Introduction

Child malnutrition is a pressing global issue, accounting for 45% of deaths among children under five (UNICEF, 2020). Although reductions in child stunting have occurred over the past decade, progress remains insufficient to achieve the 2025 World Health Assembly nutrition targets and the 2030 Sustainable Development Goals (UNICEF/WHO/World Bank Group, 2023). Worldwide, one in three children still lacks essential nutrients, particularly during the first 1,000 days of life. While much of the existing research focuses on anthropometric failures, child dietary diversity has received less attention. Adequate dietary diversity and meal frequency are crucial for early childhood development and improved anthropometric outcomes.

In India, the situation is particularly concerning. NFHS (2019-21) data indicate that only 23% of children aged 6-23 months meet the minimum dietary diversity, with high rates of stunting, wasting, and underweight children. Women's employment is a key determinant of child nutrition, as it fosters empowerment, decision-making, and improves childcare (Gillespie et al., 2019). Despite a 9.5 percentage point increase in the past five years, India's female labor force participation remains low at 32% (MOSPI, 2021-22). This study uses NFHS (2019-21) data to explore the relationship between women's employment and child dietary diversity, building on previous research linking food insecurity to economic and policy issues.

Theoretical Focus

This study investigates the complex relationship between women's employment and child dietary diversity in India, a country where child malnutrition remains high despite economic growth and food surpluses. The research examines three main pathways through which women's employment can affect dietary diversity: the income effect, the substitution effect, and the empowerment effect.

The income effect posits that when women engage in paid work, household income increases, improving access to diverse and nutritious foods. Prior research, particularly among low-income households, has found a positive link between women's employment and dietary diversity (Komatsu et al., 2018; Seymour et al., 2019). Women in agricultural roles further enhance food quality within households (Kadiyala et al., 2014; Rao & Raju, 2020). Conversely, the substitution effect highlights a potential drawback where increased work hours may lead to time trade-offs between paid work and domestic duties, potentially lowering meal quality (Zhang et al., 2023).

This is especially prominent in agricultural households during peak seasons (Vemireddy & Pingali, 2021). Lastly, the empowerment effect suggests that employment boosts women's decision-making power within the household, positively influencing dietary diversity (Komakech et al., 2022; Santoso et al., 2019). Given the declining female labor force participation in India (Mehrotra & Parida, 2017), this study explores these nuanced relationships using nationally representative data.

Data and Methods

This study uses data from the fifth round of the National Family Health Survey (NFHS, 2019-21) and district-level unemployment rates from the Periodic Labor Force Survey (2019-20). District-level literacy rates are calculated using NFHS data, with both aggregate measures assigned to individuals within each district. Child dietary diversity is assessed using three indicators: Minimum Acceptable Diet (MAD), Minimum Meal Frequency (MMF), and Minimum Dietary Diversity (MDD) for children aged 6-23 months. The key explanatory variable is the mother's employment status, controlling for household composition, woman's education, age, and other socioeconomic characteristics. To address potential endogeneity, the study employs a Control Function Approach using Instrumental Variables. Post-estimation tests for endogeneity and instrument validity are conducted, and robustness checks are performed using Probit and Two-Stage Least Squares models, with robust standard errors used to control for heteroscedasticity.

Findings

The employment of women has a significant positive effect on MDD (0.222) and MAD (0.188). This indicates that children whose mothers are employed are more likely to receive diverse diets and meet the minimum acceptable dietary standards. For MMF, the effect is positive (0.12) but not statistically significant, suggesting that employment might not directly influence the meal frequency as strongly as dietary diversity. Decision-making power, particularly in making two or more decisions jointly with the husband, positively affects MMF and dietary diversity, highlighting women's empowerment in household decisions as important. The Inverse-Mills ratio is significant for MDD (-0.101) and MAD (-0.08), suggesting the need to account for selection bias in the model. This signifies that unobserved factors affecting women's employment also play a role in child dietary diversity and adequacy. The results demonstrate that women's employment is significantly associated with improved child dietary diversity and acceptable diets, though its impact on meal frequency is less clear. Wealth, education, and regional factors also play critical roles. Importantly,

the findings emphasize the multifaceted influence of women's status, decision-making power, and socio-economic characteristics on child nutrition.

Table 1: Marginal Effects from Probit Model Using Control Function Approach: Women's Employment and Child Dietary Diversity

Explanatory Variables	Child Dietary Diversity (dy/dx)		
	MDD	MMF	MAD
Women's Employment			
No®/Yes	0.222*** (0.084)	0.12 (0.086)	0.188** (0.085)
Birth order			
One®/Two	0.055*** (0.012)	0.058*** (0.014)	0.034*** (0.009)
Three or more	0.023 (0.014)	0.059*** (0.016)	0.014 (0.011)
Child's Sex			
Male®/female	-0.002* (0.009)	-0.005 (0.01)	-0.002 (0.007)
Mother's Age			
Below 19 years®/20to30	0.008 (0.024)	-0.015 (0.027)	0.004 (0.019)
Above 30 years	0.051* (0.028)	-0.04 (0.031)	0.016 (0.021)
Mother's Education			
No Education®/Primary	-0.004 (0.017)	0.01 (0.019)	0.005 (0.013)
Secondary	0.007 (0.013)	0.008 (0.015)	-0.003 (0.01)
Higher	0.038** (0.018)	0.031 (0.02)	0.015 (0.014)
Wealth			
Poorest®/Poorer	0.007 (0.013)	0.006 (0.015)	0.023** (0.01)
Middle	0.034** (0.015)	0.031* (0.017)	0.042*** (0.011)
Richer	0.062*** (0.017)	0.047** (0.018)	0.045*** (0.013)
Richest	0.087*** (0.021)	0.086*** (0.022)	0.084*** (0.017)
Place of Residence			
Urban®/Rural	0.006 (0.012)	0.007 (0.014)	0.002 (0.009)
Caste			
Others®/SC	0.019 (0.012)	0.012 (0.013)	0.01 (0.009)
ST	0.065*** (0.015)	0.028* (0.016)	0.036*** (0.012)
Religion			
Hindus®/Muslims	0.05*** (0.015)	-0.025 (0.016)	0.015 (0.012)
others	0.042** (0.018)	0.008 (0.02)	0.011 (0.013)

Number of Decisions Made Alone or Jointly with Husband			
None®/One	-0.01 (0.02)	0.048** (0.022)	-0.002 (0.015)
Two	0.02 (0.018)	0.062*** (0.02)	0.022 (0.014)
Three	0.005 (0.013)	0.039*** (0.014)	0.015 (0.01)
Inverse Mills Ratio	-0.101** (0.049)	-0.064 (0.055)	-0.08** (0.038)
Number of Observations	9,271	9,271	9,271

Note: p<0.01***, p<0.05**, p<0.1*. In Parentheses, are Standard Errors.

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