

Prevalence of Child Malnutrition (0-5)-A Study on Boudh District, Odisha

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ABSTRACT

BACKGROUND:

0-5 year children constitute the most vulnerable segment. Their mortality rate is a very sensitive indicator of the community's health and nutrition. Prevalence of underweight is 35.8%, wasting is 21% and stunting 38.4% in India and for Odisha, it is 34.4%, 20.4% and 34.1% respectively. (NFHS-4 Data) Health indices of children in non-coastal rural are worst. Child Malnutrition in non-coastal rural area of Odisha leading to infection which is contributing to high child mortality. Health indices of children in non-coastal rural are worst. Child Malnutrition in non-coastal rural area of Odisha leading to infection which is contributing to high child mortality.

OBJECTIVE:

Objective of present study was to find out prevalence of malnutrition among the study population of Boudh district of Odisha.

METHODS:

A community based cross-sectional study was conducted from January 2019 to February 2020 in rural areas of Boudh district. Data were collected from 200 mothers or primary care takers of children aged 0-5 years using pre-tested semi structured questionnaires and measuring weight, height and MUAC of children. Analysis was done using WHO anthro software for calculating underweight, stunting and wasting children by using WHO standards.

RESULTS:

The prevalence of underweight, stunting and wasting were found to be 34.3%, 41.5% and 18.9% respectively while the prevalence of obese and overweight was 3.1% and 7.4% respectively.

CONCLUSION:

Prevalence of malnutrition among children under 5 in Boudh district is high in comparison to state and national data. The factors identified for prevalence of child malnutrition in Boudh district of Odisha can be useful for developing different strategies to eradicate the problem.

KEYWORDS: Malnutrition, Wasting, Stunting, Underweight

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I. INTRODUCTION:

“Malnutrition is a broad term which is commonly used as an alternative to under nutrition but technically it also refers to over nutrition. People are considered as malnourished if their diet does not provide adequate calories and protein for growth. They are also malnourished if they consume too many calories which is called over nutrition (UNICEF)

According to WHO, the term malnutrition refers both to under nutrition and over nutrition. Many factors can lead to malnutrition like poor diet, severe and repeated infections. Inadequate diet and disease, general standard of living, the environmental conditions, and whether a population is able to meet its basic needs such as food, housing and health care affects nutritional status of children.

According to UNICEF data, worldwide more than 26% of children under 5 years of age were stunted in 2011 that is around 165 million children worldwide. But this burden of child malnutrition is not evenly distributed around the world. In Sub-Saharan Africa and South Asia there are three fourths of the world's stunted children. In sub-Saharan Africa, 40 per cent of children under 5 years of age are stunted and in South Asia, 39% are stunted. More than one third of countries in sub-Saharan Africa have very high stunting prevalence (UNICEF, 2013).

Population wise India is in 2nd rank worldwide. Under nutrition is highly prevalent in India with 52% of children under 3 years age being under nourished in 1991- 92. In 2006, prevalence of under nutrition was found to be 40% in children under 5 years. India has set goal to decline the malnutrition percentage to 26% by 2011. As

per the report of NFHS -3 there are better performing states on one hand like Kerala (22.9%), Punjab (24.9) and Goa (25%) while on the other hand there are states like Gujarat (44.6%), Bihar (55.9%), Jharkhand (56.5%) and Madhya Pradesh (60%), where prevalence of under nutrition is very high.

NFHS-3 identified the causes associated with nutritional status of children. According to their report major contributors were ARIs, Diarrhea, vaccination coverage and IYCF practices (Infant and Young Child Feeding). Many states with higher rate of under nutrition perform worst on these indicators.

In 2012, Hunger and Malnutrition 'HUNGAMA' report revealed prevalence of under nutrition in 100 worst performing districts of India. According to the report prevalence of underweight and stunting is 42% and 59% respectively. But it is found that the underweight percentage has reduced from 53% of DLHS, 2004. 40% children below the age of five in Odisha were found underweight in 2016.

Child malnutrition is a wide spread health problem having international consequences because good nutrition is an essential determinant of well-being of children. Child malnutrition is estimated by the indicators stunting, wasting, overweight and underweight.

The WHO (World Health Organization) has estimated that malnutrition is accounting 54 percent of child mortality rate worldwide, which is about 1 million children. In another estimate by WHO indicates that childhood underweight being the cause for about 35% of all deaths in children below the age of five years worldwide. Malnutrition in children being the common globally, results in both short term and long term irreversible negative health outcomes including stunted growth and cognitive development deficits, underweight and wasting.

It has been studied that Odisha continues to be one of the most backward state and is the poorest state in spite of its rich natural heritage and human potential. The disaster and emergencies compound the poverty. The poor public accountability and diluted access and control over food and livelihoods entitlement programs for the population like Targeted Public Distribution Scheme (TPDS), ICDS Supplementary Nutrition Scheme and the Mid-Day Meal (MDM) program and the National Rural Employment Guarantee Program have failed to achieve the desired impact on hunger and nutrition.

In a study considering the age group less than 5 years, the prevalence of data for stunting and wasting in the children below 5 years of age were 34.1% and 20.4%, respectively. Here one can go through and find that almost 8% children were severely affected malnourished (SAM) and about 30% children fall under /Grade I-IV malnutrition. Further the infant mortality rate (IMR) is around 40 and on the other hand Maternal Mortality Rate (MMR) is 237. Recommended dietary intake (RDI) gap study for most nutrients is above 50%. Here it is worth to mention that only 54.9% children in between 6-8 months consume solid and semi-solid food along with breast milk. Further, 8.9% children in the age group of 6-23 months consume an adequate diet. It is shocking to know that 51% of women in the age group of 15-49 years and 44.6% children in the age group of 6-59 months were found to be anemic in the state. It has been examined that Good sanitation along with hygiene and safe drinking water accounts for a great bearing on good health and nutrition. Strangely, 77.7% of households in Odisha do have practice in open defecation. Referring to Odisha Economic Survey, the growth rates in context to GSDP- 13-14 are only 5.6%. The illiterate (with low cognitive ability) and poor health labour force significantly slows down the productivity, economy and economic growth. The above criteria accounts for good economy, as a result, Odisha reels under the tag of a poverty and backward state and figures in higher rate in malnutrition, poor health condition and is prominent in hunger map.

According to NFHS-4 data under 5 mortality rate (U5MR) is 50 per 1000 live births in India out of which 34 in urban area and 56 in rural area. Child malnutrition hampers growth and development of children and increases various morbidities and hence causes high mortality among children of 0-5 years. If we will look into the global status of malnutrition under 5, then we can find that 22.9% children under 5 are stunted, 7.7% are severely wasted. In Asia 87 million children from 0-5 years are stunted and 36 million are wasted (UNICEF 2014)

The States of India in which malnutrition is very high even after having high rate of education and density are Uttar Pradesh where most children here, in India's densest state by population, under the age of 5 are stunted due to malnutrition. In Tamil Nadu, despite high education there is a prominent child malnutrition problem. A National Family Health Survey reveals that 23% of children here are underweight, while 25% of children are moderately stunted. In Madhya Pradesh, 2015 data reveals that Madhya Pradesh has India's highest number of malnourished children where, 74.1% of children under 6 suffer from anemia, and 60% suffer with malnutrition. Jharkhand has India's highest number of malnourished children and in Bihar malnutrition percentage is at 55.9%.

According to Angus Deaton, the Noble Prize Winner for Economics, malnutrition is prominent in India is not just based on calorie intake, but also India's dependence on mostly carbohydrate-based diet which have a low protein proportion and fat content. He also explored that inadequate sanitation by the population, triggers increased exposure to infection-borne deficiencies in nutrients.

If we compare between NFHS II (1998-99) and NFHS III (2005-06) data then it is found that under

nutrition among children in Orissa reduced from 54% to 44%.

Under-nutrition status found as per Economic survey of Orissa 2010-11 that malnutrition continues to be high, 40.7% of children below three years are underweight (weight for age), 45% stunted (height for their age) and 19.5% are wasted (weight for their height).

In the state-level data there is disparity within the data of districts/populations. District-level household survey (DLHS) on reproductive and child health (2002-2004) shows the level of under-nutrition is higher in the districts with predominantly tribal population. The NFHS III (2005-06) analysis also figures that the level of under-nutrition among the tribal population is higher. According to state tribal health report card 54.4 % of children below three years are underweight (weight for age), 57.2% stunted (height for their age) and 27.6% are wasted (weight for their height).

While levels of under-nutrition have shown a decline, anemia levels have shown no changes. Nearly 65 percent of children in the age group of 6-59 months are anemic, reads out state health report card. Less than half (40%) of the families use adequately iodized salt in the state.

If we analyze prevalence of under nutrition among 0-5 years children in India, then NFHS-4 data shows that 35.7% are underweight, 21% are wasted and 38.4% are stunted. If we will focus on state level data, then in Odisha 34.4% children below 5 years of age are under 20.4% are wasted and 34.1% are stunted.

Health indices of rural area are worst in India. According to the NFHS-4 data, children living in rural areas are most affected by undernutrition. If we will analyze district level prevalence of child malnutrition in Odisha, then Boudh district is highly affected by undernutrition where 42.2% children are stunted, 29.6% are wasted and 43.5% children are underweight. Prevalence of undernutrition among children below 5 years is low in Cuttack district with 15.3% of stunting, 11.9% of wasting and 17.1% of underweight (NFHS-4)

So, it is evident that prevalence of child malnutrition is worst in Boudh district of Odisha.

II. REVIEW OF LITERATURE:

Rotimi, 1999 examined that women having a body mass index (BMI) under 18.5 reflects a progressive rise in mortality rate with a high risk of illness.

Krasovec and Anderson, 1991 found that increased perinatal and neonatal mortality a higher risk of low birth weight of babies, still births and miscarriage are some of the consequences of malnutrition in women.

Elangovan R, Shanmugan M (2004) in The Immunization and nutritional status among children under 5 in a major district in India found that 16% of the children were under malnutrition (according to weight for age and growth chart)

A Cross sectional study of malnutrition among children and associated risk factors among children aged below 5 in West Bengal, India found that Stunting result was 51%, underweight result was 41% and Wasting result was 22%. It also found that girls were more malnourished than boys.

Delletier et al (1994), 57% of under 5 years mortality in Ethiopia is related to severe and mild to moderate malnutrition.

Zerioun et al 1997, Ferroluzzi et al, 1990 found higher rates of rural malnutrition by the local studies in Ethiopia.

Sommerfelt et al, 1994 found higher level of stunting among rural than urban children.

Lily Yaa Appoh and Sturla Krekling (2001) studied the relationship between mother's nutritional knowledge, maternal education, and nutritional status of child in the Volta Region of Ghana. Formal education of maternal parent and marital status were also associated with child nutrition in bivariate analysis.

Girma Woldemariam and Timotiows Genebo (2002) examines the determinants of nutritional Status of Women and Children in Ethiopia, it reveals that household economic status, education of parents, number of prenatal care visits of the mother, child's age, birth order and preceding birth interval are important determinants of child stunting.

Harsha Aturupane et al (2008) examine the determinants of child weight and height in Sri Lanka: A quintile regression approach, it reveals that reducing child malnutrition is a key goal of most developing countries. To battle child malnutrition right set of understanding and interventions by policymakers is required to have a better understanding of its economic, social and policy determinants.

Vinod K. Mishra et al (1999) has studied the multivariate analysis considering the effects on selected demographic and socioeconomic parameters on child malnutrition indicates that the strongest predictors of child

nutrition in India were child's age, birth order of child, mother's education, and standard of living.

SusmitaBharati et al (2001) assessed spatial distribution of nutritional status considering gender of Indian children; the study figures that there is nutritional variation,spatial variations in the nutritional status of children in India with respect to the gender of children. A dismal picture of health condition in all states of India is quite visiblefor children if we refer to the scores of weight-for-age and height for-age.

Elangovan and Shanmugan (2002) to explore the basis of infectious and communicable diseases to got into study for determine the immunization and nutritional status of children aged below five in major district of India, it concluded with a result that Children of rural areas in India die mostly due to infectious and communicable diseases.

Rajaram et al (2003) extended study on the childhood malnutrition in Kerala and Goa which revealed that the confounding factors whichinfluence the nutritional condition of children in these states. The results emanated that the relative prevalence of underweight along with wasting was high in Kerala, but stunting was medium if we go through the prevalence. The study highlights and recommends more area- specific policies adoption for the development of nutritional intervention programmes.

Uma Sanghvi et al (2004) assessing on the potential risk factors for child malnutrition in rural Kerala, it indicates that 42-57 percent of child deaths in developing countries are due to the potential effects of infectious diseases in the malnourished condition of a child of which over three-quarters can be attributed to mild-to-moderate malnutrition.

Jayanta Bhattacharya et al (2004) headed on with a study in which the relationship between nutritional status was examined considering poverty and food insecurity of household members of various ages. Poverty was predictive due to poor nutritional value among the preschool children, food insecurity on the other hand does not provide additional predictive element of study for this age group.

Michele Gagnolati et al (2005) in his study and examination explores the various dimensions of under nutrition in children of India and also the effectiveness of the Integrated Child Development Services (ICDS) program in combating it.

Jyothi Lakshmi et al (2005) examined the morbidity rate and profile of preschool children taking into consideration about the relation to the child and maternal factors. Prevalence, infection duration and incidence were marginally lower in female children. The critical factors that influenced the health of Preschool children are Age, literacy status and living conditions or in simple to say the demographic factors and the environmental factors which determined the healthiness of the children.

K.R.G Nair (2007) analyzed the inter-state differentials in malnourishment among children in India, it finds the ICDS as the best package to tackle the issues and suggested to extend the program and make ICDS more focused towards controlling child malnutrition.

JethyDebasis(2009)with his extended efforts to survey and estimate the prevalence of under-nutrition and the risk factors in pre-school children of a tribal area in Kendujhar district, Odisha and evaluated that the nutritional parameters of the tribal children were unsatisfactory. The environmental factors and identified risk factors provide a clear vision that the influence of socio-economic provisions and child feeding practices display the nutritional status of children.

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Ramesh^a DemboRathAlison^a (2015) in their study Closing the health and nutrition gap in Odisha, India: A case study of how transforming the health system is achieving greater equity how political will and committed policy makers can energies the health system to promote equity in health and nutrition through equity-oriented policy, targeted investments, health system reforms that prioritize underserved geographical regions & target groups, innovative service delivery practices tailored to the needs and requirements of disadvantaged populations.

DasSanjukta(2016)made a comparative analysis of child malnutrition in Odisha with other states and found that high percentage of underweight children in Odisha. It also indicates a fact that from the bottom position Odisha is likely to attain the top one in the near future which should be a matter of serious concern.

SethyGeetanjali,JenaDhaneswari, Jena Parsuram , PradhanSrabani , BiswasTapan(2017) in Prevalence of malnutrition among under five children of urban slums of Berhampur, Odisha, India: a community a community based cross-sectional study found that Factors to be significantly associated with prevalence of malnutritionwere maternal education, hygienic and feeding practices of mother.

OBJECTIVE:

Objective of the present study is to find out the prevalence of under nutrition among children below 5 years.

III. METHODS:

A cross sectional study was conducted among children of age group 0-5 years in Boudh district of Odisha from January 2019 to February 2020.

Sample was collected by using multistage random sampling method and purposive sampling method. Boudh district is purposively selected on the basis of highest rate of child malnutrition according to NFHS-4 data. In second stage of sampling 30% of the blocks are selected that is 1 block out of 4 blocks in Boudh district.

In 3rd stage of sampling 1 GP from block are selected randomly.

In 4th stage 4 villages from 1 GP and 200 households are selected for the survey on the basis of having child/children from 0-5 years.

INCLUSION CRITERIA:

Those children who were present at the time of visit of household and who were not seriously ill were included in the study.

EXCLUSION CRITERIA:

Children having serious health problems like HIV infection, Co-genital malformation or any other chronic morbidity.

Those families where Parents or primary caretakers were not present.

Those families who were not agreeing to give the information about their children were excluded from the study even though efforts were made to aware them about the study.

Six villages were randomly selected from the one block of Boudh district and then from each village, 50 households were randomly selected for study purpose. The participating families were informed regarding the study and the purpose of study so as to keep transparency and spread awareness to the families regarding the impact of malnutrition and its possible impact to the children. Mother or caretakers of under five children who were present at the time of visit were interviewed for the primary data collection. If any household has two under five children then the youngest is selected to be the study subject. If in a house hold no under five children found then adjacent house with under five children was included in the study.

Predesigned and pretested questionnaire was used for collection of data.

Interview of mothers or primary care takers of the child was recorded. Height, Weight, MUAC were recorded by using the standard technique.

Anthropometric measurements were taken like weight is measured in a standardized scale in kilogram with minimum clothing and length measured by infant meter. MUAC was measured with MUAC tape.

Nutritional status was measured using weight for age (underweight), height for age (stunting), weight for height (wasting) and MUAC according to WHO criteria (SD classification)

Children below -2 SD of the standard median were taken as undernourished and known as severely undernourished. Children whose weight were more than 85th percentile (BMI) for the age and sex were considered as overweight. Children with MUAC 11.5 C.M to 12.5 C.M were considered as mildly malnourished and MUAC less than 11.5 C.M were considered as severely malnourished as instructed by WHO standards.

Children whose parents were not agreed to give information were excluded from the survey.

After data collection, data was coded and entered into Microsoft excel and after that analyzed by WHO anthro software.

IV. RESULT:

Total number of children studied from 0-5 years from rural villages of Boudh district of Odisha were 300, out of which 54% were male, mainly belongs to age group of 3-5 years. 24% belongs to age group of 1-3 years and 23.4% belongs to age group of 0-1 year. It shows declining birth rate among the children of 0-5 years.

Table-1: Distribution of study population according to nutritional status

Underweight(Weight for age)		Wasting(Weight for height)		Stunting(Height for age)		Normal nutrition
Male	Female	Male	Female	Male	Female	
104	62	88	62	78	48	
Total=166(55.3%)		Total=150(50%)		Total=126(42%)		Total=92(31%)

As shown in the table-1, Out of total 300 children, 69% (208) children are under nutrition. 55.3% are underweight, 50% are wasted and 42% are stunted.

It is clear from the table - 1 that children are suffering from more than one type of undernutrition.

Table-2: Gender wise distribution of nutritional status

	Undernutrition	Normal nutrition
Male	124(59.6%)	40(43.4%)
Female	84(40.4%)	52(56.5%)
Total	208	92

As shown in the table-2, out of 208 under nourished children, 59.6% were male and 40.4% were female. Out of 92 normal nutritional children, 43.4% were male and 56.5% were female.

Table -3: Distribution of wasting according to age and gender

Age(Months)	Mild		Moderate		Severe		Total
	Male	Female	Male	Female	Male	Female	
0-12	10	6	10	0	6	4	36
13-36	14	2	4	6	8	6	40
37-60	10	12	8	4	18	22	74
	34	20	22	10	32	32	
Total	54(18%)		32(10.7%)		64(21.3%)		

As shown in the table-3, out of 300 children 50% of children are wasted, among them 21.3% have severe wasting, 10.7% children have moderate wasting and 18% have mild wasting.

It is also found that 29.3% (88) of wasted children are male and 20.7% (62) are female.

Table-4: Distribution of children according to MUAC

Age(Months)	MUAC(C.M)			
	>13.5	>12.5-13.5	12.5-11.5	<11.5
0-12	38	14	10	8
13-36	36	16	8	12
37-60	96	20	10	32
Total	170(56.7%)	50(16.7%)	28(9.3%)	52(17.3%)

As per table-4, 56.7% children were having MUAC more than 13.5 C.M and 17.3% children were having less than 11.5 C.M and suffering from severe malnutrition according to MUAC measurement.

In the study population, most prevalent is mild stunting with 20.6%, 10.7% moderate stunting and 10.7% are severe stunting

Out of total 300 children (0-5) 26% stunted children are male and 16% are female.

Out of total underweight children, 62.65% (104) were male and 37.34% (62) were female. Majority of children belong to severe category (36.14%). Moderate and mild underweight category being 32% each. There is no significant difference between the genders in this underweight category. Among total underweight children, 17.3% have mild, 18% have moderate and 20% have severe underweight.

V. DISCUSSION:

In the present study the prevalence of malnutrition is 69%. It is very high than the findings of Raman D et al where it was 54% among children between the age group of 1 to 5 years.

In the present study 31% children are normal and except them all were suffering from different types of malnutrition. As we got from the present study underweight was 55.3%, wasting was 75% and stunting was 42%. If we compare this figure to the national prevalence of different forms of malnutrition then it is found that there is a big gap between the present study and the national data. This figure is very high in comparison to national data of underweight i.e. 35.7%, wasting 21%, and stunting 38.4% among 0 to 5 year children. In Odisha prevalence of underweight is 34.4%, wasting 20.4% and Stunting 34.1%.

According to the study of SusmitaBharati et al, 27.8% were under weight, 22.5 % stunted and 26.7% were wasted.

Wasting and underweight was higher than the result found by Kumar D et al, were underweight was 10.6%, wasting was 36.4% and Stunting was 51.6%.

According to the study of Kulwa et al, 22% were underweight and 3% were wasted among the children of 6 to 24 months.

Mesharm I et al, found in her study that 20% were wasted. It is found that prevalence of stunting in Kulwa study was similar to our study i.e. 43%. But the research data is less than the outcomes of Bhupeswari et al, moderate to severe stunting were found to be 68% and wasting found to be 66.8%. In this present study wasting was high among children between the age group of 37 to 48 months which is found to be 18.2%. The difference we got is due to more number of older age group children included in the present study. It is found that prevalence of malnutrition is high in later phase of children under 5.

Tara Gopal Das et al, found that children between 0 to 1 year had better nutrition status than the children between 1 to 3 years. In the present study also it is found that 1 to 3 year children have better nutritional status. Under weight and stunting percentage were found to be 45.5 % and 81.8% respectively maximum among the children of 13 to 24 months.

It is found from the present study that 28% boys were underweight while 27.6% girls were under weight. So, gender wise there is not much different between the boys and girls underweight status. It is also found that 23.5% boys are stunted while for girls the % is 21.5%. Wasting % for boys is 26.5% and for girls it is 26.9%. So, it is found that there is not much difference between the boys and girls in stunting and wasting %age.

According to NFHS-4 data 6.4% children are severely wasted in Odisha but prevalence of severe wasting among children of 0 to 5 years in the present study found to be very high at 21.3 %. The prevalence of higher percentage of wasting is a matter of concern and needs further detailed study.

According to MUAC measurement it is found that in present study 26% children are in Yellow Zone and 17.3% are in Red Zone.

According to the Study of Dairo MD et al, prevalence of severe acute malnutrition is much less than present study i.e. 5.6%. As in present study it is found to be 17.3%.

This is a study involving small sample size of 300 children and less factors to analyze the prevalence of malnutrition among the children of 0 to 5 years. Due to time and resource hurdle further study is suggested to have more explorative study in future.

VI. CONCLUSION:

If we compare between prevalence of malnutrition in present study then there is a huge difference in the state and Nation figure. Malnutrition of all the forms and grade like underweight, stunting, wasting, SAM is highly prevalent in the present study population of this rural area of Boudh district. It is also found that prevalence of all forms of malnutrition is high with increase in age among 0 to 5 year children.

VII. RECOMMENDATION:

More emphasis should be given on study of the factors affecting nutritional status of children among the age group of 0 to 5 years in rural areas. Awareness about the benefit of cleaning and maintaining hygiene should be created among children and parents. Health workers,ASHA,AWW and NGOs who are working in the rural areas should create more awareness about feeding practice,disposal of sanitary etc.

ICDS program should be strengthened.Deworming medicines and regular vaccination should be given regularly to the children below 5 years in rural areas.

As in rural area most of the children under 5 goes to the Aanganwadi centers for their primary education,the Aanganwadi workers should record the height,weight,MUAC etc. in regular manner.

These measures should be applied to keep track on malnutrition status and to eradicate the malnutrition among children in rural areas.

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