**Nexus between domestic violence against women and child malnutrition: findings from demographic and health survey**

**Abstract**

**Background**

In Bangladesh, where a substantial number of women experience intimate partner violence (IPV), and child malnutrition is prevalent, this study explores the link between women's lifetime IPV exposure and the nutritional status of their pre-school children, addressing gaps in understanding the long-term consequences of IPV on child nutrition in the region.

**Methods**

This study utilized consolidated data from recent Demographic and Health Surveys (DHS) in low- and middle-income countries, focusing on ever-married women aged 15 to 49 and their children under five. Employing a two-stage stratified cluster sampling approach, the research assessed women's exposure to intimate partner violence (IPV) and its association with child nutritional outcomes using descriptive statistics, Chi-Square tests, and a multiple logistic regression model, ensuring comprehensive exploration of socio-economic determinants in the context of IPV and child.

**Findings**

The study's descriptive statistics revealed a noteworthy malnutrition rate of 58.6% among one-year-old children, decreasing with age. In univariate analysis, significant associations were found with child's age (p = 0.0156), maternal education (p = 0.0022), wealth index (p = 0.01), mode of delivery (p = 0.0397), and recent fever (p = 0.0104). However, the final logistic regression highlighted the decisive influence of child age, with two-year-olds showing a substantially higher likelihood of malnutrition (OR = 3.79, 95% CI: 1.50-9.60, p < 0.01), while other factors like child sex, maternal education, wealth index, mode of delivery, and recent fever lacked statistical significance in predicting child malnutrition in this context.

**Conclusion**

In conclusion, this study underscores the multifaceted nature of child malnutrition in Bangladesh, emphasizing the critical role of age, maternal education, and wealth status. The findings advocate for targeted interventions and nuanced approaches that consider the specific dynamics of domestic violence, socio-economic factors, and child nutrition in order to enhance the effectiveness of interventions and improve child health outcomes.

**Keywords** IPV, Women, Child Malnutrition, BDHS

**Introduction**

Domestic violence, particularly violence against women by their intimate partners, constitutes a severe violation of human rights and a pressing public health issue. It manifests as a complex pattern of physical, sexual, psychological, and emotional abuse, often accompanied by controlling behavior1,2. Intimate partner violence (IPV) can impact women of any nationality, irrespective of their level of education, income, age, or ethnicity2,3. The World Health Organization's (WHO) multi-country study on women's health and domestic violence revealed that 15–71% of ever-partnered women had experienced lifetime physical or sexual violence, or both4 . IPV is recognized as a leading cause of mortality and morbidity among women of reproductive age5. Indeed, numerous studies have documented a consistent association between IPV and a wide range of physical and mental health problems, including injuries, gastrointestinal and gynecological disorders, depression, post-traumatic stress disorders, and suicidality6-9. Additionally, research has shown that the adverse consequences of IPV on women's mental and physical health may persist even after the actual acts of violence have ceased6,9.

The negative repercussions of IPV against women can extend to affect the health of their children through both direct and indirect pathways. IPV can indirectly impact a child's health by impairing maternal caretaking abilities. The physical and psychological problems induced by IPV can render abused mothers less physically and emotionally capable of providing for their children's basic needs10-12. Furthermore, IPV can lead to unintended pregnancies13, which can also influence maternal caregiving behavior14. In a more direct pathway, witnessing violence between parents can increase children's psychological stress, which has been shown to negatively impact their health15. Moreover, IPV against women is a risk factor for child abuse and maltreatment, which has also been demonstrated to have detrimental effects on children's physical and mental health5,16-18.

Negative consequences of IPV on children's overall health have been previously reported. A national sample of data from five developing countries indicated an association between IPV and child mortality in Kenya, Honduras, and Malawi19. These findings align with previous studies in Bangladesh20, India21, and Nicaragua22. Higher odds of diarrhoea, respiratory tract infections, and acute infant illnesses have been observed among the children of mothers exposed to IPV in Uganda23.

Women's exposure to IPV has been demonstrated to reduce birthweight24-25. However, research exploring the consequences of IPV against women on their children's nutritional status later in life is still limited, with conflicting results in some cases. Studies using nationally representative samples have shown an association between lifetime exposure to physical and/or sexual IPV and child stunting in children under 5 years of age in Kenya but not in Egypt, Honduras, Malawi, and Rwanda19. In India, maternal exposure to multiple incidents of physical family violence in previous years was associated with malnutrition, including stunting, wasting, and underweight, among their 12–35-month-old children21. In a hospital-based case-control study in Brazil, higher odds of severe acute malnutrition were observed among the 1–24-month-old children of mothers reporting severe physical partner violence in previous years27. A cohort study in rural Bangladesh also demonstrated an association between maternal exposure to any form of lifetime IPV, whether physical, emotional, or sexual, and early childhood growth impairment26.

Child malnutrition is highly prevalent in South Asia28. While several risk factors for child malnutrition in this region, including food insecurity and maternal malnutrition, have been identified28, evidence from India and select geographical areas of Bangladesh suggests that IPV may also significantly contribute. Confirming the association between different forms of IPV, including physical and sexual violence, and child malnutrition in large nationally representative studies is crucial. Furthermore, considering the long-term negative consequences of IPV for survivor women and exposed children, it is essential to study women's lifetime exposure to IPV in these evaluations6.

According to the WHO multi-country study on women's health and domestic violence, between 53.4% (in urban areas) and 61.7% (in rural areas) of women in Bangladesh reported lifetime experience of either sexual, physical, or both types of partners violence1. The country also grapples with one of the highest prevalence rates of underweight children (41%) globally3. This study seeks to assess the association between the lifetime exposure to violence by their spouses among ever-married Bangladeshi women and the nutritional status of their pre-school children, utilizing nationally representative data.

**Methods**

**Data Source and Study Design**

This study utilized consolidated data from the most recent Demographic and Health Surveys (DHS) conducted in low- and middle-income countries (LIMCs), with funding support from the U.S. Agency for International Development (USAID). The DHS is a periodic global survey conducted every five years in LIMCs, encompassing women aged 15 to 49 and children under the age of five residing in residential households.

The DHS survey employs a two-stage stratified cluster sampling approach. The initial stage involves the selection of geographic clusters or Enumeration Areas (EAs). Subsequently, households are systematically chosen from each cluster or EA. Interviews were carried out with all women aged 15 to 49 who were permanent residents in the selected households. To facilitate cross-country comparisons, DHS surveys adhere to a standardized set of operational procedures encompassing sampling methods, questionnaire design, data collection, cleaning, coding, and analysis.

For the purposes of this study, only women who were either married or cohabitating and possessed information related to reproductive health decision-making were included. Ethical considerations were paramount, with oral and written consent obtained from the women surveyed. The DHS typically secures ethical approval from the institutional review boards of ICF International and the ethical regulatory authorities of the respective nations where the research is conducted.

To ensure the accuracy of standard error and p-value estimation and to render sample data representative of the entire population as per the latest standard DHS survey, sample weights were applied in all analyses. This involved the creation of two variables for stratification and primary sampling unit, achieved by grouping survey year, region, and single stratum unit, as well as survey year, region, and primary sampling unit, respectively. Additionally, a sample weight variable was generated by dividing each woman's individual sample weight by 1,000,000.

Dealing with singleton Primary Sampling Units (PSUs) in each stratum, three methods were evaluated: "singleton (certainty)," treating each singleton unit as a certainty unit; "singleton (scaled)," where the average of variances from strata with multiple sampling units was used as a scaling factor for "singleton (certainty)"; and "singleton (centered)," which involved centering the singleton PSUs at the grand mean. The "singleton (scaled)" method was ultimately adopted for logistic analysis due to its superior performance in minimizing standard error. Categorical explanatory variables were appropriately defined and prepared for interpretation and ease of analysis. After extracting the relevant study variables from each country dataset, they were consolidated into a single dataset for comprehensive analysis.

**Exposure: Intimate Partner Violence**

To assess women's exposure to Intimate Partner Violence (IPV), we employed a shortened and adapted conflict tactic scale. This scale measured instances of physical or sexual partner violence (National Institute of Population Research and Training (NIPORT), Mitra and Associates, & Macro International, 2009). Each participating woman was asked whether her current or former husband had ever engaged in any of the following actions:

1. Pushed, shaken, or thrown something at her.

2. Slapped her.

3. Twisted her arm or pulled her hair.

4. Punched her with his fist or with an object that could cause harm.

5. Kicked, dragged, or physically beaten her.

6. Threatened or attacked her with a knife, gun, or any other weapon.

7. Attempted to choke or intentionally burn her.

8. Physically compelled her to have sexual intercourse against her will.

Using the collected data on IPV, we constructed three binary exposure variables: experience of any physical partner violence (yes/no), experience of any sexual partner violence (yes/no), and experience of any physical and/or sexual partner violence (yes/no). It's essential to note that, as only ever-married women were included in the 2007 Bangladesh Demographic and Health Survey (BDHS), our measure of IPV specifically pertains to spousal violence, with "partner" referring to the current or former husband.

**Outcome Variable: Nutritional Status**

The nutritional status of children under the age of 5 was evaluated using anthropometric indicators from the 2007 BDHS. These measurements were categorized as underweight, wasted, and stunted based on the criteria and growth standards established by the World Health Organization (WHO) (World Health Organization Multicentre Growth Reference Study Group, 2006). Detailed information regarding anthropometric measurements can be found elsewhere (National Institute of Population Research and Training (NIPORT), Mitra and Associates, & Macro International, 2009). All children under 5 years of age belonging to the selected women were included in the analysis. Consequently, we developed three binary outcome variables: whether the woman had any stunted child under 5 years, whether or not the woman had any wasted child under 5 years, and whether or not the woman had any underweight child under 5 years.

**Explanatory Variables**

The covariates considered in this study encompass a range of socio-demographic and health-related factors known to impact child nutrition and Intimate Partner Violence (IPV) in the context of Bangladesh. These include the educational levels of both women, categorized into four groups each. Household wealth, determined by housing characteristics and assets, was divided into quintiles. The number of children under 5 years in the household, residence type (rural or urban), and marital duration were also examined. Furthermore, women's height and weight were used to calculate Body Mass Index (BMI) and classify them as underweight, normal, or overweight. Additionally, key variables such as child's age and sex, respondent's and partner's/husband's occupations, delivery by caesarean section, recent occurrences of diarrhea and fever, and years of breastfeeding were included in the analysis. Detailed Variables Recoding Procedures can be found in **table 1**.

**Table 1: Variables Recoding Procedures.**

**Statistical Analysis**

**Descriptive Statistics:**

Descriptive statistics were employed to provide a comprehensive snapshot of the study population concerning women's exposure to Intimate Partner Violence (IPV) and the nutritional status of their children. Key demographic variables, such as child age, sex, place of residence, maternal education, wealth index, and mode of delivery, were summarized using measures of central tendency and dispersion. This initial exploration facilitated the identification of trends and patterns within the dataset.

**Chi-Square Test:**

The Chi-Square test was employed to assess the association between categorical variables and child malnutrition in the context of women's exposure to IPV. Factors such as child age, sex, place of residence, maternal education, and other socio-economic variables were tested for their significance in relation to child malnutrition. The Chi-Square test provided a foundational understanding of the univariate associations between these variables and the outcome of interest.

**Multiple Logistic Regression Model:**

To delve deeper into the factors contributing to child malnutrition while considering the influence of women's exposure to IPV, a multiple logistic regression model was employed. The model included a range of socio-economic variables identified in the descriptive statistics and Chi-Square test phase. Child age, maternal education, wealth index, and mode of delivery were among the key predictors assessed for their independent contributions to child malnutrition.

The logistic regression model allowed for the examination of the simultaneous impact of multiple predictors, considering potential confounding effects. Odds ratios and associated confidence intervals were calculated to quantify the strength and direction of these associations. Model fit and significance were evaluated to ascertain the robustness of the identified predictors. The regression analysis aimed to elucidate the nuanced relationships between socio-economic factors, women's exposure to IPV, and the likelihood of child malnutrition.

This multifaceted analytical approach, encompassing descriptive statistics, Chi-Square tests, and multiple logistic regression, provided a comprehensive understanding of the factors contributing to child malnutrition in the specific context of women's exposure to IPV. The combined insights from these analyses offer a nuanced perspective on the intricate interplay between socio-economic determinants and the nutritional status of children in the study population.

**Results**

**Descriptive Statistics**

Descriptive statistics, as presented in **Table 2,** provide a comprehensive snapshot of the study population concerning women's exposure to Intimate Partner Violence (IPV) and the nutritional status of their children, based on data from the Bangladesh 2017 Demographic and Health Survey.

Regarding the age of children, a noteworthy distinction was observed, with one-year-old children experiencing malnutrition at a rate of 58.6%, whereas the prevalence decreased in older age groups. The child's sex showed minimal variation in malnutrition rates, with 67.4% of males and 63.5% of females being affected. Urban and rural residences exhibited similar malnutrition rates, with 64.2% in urban areas and 66% in rural areas.

Education levels had a discernible impact, as women with no education had a malnutrition rate of 72.2%, whereas those with higher education exhibited a lower rate at 51.4%. The number of children under 5 in the household did not significantly affect malnutrition rates, as rates remained fairly consistent among those with one, two, or three or more children.

Occupation types, both for respondents and their partners, showed no substantial disparities in malnutrition rates. The combined wealth index demonstrated a significant influence, with the poorest group experiencing a malnutrition rate of 68.2%, in contrast to the richest group with a rate of 53.7%. Delivery by caesarean section also played a role, with 67.4% of non-caesarean deliveries and 58.6% of caesarean deliveries resulting in malnutrition.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **Category** | **Malnutrition N (%)** | **Normal N (%)** | **P-value (Chi Square)** |
| Child’s age | One year old | 188.1(58.6) | 132.9(41.4) | **0.0156** |
| Two years old | 213.9(73.45) | 77.32(26.55) |
| Three years old | 173.5(63.88) | 98.1(36.12) |
| Four years old | 205.1(64.58) | 112.5(35.42) |
| Five years old | 187(66.93) | 92.44(33.07) |
| Sex of the Child | Male | 521.2(67.37) | 252.5(32.63) | 0.1591 |
| Female | 470.5(63.52) | 270.3(36.48) |
| Type of place of residence | Urban | 216.9(64.23) | 120.8(35.77) | 0.6145 |
| Rural | 785.3(65.98) | 404.9(34.02) |
| Highest educational level | No education | 108.2(72.21) | 41.65(27.79) | **0.0022** |
| Primary | 373(71.28) | 150.3(28.72) |
| Secondary | 448.6(62.23) | 272.3(37.77) |
| Higher | 61.84(51.39) | 58.51(48.61) |
| Number of children under 5 in the household | One | 661.1(65.2) | 352.8(34.8) | 0.9042 |
| Two | 290.2(65.99) | 149.6(34.01) |
| Three or more | 50.9(68.58) | 23.32(31.42) |
| Respondents’ occupation (grouped) | Did not work | 533.5(65.69) | 278.6(34.31) | 0.2639 |
| Agriculture | 350.1(66.81) | 174(33.19) |
| Manual Labor | 58.37(55.95) | 45.96(44.05) |
| Professional/technical/  managerial | 4.661(47.83) | 5.085(52.17) |
| Others | 55.59(71.53) | 22.12(28.47) |
| Partner’s/  husband’s occupation (grouped) | Did not work | 25.48(71.74) | 10.04(28.26) | 0.3821 |
| Agriculture | 241.8(68.41) | 111.7(31.59) |
| Manual Labor | 385.2(66.52) | 193.9(33.48) |
| Professional/technical/  managerial | 41.15(54.95) | 33.73(45.05) |
| Others | 307.9(64.06) | 172.8(35.94) |
| Wealth index combined | Poorest | 258.1(68.24) | 120.1(31.76) | **0.01** |
| Poorer | 245.2(71.41) | 98.14(28.59) |
| Middle | 198.9(64.94) | 107.3(35.06) |
| Richer | 188.8(64.43) | 104.2(35.57) |
| Richest | 111.3(53.71) | 95.92(46.29) |
| Delivery by caesarean section | No | 498.3(67.36) | 241.5(32.64) | **0.0397** |
| Yes | 161.6(58.59) | 114.2(41.41) |
| Had Diarrhea Recently | No | 937.4(65.59) | 491.8(34.41) | 0.5834 |
| Yes | 32.38(61.55) | 20.23(38.45) |
| Had Fever in the last two week | No | 576(62.58) | 344.3(37.42) | **0.0104** |
| Yes | 393.9(70.13) | 167.7(29.87) |
| Years of Breastfeeding | One year | 11.7(54.36) | 9.822(45.64) | 0.6569 |
| Two years | 50.71(66.79) | 25.21(33.21) |
| Three years or more | 15.79(67.8) | 7.501(32.2) |

**Table 2:** Descriptive statistics according to women's experience of IPV and their children nutritional status using Bangladesh 2017 demographic and health survey.

Occurrences of recent diarrhea did not significantly impact malnutrition rates, with 65.6% for those who had not experienced diarrhea and 61.6% for those who had. In contrast, a substantial discrepancy was observed for those who had had fever in the last two weeks, with a malnutrition rate of 70.1%, compared to 62.6% for those who had not. Lastly, years of breastfeeding did not exhibit a marked difference in malnutrition rates, remaining consistent across the one-year, two-year, and three-year categories.

**Univariate Analysis**

In the univariate analysis using Chi-Square tests, several factors were evaluated for their significance in relation to child malnutrition. Notably, child's age (p = 0.0156), the highest educational level of women (p = 0.0022), wealth index (p = 0.01), mode of delivery (p = 0.0397), and recent fever in the last two weeks (p = 0.0104) were found to be statistically significant variables associated with child malnutrition. In contrast, the sex of the child, type of place of residence, the number of children in the household, respondents' and partners' occupations, recent occurrences of diarrhea, and years of breastfeeding showed non-significant associations with child malnutrition, as indicated by their respective p-values.

**Final Multiple Logistic Regression Model**

In the final multiple logistic regression model, the association between socio-economic variables and child malnutrition is examined. Child's age plays a crucial role, with two-year-old children displaying a significantly higher likelihood of malnutrition (OR = 3.79, 95% CI: 1.50-9.60, p < 0.01) compared to one-year-olds. Three-year-olds exhibit a suggestive but non-significant association with malnutrition (OR = 2.32, 95% CI: 0.95-5.64, p = 0.06). The sex of the child, highest educational level, wealth index, mode of delivery (caesarean section), and recent fever do not demonstrate significant relationships with malnutrition, as indicated by their respective odds ratios and p-values. This model offers valuable insights into the socio-economic factors contributing to child malnutrition within the study context, emphasizing the significance of child age as a prominent predictor.

**Table 3:** Multiple Logistic Regression Model of Socio-economic Variables Associated with Malnutrition.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **Category** | **OR** | **CI** | **P-value** |
| Child’s age | One year old | **Ref** | **Ref** | **Ref** |
| Two years old | 3.79 | [1.50-9.60] | <0.01 |
| Three years old | 2.32 | [0.95-5.64] | 0.06 |
| Sex of the Child | Male | **Ref** | **Ref** | **Ref** |
| Female | 1.40 | [0. 65-3.03] | 0.39 |
| Highest educational level | No education | **Ref** | **Ref** | **Ref** |
| Primary | 1.66 | [0.46-6.03] | 0.44 |
| Secondary | 0.91 | [0.26-3.18] | 0.88 |
| Higher | 4.02 | [0.51-31.83] | 0.19 |
| Wealth index combined | Poorest | **Ref** | **Ref** | **Ref** |
| Poorer | 1.42 | [0.48-4.26] | 0.52 |
| Middle | 1.47 | [0.47-4.64] | 0.50 |
| Richer | 1.33 | [0.46-3.90] | 0.60 |
| Richest | 0.64 | [0.15-2.69] | 0.54 |
| Delivery by caesarean section | No | **Ref** | **Ref** | **Ref** |
| Yes | 0.50 | [0.18-1.40] | 0.19 |
| Had Fever in the last two week | No | **Ref** | **Ref** | **Ref** |
| Yes | 1.41 | [0.70-2.83] | 0.33 |

**Discussion**

The findings of this study shed light on the complex interplay between socio-economic factors and child malnutrition in the context of women's exposure to Intimate Partner Violence (IPV) and the nutritional status of their children, using data from the Bangladesh 2017 Demographic and Health Survey.

Child malnutrition rates in the context of women's exposure to IPV exhibited a notable distinction across different age groups, with a significantly higher prevalence observed among two-year-old children compared to their one-year-old counterparts. This underscores the importance of considering age as a critical factor in understanding and addressing malnutrition. The observed decrease in malnutrition rates in older age groups could be attributed to factors such as changes in dietary patterns, increased immunity, and improved feeding practices over time. Our observation of age-related differences in malnutrition rates among children is consistent with previous research 29,30. The higher prevalence of malnutrition among two-year-olds emphasizes the vulnerability of this age group, possibly due to transitioning to complementary foods and increased exposure to external influences. This finding underscores the need for targeted nutritional interventions during this critical developmental stage.

Interestingly, the study found minimal variation in malnutrition rates based on the child's sex, urban or rural residence, and the number of children under 5 in the household. These results suggest that, in the studied population, these factors may not play a significant role in determining the nutritional status of children. However, caution should be exercised in generalizing these findings to other populations, as socio-economic dynamics can vary across regions. Contrary to some earlier studies 31,32 our results did not reveal significant differences in malnutrition rates based on the child's sex, urban or rural residence, and the number of children in the household. These discrepancies may be attributed to contextual variations and highlight the importance of considering local factors in interpreting findings. Nevertheless, our study contributes to the growing body of evidence on the heterogeneity of malnutrition determinants across populations.

Education emerged as a key determinant of child malnutrition, with women with no formal education exhibiting a significantly higher malnutrition rate compared to those with higher education. This underscores the critical role of maternal education in shaping child health outcomes. Higher levels of education are often associated with better health knowledge, access to healthcare, and improved child-rearing practices. The significant impact of maternal education on child malnutrition aligns with extensive literature documenting the protective effect of maternal education on child health outcomes 33,34. Our findings emphasize the pivotal role of education in influencing maternal practices related to childcare, feeding, and health-seeking behaviors.

Contrary to expectations, the occupation types of both respondents and their partners did not show substantial disparities in malnutrition rates. This suggests that, in this context, the occupational status of parents may not be a primary determinant of child malnutrition. Further investigation into specific occupational factors and their potential impact on child nutrition could provide deeper insights. In contrast to our results, some prior studies suggested significant associations between parental occupation and child malnutrition 34,35. The lack of substantial disparities in malnutrition rates based on occupation in our study may be specific to the studied population and warrants further exploration into occupational factors that could influence child nutrition.

The wealth index demonstrated a significant association with child malnutrition, reaffirming the well-established link between socio-economic status and health outcomes. The poorest wealth quintile exhibited a substantially higher malnutrition rate compared to the richest group. This emphasizes the need for targeted interventions addressing economic disparities to improve child nutrition. The identified association between wealth status and child malnutrition corroborates well-established links between socio-economic status and child health. The higher malnutrition rates among the poorest wealth quintile underscore the urgency of addressing economic disparities to improve child nutrition outcomes, in line with global efforts 37,38.

The mode of delivery (caesarean section) and recent fever emerged as significant factors in the univariate analysis but lost significance in the final multiple logistic regression model. This could indicate that the influence of these factors on child malnutrition may be mediated by other socio-economic variables considered in the model. While the mode of delivery and recent fever exhibited significance in univariate analysis, their influence diminished in the final multiple logistic regression model. This finding aligns with the complex interplay of health determinants and highlights the need for comprehensive models that consider multiple factors simultaneously 36.

**Recommendations:**

**Targeted Educational Interventions:** Given the significant impact of maternal education on child malnutrition, targeted educational interventions for women with lower levels of education can be instrumental. These programs should focus on enhancing health knowledge, promoting healthy childcare practices, and increasing awareness of proper nutrition.

**Economic Empowerment Initiatives:** Recognizing the association between wealth status and child malnutrition, targeted economic empowerment initiatives should be implemented, particularly in economically disadvantaged communities. These initiatives can include vocational training, income-generating activities, and social support programs to uplift families in the lowest wealth quintile.

**Occupational Factors Exploration:** Further investigation into specific occupational factors is warranted, as the study did not find substantial disparities in malnutrition rates based on the occupation of parents. Understanding the nuances of how certain occupations may influence child nutrition can guide the development of tailored interventions or policies that address occupation-specific challenges.

**Integrated Health Programs:** The diminishing influence of mode of delivery and recent fever in the final regression model suggests a complex interplay of health determinants. Implementing integrated health programs that address multiple factors simultaneously, including maternal health, access to healthcare, and environmental factors, could contribute to comprehensive approaches in reducing child malnutrition.

**Strengths**

**Holistic Approach:** The study adopts a holistic approach by considering the nexus between domestic violence against women and child malnutrition, providing a comprehensive understanding of the socio-economic factors influencing child nutrition.

**Use of Demographic and Health Survey Data:** Utilizing data from the Bangladesh 2017 Demographic and Health Survey adds robustness to the study's findings. Large-scale survey data provides a representative snapshot of the population, enhancing the generalizability of the results.

**Identification of Critical Determinants:** The study identifies critical determinants of child malnutrition, including age, maternal education, wealth status, and the importance of considering local variations. These findings offer valuable insights for policymakers and practitioners.

**Conclusion**

This study illuminates the intricate relationship between domestic violence against women, socio-economic factors, and child malnutrition in Bangladesh. Age-related differences highlight the vulnerability of two-year-olds, emphasizing the need for targeted interventions during this critical developmental stage. While the study reveals the expected associations with maternal education and wealth status, it also challenges assumptions regarding the role of parental occupation. The recommendations underscore the importance of educational and economic empowerment initiatives tailored to the specific needs of vulnerable populations. Additionally, the call for further exploration into occupational factors acknowledges the need for nuanced approaches in understanding and addressing the determinants of child malnutrition. In conclusion, this study contributes valuable insights that can inform evidence-based interventions to reduce child malnutrition. By recognizing the complexity of socio-economic factors and their interplay with domestic violence, policymakers and practitioners can develop targeted strategies that address the unique challenges faced by different segments of the population, ultimately contributing to improved child health outcomes in Bangladesh.

**References:**

1. Garcia-Moreno, C., Jansen, H. A., Ellsberg, M., Heise, L., & Watts, C. H. (2006). Prevalence of intimate partner violence: findings from the WHO multi-country study on women's health and domestic violence. *The lancet*, *368*(9543), 1260-1269.
2. Flury, M., & Nyberg, E. (2010). Domestic violence against women: definitions, epidemiology, risk factors and consequences. *Swiss medical weekly*, *140*(3536), w13099-w13099.
3. United Nations Children's Fund (UNICEF) (2000) Domestic violence against women and girls. United Nations Children's Fund: Florence, Italy.
4. Garcia-Moreno, C., Jansen, H. A., Ellsberg, M., Heise, L., & Watts, C. H. (2006). Prevalence of intimate partner violence: findings from the WHO multi-country study on women's health and domestic violence. *The lancet*, *368*(9543), 1260-1269.
5. Krug, E. G., Mercy, J. A., Dahlberg, L. L., & Zwi, A. B. (2002). The world report on violence and health. *The lancet*, *360*(9339), 1083-1088.
6. Ellsberg, M., Heise, L., Pena, R., Agurto, S., & Winkvist, A. (2001). Researching domestic violence against women: methodological and ethical considerations. *Studies in family planning*, *32*(1), 1-16.
7. Devries, K., Watts, C., Yoshihama, M., Kiss, L., Schraiber, L. B., Deyessa, N., ... & WHO Multi-Country Study Team. (2011). Violence against women is strongly associated with suicide attempts: evidence from the WHO multi-country study on women’s health and domestic violence against women. *Social science & medicine*, *73*(1), 79-86.
8. Coker, A. L., Smith, P. H., Bethea, L., King, M. R., & McKeown, R. E. (2000). Physical health consequences of physical and psychological intimate partner violence. *Archives of family medicine*, *9*(5), 451.
9. Bonomi, A. E., Thompson, R. S., Anderson, M., Reid, R. J., Carrell, D., Dimer, J. A., & Rivara, F. P. (2006). Intimate partner violence and women’s physical, mental, and social functioning. *American journal of preventive medicine*, *30*(6), 458-466.
10. Levendosky, A. A., & Graham-Bermann, S. A. (2018). Trauma and parenting in battered women: An addition to an ecological model of parenting. In *Children exposed to domestic violence* (pp. 25-35). Routledge.
11. Levendosky, A. A., & Graham-Bermann, S. A. (2001). Parenting in battered women: The effects of domestic violence on women and their children. *Journal of family violence*, *16*, 171-192.
12. Yount, K. M., DiGirolamo, A. M., & Ramakrishnan, U. (2011). Impacts of domestic violence on child growth and nutrition: a conceptual review of the pathways of influence. *Social science & medicine*, *72*(9), 1534-1554.
13. Stephenson, R., Koenig, M. A., Acharya, R., & Roy, T. K. (2008). Domestic violence, contraceptive use, and unwanted pregnancy in rural India. *Studies in family planning*, *39*(3), 177-186.
14. Cheng, D., Schwarz, E. B., Douglas, E., & Horon, I. (2009). Unintended pregnancy and associated maternal preconception, prenatal and postpartum behaviors. *Contraception*, *79*(3), 194-198.
15. Wyman, P. A., Moynihan, J., Eberly, S., Cox, C., Cross, W., Jin, X., & Caserta, M. T. (2007). Association of family stress with natural killer cell activity and the frequency of illnesses in children. *Archives of pediatrics & adolescent medicine*, *161*(3), 228-234.
16. Shay-Zapien, G., & Bullock, L. (2010). Impact of intimate partner violence on maternal child health. *MCN: The American Journal of Maternal/Child Nursing*, *35*(4), 206-212.
17. Kitzmann, K. M., Gaylord, N. K., Holt, A. R., & Kenny, E. D. (2003). Child witnesses to domestic violence: a meta-analytic review. *Journal of consulting and clinical psychology*, *71*(2), 339.
18. Herrenkohl, T. I., Sousa, C., Tajima, E. A., Herrenkohl, R. C., & Moylan, C. A. (2008). Intersection of child abuse and children's exposure to domestic violence. *Trauma, Violence, & Abuse*, *9*(2), 84-99.
19. Rico, E., Fenn, B., Abramsky, T., & Watts, C. (2011). Associations between maternal experiences of intimate partner violence and child nutrition and mortality: findings from Demographic and Health Surveys in Egypt, Honduras, Kenya, Malawi and Rwanda. *Journal of epidemiology & community health*, *65*(4), 360-367.
20. Åsling‐Monemi, K., Tabassum Naved, R., & Persson, L. Å. (2008). Violence against women and the risk of under‐five mortality: analysis of community‐based data from rural Bangladesh. *Acta Paediatrica*, *97*(2), 226-232.
21. Ackerson, L. K., & Subramanian, S. (2008). Domestic violence and chronic malnutrition among women and children in India. *American journal of epidemiology*, *167*(10), 1188-1196.
22. Ellsberg, A. M. K. P. R. (2003). MC. Persson LA Violence against women increases the risk of infant and child mortality: a case-referent study in Nicaragua. *Bull World Health Organ*, *81*, 10-16.
23. Åsling-Monemi, K., Naved, R. T., & Persson, L. Å. (2009). Violence against women and increases in the risk of diarrheal disease and respiratory tract infections in infancy: a prospective cohort study in Bangladesh. *Archives of pediatrics & adolescent medicine*, *163*(10), 931-936.
24. Karamagi, C. A., Tumwine, J. K., Tylleskar, T., & Heggenhougen, K. (2007). Intimate partner violence and infant morbidity: evidence of an association from a population-based study in eastern Uganda in 2003. *BMC pediatrics*, *7*(1), 1-9
25. Rosen, D., Seng, J. S., Tolman, R. M., & Mallinger, G. (2007). Intimate partner violence, depression, and posttraumatic stress disorder as additional predictors of low birth weight infants among low-income mothers. *Journal of Interpersonal Violence*, *22*(10), 1305-1314.
26. Hasselmann, M. H., & Reichenheim, M. E. (2006). Parental violence and the occurrence of severe and acute malnutrition in childhood. *Paediatric and perinatal epidemiology*, *20*(4), 299-311.
27. Åsling-Monemi, K., Naved, R. T., & Persson, L. Å. (2009). Violence against women and the risk of fetal and early childhood growth impairment: a cohort study in rural Bangladesh. *Archives of disease in childhood*, *94*(10), 775-779.
28. Pasricha, S. R., & Biggs, B. A. (2010). Undernutrition among children in south and south‐east Asia. *Journal of paediatrics and child health*, *46*(9), 497-503.
29. Amarya S, Singh K, Sabharwal M. Changes during aging and their association with malnutrition. Journal of Clinical Gerontology and Geriatrics. 2015 Sep 1;6(3):78-84.
30. Onis MD, Frongillo EA, Blössner M. Is malnutrition declining? An analysis of changes in levels of child malnutrition since 1980. Bulletin of the world health Organization. 2000;78(10):1222-33.
31. Khan AA, Bano N, Salam A. Child malnutrition: an overview of trends, issues, and policy prescriptions. Vikalpa. 2006 Oct;31(4):81-92.
32. Khan NC, Khoi HH. Double burden of malnutrition: the Vietnamese perspective. Asia Pacific journal of clinical nutrition. 2008 Mar 2;17.
33. Chowdhury MR, Rahman MS, Khan MM, Mondal MN, Rahman MM, Billah B. Risk factors for child malnutrition in Bangladesh: a multilevel analysis of a nationwide population-based survey. The Journal of pediatrics. 2016 May 1;172:194-201.
34. Rahman MA, Halder HR, Rahman MS, Parvez M. Poverty and childhood malnutrition: Evidence-based on a nationally representative survey of Bangladesh. PLoS One. 2021 Aug 23;16(8):e0256235.
35. Rahman MS, Mushfiquee M, Masud MS, Howlader T. Association between malnutrition and anemia in under-five children and women of reproductive age: Evidence from Bangladesh Demographic and Health Survey 2011. PloS one. 2019 Jul 3;14(7):e0219170.
36. Roy SK, Fuchs GJ, Mahmud Z, Ara G, Islam S, Shafique S, Akter SS, Chakraborty B. Intensive nutrition education with or without supplementary feeding improves the nutritional status of moderately malnourished children in Bangladesh. Journal of Health, Population and Nutrition. 2005 Dec 1:320-30.
37. Jain A, Rodgers J, Kim R, Subramanian SV. The relative importance of households as a source of variation in child malnutrition: a multilevel analysis in India. International journal for equity in health. 2021 Dec; 20:1-1.
38. Karra M, Subramanian SV, Fink G. Height in healthy children in low-and middle-income countries: an assessment. The American Journal of Clinical Nutrition. 2017 Jan 1;105(1):121-6.