample down to include these three intimate partner categories, a dichotomous variable was generated which measured IPV during pregnancy. A total of 1565 women (2.65 % of the ever-pregnant subsample of women) aged 18 to 49 years reported to have ever experienced violence during pregnancy.

Independent variable

The independent variable for the study is women's employment status in India in the last 12 months preceding the survey. The NFHS 5 questionnaire asked women, *"Have you done any work in the last 12 months?"* This was recoded into a binary variable equal to 1 if the women affirmatively answered to being currently employed or having worked during last 12 months preceding the survey and 0, if otherwise. Although women's employment was not measured specifically at the time of pregnancy, the authors considered it as a reasonable proxy for sustained long term participation in the labour market.

Covariates and controls

Our study accounted for potential confounders that influence IPV during pregnancy. This included a set of socio-economic and demographic covariates: respondents' age condensed into three subgroups of 18-24, 25-34, and 35-49 years. Place of residence classified as rural and urban, and the woman's highest level of education categorised as no education, primary, secondary and higher education. Social stratification was accounted for by religion (Hindu, Muslim, Christian and others) and caste/tribe (Scheduled Caste, Scheduled Tribe, Other Backward Classes and others). Household characteristics included the sex of the household head, household wealth index and number of children in the household under five years of age.

Intergenerational and normative contexts relevant to IPV during pregnancy were captured by adjusting the models for whether the respondent had ever witnessed her father beating her mother, whether she justifies any reason for wife-beating, number of household decisions that she participates in alone or jointly with her husband. As a proxy for women's access to information and social connectivity, exposure to mass media, assessed by the number of sources like newspapers, movies, TV or radio, was included. Partner characteristics included partner's highest level of education (primary, secondary or higher) , their working status and alcohol consumption. Finally, inter-regional variability in the prevalence of IPV during pregnancy was accounted for by including the states of India regrouped as north, central, east, northeast, northwest, west, and south. The northern region consists of Chandigarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Ladakh, Punjab, Rajasthan and Uttarakhand. Chhattisgarh, Madhya Pradesh, and Uttar Pradesh make up the Central region. Bihar, Jharkhand, Orissa and West Bengal comprise the

Eastern region. The Northeast states include Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. The states and territories of Dadra and Nagar Haveli and Daman and Diu, Goa, Gujarat and Maharashtra is known as the western region. Finally, Andaman and Nicobar Islands, Andhra Pradesh, Karnataka, Kerala, Lakshadweep, Puducherry, Tamil Nadu, and Telangana form the Southern region.

Statistical analyses

The data was cleaned and analysed using the STATA software (version 17.0). Descriptive analysis was used to summarize the socioeconomic and demographic characteristics of 58,993 ever-pregnant women (*total study sample, N*) stratified by their employment status in NFHS. Table 1 also includes the distribution of women in the study sub-sample including 1565 women who have ever experienced physical IPV during pregnancy (*analytical sample, n*). We provided survey-weighted bivariate percentages with Pearson's chi-square test. This helped us measure the strength and statistical significance of bivariate association between IPV during pregnancy and each of its covariates. These covariates were selected on the basis of broad a-priori empirical literature review and were retained in the regression model irrespective of their statistical significance in the bivariate analysis.

A baseline linear probability model of the likelihood of experiencing IPV during pregnancy would be written as:

$$V = \alpha + \beta_1 Emp + \beta_2 W + \beta_3 P + \beta_4 H + \beta_5 R + \varepsilon \quad (1)$$

where, V is a binary indicator, equal to 1, if the woman has reported physical IPV during pregnancy and 0, if otherwise in Equation 1 . *Emp* represents women's employment status, taking the value of 1, if the woman was employed, and 0, if otherwise. W represents the individual attributes of the woman. We have also included a set of partner/husband characteristics such as alcohol consumption, education attainment and their working status, denoted by P. Household level covariates are represented by H and R is the variable of region (states grouped into respective regions). ε represents the unobservable factors captured by an independent and identically distributed (IID) error term.

Our study is based on the key concern that there is potential endogeneity between women's employment and IPV during pregnancy. This can arise in three circumstances. First, considering that domestic violence (DV) is a majorly under-reported phenomenon, and the NFHS survey includes only one woman per household in the DV module, measurement error becomes unavoidable. Second, unobserved factors, such as household gender norms, household economic stress, extended family influence, or local labour market conditions influence both women's employment and their likelihood of experiencing IPV during pregnancy. Though our study includes factors like women's attitudes and gender related norms, one cannot overcome the unexplained confounder bias completely, leading to omitted variable bias. Third, IPV has a significant influence on women's employment and can interfere with her ability to work in the form of on-the-job harassment, inability to concentrate, absenteeism, frequent leaves and recurring

job change (Swanberg et al., 2005). Similarly, the literature on household bargaining model states that, women may take up employment as a means to achieve economic independence or attain better bargaining position, especially when in an abusive relationship (H. Bhattacharya, 2015a; Gedikli et al., 2023). Therefore, the incidence of IPV during pregnancy may either cause a woman to refrain from or discontinue her current job or result in taking up employment as a viable exit option from the abusive relationship. This indicates reverse causality resulting in biased and inconsistent regression estimates.

As a means to correct the endogeneity of predictor variables and the use of instrumental variable (IV) in linear regression models, the two-stage least squares (2SLS) approach was first introduced by Hausman (1978). The two-stage predictor substitution (2SPS) and two-stage residual inclusion (2SRI) are further extensions of this IV based approach into nonlinear model estimation. The first stage estimates the predicted values of the endogenous regressor, as a function of the instrument and the selected covariates and it is identical in both the approaches. However, in the second stage of the 2SRI estimation method, the endogenous regressor is not replaced by its predicted value, unlike 2SPS. Instead, the predicted value are used as a form of additional regressor, along with the original observed value. Since, physical IPV during pregnancy (V) is a binary variable, we estimated a probit model using the 2SRI estimation to account for the qualitative nature of the regressand, which is a more consistent and robust than the 2SPS method (Terza et al., 2008). Based on the conditional independence assumption, we introduce an instrument that is ideally "as good as randomly assigned", strongly correlated with the independent variable and should affect the dependent variable only through the endogenous regressor and no other pathways (Lousdal, 2018). Following previous literature on IPV and women's employment association, we chose PSU or cluster average female working status as the IV for this paper (Lenze & Klasen, 2017; Biswas & Thampi, 2021). It is defined as the proportion of women in the respondent's primary sampling unit (PSU) who were employed in the 12 months prior to the survey. This IV was calculated using the leave-one-out technique to avoid inbuilt correlation. The suitability is based on the fact it reflects the labour market participation scenario in the woman's local environment. The average cluster-level female working status is also indicative of the peer effects of gender norms in the woman's local community which influences her likelihood of being employed. In other words, a woman in a cluster with an overall higher average female employment rate will be more likely to be employed compared to a cluster with a lower average female employment rate. Another important rationale for choosing this instrument was that it is not directly associated with the risk of IPV during pregnancy.

Results

Descriptive Statistics

IPV during pregnancy and Women's employment status

Table 1 presents the weighted percentage distribution of ever pregnant women (N) and women who have ever experienced physical IPV during pregnancy (n) by the individual, household socio-

economic and gender norm characteristics. Among the 58,993 ever pregnant women (N), 1565 (n), i.e. 2.65%, of women reported having experienced physical intimate partner violence during pregnancy (n). The prevalence of physical IPV during pregnancy was notably higher among working women when compared to non-working women (4.14 % vs 2.01%), highlighting the employment based gradient in exposure to violence during pregnancy.

Demographic factors

Among those who have experienced IPV during pregnancy, employed women were disproportionately represented in the older age groups. Approximately, 62.1% of employed women were aged above 35 years, compared to 40.9% among non-working victims. Educational attainment differed modestly by employment status. A substantially high proportion of employed women reported having no formal education (32.8%) compared to their unemployed counterparts (40.4%). Rural residence was slightly more common among victims of IPV during pregnancy (77.3%) when compared to the total sample (72.1%). Geographically, over one-third of women (38.5%) reporting IPV during pregnancy were concentrated in the southern states of India, followed by the western (25.4%) and eastern (21.2%) regions.

Socioeconomic household level factors

The wealth gradient was clearly observable in the descriptive statistics. Over 80.7% of the working women in the IPV subsample were concentrated in the lower to middle wealth quintile, compared to two-thirds (66.5%) in the total sample. This highlights that women from economically constrained households are particularly vulnerable to violence during pregnancy. Employed victims of violence were more likely to live in female-headed households (24.6% vs 16.4% among non -working victims). These women were also more likely to have no young children. These factors reflects household composition which may encourage and facilitate labour force participation.

Partner related characteristics

Partner related characteristics are some of the most important determinants of IPV during pregnancy. Almost three-quarters of the subsample (75.7%) and a little over in the total sample (83.3%) consist of women whose husbands or male partners have been working in the last 7 days or in the past 12 months preceding the survey. Alcohol abuse was highly prevalent, especially among partners of unemployed women (57.7%) than among employed women victims of IPV during pregnancy (34.3%). However, in the total sample, employed women were about 11% higher in count (31.7% vs 20.8%) than unemployed ones in having alcoholic partners.

Gender norms and attitudinal characteristics

A higher proportion of working women justified at least one reason of wife-beating (54.6% vs 47.1%), and having witnessed violence between her parents during childhood (24.4% vs 16.7%) indicating that normative influences are strongly patterned in the study samples. Close to one-third

of the larger sample (66.3%) and about one-fourth (43.9%) of the IPV subsample reported to have participated in all the major household decisions.

Table 1: Distribution of ever pregnant women and women who experienced physical IPV during pregnancy by employment status and socio-demographic characteristics, India, NFHS 5 , 2019-2021.

Variables	Women who have ever been pregnant				Women who experienced physical IPV during pregnancy			
	Total sample (N) (1)	Working status		χ^2 (p value) (4)	Analytical sample (n) (5)	Working status		χ^2 (p value) (8)
		Not Working (2)	Working (3)			Not Working (6)	Working (7)	
Employment status								
Working	17815 (30.20%)				827 (52.84%)			
Not working	41178 (69.80%)				738 (47.16%)			
IPV during pregnancy								59.72 (0.000)
Yes						2.01	4.14	
No						97.99	95.86	
Age group				259.95 (0.000)				15.54 (0.000)
18 to 24 years	7712	16.37	5.45		174	16.52	5.13	
25 to 34 years	20703	36.48	31.90		594	42.57	32.73	
35 to 49 years	30578	47.15	62.65		797	40.91	62.14	
Woman's highest level of education				53.57 (0.000)				1.51 (0.221)
No education	17247	26.48	35.62		570	32.80	40.42	
Primary	8384	13.76	15.25		300	18.30	20.18	
Secondary	27170	48.75	39.83		628	44.05	35.72	
Higher	6191	11.01	9.31		67	4.85	3.69	
Place of residence				15.26 (0.000)				3.96 (0.05)
Urban	18089	31.85	27.91		426	31.25	22.70	
Rural	40904	68.15	72.09		1139	68.75	77.30	
Region				155.85 (0.000)				6.64 (0.00)
North	4371	7.98	0.61		62	4.86	2.94	
Central	6363	11.81	0.84		174	14.34	7.47	
East	17630	34.39	19.47		450	35.58	21.15	
Northeast	3251	5.89	4.64		59	3.14	4.49	
West	12724	18.67	28.28		323	16.37	25.44	
South	14654	21.26	33.12		497	25.71	38.52	
Religion				90.28 (0.000)				1.05 (0.36)
Hindu	46651	76.35	85.37		1234	79.84	77.76	
Muslim	9525	19.45	8.51		255	17.05	15.39	
Christian	1521	2.12	3.63		43	1.44	4.23	
Others	1297	2.07	2.49		33	1.67	2.62	
Caste/Tribe				70.05 (0.000)				0.35 (0.78)
SC	12338	19.93	23.18		395	26.10	24.30	
ST	5194	7.25	12.41		165	9.52	11.73	
OBC	24822	41.70	42.94		656	40.90	43.04	
Others/Missing	16639	31.12	21.47		349	23.48	20.93	
Household wealth index				25.58				4.82

				(0.000)				(0.000)
Poorest	11520	19.57	19.44		403	27.72	23.58	
Poorer	12552	20.60	22.84		387	20.87	29.01	
Middle	12589	20.07	24.27		392	22.31	28.07	
Richer	12110	20.62	20.33		230	14.63	14.81	
Richest	10222	19.15	13.12		153	14.46	4.54	
Female household head				35.98 (0.000)				5.11 (0.02)
Yes	9607	15.22	18.73		317	16.43	24.61	
No	49386	84.78	81.27		1248	83.57	75.39	
Number of young children in the household				188.02 (0.000)				27.68 (0.000)
No children	35612	55.27	72.15		1035	55.46	78.19	
1-2 children	21393	40.67	26.08		487	39.70	21.56	
3+ children	1988	4.06	1.77		42	4.84	0.25	
Partner's highest level of education				32.02 (0.000)				3.01 (0.03)
No education	11504	17.45	24.24		389	22.73	27.32	
Primary	9065	15.00	16.21		344	20.07	24.09	
Secondary	30129	52.28	48.28		719	46.66	45.18	
Higher	8014	14.78	10.82		106	9.87	3.25	
Don't know	281	0.49	0.45		7	0.67	0.17	
Partner's working status				9.85 (0.00)				0.01 (0.91)
No	10714	18.78	16.73		383	24.78	24.26	
Yes	48279	81.22	83.27		1181	75.22	75.74	
Alcoholic husband/partner				205.10 (0.000)				3.50 (0.06)
Yes	14214	20.81	31.69		962	57.70	34.31	
No/Missing	44779	79.19	68.31		603	42.30	65.69	
Women's agency (number of household decisions)				4.69 (0.01)				0.98 (0.37)
No HH decisions	9620	15.75	17.59		523	30.55	36.70	
1-2 HH decisions	9935	17.17	16.08		330	22.61	19.42	
All HH decisions	39438	67.08	66.33		711	46.84	43.88	
Justifies at least reason of wife beating				69.83 (0.000)				9.75 (0.000)
Yes	29119	47.10	54.58		1029	59.81	72.44	
No	29874	52.90	45.42		535	40.19	27.56	
Witnessed father beating mother				112.45 (0.000)				3.56 (0.06)
Yes	11210	16.68	24.38		775	45.21	54.39	
No	472783	83.32	75.62		790	54.79	45.61	
Exposure to mass media (number of sources)				14.94 (0.000)				0.98 (0.37)
None	14751	26.27	22.08		409	29.22	22.78	
1-2	37976	62.95	67.66		1005	61.14	67.70	
3-4	6266	10.78	10.26		150	9.64	9.52	
Asset Ownership (alone /jointly)								
Owns land/house	27351	45.26	48.92	14.82 (0.000)	748	41.47	54.97	7.72 (0.01)
Does not own	31642	54.74	51.08		816	58.53	45.03	
Total sample	**58993**				**1565**			

Note: Columns (1) to (4) : Survey weighted bivariate distribution of 58,993 ever pregnant women by working and non-working status. Columns (5) to (8) : Survey weighted bivariate distribution of 1565 women who reported having experienced IPV during pregnancy by employment status. N: Number of women in the full sample of ever pregnant women. n: Number of women in the analytical subsample reporting physical IPV during pregnancy.%: Survey weighted bivariate percentage of women for each covariate across working status. χ^2 (p value) : Chi-Square statistics with corresponding p-values denoting survey design-adjusted bivariate differences in the distribution of women within covariate by employment status for total sample and sub-sample.

Results of Linear Probability Model Estimation

, Column 1 reports the estimation results from equation (1) measuring the probability of a an employed woman in India having ever experienced physical IPV during pregnancy. Having adjusted for individual and household level demographic and socio-economic characteristics as well as partner and normative covariates, the results indicate a minor, but nonetheless, statistically significant positive effect on the probability of reporting physical IPV during pregnancy (β = 0.013, CI 0.007-0.019, p<0.001). In other words, the linear probability model (LPM) estimates indicate that if an Indian woman is employed, the probability that she will report having ever experienced physical IPV during pregnancy increases by 0.013, or 1.3 percent statistically significant at 1 percent. This estimate indicates that our paper aligns with the male backlash theory and women's involvement in the labour force participation increases stress and conflict in a relationship often posing a possible threat to the traditional male breadwinner image. That is when the male partner uses violence as a means of exercising power on his female partner.

Muslim women exhibited a higher gradient (β = 0.013, CI 0.005-0.021, p<0.01) of reporting physical violence during pregnancy across the four categories of religion. Among other socio-economic covariates, household wealth index has a nonlinear effect on IPV during pregnancy. Women from richer (β =-0.014, CI -0.024--0.005, p<0.01) and richest (β =-0.011, CI -0.023--0.0002, p<0.05) households were at a significantly negatively associated with IPV during pregnancy, consistent with the empirical literature on the buffering effect of economic resources against violence (Panda & Agarwal, 2005). To consider regional influence, the central (β=0.008, CI 0.003-0.014, p<0.01) and western (β=0.009, CI 0.003-0.016, p<0.01) states were small but significantly associated with the likelihood of IPV during pregnancy.

Among the strongest protective predictors of IPV during pregnancy, was woman's household decision making agency. When compared with the reference category of women who did not participate any major household decision, with every woman who participated in one to two decisions, a 1.7 percent lesser (β= -0.017, CI -0.028--0.006, p<0.001) and those who participated in all three major household decisions either alone or jointly with male partner, a 2.9 unit reduction in the gradient of reporting IPV during pregnancy (β= -0.029, *CI* -0.038--0.020, p<0.01). Among the partner related characteristics, women whose partner/husband consumed alcohol consumption were 4.6 percent more likely to have faced physical violence during pregnancy (β = 0.046, CI 0.038-0.056=4,p<0.001).

Gender and attitudinal characteristics also had a significant impact on violent relationships. Women's who justified at least one reason of wife-beating (β = 0.006, CI 0.001-0.011, p<0.05). Besides, childhood exposure to violence also increased the probability of IPV during pregnancy. For every one unit increase in women who have grown up witnessing violent relationship dynamics between parents, there has been a 0.42 unit increase in the gradient reporting IPV during pregnancy (β = 0.042, CI 0.033-0.050, p<0.001).

The covariates in the LPM model explained 4.2% variation in IPV during pregnancy (R^2 = 0.042). This magnitude is common in cross-sectional studies on complex social phenomena (Paul, 2016). However, we ran another diagnostic, known as "the percent correctly predicted" of

the model. Our estimates report 70.1 percent correct prediction rate of the LPM model, thereby indicating that our linear model is able to identify and account for the covariates of physical IPV during pregnancy However, given that women's employment status in India might be endogenous to physical IPV during pregnancy, the estimates of this linear model would be potentially biased and inconsistent.

Results of Two-stage Residual Inclusion (2SRI) and Instrumental Variable Estimation

Henceforth, we instrumented the regressor, women's employment with cluster level mean women's working status in the IV regression model using the a two-stage residual inclusion (2SRI) approach. Ideally, this instrument should be strongly correlated with women's working status but necessarily independent of physical IPV during pregnancy. It is indicative of the local labour market conditions which is unlikely to influence the likelihood of experiencing IPV during pregnancy.

The first stage results of the 2SRI IV model at the bottom of Table 2, column 2 confirms an extremely strong positive association between the instrument and the endogenous independent variable. A one unit increase in cluster average female employment is associated with 2.85 unit increase in the probability of the woman being employed, highlighting the influence of local labour market conditions and attitudes towards employment.

The second-stage IV estimates in Table 2, column 3 indicate a still positive but now slightly stronger positive association of women's employment and physical IPV during pregnancy. Every 1 unit increase in women's labour force participation increases the percentage of women having ever experienced physical violence during pregnancy increased by 3.3 percent (*M.E.*= 0.033, CI 0.012-0.053, $p<0.001$). The marginal effect is slightly higher yet directionally consistent, when compared to the LPM estimate in Table 2, Column 1.This increase in effect size suggests that the LPM estimate was underestimated and biased, owing to one or more reasons of measurement error, omitted variable bias, or reverse causality.

Muslim women continue to show a significantly higher association with physical violence during pregnancy (*M.E.*= 0.016 , CI 0.006-0.026, $p<0.01$). Regional influence remains intact only for the central states comprising of Uttar Pradesh, Chhattisgarh and Madhya Pradesh. Women residing in these states had a 12 percent higher probability (*M.E.*=0.012, CI 0.005-0.019, $p<0.001$) of having experienced IPV during pregnancy for every single unit increase in labour force participation. The western states were lost their statistical significance of association in the 2SRI model. Similar to the LPM estimates, household affluence had a nonlinear association with violence during pregnancy (*M.E.*= -0.011, CI -0.020--0.002, $p<0.05$), establishing the protective effect of economic resources against the risk of abuse.

A very interesting observation was that partner's education level gained moderate significance at 5 percent indicating that husband's primary level of education has very minor yet significant positive effect (*M.E.*=0.008, CI -0.0002-0.015, $p<0.05$). A greater level of women's agency in their households in form of participation in one or two household decisions (*M.E.*= -0.011, CI -0.020--0.002, $p<0.01$) and in all major decisions (independently or jointly with the male

partner) including, healthcare, large household purchases and visiting peers and relatives, (*M.E* = -0.024, CI -0.032--0.016, $p<0.001$) continued a strong positive association with the violence during pregnancy. Across both the LPM and the 2SRI models, factors identified with gender norms and attitudinal or behavioural characteristics consistently emerged as the strongest factors triggering physical violence during pregnancy. Partner's alcohol consumption (*M.E.*= 0.039, CI 0.032-0.047, $p<0.001$), women's acceptance and normalisation of physical violence (*M.E.*= 0.007, CI 0.002-0.011, $p<0.01$), and childhood exposure to interparental violence (*M.E.*= 0.033, CI 0.026-0.040, $p<0.001$) were substantially positively correlated with IPV during pregnancy.

Table 2: Regression estimates using the 2SRI IV regression approach measuring the marginal effect of women's employment on physical IPV during pregnancy, NFHS-5 (2019-2021)

Characteristics	**LPM**		**2SRI Probit**	
	Coefficient (1)	*95% CI* (2)	*Marginal effects* (3)	*95% CI* (4)
Working status (Regressor)				
No	Ref		Ref	
Yes	0.013***	0.007-0.019	0.033***	0.012-0.053
Women's age				
18 -24 years	Ref		Ref	
25-34 years	0.003	-0.004-0.010	-0.002	-0.011-0.008
35-49 years	-0.003	-0.011-0.005	-0.009	-0.019-0.002
Woman's highest level of education				
No education	Ref		Ref	
Primary	0.004	-0.005-0.013	0.002	-0.005-0.001
Secondary	-0.002	-0.009-0.005	-0.002	-0.008-0.004
Higher	-0.004	-0.014-0.006	-0.008	-0.018-0.001
Place of Residence				
Rural	Ref		Ref	
Urban	0.001	-0.005-0.007	0.003	-0.004-0.008
Regions				
North	Ref		Ref	
Central	0.008**	0.003-0.014	0.012***	0.005-0.019
East	0.004	-0.002-0.010	0.008	-0.000-0.016
Northeast	-0.007	-0.015-0.001	-0.002	-0.010-0.006
West	0.009**	0.003-0.016	0.008	-0.0004-0.017
South	-0.003	-0.009-0.004	-0.002	-0.008-0.005
Religion				
Hindu	Ref		Ref	
Muslim	0.013**	0.005-0.021	0.016**	0.006-0.026
Christian	0.001	-0.013-0.016	0.001	-0.012-0.014
Others	0.002	-0.016-0.021	0.002	-0.014-0.019
Caste/Tribe				
SC	Ref		Ref	
ST	-0.004	-0.014-0.006	-0.005	-0.012-0.002
OBS	-0.001	-0.007-0.006	-0.001	-0.007-0.005
Other caste/tribe	-0.001	-0.008-0.007	-0.001	-0.008-0.007
Household Wealth Index				
Poorest	Ref		Ref	
Poorer	-0.005	-0.013-0.004	-0.004	-0.012-0.003
Middle	-0.005	-0.015-0.005	-0.002	-0.011-0.006
Richer	-0.014**	-0.024--0.005	-0.011*	-0.020--0.002
Richest	-0.011*	-0.023--0.0002	-0.008	-0.020-0.004
Female household head				

No	Ref		Ref	
Yes	-0.001	-0.008-0.006	-0.003	-0.009-0.003
Number of young children in the household				
0	Ref		Ref	
1-2	-0.005	-0.011-0.000	-0.004	-0.009-0.001
3 or more	-0.008	-0.018-0.003	-0.005	-0.015-0.006
Partner's highest level of education				
No education	Ref		Ref	
Primary	0.009	-0.000-0.019	0.008*	0.0002-0.015
Secondary	0.004	-0.004-0.011	0.003	-0.002-0.009
Higher	0.003	-0.008-0.014	0.001	-0.010-0.012
Partner's working status				
No/Missing	Ref		Ref	
Yes	-0.004	-0.011-0.003	-0.003	-0.011-0.004
Alcoholic husband/partner				
No	Ref		Ref	
Yes	0.046***	0.038-0.054	0.039***	0.032-0.047
Women's agency (number of household decisions)				
0	Ref		Ref	
1-2	-0.017**	-0.028--0.006	-0.011*	-0.020--0.002
All 3 major decisions	-0.029***	-0.038--0.020	-0.024***	-0.032--0.016
Justifies at least reason of wife beating				
No	Ref		Ref	
Yes	0.006*	0.001-0.011	0.007**	0.002-0.011
Witnessed father beating mother				
No	Ref		Ref	
Yes	0.042***	0.033-0.050	0.033***	0.026-0.040
Exposure to mass media (number of sources)				
0	Ref		Ref	
1-2	0.003	-0.004-0.010	0.00004	-0.006-0.006
3-4	0.009	-0.001-0.019	0.006	-0.004-0.016
Owns land/house alone or jointly				
No	Ref		Ref	
Yes	-0.0002	-0.005-0.005	-0.011	-0.005--0.004
Intercept	0.025***	0.010-0.041	-0.024***	-0.032--0.016
Number of observations (N)	58993		58993	
Number of clusters	9099		9099	
Pseudo R^2	0.042		0.015	
First stage estimate for the instrumental variable			2.85***	2.62-3.09
First stage F-test for the instrumental variable			579.12****	

Note: Columns (1) & (2) report LPM coefficient estimates with 95% CIs. Column (3) & (4) report first stage 2SRI coefficient estimates predicting women's employment using cluster level female employment rate as the instrumental variable . Column (5) & (6) report second stage 2SRI coefficient estimates of the effect of women's employment status on physical IPV during pregnancy. CI: Confidence Interval. Significance levels P-value indication: *** p < 0.001, ** p < 0.01, * p < 0.05.

Validity of the instruments and Robustness checks

The first stage F-statistic (579.12, $p<0.001$) exceeded the conventional Stock-Yogo critical threshold of 10, by an astronomical margin, indicating that the instrument is a strong, relevant and reliable predictor of the endogenous regressor. (Nelson & Startz, 1990; Stock et al., 2002; Stock & Yogo, 2004).

Discussion

This study examined whether the relationship between women's employment status acts as means of improved bargaining through greater exit options or increases the risk of physical violence during pregnancy in India. The findings indicate that women's employment status in India is

positively associated with physical IPV during pregnancy. One must keep in mind that while this positive association between the regressor and the regressand indicates higher risk , but on a closer look, it indicates that working women in India are more likely to report any physical abuse inflicted on them by their partners. The persistent direction and strengthening of association, after accounting for potential endogeneity, justifies the use of 2SRI model, improving the robustness of results. The null hypothesis of exogeneity is rejected and the relationship is best interpreted bi-directional rather than unidirectional.

This bidirectionality can be interpreted through multiple, non-competing mechanisms. First, an Indian woman's employment may challenge the normative gender hierarchy and provoke male backlash, particularly in contexts where employment is necessity driven rather than individual choice. In patriarchal settings, like Sub Saharan Africa and South-East Asia, violence may also be used as an instrument of control by male partners to extract their wives' earnings or reassert their authority, leading to a higher prevalence of IPV among employed women (Krishnan et al., 2010; Buller et al., 2018; Angelucci & Heath, 2020; *The Impacts of Economic Interventions on Intimate Partner Violence*, 2022). Second, while most evidence from India and other developing countries supports this male backlash effect (Atkinson et al., 2005; Chibber et al., 2012; Finnoff, 2012; Biswas & Thampi, 2021b; Chandra et al., 2025; Zafar et al., 2022), this relationship is highly context dependent. For example, empirical evidence from South Korea found that unemployed women were at a higher risk of violence during pregnancy compared to employed women (Lee & Lee, 2018). This is attributable to the local labour market opportunities, state legal infrastructure and support mechanisms for survivors and regional normative setting. Third, employed women may have greater exposure to social support networks, institutional platforms and information channels which increases their awareness leading to higher rates of disclosure compared to economically inactive women (Bergvall, 2024; Dalal, 2011a). The regional influence of the central states, though statistically significant was so weak in its effect size that we interpreted it as a weak evidence of positive association.

Beyond employment status, household wealth index emerged as a significant protective factor. We found that women from richer households were substantially less likely to report violence, most likely because these women are less prone to economic stress, which means that they may not need to work out of necessity, reducing their dependence on abusive partners, especially during pregnancy (Dalal, 2011b; Larsen et al., 2021; Kebede et al., 2022).

Among partner related characteristics, alcohol consumption remained significant across the models. Though the association between the partner's alcohol abuse and perpetration of gender based violence has been contested in the early literature (Leonard, 2005), recent studies have re-established the link stating a twice as higher risk of IPV among pregnant women [30,35,45,77-78]. Our findings align with this literature with an effect size of 0.046 ($p<0.001$), meaning that working women in the NFHS-5 sample who have alcoholic partners are 4.6% more likely to have reported physical IPV during pregnancy compared to their counterparts. Literature states that Behavioural Couple's Theory (BCT) coupled with short-term financial incentives may be central to effective

intervention in addressing male drinking habits (Hartmann et al., 2021; Satyanarayana et al., 2016; Periyasamy et al., 2025).

Our study re-stablished the central role of gender norms and attitudinal characteristics in IPV research. These includes the protective effect of women's household decision agency, and the most potent determinant, including justification of wife-beating and childhood exposure to violence. Multi-country DHS evidence states that a woman's childhood exposure to interparental conflict is highly correlated with a woman's acceptance of intimate partner violence (Dasgupta, 2019; Ludermir et al., 2017; Mehfooz et al., 2023).Our findings directly align with this literature because these factors frequently co-occur and more than the additive effects may most likely operate collectively, thereby multiplying the woman's vulnerability towards violence.

Multiple randomized and quasi experimental studies set in LMICs have revealed benefits of cash and/or food based transfer programmes in bringing about an overall improvement in household stress and regular conflicts (Hidrobo et al., 2016; Haushofer et al., 2019; Roy et al., 2019; Heath et al., 2020). While increasing the social costs of violence for men has shown considerable promise (Bowlus & Seitz, 2006), on women-centric economic interventions such as increased income support for single mothers or subsidised child care for working mothers without bringing in normative change first, may produce undesirable effects as observed in high-income settings (Anderberg et al., n.d.).

Community based programs such as Self-Help groups have shown promising improvement in maternal health outcomes in rural India. However, SHG participation may reduce the perpetration of violence in the short-term but women's access to credit facilities in the medium-term creates has reported increase in violence (S. Jejeebhoy et al., 2017; Williams et al., 2025). Pregnancy offers a strategic window of opportunity to healthcare practitioners for identification and management of IPV. This can be achieved by integrating routine screening, counselling and referrals into several state and national level maternal and reproductive health programs in India (Chamberlain & Perham-Hester, 2000; Hammoury & Khawaja, 2007; Deshpande & Lewis-O'Connor, 2013; Taft et al., 2013; Chaves et al., 2019).

Strengths and Limitations

The primary strength of this study lies in the use of the nationally representative NFHS-5 data which provides a geographically, culturally and socio-economically diverse sample. As the Indian version of the DHS, the NFHS uses standardised sampling procedures and survey instruments ensuring methodological consistency and allowing comparability and reproducibility across countries. This study contributes to an underexplored niche of IPV research focusing on violence during pregnancy, a period that is both biologically and socially critical with long term implications for maternal and child health.

While the NFHS provides a rich data dataset, the limitations must be considered. First, the relatively small subsample of women who reported experiencing IPV during pregnancy may result in precision and representativeness issues in subgroup analyses. Second, the variable on prevalence of IPV during pregnancy is reported in the state module, thereby limiting finer subnational analyses. Third, NFHS relies on self-reported data, which introduces the possibility of recall and

social desirability bias, given the stigma and sensitivity surrounding IPV. Third, the cross-sectional design prevents a temporal assessment of how the risk of IPV may fluctuate over the course of pregnancy. Longitudinal data would allow a better understanding of how women's employment interacts with the risk of violence across trimesters, as well as in the pre and post pregnancy periods. Such design, including life course analysis would clarify if pregnancy acts as a trigger for violence or gets intensifies the risk conditional upon risk factors. (Chen et al., 2022; Chan et al., 2022; Cochran et al., 2023). Finally, as indicated Bhattacharya (2015) in her study, the DHS variable on woman's employment status is not feasible for establishing direct causal links with the incidence or reporting of IPV. Since it is reported for the past 12 months preceding the survey, one cannot distinguish whether the woman was already employed or whether she took up the employment after experiencing violence. In addition to this, it is beyond the scope of this analysis to account for the potential nonlinear association between the frequency and strength of violence and women's employment status. Therefore, the estimated marginal effects in the second stage 2SRI model were interpreted as partial correlation of women's labour force engagement with the likelihood of experiencing IPV during pregnancy, controlling for the covariates.

Conclusion

These empirical findings underscore the need to focus on modifiable policy variables of IPV during pregnancy, rather than treating economic participation as an exclusive point of intervention. Violence mechanisms are deeply embedded into intergenerational trauma, intrahousehold power dynamics and culturally handed down belief systems. Our work suggests that future research may benefit by moving beyond traditional linear regression techniques to analyse IPV data using intersectional and non-linear approaches, such as structural equation modelling or counterfactual causal inference frameworks. Only by implementing effective gender advocacy programs through a life course approach at the grassroot level targeting both male and female normative attitudes can change the trajectory of IPV and especially during pregnancy prevalence in a setting like India.

Data availability

The data used for analysis in this study is available free of cost on public domain of the DHS Program website. Any individual can register and download the dataset from https://dhsprogram.com/data/new-user-registration.cfm. For any further clarifications regarding this study may be addressed to the corresponding author at poushaly53@iipsindia.ac.in.

Author contributions

PT conceptualized the study. PT interpreted the data and wrote the initial draft of the manuscript. CS provided guidance in the data analyses, interpretation of results and overall structuring of the manuscript. Both the authors have read and approved the final version of the manuscript.

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Declarations

Competing interests
There are no competing interests to be declared.

Ethical approval
The paper uses secondary data (NFHS-5) for analysis which is available free of cost on public domain of the DHS Program website. The NFHS-5 survey has been jointly reviewed and approved by the ICF International Institutional Review Board (IRB) and the International Institute For Population Sciences (IIPS). Therefore, no further ethical approval was required for this study.

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