Nutritional Status of Children in India and SDGs:

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Abstracts:- Despite economic growth in India having recently been achieved to a greater extent than previously, the fruits of development have failed to improve the nutritional status of the country's children. Adequate nutrition is required during infancy and early childhood for the physical growth and mental and cognitive development of children to their potential level. Deficit nutrition leads to short-term and long-term effects like mental impairment, reduced intellect, and lower productivity. Moreover, nutritional status is also inversely related to the child mortality rate; as nutritional status is increased, it leads to a lower child mortality rate. However, many factors affect the nutritional status of children, like economic factors, political factors, social factors, environmental factors, and so on, but parental factors play a crucial role in determining the nutritional status of children in India. The study's first objective will show the status of child malnutrition in India; the second will explain how parental factors influence the nutritional status of children in India; and the third will examine whether India has achieved Sustainable Development Goals (SDG goal 2). The present study will employ secondary data like the NFHS-5 (2019-21).

I. INTRODUCTION

Despite recent economic growth in India, the development benefits have failed to enhance the country's children's nutritional status. India is a classic South-Asian case, embodying the cliché of the "Asian Enigma," in which progress on childhood malnutrition appears to have stalled, with the country lagging well behind other Asian countries with similar economic growth rates. Malnutrition is defined as any discrepancy between the nutrients the body requires and the supplements it obtains, and it can manifest as either under-or over-nutrition (Das, 2010). Child nutrition has long been viewed as a social issue connected to children's rights. However, it was eventually determined that the issue was more economical. Childhood malnutrition results in eloquent losses later in adolescence and adulthood. When considering the advancement of human growth, excellent health and nutrition are fundamentally desirable because they contribute to developing physical and cognitive abilities. Child malnutrition increases a child's vulnerability to several infections and retards recovery, resulting in a significant disease burden in underdeveloped nations (Murray & Lopez, 1997). Inadequate nutrition also raises the incidence of non-communicable diseases, driving up the cost of health care. Malnutrition is responsible for about half of all child deaths under five worldwide. Each year, it results in the deaths of three million children. According to a World Bank estimate, child malnutrition contributes to 22% of the disease burden among children in India (World Bank, 2015). Child health, malnutrition, and immunization are major national and international concerns to combat child mortality and morbidity (Abhisek et al., 2011). Child malnutrition can be caused by three basic factors: stunting (in terms of height or age), being underweight (in terms of weight for age), and wasting (weight for height). According to the World Health Organization's standards, malnutrition can be categorized into protein energy malnutrition (PEM) and micronutrient deficiencies (MND). PEM usually manifests itself between the ages of 6 months and 2 years due to intermittent or absent breastfeeding, the introduction of low-protein meals, and various diseases (FAO, WHO, 2004). There are visible indicators of malnutrition, including underweight, stunting, and wasting. A lack of proper nutrition immediately preceding the survey is called "wasting." It could result from insufficient food intake or a recent illness that has resulted in weight loss and the development of malnutrition in the individual concerned.

The WAZ ratio of children under minus three SD from the reference population median is classed as highly wasted. In contrast, the WAZ ratio of children under minus two standard deviations from the reference population median is categorized as wasted. The HAZ index measures growth retardation, both linear and cumulative. Stunted children are those whose HAZ Z-score is less than negative (-2 SD) from the reference population median. For an extended time, these children are malnourished and stunted. The same is true if the Z score is less than or equal to three standard deviations (-3SD), in which case the child is categorized as severely stunted. Chronic illness and repeated malnutrition contribute to stunting, resulting from insufficient nutrition over an extended period. In addition to the height-for-age and weight-for-height indices, a weight-for-age index is calculated.

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Acute malnutrition as well as chronic malnutrition, are taken into consideration. Weight-for-age underweight children are defined as those whose weight-for-age is less than minus two standard deviations below the median of the reference population. The associated z scores are calculated by taking the median of the reference population. It is often quantified using specialized software, such as ANTHRO, available from the World Health Organization.

In this context, the current study evaluates the trajectory and pattern of child malnutrition in all Indian states, as well as the consequences of this malnutrition on the child mortality rate and the age groups that are more vulnerable to different types of anthropometrics. Although the malnutrition problem cannot be solved overnight, it may be addressed by becoming aware of and addressing the three anthropometric indicators of malnutrition, which include stunting (height or age), underweight (weight for age), and wasting (weight for height).

II.   REVIEW OF LITERATURE

Child malnutrition is directly affected by the mother's nutritional condition and the child's feeding habits (Menon et al., 2018). A mother's nutritional status is intrinsically related to that of her child, as has been well proven (Coffey 2015 et al., 2018), and her nutritional condition is a significant predictor of the child's survival, as has been well proven (Coffey, 2015 et al., 2018). Health and malnutrition are passed down through generations due to poor maternal health and nutrition. Low birth weight and malnutrition during pregnancy result in insufficient breastfeeding length, which results in child malnutrition (Delisle, 2008). (Black et al., 2013). Breastfeeding duration significantly impacts malnutrition, infant mortality rates, and other outcomes (Banerjee, 2018; Binns & Lee, 2014).

Although undernutrition is more widespread among adult females, actions should be taken to ascertain the root causes of that population's malnutrition (Mamta et al., 2016). In rural India, there is a chance of a greater rate of infant deaths among same-sex children due to a high rate of stunting and a lack of immunization. On the other hand, in the case of the opposite sex, stunting is minimal, and immunization is high, resulting in a low newborn death rate (Rohini et al., 2003). In addition to that, a multilevel logistic regression analysis based on a 2011 survey in Bangladesh (Chowdhury et al., 2016) explored child malnutrition's significant influences on age, the child's gender, the mother's BMI, the mother's educational status, the father's educational status, the child's place of residence, socioeconomic status, community status, religion, region of residence, and food security. Poor socioeconomic and communal status children were more likely to suffer from malnutrition. Mothers' educational level correlates closely with their children's nutritional status and mortality indices. Although there is a growing body of evidence indicating that children's nutritional, health, and educational status improves with their parent's education level, mainly their mothers' (Cumming, 2013; Gulati et al., 2012), there is also evidence indicating that mortality rates decrease with

mothers' (Khan & Mohanty, 2018; Menon et al., 2018; Bora and Saikia, 2018). Females with higher levels of education have fewer and healthier pregnancies, and they are also more likely to raise their children to be educated and productive adults, resulting in a more stable and healthy society (UNICEF, 2007). In 2015-16, approximately 69% of women were literate, up from 43.3 percent in 1992–1993, demonstrating the high priority placed on education by various state-supported initiatives. Women's educational attainment has improved at the primary, secondary, and tertiary levels. 20. The proportions of underweight and stunted children under the age of five and child mortality rates are depicted in Figure 13 below by women's educational level. According to Shaili Vyas, S. D. Kandpal, and Jayanti Semwal, a survey in Dehradun in 2011 indicated that the majority of moms (41.20 percent) were illiterate and that 73.30 percent of these mothers had undernourished children. Among our study participants, most mothers (92.20 percent) were housewives or jobless. In comparison, the highest rate of undernutrition (88.46 percent) was identified in children whose mothers worked as unskilled laborers, whereas children of housewives were only 59.22 percent undernourished. Therefore, maternal occupational status is significantly associated with the nutritional status of children in India.

➤ *Significance of the Study*

Human beings require good health to engage in any activity that requires them to move around. According to health economics, child health is essential throughout a child's life since it is the "first period of sustainable achievements in health" that lasts a person's entire life. It implies that we should be aware of the anthropometric outcome of children and the things that influence them. After conducting a study of the literature, I discovered that very few studies had been done that have linked child malnutrition with parental factors that influence the nutritional status of children in India, which are extremely important in improving the nutritional status of children in India.

➤ *Objective of the Study*

- *To examine the nutritional status of children in India*
- *To explain whether India achieved the SDGs target or not.*
- *To evaluate the impact of parental factors on child malnutrition in India.*

III.   DATA AND METHODOLOGY

The present study will employ secondary data like the third and fourth rounds of the national family household surveys (NFHS-IV & NFHS-V). The National Family House Survey (NFHS) is a large-scale, multi-round survey conducted in a randomly selected sample of Indian households. The current study will be analytical in nature and descriptive in scope. However, Excel and STATA software will be utilised to do this research.

A. Trends of Child Malnutrition Among Children In India.

It is undeniable that, despite increasing government attention, legislation, and initiatives, India has failed to witness a significant reduction in the incidence of child malnutrition. Several essential elements, including social and economic circumstances, environment, and parental characteristics cause child malnutrition. In 2021, 32.11 percent of children under five in India were underweight, 35.47 percent were stunted, and percent were wasting. As a result, India is home to over one-third of the world's stunted children.

Table 1 Scenario of Nutritional Status of Children Under Five in India

States	Stunting		Wasting		Underweight	
	2016	2021	2016	2021	2016	2021
Andhra Pradesh	31.40	31.16	17.16	16.06	31.85	29.58
Assam	36.41	35.29	17.02	21.73	29.83	32.80
Bihar	**48.32**	**42.95**	20.82	22.89	43.85	**40.99**
Chandigarh	28.60	25.30	10.86	8.41	24.48	20.56
Chhattisgarh	37.61	34.60	23.07	18.88	37.70	31.34
Goa	20.07	25.77	21.89	19.12	23.83	24.02
Gujarat	38.45	39.02	26.44	25.10	39.31	39.70
Haryana	33.99	27.49	21.21	11.53	29.41	21.54
Jharkhand	45.29	39.58	**28.99**	22.41	**47.82**	39.42
Karnataka	36.16	35.43	26.07	19.52	35.23	32.88
Kerala	20.0	**23.41**	15.72	15.75	**16.10**	19.61
Madhya Pradesh	42.00	35.67	25.76	18.95	42.79	32.91
Maharashtra	34.43	35.24	25.55	**25.60**	35.96	36.04
Delhi	31.85	30.87	15.93	11.24	27.00	21.71
Odisha	34.14	31.01	20.35	18.06	34.41	29.59
Punjab	25.71	24.49	15.62	10.57	21.64	**16.87**
Rajasthan	39.11	31.78	22.98	16.77	36.72	27.56
Tamil Nadu	27.14	25.04	19.69	14.61	23.76	21.99
Uttar Pradesh	46.25	39.71	17.88	17.32	39.47	32.07
Uttarakhand	33.50	27.00	19.49	13.18	26.58	21.04
West Bengal	32.51	33.87	20.28	20.33	31.55	32.34
Indian average	**38.41**	**35.47**	**21.04**	**19.26**	**35.75**	**32.11**

(Source: Authors calculation from NFHS-4 and NFHS-5)

The statistics show that the trend in malnutrition has been decreasing over time. However, it has not yet reached the level that is required. The rate of stunted children has decreased somewhat from 38.41 percent to 35.47 percent, according to data from the National Family Household Survey (NFHS). The level of stunting has improved in all states, but not to the extent that the central government would like. Stunting rates are highest in Bihar, followed by Jharkhand, Uttar Pradesh, and Gujarat at 42.95 percent, 39.64 percent, 39.58 percent, and 39.04 respectively, compared to 48.32 percent, 45.29 percent, 46.25 and 38.45 percent previously. On the other hand, Kerala has the lowest stunting rate, at 23.36 percent in the fifth round of the NFHS, compared to 20.0 percent in the fourth round.

Meanwhile, being underweight is a problem connected with malnutrition that is particularly difficult to manage. Today's culture considers the majority of children to be underweight. The lack of sufficient prenatal care is the primary cause of this anthropometric abnormality. Even though the percentage of underweight people has dropped from 35.75 percent to 32.11 percent, it has not yet reached the target level. However, if we see the malnutritional child level in India, Punjab (16.87 percent) has the lowest child underweight level, followed by Kerala (19.61 percent). In contrast, it is highest in Bihar (40.99 percent) followed by

Gujarat (39.70 percent), Jharkhand (39.42 percent), and Maharashtra (36.04 percent).

Nowadays, wasting in children has become a severe anthropometric indicator of malnutrition. Despite the Indian government's efforts to solve the malnutrition epidemic, wasting has climbed from 21.04 percent to 19.26 percent nationwide. If we look at the situation in India, Chandigarh (8.41 percent) has the lowest percentage of wasting, followed by Punjab (10.57 percent), Delhi (11.24 percent), and Haryana (11.53 percent). In comparison, Maharashtra (25.60 percent) has the most significant rate of wasting prevalence, followed by Gujarat (25.10 percent) at 6% and 28.8%, respectively.

B. Child Nutritional Status & Sustainable Development Goal (SDGs):

SDG-2: The second Sustainable Development Goal (SDG) is to eradicate world hunger, ensure food security and improve nutrition, and encourage farming practices that are gentler on the environment. It is one of the most critical targets of the Sustainable Development Goals (SDGs) to eliminate all forms of malnutrition by 2030. This includes lowering the prevalence of stunting and wasting in children under five and meeting the nutritional needs of adolescent girls, pregnant or lactating women, and older people. The

Millennium Development Goals (MDGs) focused on food security, undernutrition, and underweight children. On the other hand, if we use the projection method known as "business as usual," it is anticipated that the Sustainable Development Goal target for stunting and wasting in India will be 20.92 percent and 19.12 percent, respectively, by 2030. Moreover, if we look at child stunting and wasting prevalence, the percentage share is 35.47 percent and 19.22 percent, respectively. Further, if we compare India's child stunting and wasting level with the SDGs target, India is far from achieving the SDGs goal. Although child stunting and wasting declined across all states of India, the decreased share is not desirable to reach the SDGs target. no states of India have achieved the SDGs target of reducing stunting level to 20.92 percent by 2030. Whereas some states are very far behind to reach the SDGs target like Bihar (48.32 percent), followed Uttar Pradesh (39.58 percent), Jharkhand (39.64 percent), Gujarat (39.05 percent), Madhya Pradesh (35.58 percent) respectively. Similarly, some states are already achieved the SDGs target of wasting level to 19.12 percent and they are Chandigarh (8.41 percent) followed Punjab (10.47 percent) by Delhi (11.12 percent), Haryana (11.57 percent), Uttarakhand (13.23 percent), Tamil Nadu (14.62 percent), Kerala (16.10 percent), Andhra Pradesh (16.05 percent), Rajasthan (16.78 percent), Uttar Pradesh (17.26 percent), Odisha (18.03 percent), Chhattisgarh (18.93 percent), Madhya Pradesh (18.89 percent) and Goa (19.09 percent respectively where as some state are quietly far away from meeting the target of SDG of reducing wasting like Maharashtra (25.47 percent), Gujarat (25.04 percent), Bihar (22.86 percent), Jharkhand (22.37 percent). Moreover,

some states are nearer to reach the SDGs target of stunting like Kerala (23.36 percent), Punjab (24.46 percent) & Tamil Nadu (25.06 percent). Therefore, it is very important for the government to take specific policy and made more expenditure on these worse performing states for the overall reduction of child malnutrition in India and also to meet the SDGs goal of ending all form of malnutrition.

C. Nutritional Status of Children & Role of Parental Factor:

Various factors influence the nutritional status of children under five years of age in India including environmental, social, economic, political, cultural, and parental factors. Among them, parental factors play a crucial role in determining nutritional status.

➢ *Effect of Father's Education on Child Nutritional Status:*

Without question, parents are the backbone of children under the age of five, as they make all of the child's decisions throughout this time. Education of the father has a significant impact on the nutritional condition of children because educated people are more concerned about the health of their children, which leads to improved nutritional status. However, children's nutritional status varies depending on their level of education. For example, fathers with a higher level of education have the lowest level of anthropometric failure (stunting, wasting, and underweight), which has led to an increase in children's nutritional status, and vice versa.

Table 2 Father's Education & Nutritional Status of Children

Father's highest educational level	Stunting	Non-stunting	Wasting	Non-wasting	Underweight	Non-underweight	Total
no education	47.35	52.65	22.47	77.53	42.83	57.17	100
Primary	41.16	58.84	18.37	81.63	35.7	64.3	100
Secondary	34.2	65.8	19.01	80.99	31.07	68.93	100
Higher	24.96	75.04	15.16	84.84	21.44	78.56	100
don't know	33.21	66.79	19.03	80.97	32.26	67.74	100
Total	35.53	64.47	18.8	81.2	31.83	68.17	100

Source: Author's calculation from NFHS-2021

It is obvious from the preceding Table 2 that there is an inverse relationship between the father's educational level and the anthropometric measures of the child (stunting, wasting, and underweight), and the converse is also true. On the other hand, fathers' educational levels are split into four categories: no education, primary education, secondary education, and further education. Furthermore, the level of stunting is lowest in fathers with higher education (24.96 percent), followed by fathers with secondary education (34. 2percent), and it is highest (47.35 percent) in fathers with no education at all. Likewise, the wasting rate is lowest (15.16 percent) when the father has a higher degree of education, and it is highest (22.47 percent) when the father has no education at all. Additionally, the prevalence of underweight is lowest (21.44 percent) in fathers with greater levels of education, whereas it is highest (42.83 percent) in fathers with no level of educational attainment.

➢ *Father's Occupation and its Effect on Nutritional Status of Children:*

The father's occupation is a key predictor of the predictand known as the nutritional condition of kids in India, even though most fathers have excellent academic records. Even though some fathers are well educated, the nutritional condition of their children is not as good as it may be due to the wide range of occupations. The father's occupation is divided into six categories like professional or technical, clerical, sales, services or household, agricultural, skilled and unskilled etc. The anthropometric measurements such as stunting, wasting, and underweight are more common among fathers who work in the informal sector, such as the agricultural sector, and they are less common among fathers who work in the professional and clerical sectors.

Table 3 Father's Occupation and Child Nutrition Level

Father's level of occupation	Stunting	Non-stunting	Wasting	Non-wasting	Underweight	Non-underweight	Total
Professional/technical	23.46	76.54	16.3	83.7	21.51	78.49	100
Clerical	32.5	67.5	15.52	84.48	25.97	74.03	100
Sales	33.12	66.88	19.93	80.07	29.44	70.56	100
Services/household	32.62	67.38	17.72	82.28	27.78	72.22	100
Agricultural	39.17	60.83	20.44	79.56	35.57	64.43	100
skilled and unskilled	37.12	62.88	18.03	81.97	33.06	66.94	100
Other	34.91	65.09	19.79	80.21	33.45	66.55	100
Total	35.53	64.47	18.8	81.2	31.83	68.17	100

Source: Author's calculation from NFHS-2021

It is evident from the table-3 that the father's occupation variation directly affects the nutritional status of children. The share of stunting (39.17) is higher in fathers who are doing agricultural work or engaged in the informal sector, and it is lowest (23.46%) in fathers who are engaged in professional or technical work. Meanwhile, if we see the wasting level, the portion of wasting is highest (20.44%) among fathers doing agricultural or informal work and lowest (15.52%) in clerical work. Furthermore, the percentage of underweight is at the peak (35.57%) in the father working in an agricultural or allied sector. In contrast, it is at the bottom (21.51%) in the mother who is doing some professional and technical work. Indeed, it is proved that the father's occupation is a significant determinant in reducing child malnutrition. therefore, various health awareness programs and employment should be provided to mothers for better nutritional status of children in India.

> *Mothers' Education and its Impact on Child Nutritional Level:*
The mother's educational status is the most eloquent factor influencing child nutrition in India. However, the mother's higher education level reduced the arthrometric outcome of children (stunting, wasting, and underweight) to a great extent (Md et al., 2018).

Table 4 Mother's Education & Nutritional status of Children

Mother's highest educational level	Stunting	Non-stunting	Wasting	Non-wasting	Underweight	Non-underweight	Total
no education	46.33	53.67	21.54	78.46	42.08	57.92	100
Primary	41.56	58.44	19.94	80.06	37.14	62.86	100
Secondary	33.32	66.68	18.89	81.11	30.21	69.79	100
Higher	23.02	76.98	16.81	83.19	20.94	79.06	100
don't know	0	100	100	0	0	100	100
Total	35.47	64.53	19.26	80.74	32.11	67.89	100

Source: Author's calculation from NFHS-2021

According to Table-4, the nutritional condition of children is influenced by four different levels of maternal education: no education, primary education, secondary education, and higher education. Furthermore, there is an indirect association between the mother's education level and the kid's anthropometric parameters (stunting, wasting, and underweight). Because the number of stunted children (23.02 percent) is lowest among mothers with higher education, followed by secondary mothers (33.32 percent), and the proportion of stunted children (46.33 percent) is largest among mothers with no education. Meanwhile, the wasting prevalence is lowest (16.81 percent) among mothers with higher levels of education, and it is highest (21.54 percent) among mothers with no formal educational background. Furthermore, in the case of underweight, the frequency of underweight (20.94 percent) is lowest among mothers with more excellent educational backgrounds. In contrast, it is highest (42.08 percent) among mothers with no educational background. As a result, more steps should be taken to educate mothers, and health awareness programs should be implemented to improve the nutritional status of children in India.

> *Mother's Occupation and Child's Nutritional Level:*
Unequivocally, a mother's occupation also acts as one of the most influential factors that directly influence the nutritional condition of children. However, only mothers engaged in technical or professional work positively impact their children's nutritional outcomes (Shaili et al. D. Kandpal, 2011).

Table 5 Mother's Occupation and Child Nutrition Level

Mother's level of occupation	Stunting	Non-stunting	Wasting	Non-wasting	Underweight	Non-underweight	Total
not working	34.82	65.18	18.83	81.17	31.44	68.56	100
professional/ technical	21.27	78.73	15.71	84.29	16.63	83.37	100
Clerical	25.42	74.58	10.31	89.69	14.36	85.64	100
Sales	28.09	71.91	16.88	83.12	21.62	78.38	100

Services/household	39.5	60.5	16.86	83.14	34.82	65.18	100
agricultural	43.44	56.56	20.63	79.37	37.71	62.29	100
skilled and unskilled	36.6	63.4	16.36	83.64	34.85	65.15	100
Other	39.2	60.8	24.36	75.64	35	65	100
don't know	67.71	32.29	12.25	87.75	61.18	38.82	100
Total	35.55	64.45	18.79	81.21	31.86	68.14	100

Source: Author's calculation from NFHS-2021

It is evident from the table-5 that mothers' occupation variation directly affects the nutritional level of children. The prevalence of stunting (43.44 percent) is higher in mothers doing agricultural work or engaged in the informal sector, and it is lowest (21.27 percent) in mothers who are engaged in the clerical sector. Meanwhile, if we see the wasting level, the portion is highest (20.63 percent) among mothers doing agricultural or everyday work and lowest (10.31 percent) in clerical work. Furthermore, the percentage of underweight is at the peak (37.71 percent) in mother who is engaged in the agricultural or allied sector where. In contrast, it is at the bottom (16.63 percent) in mother who is doing some professional and technical work. Indeed, it is proved that maternal occupation is a significant determinant in reducing child malnutrition. therefore, various health awareness programs and employment should be provided to mothers for better nutritional status of children in India.

IV. CONCLUSION

Indeed, child malnutrition is one of India's most serious health problems; even though numerous policies have been enacted, the desired health outcome has yet to be attained. However, let us look at the nutritional status of certain states in India, such as Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh, and Chhattisgarh. Their children's nutritional status is frightening, as these states are socioeconomically backward. As a result, the government should pay special attention to and execute policies aimed at reducing malnutrition in these states. Similarly, parental factors such as the mother's education, occupation, and father's education and occupation significantly impacted children's nutritional status in India. However, a direct and lasting association exists between mothers' education and their children's nutritional status. As the mother's educational level grows, the child's nutritional level increases, and vice versa. At the same time, a father's education is critical, although less so than a mother's (Prendergast et al., 2015). Therefore, the government should prioritize mothers' education and execute various nutritional awareness programs to reduce child malnutrition. Additionally, the occupations of the mother and father significantly impact the nutritional status of children in India, as fathers and mothers who work in technical or professional fields have a good effect on their child's nutritional status. As a result, the government should give mothers and fathers technical, professional, and vocational training on a grassroots level to reduce child malnutrition in India.

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