International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 15 Issue 04 , April - 2026

Health and Nutritional Status of Children Below 5 Years of Age: In Selected Villages of Basanti CD Block, West Bengal

Sudipta Chakraborty
Vidyasagar College
District – Kolkata, West Bengal, India

Abstract

Background: **According to the 2009 Human Development Report for South 24 Parganas district, Basanti CD block had a poverty rate of 64.89% among households. Basanti is recognized as one of the most economically disadvantaged blocks in the entire country. In comparison to Thakurpukur Maheshtala CD block within the same district, the poverty ratio in Basanti was ten times higher. The population of children aged 0-6 years in Basanti Block is 50,770, which accounts for 15% of the total population. Out of this, there are 25,767 male children and 25,003 female children. As a result, the Child Sex Ratio in Basanti Block is 970, which is higher than the average Sex Ratio of 966 in the same block.**

Objective: **To identify the present health situation of children below 5 years of age, across the selected villages of Basanti CD block.**

Material And Methods: **A door to door survey was conducted in selected villages of Basanti CD block (Hiranmaypur, Radharanipur, Birinchi Bari, Parbatipur and Laskarpur), during the months of April-May, 2023. Data was collected using systematic sampling method, with a semi structure questionnaire. Parents, especially mothers who have children under 5 years of age were surveyed. 'Length/height-for-age Boys and Girls', these growth charts were collected from WHO to plot age wise height of children. Data was analyzed using Microsoft Excel 2013.**

Results: **76.53% of children fall into the underweight category, with both boys and girls consistently plotting below the WHO 3rd percentile for height and weight. This vulnerability is slightly more pronounced in boys (50.35%) than girls (49.65%). The health landscape is further complicated by a high prevalence of chronic respiratory conditions like asthma (38.89%) and acute illnesses such as fever and cough (46.67%).**

Conclusion: **To secure the future of these children, a multi-dimensional policy intervention is required. The government must move beyond general health coverage to implement targeted infrastructure improvements, including higher-quality food provisions at ICDS centers and more robust monitoring of growth indicators. Strengthening the Anganwadi system with qualified staff and ensuring accessible medical facilities can mitigate the effects of poverty-driven malnutrition.**

Keywards **- Stunting, Malnutrition, BMI, WHO, Wasting**

I. INTRODUCTION

"Child health is a state of physical, mental, intellectual, social and emotional well-being and not merely the absence of disease or infirmity. Healthy children live in families, environments and communities that provide them with the opportunity to reach their fullest developmental potential." WHO

Children's optimal health and their overall growth (physically and mentally) depends upon the environment which is provided by the adult member of their family. Besides this, health and well-being of children is also interrelated with the health status, habits of the mother and the environment where the mother stayed during and even before her pregnancy. Dummy Thomas, the founder of St. Jude Children's Research Hospital told that "no child should die in the dawn." But, across the world almost 7.6 million children (under 5 years) die every year. Low Income and Middle-Income Countries (LMI's) accounted for more than 99% of child death of this 7.6 million during 2010 and Sub-Saharan African countries hold half of this death. For the reduction of child mortality Substantial Development Goal (SDG) has been made globally. During 2021 Sub-Saharan African and Southern Asia, these two regions accounted for greater than 80% of 5 million children under 5 years. According to the report of WHO, Central and Southern Asia had the 2nd highest neonatal mortality, with 22 deaths per 1000 live birth in 2021.

"The Covid-19 crisis will exacerbate maternal and child undernutrition and child mortality in Low- and Middle-income Countries" - this article included 118 countries of the world – no. of children under 5 years with wasting will uplift in the moderate scenario with an addition of 9.3 million children in 2020-22.

According to different indicators described by National Health Mission (NHM), we can understand about the health situation of children. Here these different indicators are also greatly influenced by different diseases, which also influence the child health.

UNICEF described that, West Bengal ranks among India's eight poorest states, facing significant challenges in health, education, and general living standards. Despite these difficulties, the state's well-established Panchayati Raj system offers a powerful way to protect and promote children's rights at the local level. Current data highlights a serious nutritional crisis: 32.5% of children under five suffer from stunting, 20.3% from wasting, and over half (54.2%) are anemic. Additionally,

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 15 Issue 04 , April - 2026

less than half of newborns are breastfed within the first hour of birth, indicating an urgent need for better early-childhood care.

II. STUDY AREA

Basanti is a Community Development block (location: 88.7104ºE – 88.7418º E, 22.219ºN – 22.381ºN) in South 24 Parganas, West Bengal, famously known as the gateway to the Sundarbans. It is an almost entirely rural region, where 98% of the 336,717 residents live in small villages. The population is diverse, with a sex ratio of 966 and a significant presence of Scheduled Caste and Scheduled Tribe communities. While Bengali is the primary language, there is a noticeable gap in education, as male literacy (75.75%) is significantly higher than female literacy (60.62%).

Economically, Basanti face severe challenges and is ranked among the poorest areas in India. Over 54% of households live below the poverty line, and the local economy relies heavily on manual labor. Nearly half of the workforce consists of agricultural laborers, and with over 60% of the population classified as non-workers, the region experiences intense social and financial pressure.

The healthcare system operates through a network of Primary Health Centres and Sub-centres, with the Basanti Rural Hospital serving as the main facility. Although maternity and child welfare services are available, the combination of widespread poverty and a scattered rural population makes it difficult to provide consistent and effective medical care to everyone in the block.

III. OBJECTIVE

The state of child health refers to the overall well-being and conditions affecting children's physical and mental health. It includes aspects such as growth and development, immunization, nutrition, disease prevention, access to healthcare, and overall well-being. Providing access to proper nutrition, safe shelter, clean environments, and opportunities for play and exercise is crucial for promoting the physical health and well-being of children. Based on this, the primary objective of the study was “Present health and nutritional status of children below 5 years of age: Basanti CD block.

IV. METHODOLOGY

During the months of April-May, 2023, the study was carried in the selected villages of Basanti CD block (Hiranmaypur, Radharanipur, Birinchi Bari, Parbatipur and Laskarpur), South 24 Parganas, West Bengal. The primary data was collected by interviewing the mothers, who have children below 5 years of age, with a semi-structured questionnaire. But, some data was collected from their father/caregiver, when their mother was not available in that time. During the survey, according with all other information which are related to children health status, weights and heights of the children, was also measured. The weights are measured with a weighing machine and heights are measured with a non-stretchable tape. All this measurements were measured twice, and along with these measurements, other information were used for the analysis. The children of the surveyed villages, are classified into three category; indicators of malnutrition (WHO), based on the collected data of age, heights and weights of the children.

- Underweight (refers to a condition where a child has a significantly low height for their age).
- Stunting (signifies to a condition characterized by a child's low weight for their height).
- Wasting (simply means that a child weighs less than what is considered healthy for their age).

Based on primary data, Body Mass Index (BMI) is calculated measure to assess body weight relative to height. It is measured by dividing a person's weight in kilograms by the square of their height in meters (BMI = weight / height^2). Analyzing this measure, children are classified into different weight categories.

- Underweight: BMI less than 18.5
- Normal weight: BMI between 18.6 and 24.9
- Overweight: BMI between 25 and 29.9 and
- Obesity: BMI of 30 or higher

Height-for-age growth chart, for both Girls and Boys has been plotted, to compare a child’s height against the average for their specific age and gender. It features curved percentile lines (ranging from the 3rd to the 97th) that indicate how a child ranks within a population. For instance, the 50th percentile represents the median height, where exactly half of the children in that demographic are taller and the other half are shorter.

A scatter diagram is prepared with primary data (family income and children weight) and plotted by using Microsoft Excel, 2013.

V. RESULT AND OBSERVATION

The surveyed villages show a regressive population trend, meaning the number of infants is declining while the base of the population narrowest. Currently, children aged 25–36 months represent the largest group at 32.65%. Interestingly, the survey recorded more girls (56) than boys (49). While the proportion of male children remains steady across different ages, the percentage of girls increases as they get older. This suggests that while more boys may be born initially, they appear more vulnerable to health challenges. Consequently, girls exhibit higher survival rates, which points toward a future increase in the female population within older age groups.

A. Status Of Stunting, Wasting And Underweighted Child Across The Villages

The average age of the children is 36.25 months with a standard deviation of 17.83 months. On average the children weight is 14.13 kg with standard deviation of 12.79 kg. Then average height is 85.74 cm with a standard deviation of 13.79 cm. Prevalence of stunting wasting and underweight is 40%, 35% and 24% respectively among the age group of 0-6 months. Across the surveyed villages, malnutrition is prevalent, with stunting affecting 40% of children, followed by wasting (36%) and underweight (24%). Radharanipur faces the highest level of stunting, indicating chronic, long-term nutritional deficits that threaten cognitive development. In

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 15 Issue 04 , April - 2026

contrast, Parbatipur struggles with the highest rates of wasting and underweight cases, reflecting acute health issues like sudden food shortages or frequent illness. Overall, these findings highlight a fragmented health landscape where children suffer from both long-term growth delays and immediate weight-related health crises.

- *Stunting*

The data shows that girls are more significantly affected by stunting (57.38%) compared to boys (42.6%). This condition is most prevalent in both genders among children aged 48 to 59 months. Within this specific age group, boys represent a higher share at 71.43%, while girls account for 28.57%. stunting in boys increases rapidly between 12 and 23 months, whereas in girls, the condition progresses more gradually from birth. Overall, the findings indicate that girls face higher rates of stunting, likely due to a greater burden of illness and inadequate nutritional intake.

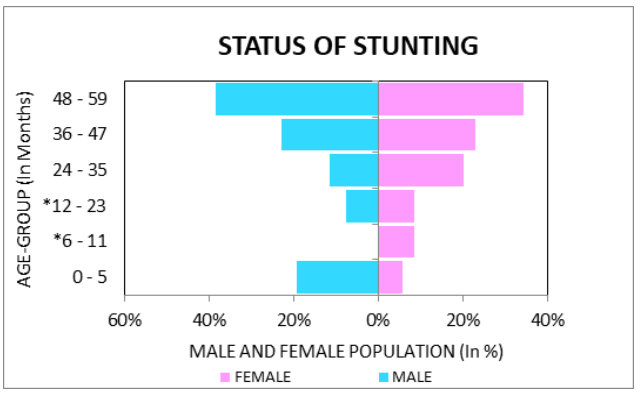

Fig.1 - Age and Sex Wise Distribution of Stunting Children

- *Wasting*

The age-wise distribution of children from 0 to 59 months reveals that boys are more frequently affected by wasting (57.14%) than girls (42.86%). This trend is the reverse of what was observed for stunting, where girls were the more vulnerable group. Among the surveyed children, wasting is most prevalent in girls aged 24–35 months and in boys aged 48–59 months. Conversely, the lowest incidence of wasting is found in boys aged 6–11 months and girls in the 12–23 month age group. The progression of this condition also varies by gender. Excluding the youngest infants (0–5 months), the number of wasted boys increases steadily and continuously starting from the 6–11 month period. In contrast, the number of wasted girls does not follow a linear path, appearing in a more scattered and inconsistent pattern across different age groups.

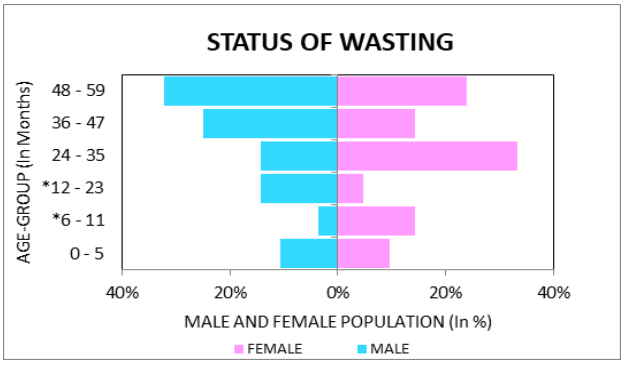

Fig. 2 - *Age and Sex Wise Distribution of Wasting Children*

- *Underweight*

Between boys and girls, again boys (54.55%) have been recorded at the topmost position of the state of malnutrition, underweight as compared to girl Childs (45.45%). From the age sex pyramid of underweighted children, it has been observed that among the different age group 48-59 months age group has the highest no. of underweighted children. On the other hand, lowest no. of boys is belonging on both 24-35 and 12-23 age group though there is no underweighted child in the 6-11 months. Whereas, lowest number of girls is occupied by the age group of 12-23 and 6-11 months. In 0-5, 36-47, 12-23 age group more boy children are underweighted that the girls, whereas in the 48-59 age group boys and girls occupy the same proportion.

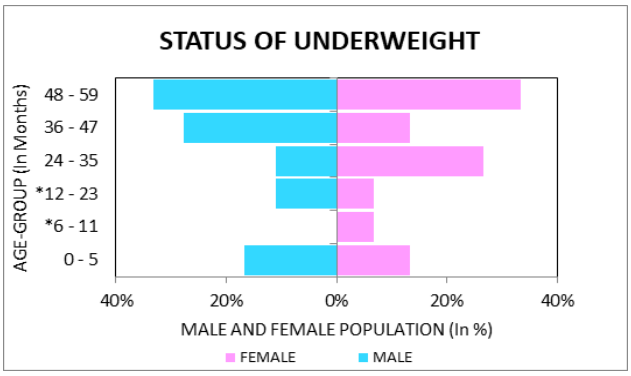

Fig. 3 - *Age and Sex Wise Distribution of Underweighted Children*

B. Body Mass Index (Bmi) Of Children

In Radharanipur, Hiranmaypur, Birinchi Bari, Parbatipur and Laskarpur; 14, 15, 17, 18 and 11 children have the BMI value respectively, which are below 18.6 BMI line which means that this 75 children have not a proper weight which is necessary for their growth and they are underweighted. Besides this, 6 children in Radhaanipur, 3 children both in Hiranmaypur and Birinchi Bari, only 2 Childs in Parbatipur and 9 children in Laskarpur i.e. total 23 children's BMI are between the 18.6-24.9 BMI value, so they have a normal weight which is necessary for their growth and development. In Parbatipur and Birinchi Bari, highest number of children (18 and 17 respectively) has the BMI value lower than 18.6 lowest in Laskarpur. So, Laskarpur is in a good position than these villages. Again, in Laskarpur highest number of children has shown (who have BMI between 18.6-24.9). So, in terms of normal weight, this village is in the lowest rank an Hiranmaypur as well as Birinchi Bari in the lowest, because there, in terms of education, literacy, monthly income, medical facilities; Laskarpur put behind Hiranmaypur and Birinchi

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 15 Issue 04 , April - 2026

Bari. There is a hospital (Jharkhali Hospital in Laskarpur) also.

The data shows a major health crisis, as 72% of children across these villages are underweight and lack the body mass needed for healthy growth. While villages like Parbatipur and Birinchi Bari struggle with the highest numbers of underweight children, Laskarpur is in a much better position with the highest number of children at a normal weight. This success is directly linked to Laskarpur having better income, higher literacy, and the advantage of a local hospital. Ultimately, this highlights that children's physical health depends heavily on access to medical facilities and financial stability, leaving those in poorer villages at a serious disadvantage.

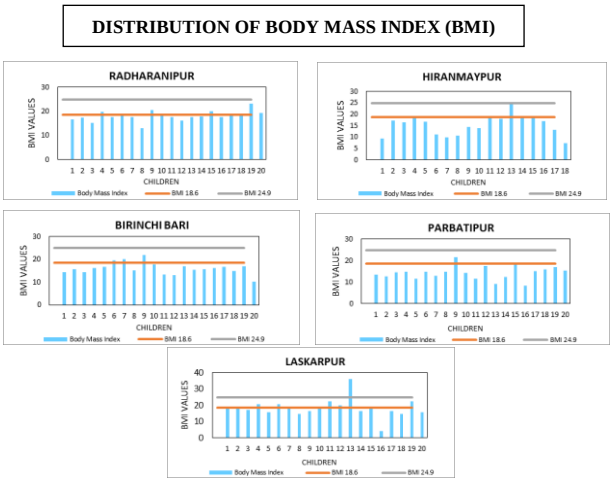

Fig. 4 – Selected Village-wise Distribution of BMI

C. Growth Chart For Girls

Health professionals use growth charts to monitor developmental trends by plotting height against age. Among the surveyed girls, 24 fall below the 3rd percentile, signaling potential growth concerns that require medical evaluation, while 12 girls fall below the 15th percentile, representing the lower end of the normal growth spectrum. Additionally, 8 girls are below the 50th percentile (median) and 2 girls fall below

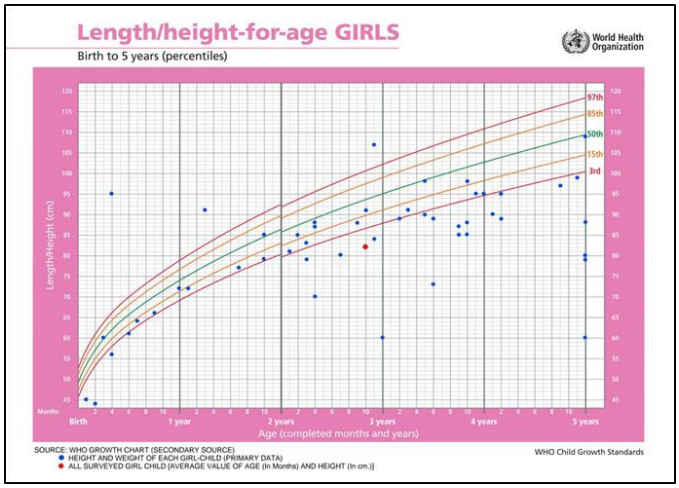

Fig. 5 – Growth Chart for Surveyed Girls below 5 years of age (Graph from WHO)

the 85th percentile, indicating they are shorter than the majority of their peers. Conversely, 3 girls are above the 97th percentile, making them significantly taller than the reference population. Most critically, the average height and weight of 50 girls in the study fall below the 3rd percentile. This suggests a widespread trend of stunted growth in the region, highlighting an urgent need for intervention to support their future development.

This data highlights a critical public health emergency, as the average growth of the 50 surveyed girls falls below the 3rd percentile. This indicates that the typical girl in the region is smaller than 97% of healthy children worldwide, confirming that stunting is a widespread environmental issue rather than a result of individual genetics. Because so few girls reach the 50th percentile (the median), it is clear that chronic malnutrition has become the local "norm." These findings signify that the vast majority of girls are being denied their biological growth potential, making urgent nutritional and medical support essential for the region.

D. Growth Chart For Boys

The growth analysis for the surveyed boys reveals significant developmental concerns compared to standard reference populations. Notably, 22 boys fall below the 3rd percentile, weighing less than 97% of their peers, while 15 boys fall below the 15th percentile, placing them lower than 85% of the reference group. Regarding the median, 3 boys are below the 50th percentile and 4 boys are above it, indicating

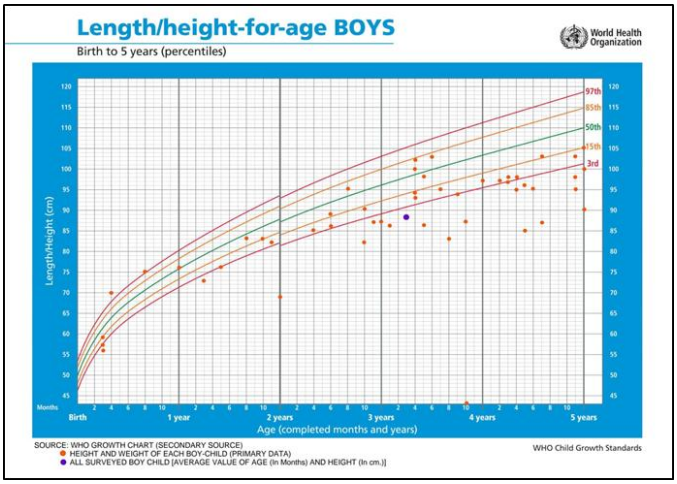

Fig. 6 - Growth Chart for Surveyed Boysbelow 5 years of age (Graph from WHO)

they are relatively taller or heavier. Only 2 boys are above the 97th percentile, making them significantly larger than the vast majority. Crucially, the average height and weight of 46 boys fall below the 3rd percentile, signaling a widespread regional trend of stunted growth and underweight status.

The data signifies a widespread public health crisis, as the vast majority of boys are failing to reach their biological growth potential. When 46 boys fall below the 3rd percentile,

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 15 Issue 04 , April - 2026

it means they are smaller than 97% of children in a healthy global population, indicating severe, long-term malnutrition rather than just natural variation. The extreme lack of children near the 50th percentile (the median) further proves that the local environment—shaped by poverty and poor diet—is systematically hindering healthy development. This statistical skew highlights that underweight and stunted growth have become the "norm" for boys in this region rather than the exception.

E. Children Vaccination

The scatter diagram illustrates the relationship between monthly family income and child weight, revealing an extremely weak positive connection. Based on the R2 value of 0.0226, income explains only about 2.3% of the differences in child weight. The nearly horizontal trend line suggests that a family's financial status is not a reliable predictor of a child's physical growth in this study. Most of the data is concentrated among families earning between ₹5,000 and ₹15,000. Within this income group, there is a wide range of child weights—spanning from 5 kg to 20 kg. This high level of variation shows that children from families with similar earnings can have very different growth outcomes, likely due to factors like

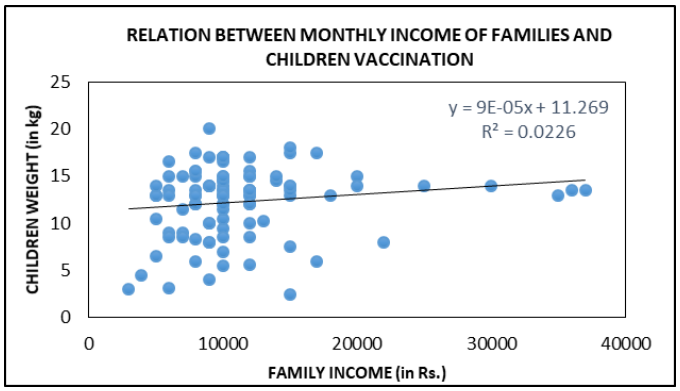

Fig. 7 – Association of Family's Monthly Income and Children Vaccination Status

age, diet quality, or individual health. While there is a slight mathematical link between higher income and weight, wealth is not the primary factor for healthy development in these villages. Even the highest-earning households do not consistently have heavier children. This indicates that improving child health in the region depends more on broader nutritional education and medical access than on income alone.

Children in these villages face high health risks due to a combination of poverty, pollution, and geography, with 38% suffering from asthma and nearly 47% from frequent fevers. While most children are born at a healthy weight but it is also observed that in Biranchi Bari 42.86% children born before 3 weeks. . Again, if we look at the full vaccination scenario 100% children have full vaccined which means that they are more immunized children and potentially which will lead to growth and development as well as maintaining proper health. Economic status heavily dictates diet; wealthier families can afford milk and delay solid foods, whereas poorer families must start solids as early as 11 months. Most children rely on basic staples like rice and government-provided meals, with very few receiving the protein-rich or diverse diets necessary for healthy growth.

VI. CONCLUSION

The findings from this study underscore that malnutrition remains a critical public health challenge within the Basanti CD Block, with stunting, wasting, and underweight status affecting a staggering majority of the pediatric population. Notably, 76.53% of children fall into the underweight category, with both boys and girls consistently plotting below the WHO 3rd percentile for height and weight. This vulnerability is slightly more pronounced in boys (50.35%) than girls (49.65%). The health landscape is further complicated by a high prevalence of chronic respiratory conditions like asthma (38.89%) and acute illnesses such as fever and cough (46.67%), which are aggravated by the region's unique environmental and socio-economic stressors. A severe public health crisis where chronic malnutrition and poverty have made stunted growth the "norm" for nearly all children. Ultimately, the findings highlight an urgent need for systemic intervention to prevent a generation from being permanently left behind.

VII. RECOMMENDATION

This study shows that a child's health is deeply connected to their family's income and their mother's well-being. Problems like low wages, early marriage, and a lack of maternal education often hold back a child's growth. While some villages have reached high vaccination rates, others still struggle with inconsistent healthcare and a lack of essential vitamins. Because many families cannot afford a variety of healthy foods, children rely mostly on basic grains, making their physical development dependent on their parents' earnings.

To fix this, the government needs to go beyond basic healthcare and improve local infrastructure. This includes providing better quality food at ICDS (Anganwadi) centers and carefully tracking children's growth. By hiring qualified staff and making medical clinics easier to reach, the community can fight the effects of poverty-driven malnutrition. Ultimately, solving these issues is essential for the nation's progress, ensuring every child in the Basanti Block has a fair chance at a healthy future.

CONFLICT OF INTEREST: No

FUNDING: No funding sources

REFERENCES

[1] Bose, K., Biswas, S., Bisai, S., Ganguli, S., Khatun, A., Mukhopadhyay, A., & Bhadra, M. (2007). Stunting, underweight and wasting among Integrated Child Development Services (ICDS) scheme children aged 3-5 years of Chapra, Nadia District, West Bengal, India. Stunting, Underweight and Wasting Among Integrated Child Development

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 15 Issue 04 , April - 2026

Services (ICDS) Scheme Children Aged 3–5 Years of Chapra, Nadia District, West Bengal, India, 3(3), 216–221.

[2] Department of Sundarban Affairs, Govt. of West Bengal. (n.d.). https://www.sundarbanaffairswb.in/home/page/basanti

[3] De, P. P., & Chattopadhyay, N. (2019). Effects of malnutrition on child development: Evidence from a backward district of India. Clinical Epidemiology and Global Health, 7(3), 439–445.

[4] Dutta, A., & Ghosh, S. (2016). Impact of integrated child development scheme on child malnutrition in West Bengal, India. Maternal and Child Nutrition, 13(4).

[5] Dutta, A., & Ghosh, S. (2016). Impact of integrated child development scheme on child malnutrition in West Bengal, India. Maternal and Child Nutrition, 13(4).

[6] Environmental health and preventive medicine. (n.d.). BioMed Central. https://environhealthprevmed.biomedcentral.com/

[7] International Journal of Community Medicine And Public Health. (n.d.). https://www.ijcmph.com/

[8] Khobragade, A. W., & Yadav, R. G. (2020). Nutritional status of under five children attending Anganwadi in rural area of central India. International Journal of Community Medicine and Public Health, 7(12), 5165.

[9] Pal, Sohini, Anwaruzzaman, A.,k.,m.(2021). Child Health Status in Rural West Bengal: A District-Level Analysis, 43 (2).

[10] Pappachan, B., & Choonara, I. (2017). Inequalities in child health in India. BMJ Paediatrics Open, 1(1), e000054. https://doi.org/10.1136/bmjpo-2017-000054

[11] Sathyanath M, Shreyaswi, Kiran, N. Uday & Rashmi (2013). Prevalence And Risk Factors Of Under Nutrition Among Under Five Children In A Rural Community. Nitte University Journal of Health Science, (Vol. 3, no.4, December, 13).

[12] Sinha, Teeku, Singh, G. & Nag, Urya (2019). Nutritional Status of Children Under 5 Years in Tribal Villages of Bastar, Chhattisgarh India. HSOA Journal of Internal Medicine and Primary Health Care, 3: 007, 3-6.

[13] World Health Organization: WHO. (2019). Child health. www.who.int. https://www.who.int/health-topics/child-health#tab=tab_1

[14] http://lsi.gov.in:8081/jspui/bitstream/123456789/5332/1/35313_1991_SOU.pdf

[15] https://censusindia.gov.in

[16] https://www.unicef.org/

[17] https://nhm.gov.in/index1.php?lang=1&level=2&sublinkid=822&lid=218