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linking maternal work status with child nutrition and morbidity in rural Bangladesh: A multifactorial Analysis

Tanha Siddika Lisa*[1], Maher Afrose[2], Kaushtav Mallick Kabya[2], Ashiqur Rahman[3], Asif Mohammad Abdullah[4], Farhana Ferdaus[5]

[1] *Department of Biochemistry, Medical College for Women & Hospital, Uttara, Dhaka*
[2] *Shaheed M Monsur Ali Medical College Hospital, Sirajganj*
[3] *Department of Medicine, Holy Family Red Crescent Medical College Hospital, Dhaka*
[4] *Department of Medicine, Bangladesh Specialized Hospital, Dhaka*
[5] *Department of Community Medicine and Public Health, Khulna City Medical College, Khulna*

ABSTRACT: ***Background:*** In rural Bangladesh, the increasing participation of women in the labor force—particularly in the garment sector—raises important concerns about child health and nutrition. The dual burden of work and caregiving may adversely affect child well-being, especially in low-income households. This study aims to examine the association between maternal work status and child nutritional outcomes and morbidity in selected rural areas of Gazipur District. ***Methods:*** A cross-sectional study was conducted from September 2024 to February 2025 among 250 working mothers and their 261 children across 300 households in six unions of Kaliakair Upazila, Gazipur. Data were collected using structured, interviewer-administered questionnaires, along with anthropometric measurements of children. Variables included maternal age, education, working hours, socioeconomic status (SES), exclusive breastfeeding history, and recent child illnesses. Nutritional status was assessed using WHO growth standards. Descriptive statistics, chi-square tests, and multivariable logistic regression were applied to identify factors associated with undernutrition. ***Results:*** Most mothers (52%) were aged 24–29 years and nearly 73% had education up to SSC or HSC level. Approximately 72.8% of children had a history of exclusive breastfeeding, while 53.3% had experienced at least one illness episode in the past three months. Nearly 47.5% of children were undernourished—18.4% stunted, 16.9% underweight, and 12.3% wasted. A statistically significant relationship was observed between maternal working hours and child nutritional status (p=0.001), with the prevalence of undernutrition rising to 56.7% among children of mothers working more than 10 hours daily. Multivariable analysis revealed that extended working hours (AOR=2.45, p=0.003), lack of exclusive breastfeeding (AOR=1.75, p=0.031), recent illness (AOR=1.88, p=0.016), and lower socioeconomic status (AOR=1.96, p=0.017) were independently associated with child undernutrition. ***Conclusion:*** Maternal work status—particularly long working hours—has a significant impact on child nutrition and morbidity in rural Bangladesh. Children of working mothers from lower socioeconomic backgrounds face a heightened risk of undernutrition and illness.

Keywords: Maternal Employment, Child Nutrition, Undernutrition, Exclusive Breastfeeding, Child Morbidity, Rural Bangladesh, Garment Workers, Socioeconomic Status.

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***Corresponding Author:**
Dr. Tanha Siddika Lisa

INTRODUCTION

Reducing infant and child mortality remains a cornerstone of global development efforts. One of the Millennium Development Goals (MDGs) was to reduce the under-five mortality rate by two-thirds by the year 2015 [1-3]. This target highlights the importance of early-life health as a foundation for long-term human capital development. Well-nourished children are not only more likely to excel academically but also to grow into healthy adults, actively participate in the labor force, and provide better care for the next generation [2, 4]. In Bangladesh, despite progress,

the under-five mortality rate remains a public health concern, with an estimated 65 deaths per 1,000 live births, of which 57% are neonatal deaths, as reported in the Bangladesh Demographic and Health Survey (BDHS) 2007 [1]. Regardless of cultural or economic context, mothers are universally recognized as the primary agents of child health, nutrition, and education. Numerous studies have consistently shown that higher levels of maternal education are associated with lower child mortality and better nutritional outcomes. Educated mothers are more likely to adopt appropriate feeding practices, recognize early signs of illness, and seek timely medical care, including immunizations [5, 6].

Maternal education is widely recognized as a pivotal determinant of child health and survival. According to the World Bank (1993), maternal education plays a crucial role in reducing infant mortality and improving overall child health outcomes [6]. Numerous studies have consistently shown that mothers' education has a stronger and more direct impact on child health than fathers' education, as educated mothers are more likely to access health services, follow medical advice, and adopt appropriate feeding and hygiene practices [7-9]. Beyond knowledge acquisition, education empowers women by enhancing decision-making capacity, delaying early marriage, reducing fertility, and increasing household income [10-14]. Globally, malnutrition among children aged 0–12 years remains alarmingly prevalent, with an estimated 149 million children stunted, 45 million wasted, and 37 million overweight [15-17]. This enduring public health challenge disproportionately affects vulnerable populations, particularly those in lower socioeconomic strata [18, 19]. Evidence indicates that children under five and school-aged children are commonly affected by multiple forms of malnutrition, including stunting, wasting, underweight, overweight, obesity, and micronutrient deficiencies [20-22]. Malnutrition impairs physical growth and cognitive development and significantly increases childhood morbidity and mortality [23-25]. Key determinants of undernutrition in children include suboptimal infant and young child feeding practices, household food insecurity, poor dietary diversity, limited access to health services, and low maternal education [26-28].

Moreover, non-nutritional factors such as maternal workload, insufficient caregiving time, weak family support systems, and early reliance on processed or ready-to-eat foods further exacerbate poor nutritional outcomes in children [29, 30]. Adequate nutrition and responsive caregiving are central to child survival, growth, and development. These are primarily maternal responsibilities, yet a mother's ability to provide optimal care is shaped by several interrelated factors, including her educational level, health status, workload, autonomy in household decision-making, and access to social support [31, 32]. In South Asia, many women exit the labor force after childbirth due to caregiving responsibilities. Those who remain employed—especially women from low-income backgrounds—often work in informal sectors that lack maternity benefits, job security, or childcare support, thereby placing additional strain on both maternal and child health [33]. Nonetheless, maternal employment can have positive effects as well. A woman's income can enhance household food security, improve access to nutritious foods, and support child health services, provided the employment is stable, adequately paid, and accompanied by support systems [19, 20]. However, the competing demands of employment and childcare often induce psychosocial stress in working mothers [22]. Furthermore, reduced maternal time availability due to employment has been linked to inadequate child feeding and supervision, ultimately leading to adverse nutritional outcomes in children [25, 26]. The relationship between maternal employment and child health is therefore complex and context-dependent. It is shaped by multiple mediating factors such as job type, employer policies, maternal earnings, and household support systems [22]. Understanding these dynamics is critical for designing policies that protect child nutrition while empowering women economically. This study aims to explore the multifactorial relationship between maternal employment and child nutritional status and illness, identifying key

socioeconomic and caregiving factors affecting child health outcomes in rural settings.

METHODOLOGY

This cross-sectional study was conducted between September 2024 and February 2025 in Kaliakair Upazila of Gazipur District, Bangladesh. Data were purposively collected from 300 households across six unions—Latabaha, Fulbaria, Madhyapara, Mouchak, Sreefaltali, and Sutrapur—to reflect both rural and semi-industrial populations in the region. A total of 250 working mothers aged 18 years and above were included, along with data on 261 of their children. Most of the mothers were employed in the garment industry, while others worked as day laborers or school teachers. Participants typically had one to three children and belonged to lower-middle or middle socioeconomic classes. The majority had completed secondary to higher secondary education. Households were selected purposively with assistance from local health workers and community leaders. Eligible participants were working mothers with at least one child residing in the household. Data collection was conducted through face-to-face interviews using a structured, pre-tested questionnaire in Bangla. The questionnaire gathered detailed information on maternal socio-demographic background, employment type and workload, education, caregiving practices, and household living conditions. Child health and nutrition data included reported morbidity within the previous two weeks (such as diarrhea, fever, and respiratory infections) and anthropometric measurements. Children's weight, height/length, and mid-upper arm circumference (MUAC) were measured using standard procedures. WHO growth standards were applied to compute Z-scores for weight-for-age, height-for-age, and weight-for-height to assess undernutrition. Descriptive statistics were used to summarize maternal and child characteristics. Associations between maternal work status and child health or nutritional outcomes were examined using chi-square tests and independent t-tests. Multivariable logistic regression models were employed to adjust for confounding variables such as maternal education, parity, socioeconomic status, and sanitation facilities. Privacy and confidentiality were maintained throughout the research process, and all data were anonymized before analysis.

RESULTS

Table 1: Socio-Demographic Characteristics of Working Mothers (n = 250)

Variable	Category	n	%
Age of Mother (years)	18–23	55	22.0
	24–29	130	52.0
	30–35	65	26.0
Education Level	Secondary (Class 6–9)	42	16.8
	SSC Pass	110	44.0
	HSC Pass	73	29.2
	Graduation and above	25	10.0
Socioeconomic Status	Lower	88	35.2
	Lower-middle	118	47.2
	Middle	44	17.6
Working Hours per Day	≤ 8 hours	68	27.2
	9–10 hours	122	48.8
	> 10 hours	60	24.0
Number of Children	1 child	240	96.0
	2–3 children	10	4.0

Table 1 shows that most mothers (52%) were aged 24–29 years, and nearly three-fourths (73.2%) had education up to SSC or HSC level. Around 47.2% of households belonged to the lower-middle-class group. Almost half of the participants worked 9–10 hours daily, and the vast majority had only one child.

Table 2: Characteristics of Children (n = 261)

Variable	Category	n	%
Age of Child (months)	1–12	40	15.3
	13–24	65	24.9
	25–36	70	26.8
	37–48	55	21.1
	49–60	31	11.9
Exclusive Breastfeeding History	Yes	190	72.8
	No	71	27.2
Disease History (Last 3 Months)	Yes (≥1 illness episode)	139	53.3
	No	122	46.7
Nutritional Status (WHO Z-scores)	Normal	137	52.5
	Stunted	48	18.4
	Underweight	44	16.9
	Wasted	32	12.3

Table 2 describes the child characteristics. A large portion of children (26.8%) were aged 25–36 months. Around 73% had a history of exclusive breastfeeding, and over half (53.3%) experienced at least one illness episode—such as diarrhea, respiratory infection, or fever—within the past three months. Nearly half of the children were affected by undernutrition, with 18.4% stunted, 16.9% underweight, and 12.3% wasted.

Table 3: Association Between Maternal Working Hours and Child Undernutrition (n = 250)

Working Hours	Undernourished Children (n, %)	Well-nourished Children (n, %)	Chi-square (χ^2)	p-value
≤ 8 hours (n=68)	18 (26.5%)	50 (73.5%)		
9–10 hours (n=122)	50 (41.0%)	72 (59.0%)	13.28	0.001
> 10 hours (n=60)	34 (56.7%)	26 (43.3%)		

Table 3 shows a statistically significant association between maternal working hours and child nutritional status ($\chi^2 = 13.28$, $p = 0.001$). The proportion of undernourished children increased as maternal working hours rose, from 26.5% in those working ≤8 hours to 56.7% in those working more than 10 hours daily.

Table 4: Multivariable Logistic Regression of Predictors of Child Undernutrition (n = 250)

Variable	Adjusted Odds Ratio (AOR)	95% Confidence Interval (CI)	p-value
Working >10 hrs vs. ≤8 hrs	2.45	1.35–4.44	**0.003**
9–10 hrs vs. ≤8 hrs	1.68	1.01–2.81	0.047
Lower SES vs. Middle	1.96	1.13–3.38	**0.017**
Not exclusively breastfed	1.75	1.05–2.91	**0.031**

Recent illness in child	1.88	1.12–3.14	**0.016**
Mother's education ≤SSC vs. ≥HSC	1.43	0.84–2.45	0.19

Table 4 states that children of mothers working more than 10 hours had significantly higher odds of undernutrition (AOR = 2.45, p = 0.003). Children with no history of exclusive breastfeeding and those who experienced recent illness also had a significantly higher risk. Lower socioeconomic status remained an independent predictor of undernutrition. Maternal education was not statistically significant after adjustment.

DISCUSSION

This study examined the association between maternal work status and child nutrition and morbidity among 250 working mothers and 261 children in six unions of Kaliakair Upazila, Gazipur. The findings reveal that children of working mothers, particularly those engaged in labor-intensive occupations with long working hours, are at significantly higher risk of undernutrition and illness. Nearly half (47.5%) of the children in this study were undernourished: 18.4% were stunted, 16.9% were underweight, and 12.3% were wasted. These rates are notably higher than the national averages reported in the Bangladesh Demographic and Health Survey 2022, which documented stunting at 24%, underweight at 18%, and wasting at 8% among children under five years [34]. The higher burden observed here may be attributed to the dual challenges faced by working mothers in low-income rural settings, including limited time for child care, inadequate complementary feeding, and insufficient health monitoring.

A significant association was found between maternal working hours and child nutritional outcomes (p=0.001). Among mothers working more than 10 hours per day, 56.7% of their children were undernourished, compared to 41.0% and 26.5% for those working 9–10 hours and ≤8 hours, respectively. This trend aligns with findings from similar studies in South Asia, where maternal workload has been shown to limit time available for breastfeeding and child feeding practices, adversely impacting nutritional outcomes [5, 20, 22]. Multivariable logistic regression confirmed that longer maternal working hours (>10 hours/day) increased the odds of undernutrition by 2.45 times (AOR=2.45; 95% CI: 1.35–4.44; p=0.003). Additionally, children who were not exclusively breastfed had 1.75 times higher odds of being undernourished (p=0.031). This finding reinforces evidence from prior studies showing that early cessation or lack of exclusive breastfeeding is a major risk factor for child undernutrition and infections [24, 26]. Recent illness history in the last three months was reported in 139 children (53.3%) and was also independently associated with undernutrition (AOR=1.88; p=0.016). This reflects the well-established bidirectional relationship between infection and malnutrition, where one reinforces the other [27, 28]. Moreover, socioeconomic status significantly influenced outcomes: children from lower SES households had nearly twice the risk of being undernourished (AOR=1.96; p=0.017), consistent with global and national research linking poverty with poor dietary diversity, limited health access, and food insecurity [29-69]. Interestingly, maternal education, though significant in bivariate analysis, lost significance in multivariable modeling (p=0.19), suggesting that structural barriers like income, job demands, and health access may have stronger influences in this context than education alone. Overall, this study adds to the growing body of literature emphasizing the need for targeted policies to support working mothers—especially in sectors like garments—through provision of workplace-based child care, nutrition counseling, and flexible working conditions. Government and NGO initiatives could play a key role in improving child outcomes by integrating maternal employment considerations into rural health and nutrition programs.

CONCLUSION

This study highlights a strong association between maternal work status and child undernutrition and morbidity in rural Bangladesh.

Children of mothers working long hours, especially in the garment sector, were significantly more likely to be undernourished and experience illness. Key risk factors included extended working hours, lack of exclusive breastfeeding, recent illness, and lower socioeconomic status. These findings underscore the urgent need for supportive workplace policies, community-based nutrition programs, and accessible child care services to mitigate the health risks faced by children of working mothers in low-income rural settings.

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