Social Science Spectrum ISSN 2454-2806
Vol. 11, No. 4, December 2025, pp. 152-162

Association between intimate partner violence and women's nutritional status in India: A cross-sectional analysis of NFHS-5 data

Priyanka Kumari[1] & R. Nagarajan[2]

Abstract

Intimate partner violence (IPV) is a major public health concern with well-documented effects on women's health, yet its relationship with nutritional status remains underexplored in low- and middle-income countries. This study examines the association between IPV and women's nutritional status in India using data from the National Family Health Survey (NFHS-5, 2019-21). The analysis includes 62,381 currently married women aged 18-49 years who were included in the domestic violence module. Nutritional status was assessed using body mass index (BMI), categorised as chronic energy deficiency (BMI < 18.5 kg/m²) and overweight/obesity (BMI ≥ 25.0 kg/m²). Logistic regression models were used to estimate the associations between physical, sexual, and emotional IPV and nutritional outcomes, adjusting for socio-demographic and behavioural factors. Overall, 19.5 percent of women were overweight or obese, while 7.7 percent were undernourished. Women exposed to physical IPV had higher odds of chronic energy deficiency in adjusted models (AOR: 1.11, 95% CI: 1.03-1.20), whereas no significant association was observed with overweight/obesity. Associations for sexual and emotional IPV were not statistically significant after adjustment. Socioeconomic factors, particularly education, wealth, and residence, were strong determinants of nutritional status. These findings suggest that IPV, especially physical violence, contributes to undernutrition among women in India through pathways of material deprivation and psychosocial stress. Integrating IPV prevention with nutrition and social protection interventions is essential for improving women's health outcomes.

Keywords: Intimate partner violence, nutritional status, NFHS-5

I. Background

Women's nutritional status, commonly assessed using body mass index (BMI), is shaped by a complex interplay of biological, psychological, and socio-economic factors. Intimate partner violence (IPV), a pervasive violation of human rights and a major public health concern, affects nearly one in three women globally and has profound consequences for women's physical, mental, and reproductive health (Devries et al., 2013; Ellsberg et al., 2008). IPV has been widely associated with adverse outcomes such as injury, sexually transmitted infections, unintended pregnancies, depression, and post-traumatic stress disorder (PTSD) (Campbell, 2002; Coker et al., 2002). More recently, attention has shifted toward understanding how IPV influences women's nutritional status, although the pathways linking IPV to BMI remain complex and insufficiently theorised, particularly in low- and middle-income country (LMIC) contexts (Chisholm et al., 2017; Mukamana et al., 2022).

The relationship between IPV and BMI can be understood through interconnected biological, behavioural, and structural pathways. From a biological perspective, exposure to chronic stress resulting from violence activates the hypothalamic–pituitary–adrenal (HPA) axis, leading to prolonged cortisol secretion, metabolic dysregulation, and alterations in appetite and fat distribution (Tomiyama, 2019). These physiological responses may contribute to both weight gain and weight

[1] Priyanka Kumari, International Institute for Population Sciences, Govandi Station Road, Deonar, Mumbai 400088. Email: priyankasharma3418@gmail.com (Corresponding Author)

[2] R. Nagarajan, Professor, Department of Population and Development, International Institute for Population Sciences, Govandi Station Road, Deonar, Mumbai 400088. Email: nagarajan.gipe@gmail.com

Acknowledgement: The authors would like to thank the anonymous reviewers of the journal for their helpful comments and suggestions for improving the paper.

loss depending on individual stress responses and environmental conditions. Additionally, trauma-related neuroendocrine changes can impair gastrointestinal functioning and nutrient absorption, further influencing nutritional outcomes.

Psychosocial mechanisms also play a critical role. IPV is strongly associated with mental health conditions such as depression, anxiety, and PTSD, which are well-established determinants of eating behaviour and energy balance (Ellsberg et al., 2008; Ludermir et al., 2010). Women experiencing IPV may engage in emotional or stress-induced eating as a coping strategy, leading to increased caloric intake and higher BMI (Mason et al., 2018). Conversely, psychological distress may suppress appetite, contribute to disordered eating behaviours, and reduce motivation for self-care, thereby increasing the risk of undernutrition. Social isolation, stigma, and reduced autonomy further exacerbate these effects by limiting access to social support and health-promoting resources.

Importantly, structural and socioeconomic pathways mediate the IPV-BMI relationship, particularly in LMIC settings. IPV often co-occurs with economic deprivation, food insecurity, and restricted decision-making power, all of which directly affect women's access to adequate nutrition. Women subjected to controlling behaviours may be prevented from working, accessing healthcare, or procuring food, thereby increasing vulnerability to chronic energy deficiency (Ackerson & Subramanian, 2008; Koenig et al., 2003). In such contexts, undernutrition may be a more immediate and visible consequence of IPV than obesity.

At the same time, evidence from high-income settings suggests that exposure to violence, including childhood and sexual abuse, is associated with obesity through pathways such as emotional eating, sedentary behaviour, and long-term metabolic dysregulation (Boynton-Jarrett et al., 2012; Bentley et al., 2009). However, these patterns may not fully translate to LMIC contexts, where limited access to excess calories and gendered intra-household food allocation can constrain the manifestation of obesity, even in the presence of similar psychological stressors.

The type and severity of IPV further shape nutritional outcomes. Physical violence may have more direct effects through injury, restricted mobility, and deprivation of basic needs, while sexual violence is often linked to reproductive health complications and heightened psychological trauma that can disrupt nutritional status. Emotional violence, although less visible, may exert sustained effects through chronic stress, diminished self-worth, and long-term behavioural changes affecting diet and lifestyle. These differential pathways highlight the need to examine IPV not as a uniform exposure but as a multidimensional phenomenon with distinct health implications.

The broader socio-cultural context is particularly important in shaping these relationships in countries such as India. Gender norms that prioritise men's needs, combined with limited autonomy among women, often result in unequal food distribution within households, where women may eat last and least. In such settings, IPV can exacerbate existing inequalities, further compromising women's nutritional status (IIPS & ICF, 2021). Additionally, intersecting factors such as caste, education, and rural residence influence both exposure to IPV and access to nutritional resources, reinforcing structural vulnerabilities.

Despite growing recognition of these pathways, empirical evidence on the IPV-BMI relationship remains mixed, with studies reporting both positive and negative associations depending on context, population, and methodological approaches. This inconsistency underscores the need for context-specific analyses that simultaneously consider different forms of IPV and their interaction with socio-economic determinants.

Against this backdrop, the present study aims to examine the association between different forms of intimate partner violence and women's nutritional status in India using nationally representative data from NFHS-5. By distinguishing between chronic energy deficiency and overweight/obesity, this study seeks to provide a nuanced understanding of how IPV contributes to the dual burden of malnutrition and to inform targeted public health interventions.

II. Methods

Data source and study design

This study utilised data from the fifth round of the National Family Health Survey (NFHS-5), conducted in India during 2019-2021. NFHS-5 is a nationally representative, cross-sectional household survey implemented as part of the Demographic and Health Survey (DHS) programme, designed to provide reliable estimates of population, health, and nutrition indicators across all states and union territories of India. The survey followed a two-stage stratified sampling design and achieved a high response rate of approximately 97%, ensuring robust national and subnational representation.

A total of 724,115 women aged 15-49 years were interviewed. For this analysis, the sample was restricted to currently married or cohabiting women aged 18-49 years who were selected for and successfully completed the domestic violence module. Women who were pregnant at the time of the survey or had delivered within two months prior to the interview were excluded to minimise bias in anthropometric measurements. Only women with valid height and weight measurements were included. After applying these inclusion and exclusion criteria, the final analytic sample comprised 62,381 women.

Outcome variable

The primary outcome variable was women's nutritional status, measured using body mass index (BMI), calculated as weight in kilograms divided by height in meters squared (kg/m²). BMI was used to classify women into nutritional categories based on standard World Health Organization (WHO) cut-offs. For the purpose of this study, two binary outcome variables were constructed. Chronic energy deficiency (CED) was defined as a BMI of less than 18.5 kg/m², while overweight and obesity were defined as a BMI of 25.0 kg/m² or higher. Women with BMI values within the normal range (18.5-24.9 kg/m²) served as the reference category in the regression analysis.

Exposure variables

The key exposure variables in this study were different forms of intimate partner violence (IPV), measured using the domestic violence module of NFHS-5. Women were asked a series of standardised questions about their experiences of violence perpetrated by their current or most recent partner. Based on these responses, IPV was categorised into physical, sexual, and emotional forms. Physical violence included acts such as slapping, pushing, punching, kicking, strangling, or threats with a weapon. Sexual violence referred to forced sexual intercourse or other sexual acts against the woman's will. Emotional violence encompassed humiliation, threats, and verbal abuse that undermined a woman's dignity. Each form of violence was coded as a binary variable indicating whether the respondent had experienced that type of violence in the past 12 months.

A composite binary variable for "any IPV" was constructed by combining the indicators of physical, sexual, and emotional violence. Women were coded as experiencing IPV (1) if they reported at least one form of violence in the past 12 months, and as not experiencing IPV (0) if they reported none.

Covariates

The analysis controlled for a range of socio-demographic and behavioural variables identified from previous literature as important determinants of nutritional status. These included age, education, occupation, reproductive status, lifestyle behaviours, and household characteristics. Age was categorised into three groups (18-24, 25-34, and 35-49 years), while education was classified as no education, primary, secondary, and higher. Occupational status distinguished between women who were not working, those engaged in agricultural labour, manual work, and non-manual occupations.

Reproductive variables included whether the respondent had given birth in the past year and whether she was currently breastfeeding. Lifestyle factors included alcohol consumption and tobacco use. Household characteristics comprised place of residence (urban or rural), caste (Scheduled Caste, Scheduled Tribe, Other Backward Class, and others), and wealth quintile, ranging from poorest to richest.

Statistical analysis

Descriptive statistics were used to summarise the socio-demographic profile of the study population and to estimate the prevalence of overweight/obesity and chronic energy deficiency. Bivariate analyses were conducted to examine differences in nutritional outcomes across categories of IPV and other covariates. To assess the association between IPV and nutritional status, binary logistic regression models were fitted separately for each outcome variable. Both unadjusted and adjusted odds ratios with 95% confidence intervals were reported. The adjusted models controlled for all selected covariates to account for potential confounding. All analyses were performed using Stata version 16, and appropriate sampling weights were applied to account for the complex survey design and to ensure nationally representative estimates.

III. Results

Prevalence of overweight/obesity and chronic energy deficiency

The study sample comprised 62,381 currently married women aged 18-49 years. Overall, 19.5 percent of women were classified as overweight or obese (BMI ≥ 25.0 kg/m²), while 7.7 percent were found to have chronic energy deficiency (CED) (BMI < 18.5 kg/m²). The distribution of nutritional status varied considerably across different forms of intimate partner violence (IPV) and socio-demographic characteristics (Table 1).

Women who reported experiencing physical violence in the past 12 months had a slightly lower prevalence of overweight/obesity (18.1%) compared to those who did not report such violence (19.9%). In contrast, the prevalence of chronic energy deficiency was higher among women exposed to physical violence (8.7%) than among those not exposed (7.3%). A similar pattern was observed for sexual violence, where women who experienced sexual violence had a lower prevalence of overweight/obesity (15.0%) but a higher prevalence of CED (9.5%) compared to their counterparts (19.7% and 7.6%, respectively). Women exposed to emotional violence also showed a higher prevalence of CED (8.5%) and a lower prevalence of overweight/obesity (17.9%) compared to those not exposed.

Consistent with these findings, women who experienced any IPV in the last 12 months had a lower prevalence of overweight/obesity (18.0%) and a higher prevalence of CED (8.5%) compared to those who did not experience any IPV (20.0% and 7.3%, respectively).

Clear socio-demographic gradients were observed in nutritional outcomes. The prevalence of overweight/obesity increased with age, rising from 7.6% among women aged 18-24 years to 24.3% among those aged 35-49 years. Similarly, overweight/obesity was more prevalent among women with higher levels of education (23.2%) and those belonging to the richest wealth quintile (28.4%). In contrast, chronic energy deficiency was more common among younger women (12.0% in the 18-24 age group), those with no formal education (9.5%), and women residing in rural areas (9.2%). Women from the poorest wealth quintile exhibited the highest prevalence of CED (13.1%), while those engaged in agricultural work also showed elevated levels (10.5%).

Association between IPV and nutritional status

The results of the logistic regression analysis revealed significant associations between different forms of IPV and women's nutritional status (Table 2). In unadjusted models, women who experienced physical violence had significantly lower odds of being overweight or obese (OR: 0.82,

Table 1: Prevalence of obesity and chronic energy deficiency among women aged 18-49 by their background characteristics.

Characteristics of women	Overweight or Obese (BMI>25.0	Chronic Energy Deficiency (BMI<18.5)	Number of women
Physical violence in the last 12 months			
No	19.9	7.3	48,053
Yes	18.1	8.7	14,328
Sexual violence in the last 12 months			
No	19.7	7.6	59,137
Yes	15.0	9.5	3,244
Emotional violence in last 12 months			
No	19.7	7.5	54,795
Yes	17.9	8.5	7,568
Any IPV in last 12 months			
No	20.0	7.3	45,675
Yes	18.0	8.5	16,706
Age			
18-24	7.6	12.0	9,398
25-34	17.7	8.3	21,735
35-49	24.3	5.9	31,249
Education			
No education	15.8	9.5	17,812
Primary	19.2	8.0	8,699
Secondary	20.9	7.3	28,877
Higher	23.2	4.0	6,993
Occupation			
Not working	19.7	7.2	40,206
Agricultural	16.6	10.5	10,963
Manual	20.6	8.2	4,218
Non-manual	22.3	5.4	6,994
Birth in the past year			
No	20.3	7.3	57,194
Yes	10.0	11.1	5,187
Currently breastfeeding			
No	21.3	6.7	51,487
Yes	10.8	12.2	10,894
Consume alcohol			
No	19.6	7.6	61,684
Yes	12.1	11.7	697
Smokes tobacco			
No	19.8	7.5	58,890
Yes	13.9	10.8	3,491
Place of residence			
Urban	24.5	4.2	19,173
Rural	17.2	9.2	43,208
Caste			
Scheduled caste	17.8	8.5	13,148
Scheduled tribe	12.2	10.4	5,520
Other Backwards Class	20.4	7.9	26,168
Others	21.6	5.8	17,546
Wealth quintile			
Poorest	9.9	13.1	12,113
Poorer	15.3	9.3	13,231
Middle	20.6	7.8	13,260
Richer	24.0	4.8	12,886
Richest	28.4	2.8	10,892
Total	19.5	7.7	62,382

Table 2: Adjusted and unadjusted odds ratios of obesity and chronic energy deficiency among women

Characteristics of women	Obesity (BMI>25)		Chronic Energy Deficiency (BMI<18.5)	
	Unadjusted OR [95% CI]	Adjusted OR [95% CI]	Unadjusted OR [95% CI]	Adjusted OR [95% CI]
Physical violence in the last 12 months				
No				
Yes	0.82 [0.78-0.87]***	0.98 [0.92-1.04]	1.32 [1.23-1.41]***	1.11 [1.03-1.20]**
Sexual violence in the last 12 months				
No				
Yes	0.76 [0.69-0.85]***	0.90 [0.81-1.01]	1.27 [1.12-1.44]***	1.05 [0.92-1.21]
Emotional violence in 12 months				
No				
Yes	0.84 [0.78-0.89]***	0.95 [0.88-1.03]	1.16 [1.06-1.26]***	0.92 [0.83-1.03]
Any IPV in last 12 months				
No				
Yes	0.82 [0.78-0.86]***		1.26 [1.18-1.34]***	
Age				
18-24				
25-34		2.27 [2.07-2.48]***		0.73 [0.67-0.80]***
35-49		3.40 [3.10-3.73]***		0.53 [0.48-0.58]***
Education				
No education				
Primary		1.22 [1.14-1.31]***		0.87 [0.79-0.95]***
Secondary		1.28 [1.21-1.35]***		0.82 [0.76-0.88]***
Higher		1.26 [1.16-1.37]***		0.69 [0.60-0.80]***
Occupation				
Not working				
Agricultural		0.85 [0.80-0.91]***		1.27 [1.18-1.37]***
Manual		1.03 [0.95-1.12]		1.23 [1.09-1.38]***
Non-manual		0.99 [0.92-1.05]		0.95 [0.85-1.07]***
Birth in the past year				
No				
Yes		0.78 [0.70-0.87]***		0.89 [0.80-1.00]
Currently breastfeeding				
No				
Yes		0.85 [0.79-0.92]***		1.39 [1.28-1.51]***
Consumes alcohol				
No				
Yes		1.05 [0.90-1.21]		0.90 [0.75-1.07]
Smokes tobacco				
No				
Yes		0.94 [0.86-1.02]		1.30 [1.18-1.43]***
Place of residence				
Urban				
Rural		0.92 [0.88-0.97]**		1.24 [1.12-1.36]***
Caste				
Scheduled caste				
Scheduled tribe		0.83 [0.77-0.90]***		0.83 [0.76-0.91]***
Other Backwards Class		0.95 [0.90-1.01]		1.04 [0.96-1.13]
Others		1.04 [0.98-1.11]		0.77 [0.70-0.85]***
Wealth quintile				
Poorest				
Poorer		1.66 [1.54-1.80]***		0.70 [0.65-0.76]***
Middle		2.27 [2.10-2.45]***		0.59 [0.54-0.65]***
Richer		2.69 [2.48-2.94]***		0.43 [0.39-0.48]***
Richest		2.91 [2.66-3.19]		0.30 [0.26-0.35]***

Note: ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$; CI = Confidence Interval; AOR = Adjusted Odds ratios.

95% CI: 0.78-0.87) and higher odds of having chronic energy deficiency (OR: 1.32, 95% CI: 1.23-1.41). However, after adjusting for socio-demographic and behavioural factors, the association between physical violence and overweight/obesity was no longer statistically significant (AOR: 0.98, 95% CI: 0.92-1.04). In contrast, the association with chronic energy deficiency remained significant, with women exposed to physical violence having 11% higher odds of CED (AOR: 1.11, 95% CI: 1.03-1.20). Sexual violence was also associated with lower odds of overweight/obesity in the unadjusted model (OR: 0.76, 95% CI: 0.69-0.85) and higher odds of CED (OR: 1.27, 95% CI: 1.12-1.44).

However, these associations were attenuated and became statistically non-significant after adjustment (AOR: 0.90, 95% CI: 0.81-1.01 for overweight/obesity; AOR: 1.05, 95% CI: 0.92-1.21 for CED). Similarly, emotional violence was associated with lower odds of overweight/obesity (OR: 0.84, 95% CI: 0.78-0.89) and higher odds of CED (OR: 1.16, 95% CI: 1.06-1.26) in unadjusted analyses, but these relationships were not statistically significant in adjusted models.

Additionally, the composite measure of IPV showed a similar pattern, with women who experienced any IPV in the last 12 months having significantly lower odds of overweight/obesity (OR: 0.82, 95% CI: 0.78-0.86) and higher odds of chronic energy deficiency (OR: 1.26, 95% CI: 1.18-1.34) in the unadjusted model. The composite variable of IPV was removed from the adjusted model to show the disaggregated effect of the other three IPV variables and to eliminate the multicollinearity.

Socio-demographic determinants of nutritional status

Age emerged as a strong predictor of nutritional status. Compared to women aged 18-24 years, those aged 25-34 years and 35-49 years had significantly higher odds of being overweight or obese (AOR: 2.27, 95% CI: 2.07-2.48 and AOR: 3.40, 95% CI: 3.10-3.73, respectively), while their odds of chronic energy deficiency were significantly lower. Educational attainment was positively associated with overweight/obesity, with women having secondary and higher education showing increased odds relative to those with no education. Conversely, higher education was associated with reduced odds of chronic energy deficiency.

Occupational status also influenced nutritional outcomes. Women engaged in agricultural and manual labour had higher odds of chronic energy deficiency compared to those not working, while non-manual occupations were associated with lower levels of undernutrition. Reproductive factors played an important role, as women who had given birth in the past year or were currently breastfeeding exhibited lower odds of overweight/obesity but higher odds of chronic energy deficiency.

Lifestyle factors showed mixed associations. Tobacco use was significantly associated with higher odds of chronic energy deficiency (AOR: 1.30, 95% CI: 1.18-1.43), while alcohol consumption was not significantly associated with either outcome. Place of residence also mattered, with rural women having higher odds of CED (AOR: 1.24, 95% CI: 1.12-1.36) and lower odds of overweight/obesity compared to urban women.

Socioeconomic status exhibited a clear gradient. Women in higher wealth quintiles had significantly greater odds of being overweight or obese, with those in the richest quintile having nearly three times higher odds (AOR: 2.91, 95% CI: 2.66-3.19) compared to women in the poorest quintile. In contrast, higher wealth was associated with substantially lower odds of chronic energy deficiency, highlighting persistent inequalities in nutritional outcomes. Differences were also observed across caste groups, with women from Scheduled Tribes showing lower odds of overweight/obesity but higher vulnerability to undernutrition compared to Scheduled Castes.

IV. Discussion

This study advances understanding of the relationship between intimate partner violence (IPV) and women's nutritional status by demonstrating that different forms of IPV are associated with distinct and context-dependent nutritional outcomes in India. The findings indicate that recent physical IPV is independently associated with chronic energy deficiency (CED), even after adjustment for socio-demographic and behavioural factors, whereas associations with overweight and obesity are attenuated in adjusted models. These results support the proposition that IPV operates as a structural determinant of health, influencing nutritional outcomes through intertwined material, psychosocial, and biological pathways (Heise, 2011; Ackerson & Subramanian, 2008; Black et al., 2013). Evidence from India also suggests that IPV is closely linked to adverse maternal and reproductive health outcomes, reinforcing its broader impact on women's health and well-being (Jejeebhoy, 1998; Stephenson et al., 2006).

The robust association between physical IPV and CED suggests that mechanisms of material deprivation and constrained resource access are central to this relationship. Physical violence is often embedded within patterns of coercive control that restrict women's mobility, labour force participation, and access to food and healthcare (Koenig et al., 2003; Jejeebhoy & Cook, 1997). In the Indian context, where women's access to household resources is frequently mediated by patriarchal norms, such restrictions can have direct nutritional consequences. Studies using NFHS data have shown that women experiencing IPV are more likely to face food insecurity, poor health service utilisation, and limited autonomy, all of which contribute to undernutrition (Ackerson & Subramanian, 2008; Rahman et al., 2016). Additionally, the physiological and psychological consequences of violence including chronic stress and mental health disorders-may further impair appetite and nutrient absorption, compounding the risk of CED (Devries et al., 2013; Tsai et al., 2015).

In contrast, the absence of a significant association between IPV and overweight/obesity in adjusted models suggests that pathways linking violence to excess adiposity are highly context-specific. While studies from high-income countries have documented links between violence exposure and obesity through stress-induced eating and sedentary behaviour (Danese & Tan, 2014; Mason et al., 2018), these mechanisms may operate differently in India. The coexistence of food insecurity and gendered food allocation patterns often limits women's caloric intake, even in the presence of psychological distress (IIPS & ICF, 2021; Haddad et al., 2015). Indian studies have highlighted that intra-household inequalities frequently disadvantage women nutritionally, particularly in rural and low-income settings (Palriwala, 2013; Rao, 2020). This structural context may explain why IPV is more strongly associated with undernutrition than obesity.

The findings for sexual and emotional IPV further illustrate the complexity of these relationships. Although sexual IPV was associated with higher odds of CED in unadjusted models, this relationship was attenuated after adjustment, suggesting mediation through socioeconomic factors. However, the mental health consequences of sexual violence such as depression, anxiety, and post-traumatic stress disorder remain important pathways affecting nutritional status (Ludermir et al., 2010; Silverman et al., 2009). In India, sexual violence is also linked to reproductive coercion and unintended pregnancies, which may increase nutritional demands and exacerbate vulnerability among already disadvantaged women (Jejeebhoy, 1998; Stephenson et al., 2006). Emotional IPV, though less visible, may exert sustained effects through chronic psychological stress and reduced self-efficacy, influencing dietary behaviour and health-seeking practices (Ellsberg et al., 2008).

Importantly, the composite measure of IPV reinforces these patterns by demonstrating that exposure to any form of IPV is associated with lower odds of overweight/obesity and higher odds of CED in unadjusted analyses. This finding underscores the cumulative burden of violence and suggests that multiple, overlapping mechanisms particularly those related to chronic stress, economic deprivation, and restricted autonomy may operate simultaneously to shape adverse nutritional outcomes among women (Ackerson & Subramanian, 2008; Ellsberg et al., 2008; Weiser et al., 2007).

The broader socio-cultural and economic environment plays a critical role in shaping these associations. In India, gender norms that prioritise men's needs, combined with limited female autonomy, often result in unequal distribution of food and healthcare resources within households (IIPS & ICF, 2021). Women may eat last and consume less nutritious food, particularly in resource-constrained households, increasing their vulnerability to undernutrition (Palriwala, 2013). Caste and socioeconomic inequalities further compound these disparities, as marginalised groups often face both higher exposure to IPV and poorer nutritional outcomes (Desai & Dubey, 2012; Subramanian et al., 2006). These findings highlight the intersectional nature of IPV and nutrition, where gender, class, and caste interact to shape health outcomes.

Consistent with previous research, socio-demographic factors such as age, education, occupation, and wealth were strong determinants of nutritional status. Increasing age and higher socioeconomic status were associated with elevated odds of overweight and obesity, reflecting ongoing nutrition transitions in India (Dinsa et al., 2012; Luhar et al., 2018). Conversely, lower socioeconomic status, rural residence, and engagement in manual labour were associated with higher risks of CED, indicating persistent structural deprivation (FAO, 2019; Headey & Hoddinott, 2015). Tobacco use was also associated with undernutrition, consistent with evidence suggesting that nicotine suppresses appetite and alters metabolic processes (Chiolero et al., 2008).

Taken together, these findings demonstrate that the relationship between IPV and women's nutritional status is shaped by the interaction of biological stress responses, behavioural adaptations, and structural inequalities. The persistence of the association between physical IPV and CED highlights the need for integrated public health interventions that address both violence prevention and nutritional vulnerability. Policies aimed at improving women's autonomy, access to resources, and social protection mechanisms may play a critical role in mitigating the health impacts of IPV. A multisectoral approach that integrates gender-based violence prevention with nutrition-sensitive programmes is essential for improving women's health outcomes in India.

V. Limitations

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design of NFHS-5 precludes causal inference, limiting the ability to establish temporal relationships between exposure to intimate partner violence (IPV) and nutritional outcomes. It is possible that reverse causality or unobserved confounding may influence the observed associations. Second, IPV was measured using self-reported data, which may be subject to recall bias and social desirability bias, particularly given the sensitive nature of violence-related questions. Underreporting of IPV is therefore likely, which may lead to conservative estimates of its association with nutritional status.

Third, the measurement of IPV was restricted to experiences within the past 12 months and did not capture the cumulative or lifetime exposure to violence. Given that the health consequences of IPV often accumulate over time, this may underestimate its long-term impact on nutritional status. Fourth, although a wide range of socio-demographic and behavioural covariates were included, residual confounding cannot be ruled out, particularly with respect to unmeasured factors such as dietary intake, physical activity, mental health status, and intra-household food allocation dynamics. Fifth, BMI, while widely used, is a limited indicator of nutritional status and does not capture body composition, micronutrient deficiencies, or fat distribution, which may also be influenced by IPV.

Finally, the domestic violence module of NFHS-5 is administered to only one eligible woman per household, which may introduce selection bias and limit the generalisability of findings. Despite these limitations, the use of nationally representative data and rigorous analytical methods enhances the robustness and policy relevance of the study.

VI. Policy Implications

The findings of this study have important implications for public health policy and programme design in India. The robust association between physical IPV and chronic energy deficiency highlights the need to integrate violence prevention strategies within broader nutrition and health interventions. Addressing IPV should not be viewed solely as a social or legal issue but as a critical determinant of women's health and nutritional well-being.

Policy efforts should focus on strengthening multisectoral approaches that link health systems, social protection programmes, and gender empowerment initiatives. For instance, incorporating IPV screening and counselling services within maternal and reproductive healthcare programmes can facilitate early identification and support for affected women. Nutrition programmes, such as the Integrated Child Development Services (ICDS) and Poshan Abhiyaan, should explicitly recognise IPV as a risk factor for undernutrition and incorporate targeted support mechanisms for vulnerable women.

Enhancing women's economic empowerment and autonomy is also essential for mitigating the adverse effects of IPV on nutritional outcomes. Interventions that promote women's access to income-generating opportunities, education, and decision-making power within households may reduce both exposure to violence and vulnerability to undernutrition. Additionally, strengthening food security through social protection schemes, including the Public Distribution System (PDS), can help buffer the nutritional consequences of IPV, particularly among low-income and rural populations.

At a broader level, addressing deeply rooted gender norms and inequalities is critical for both violence prevention and improved nutritional outcomes. Community-based interventions that challenge patriarchal norms, promote gender equity, and engage men and boys in behaviour change have shown promise in reducing IPV and improving women's health outcomes. Finally, future policies should emphasise the need for integrated data systems and longitudinal research to better understand the long-term pathways linking IPV and nutrition, thereby informing more effective and targeted interventions.

References

Ackerson, L. K., & Subramanian, S. V. (2008). Domestic violence and chronic malnutrition among women and children in India. *American Journal of Epidemiology, 167*(10), 1188–1196. https://doi.org/10.1093/aje/kwn049

Afshin, A., Forouzanfar, M. H., Reitsma, M. B., Sur, P., Estep, K., Lee, A., … & Murray, C. J. L. (2017). Health effects of dietary risks in 195 countries, 1990–2017. *The Lancet, 393*(10184), 1958–1972. https://doi.org/10.1016/S0140-6736(19)30041-8

Audrain-McGovern, J., & Benowitz, N. L. (2011). Cigarette smoking, nicotine, and body weight. *Clinical Pharmacology & Therapeutics, 90*(1), 164–168. https://doi.org/10.1038/clpt.2011.105

Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., … & Uauy, R. (2013). Maternal and child undernutrition and overweight in low- and middle-income countries. *The Lancet, 382*(9890), 427–451. https://doi.org/10.1016/S0140-6736(13)60937-X

Boynton-Jarrett, R., Rosenberg, L., Palmer, J. R., Boggs, D. A., & Wise, L. A. (2012). Child and adolescent abuse in relation to obesity in adulthood: The Black Women's Health Study. *Pediatrics, 130*(2), 245–253. https://doi.org/10.1542/peds.2011-1554

Chiolero, A., Faeh, D., Paccaud, F., & Cornuz, J. (2008). Consequences of smoking for body weight, body fat distribution, and insulin resistance. *The American Journal of Clinical Nutrition, 87*(4), 801–809. https://doi.org/10.1093/ajcn/87.4.801

Danese, A., & Tan, M. (2014). Childhood maltreatment and obesity: A systematic review and meta-analysis. *Molecular Psychiatry, 19*(5), 544–554. https://doi.org/10.1038/mp.2013.54

Desai, S., & Dubey, A. (2012). Caste in 21st century India: Competing narratives. *Economic and Political Weekly, 46*(11), 40–49.

Devries, K. M., Mak, J. Y. T., García-Moreno, C., Petzold, M., Child, J. C., Falder, G., … & Watts, C. H. (2013). The global prevalence of intimate partner violence against women. *Science, 340*(6140), 1527–1528. https://doi.org/10.1126/science.1240937

Dinsa, G. D., Goryakin, Y., Fumagalli, E., & Suhrcke, M. (2012). Obesity and socioeconomic status in developing countries: A systematic review. *Obesity Reviews, 13*(11), 1067–1079. https://doi.org/10.1111/j.1467-789X.2012.01017.x

Ellsberg, M., Jansen, H. A. F. M., Heise, L., Watts, C. H., & García-Moreno, C. (2008). Intimate partner violence and women's physical and mental health. *The Lancet, 371*(9619), 1165–1172. https://doi.org/10.1016/S0140-6736(08)60522-X

Food and Agriculture Organization of the United Nations (FAO). (2019). *The state of food security and nutrition in the world 2019.* Rome: FAO. https://doi.org/10.4060/ca5162en

Haddad, L., Cameron, L., & Barnett, I. (2015). The double burden of malnutrition in SE Asia and the Pacific. *Food Policy, 54*, 6–13. https://doi.org/10.1016/j.foodpol.2015.03.006

Heise, L. (2011). What works to prevent partner violence? An evidence overview. London School of Hygiene & Tropical Medicine.

Hindin, M. J., Kishor, S., & Ansara, D. L. (2008). *Intimate partner violence among couples in 10 DHS countries.* Calverton, MD: Macro International.

International Institute for Population Sciences (IIPS), & ICF. (2021). *National Family Health Survey (NFHS-5), 2019–21: India.* Mumbai, India: IIPS.

Jejeebhoy, S. J. (1998). Wife-beating in rural India: A husband's right? *Economic and Political Weekly, 33*(15), 855–862.

Jejeebhoy, S. J., & Cook, R. J. (1997). State accountability for wife-beating: The Indian challenge. *The Lancet, 349*(S1), s10–s12. https://doi.org/10.1016/S0140-6736(97)90004-4

Jewkes, R., Flood, M., & Lang, J. (2015). From work with men and boys to reduction of gender inequities. *The Lancet, 385*(9977), 1580–1589. https://doi.org/10.1016/S0140-6736(14)61683-4

Koenig, M. A., Stephenson, R., Ahmed, S., Jejeebhoy, S. J., & Campbell, J. (2003). Determinants of domestic violence in North India. *American Journal of Public Health, 93*(1), 132–138. https://doi.org/10.2105/AJPH.93.1.132

Leung, C. W., Epel, E. S., Ritchie, L. D., Crawford, P. B., & Laraia, B. A. (2014). Food insecurity and diet quality. *Journal of the Academy of Nutrition and Dietetics, 114*(12), 1943–1953. https://doi.org/10.1016/j.jand.2014.06.353

Ludermir, A. B., Lewis, G., Valongueiro, S. A., de Araújo, T. V. B., & Araya, R. (2010). Violence and postnatal depression. *The Lancet, 376*(9744), 903–910. https://doi.org/10.1016/S0140-6736(10)60887-2

Luhar, S., Timæus, I. M., Jones, R., Cunningham, S., Patel, S. A., Kinra, S., & Ebrahim, S. (2018). Forecasting obesity in India. *PLOS ONE, 13*(2), e0193137. https://doi.org/10.1371/journal.pone.0193137

Mason, S. M., Wright, R. J., Hibert, E. N., Spiegelman, D., Forman, J. P., & Rich-Edwards, J. W. (2018). IPV and type 2 diabetes. *Diabetes Care, 41*(6), 1157–1163. https://doi.org/10.2337/dc17-2336

Popkin, B. M., Corvalan, C., & Grummer-Strawn, L. M. (2020). Double burden of malnutrition. *The Lancet, 395*(10217), 65–74. https://doi.org/10.1016/S0140-6736(19)32497-3

Rao, N. (2020). Gender and nutrition in South Asia. *Food Policy, 95*, 101935. https://doi.org/10.1016/j.foodpol.2020.101935

Silverman, J. G., Decker, M. R., Reed, E., & Raj, A. (2009). IPV and reproductive health. *Journal of Women's Health, 18*(6), 933–940. https://doi.org/10.1089/jwh.2008.1097

Smith, L. C., & Haddad, L. (2015). Reducing child undernutrition. *World Development, 68*, 180–204. https://doi.org/10.1016/j.worlddev.2014.11.014

Subramanian, S. V., Nandy, S., Irving, M., Gordon, D., Lambert, H., & Davey Smith, G. (2006). The mortality divide in India. *American Journal of Public Health, 96*(5), 818–825. https://doi.org/10.2105/AJPH.2004.060103

Tomiyama, A. J. (2019). Stress and obesity. *Annual Review of Psychology, 70*, 703–718. https://doi.org/10.1146/annurev-psych-010418-102936

Tsai, A. C., Tomlinson, M., Comulada, W. S., & Rotheram-Borus, M. J. (2015). IPV and depression severity. *Journal of Affective Disorders, 180*, 95–102.

Weiser, S. D., Leiter, K., Bangsberg, D. R., Butler, L. M., Percy-de Korte, F., Hlanze, Z., Phaladze, N., Iacopino, V., & Heisler, M. (2007). Food insufficiency is associated with high-risk sexual behavior among women in Botswana and Swaziland. *PLoS Medicine, 4*(10), e260.

World Bank. (2016). *World development report 2016: Digital dividends.* Washington, DC: World Bank. https://doi.org/10.1596/978-1-4648-0671-1

Yount, K. M., & Carrera, J. S. (2006). Domestic violence and health. *Social Forces, 85*(1), 355–387.