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An Analysis upon Nutritional Requirement and Status of Pre-School Children: A Case Study of Purulia District in West Bengal

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Abstract – Nutrition and health were the most important contributory factors for human resource development in the country (Amirthaveni and borikor, 2001). But still, undernourishment continued to be a major public health issue and caused of a substantive proportion of all child deaths in every years specifically in developing countries like India (black et al., 2003). The large sections of Indian publication were suffered from varying of energy deficiency.

The most vulnerable group regarding health and nutritional status was preschool children living in rural as well as in urban slum areas, within the tribal preschool children were the main victims of under nourishment.

The past seven decades have seen remarkable shifts in the nutritional scenario in India. Even up to the 1950s severe forms of malnutrition such as kwashiorkar and pellagra were endemic. As nutritionists were finding home-grown and common-sense solutions for these widespread problems, the population was burgeoning and food was scarce. The threat of widespread household food insecurity and chronic under nutrition was very real. Then came the Green Revolution. Shortages of food grains disappeared within less than a decade and India became self-sufficient in food grain production.

India has variety of tribal population they constitute about 8% of total population, these are considered to be aboriginals and confined to living in hilly and dense forest area isolated from the main stream. A great majority of them inhabitant in the central India.

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INTRODUCTION

Adequate nutrition is essential for children's health and development. Globally it is estimated that under nutrition is responsible, directly or indirectly, for at least 35% of deaths in children less than five years of age. Under nutrition is also a major cause of disability preventing children who survive from reaching their full development potential. An estimated 32% or 186 million, children below five years of age in developing countries are stunted and about 10% or 55 million are wasted. Unless massive improvements in child nutrition are made, it will be difficult to achieve MDG 1 and 4 by 2015.

There is a critical window of opportunity to prevent under nutrition by taking care of the nutrition of children in the first two years of life, girls during adolescence, and mothers during pregnancy and lactation – when proven nutrition interventions offer children the best chance to survive and reach optimal growth and development.

Detrimental and often undetected until severe, under nutrition undermines the survival, growth and development of children and women, and diminishes the strength and capacity of nations. With persistently high levels of under nutrition, vital opportunities to save millions of lives are being lost, and many more millions of children are not growing and developing to their full potential. Nutrition is a core pillar of human development and concrete, large-scale programming not only can reduce the burden of under nutrition and deprivation in countries but also can advance the progress of nations.

Nutrition and health were the most important influential factors for human resource development in

the country.But still, undernourishment continued to be a major public health issue and caused of a significant proportion of all child deaths in every years specifically in developing countries like India. Under nutrition contributes to the death of 5.6 million children under five years in the developing world each year- the equivalent of 10 children a minute (UNICEF). The children under five forms a most vulnerable group in any community and their nutritional status is a sound indicator of health and nutrition of that community. The poverty is a major cause of malnutrition; there are also socio-cultural factors that have kept large population groups in need of an adequate level of nutrition. The alarming levels of nutritionally deprived children in aggregate have its own socio-economic dimension reflected in caste/class differential which are reasonably wider and variant across different states of India. The basic cause of malnutrition in our country is the non-availability of nutritionally adequate food in the case of children especially the poor and deprived sections. The large sections of Indian population were suffered from varying degrees of protein energy deficiency.

About half of the World's total population of indigenous people, often referred as tribals, are living in India. The tribal population in Indian language known as "Adivasi", stands for original inhabitants, constitute 8.2% of the total population of India. The general feature of tribal population in India is exclusive geographical habit. The tribal people are living in a distinctive socio economic and cultural setup entirely different from general population. Their food habit and food intake and pattern of consumption is different from general population and the quantum of intake depends on the seasonal availability of agriculture and forest products. There is a close relationship between tribal eco system and nutritional intake. Under nutrition among the tribals has been closely linked with high food insecurity, low quality of complimentary food and high burden of intestinal parasitic and other infections, low birth weight intra-uterine growth hindrance (related to maternal malnutrition), despite improvement in economic situations over recent years.

Child malnutrition is a wide spread public health problem having international consequences because good nutrition is an essential determinant for their well-being. The most neglected form of human deprivation is malnutrition; particularly among preschool children (Sayed, *et. al., 1995*). WHO cites malnutrition as the greatest single threats to the world's public health, it is still widely believed that malnutrition is restricted to the third world population (Agrahar- Murugkar, 2005). Over population and poverty are pervasive in Bangladesh and causing population hazards like malnutrition among pre-school children who are naturally innocent, vulnerable, dependent often suffering from malnutrition (Bangladesh Health and Demographic Survey 2011). The prevalence of malnutrition in Bangladesh remains among the highest in the world (Chowdhury, *et. al.,* 2008). Persistent malnutrition contribute not only to widespread failure toward meeting the first MDG of having poverty and hunger, it also undermines efforts to reach MDG relating to maternal and child health. Malnutrition and hunger feed directly into ill health and poverty (Excler, *et. al.,* 1985). According to BDHS 2011 there has been some improvement in child nutritional status over the past four years (*Gabriela Mistral, 1948)*. The level of stunting has declined from 51 percent in 2004 and 43 percent in 2007 to 41 percent of children under five in 2011.The pattern and change in wasting has been small and inconsistent (Gopalan, 2002). Bangladesh has a variety of tribal population reflecting its great ethnic diversity. They constitute about 1% of total population, though they are scattered all over the hilly and dense forest region of the country. So, as observed, their ethnic origin, culture, feeding practice, literacy rate and profession are different from those of indigenous Bengali people. As these are very important determinants for nutrition, it is expected that there will be an obvious difference in the nutritional status of 3 to 5 years children of Chakma tribe from that of Bengali children (Hasan, *et. al.,* 1996). Nutritional assessment by anthropometric measurement is an important technique for identifying individuals, groups or communities whose growth is not keeping up with the expected pattern (Sherestha, 2004). Bairagi and Chowdhury showed that mother's education, family income, sex and birth order of the children are important determinant of malnutrition (Myaz, *et. al.,* 2010). In Bangladesh this is further aggressive and critical because of unbalanced diet and poverty stress. Nutritional status is a sensitive indicator of community health and nutrition among preschool children, especially the prevalence of under nutrition that affects all dimensions of human development andp leads to growth faltering in early life (National Family Health Survey, 2005-2006). Therefore, the assessment of the nutritional status of a community is one of the first steps for the formulation of any public health strategy to combat malnutrition. The principal aim of such an assessment is to determine the type, magnitude and distribution of malnutrition in ethnic community and to identify the risk group and determine the contributory factors.

The years between 1 and 6, growth is generally slower than in the 1st year of life but continues Gradually. Activity also increases markedly during the 2nd year of life as the child becomes increasingly mobile. Development of a full dentition by about the age of 2 years also increase. The range of foods that can safely be eaten. There is an increased need for all nutrients, but the pattern of increase various for different nutrients in relation to their rule in growth of specific tissues.

NUTRIONAL REQUIREMENT OF PTRESCHOOL CHILDREN

Energy Energy is required for growth and activity. Insufficient food will not only result in under nutrition in terms of inadequate weight gain but will also hinder growth. The rate of growth fluctuate from one age to another. Up to 10 years of age there is no difference in sex for RDA. Due to improper weaning practice, the child may not meet caloric and protein requirement and pave the way for PEM. Insufficient Caloric intake can lead to protein deficiency.

Proteins : The increase in the muscle mass that must accompany bone growth requires positive nitrogen balance i.e. met by protein intake of 1.5 to 2 g/ kg. body weight . The increase in total body size necessaties a larger vascular system to transport Nutrients to the tissues and waste all products away from the tissues. Thus there is an increase in demand for nutrients needed in blood formation like Protein, Iron Folacin and pyridoxine . Bone growth also creates a need for protein.

The RDA of Pre School Children : (1-6 years is given in Table No. 1)

Fat : Fat energy including invisible fat for children should be 25% of total energy and essential fatty acid energy is 5 to 6%.

Minerals: Calcium requirements of children is calculated on the basis of the amount of Calcium accretion in the body. This deposition is not uniform throughout growing period, but would be relatively greater during early childhood and during adolescence than during the other periods of growth. Since, all dietary calcium is not absorbed 400 mg. per day is prescribed through the actual requirement may be Less. Deficiency of Calcium can affect the bones of growing children .

Milk is the best source of calcium. Hence the diet of preschool child should include 1-2 glasses of Milk per day.

Nutrient	Years	
	1 - 3	4 - 6
Weight Kg.	12.2	19.0
Energy – K cal	1240	1690
Protein – g	22	30
Fat g	25	25
Calcium mg	400	400
Iron mg	12	18
Vitamin A mcg	400	400
Beta carotene mcg	1600	1600
Thiamine mg	0.6	0.9
Ribo flavin mg	0.7	1.0
Nicotinic acid mg	8	11
Pyridoxine mg	0.9	0.9
Ascorbic acid mg	40	40
Folic acid mcg	30	40
Vitamin B^{12} mcg	0.2 to 1	0.2 to 1

Table No. 1 Recommended dietary allowances for preschool children.

Iron : During growth for an increase in each kilogram in body weight 30 mg of iron is required and since the increase in body weight during childhood is 2 Kg. /year on an average the daily requirement of iron for growth will be 0.2 mg. The physiological requirement can vary markedly for 1 – 2 years from 0.2 - 0.5 mg. per kg. of body weight per day.

To meet this increased demand for iron, iron rich foods like rice flakes, egg yolk and greens should be included in the diet. Dietary lack of iron accompanied by hook worm infestation can lead to anemia.

Vitamins: The incidence of vitamin a deficiency signs are high and serum vitamin A levels are generally low. Among Indian children whose dietary intake is less than 100 mcg. According to the studies conducted by ICMR, children receiving food supplements which provided a total of 3 hundred mcg of vitamin A per day over a period of 6 months, serum vitamin A levels were found to be around 30 mg. per dl and no clinical signs of vitamin A deficiency. Based on this data 400 mcg have been suggested including the safety allowances. Deficiency of vitamin A in children can cause bitot's spots, night blindness or in severe cases total blindness also. Milk, eggs, carrots, and green leafy vegetables should be included in the diet.

FACTORS AFFECTING NUTRITIONAL STATUS OF SCHOOL CHILDREN

Nearly two out of three pre- school children in India are malnourished.

Growth is influenced by nutrition. Frequent attacks of infectious diseases affect growth and increase the

requirements of various nutrients. Incidence of PEM vitamin A Deficiency are high among this age group.

Repeated illness – especially the common illness such as diarrohera measles, whooping cough and other respiratory infections are the principal underlying causes of malnutrition. They take away appetite and so reduce food intake often for many days each month, they inhibit the absorption of the food that is eaten, they drain the body of nutrients through diarrohea and vomiting, they burn up calories in fever the result is frequent weight loss.

The mechanisms by which infections worsen ; nutritional status are anoreaxia, cultlural and therapeutic practices, malabsorption, catabolic losses , anabolic losses, fever additional intestinal losses, reduced growth and weight loss .

Overall need for nutrients increases throughout the growth but there will be periods when; growth is slow and the need for certain nutrients will be reduced proportionately. Children reflect these changes in need, by fluctuations in appetite. This may.

Cause anxiety to parents. Unless such period is prolonged or is accompanied by signs of under nutrition such as lethargy, fatigue and increased susceptibly infection, should not cause concern

Health Status of pre – school children can be evaluated with the help of growth Chart

Factors Responsible for reflecting the food by Preschool Child

- The Child may be sick
- Worm infestation particularly hook worm
- Nutritional deficiency
- The child is too tired
- Insufficient time too tired
- Psychological disturbed
- Stress of school
- Absence of father or mother
- Birth of a sibling
- Shifting to a new place
- To draw the attention of parents
- Unfavorable comments on food
- Repetitive food , no variety
- Food is not according to the likings of child
- Food is not palatable , not at right temperature
- Snack taken just the mea
- Diverted to play

Show the comparative growth curves of normal and undernourished Indian children up to 5 years weigh of preschool children are recorded in growth charts under ICDS scheme. Children from 1-5 years are measured once in three months, mid-arm-circumference to know the nutritional status.

REVIEW OF LITERATURE

Review of literature is a key step in research process. Review of literature refers to an extensive, exhaustive and systematic examination of publications relevant to the research project9. The review of related literature is valuable guide to define the problem, recognizing its significance, suggesting promoting data gathering devices, appropriate study design and source of data.

Review of literature for the present study has been organised under the following headings1. Literature related to the prevalence of malnutrition and its relation with feeding practices.2.Literature related to the feeding practices of mothers and nutritional status of their children.3.Literature related to the influence of weaning practices on nutritional status of children4.Literature related to the malernal nutritional knowledge and child nutritional status.

The etiology of the early onset of stunting is diverse among populations of varying biological, environmental and cultural circumstances. Other causative factors are antecedents in pregnancy and pre pregnancy, Infants, size at birth and during the first 6 month of life the malernal size upon entry into pregnancy and weight and fat gain during pregnancy and lactation. (Neumann C.G., Harrison GG).

The primary goal of this review is to examine the timing and nature of dietary inadequate during the first 5 year of life. An important issue is that many children in developing countries are already nutritionally depleted by the end of first year of life, because malernal under nutrition can cause low foetal accumulation of nutrient stones and secretion of inadequate amounts of some micronutrients in breast milk. Improvement of malernal diet and micronutrient status is required to remedy this situation. Inadequate micronutrients status is required to remedy this situation. Inadequate micronutrients intake and resulting deficiencies are common in pre-Schoolers

because of a lack of sufficient animal source foods and have been associated with delayed child development. Dietary diversity is an especially important determinant of micronutrients intake when animal source foods intake is low. Interventions with animal source foods have produced improvements in growth, micronutrient status, cognitive performance and activity of children. Although much is now known about the role of inadequate diets in pre- Schooler malnutrition. On a grobal scale the ability of house to apply this knowledge to improve the diets of their children is till limited. (Allen LH et. al)

Abdul Sayed ZT has done the study on the determinants of nutritional miasmas (NM) and kwashiorkor (K) using Sudanese children aged 6-36 months. Subjects consisted of 55 children with NM and 55 with K, admitted to the children's Emergency Hospital in Khartoum. Mothers were interviewed in hospital, and information on duration of breastfeeding, age at introduction of supplementary foods, and weaning foods was obtained. Observations were made in 20 percent of homes of study children. The results suggest a positive association between prolonged breastfeeding without introduction of supplementary feeding between the ages of 6and 24 months, and NM. Using multivariate analysis the data show that late introduction of supplementary foods produces an increase of 1.4 fold odds of developing nutritional miasmas, rather than kwashiorkor. In contrast the odds ratio is1.9 for the two conditions in terms of age of cessation of breastfeeding, the kwashiorkor children breastfeeding for fewer months. Results suggest strategies to reduce the prevalence of NM and moderate PEM25

Excler JL, Nicolas E, Mojon M conducted a study on Protein-energy malnutrition in an urban African milieu, etiologic factors in kwashiorkor and miasmas-kwashiorkor. The etiologic factors of protein-energy malnutrition have been studied in 59 children with kwashiorkor (KWK) or miasmas-kwashiorkor (MKWK) and living in an African urban area. The decline of breast feeding leads toan earlier PEM, mainly MKWK. This decline is linked to urbanization, mother's activities, dislocation of traditional structures and use of artificial formulas. Essentially based on cereals, the diet is responsible of the post-weaning P.E.M. Poverty, ignorance and food taboos are related to a lack in weaning food varieties. A small number of infants with KWK had a rich protein diet putting back the cause of anhypoproteic diet on the KWK onset. Infections play a determinant role in the onset of KWK and of some MKWK, after 2 years of age. Diarrhoea, measles, bronchopulmonary and parasitic diseases are the most prevalent infections. Amongsocio-cultural factors, conjugal disorders are predominating with child-mother break-up and father's bonding failure. At the opposite of rural areas, the family size is reduced.

Hasan J, Ray J, Khan Z conducted a study on influences of weaning practices on nutritional status in a cohort of 200 infants over a period of one year in the rural area of Aligarh. Weaning was late in most of the infants under study. The nutritional status of infants up to 6 months was significantly better than that of infants more than 6 months of age. Most of them used the family- food as weaning food28

Osuhor PC had prepared a standardized questionnaire and administered to 65mothers attending the Nutrition Clinic of the A hmadu Bellow University Teaching Hospital, Kaduna, Northern Nigeria, over the October-December 1978 period to determine at what age the 1st supplementary diet was introduced, the age the child was weaned, and the weaning practices. The questionnaire dealt with various aspects of weaning knowledge, attitudes, and practices. The mothers were referred to the Nutrition Clinic because their babies already were suffering from protein energy malnutrition, had failed to thrive, or had severe infections, e.g., measles, gastroenteritis, or respiratory diseases. 58 of the families were of low socioeconomic status. 36 mothers introduced supplementary feeds when their ch8ildren were between7-9 months. All the mothers used corn, or millet gruel. A decision to wean a child may be made if the child can crawl, walk, or has a good set of erupted milk teeth, even if the child has not reached the traditional weaning age of 20-24 months. The mean age of weaning was 17 months in this study. 78.5 percentage of the mothers responded to the question about weaning food taboos, prohibitions, and their reasons during the weaning period. Even when protein is available, a child may be denied the protein because of socioeconomic factors. The use of carbohydrate gruels among these low socioeconomic facilities coupled with sociocultural factors compounded the feeding problem, and, consequently, protein energy malnutrition was common during the weaning period29

Puri RK, Sachdeva R had done a study on supplementary foods suited for weaning and feeding of infants were developed, using locally available foods in Punjab. Methods of cooking employed were those used commonly by low and middle-income families, Cereal –pulse combinations along with some sesame seed and groundnuts were used to enhance the protein quality. The ratio used was such that the preparation did not deviate much from the accepted tastes of the population. Fresh green vegetables were also used. Fifteen recipes were standardized and acceptability trials carried out with mothers and infants or the different socio-economic groups. The preparations were highly accepted by all. Analysis of these were done for protein, calories, vitamin C and iron to see their contribution to the diet. The cost per

serving a very low cost a substantial amount of the above nutrients could be given to in making these recipes will go a long way towards popularizing such formulations.

Malla S and Shrestha SM conducted a study on Complementary Feeding Practices and its Impact on nutritional status of under two old children in urban areas of the Kathmandu, Nepal. Magnitude of the malnutrition was very high in Nepal. Child nutrition problem due to faulty child feeding practice was widely observed in many parts of the country including Kathmandu valley. Complementary feeding practice among the young children has been found very critical in urban areas of Kathmandu valley. The study was based on primary data collected by applying the 30cluster sampling method. Target population of the study were young children aged 0-24 months. A set of questionnaire was used to interview mothers of 150 households. Finding of the study indicated that about 92 percent households were found practicing Traditional Complementary Feeding Practices and 8 percent households were found practicing Commercial Complementary Feeding Practices. Traditional complementary foods given to the children were found lacking in macronutrient carbohydrate and protein severely, therefore, not fulfilling the nutritional requirement of the children. Among traditional complementary food fed children, 63 percent of children were found suffering from mild to severe form of malnutrition whereas among commercial food fed, only 41 percent of children were found suffering from such form of malnutrition. About 33 percent of the children suffering from severe malnutrition, parents were employed. Nutritional status of children from Kathmandu district found better compared to young children from other district. Children from Lalitpur district were found more severely malnourished. Surprisingly baby boys found more severely malnourished compared to baby girls. Traditional foods fed children were found more severely malnourished compared to commercial complementary food fed.

METHODOLOGY

Research methodology is way to solve systematically the research problem. The methodology enables the researcher to project a blue print of the details, data, approach, analysis and findings of research undertaken. The methodology of research indicates the general pattern of an organized procedure for gathering valid and reliable data for the purpose of investigations.

This paper includes the description of research approach, research design, variable setting, population, sample and sample size, sampling techniques, sampling criteria, development of tool, description of the tool, pilot study, data collection procedure, plan of data analysis. analysis.

This study was to done assess the nutritional status of tribal pre-School children (1-6 age group) of the populating Bankura district in West Bengal (India)

Research approach: A research approach tells the researcher what data to collect and how to analyses it. It also suggests possible conclusions to be drawn from the data. In view of the nature of the problem selected for the sturdy and objectives to be accomplished, a descriptive appropriate survey approach was considered as appropriate for the preset study.

Research Design :- A research design is a blueprint for conduction a study that maximizes control over factors that could interfere with the validity of the findings. It is the plan and structure and strategy of reinvestigation of answers the research questing. It helps the research in deferring the attribute, selection of population and type of statistical analysis to interpret the data. The investigative design selected for this study is descriptive correlative design. The purpose of descriptive Co-relation design is to describe variable and examine relationships. Among trise variable.

Variables: Burn and grove explained that research variables or concepts are the qualities, properties or characteristics identified in the research propose and objectives or questions, properties are observed or measured in a study.

In present study research variable are :-

- Nutritional status – Anthropometry measurement
- Weight for age
- Height for age
- Weight for height .
- Demography variables of mothers included
- Age
- Education
- No of under six children
- Occupation

Population: The term population refers to the target population which presents the entire set of individuals who meet the sampling criteria.

The total number of houses in Barjora Block-49 and Female children-89, chatna block-51, and Female children-100 and G. Ghati Block 30, Female children-52. The sample is selected randomly. Turget population present study comprise the malnutrition and nutritional status of tribal pre-School children between 1-6 age group.

Sample:- sample refers to the subject of a population that is selected to participate in a particular study . it is the portion of the population which represent the entire population. In the present study sample consist of 501 children of Bankura District in west Bengal.

Sampling Technique : To conduct the survey I shall be use stratified random sampling method in this method will be classified the total tribal children (1- 6 age roup) into 4 groups or strata : -

1. School Children for 1 – 3 years of age group (male)
2. The School Children for 1 – 3 years of age group (female)
3. The school children for 3 – 6 age groups (male)
4. The school children for 3 – 6 age groups (female)

Diet survey by diet recall method: In this method a trained interviewer ask the responded to recall in detail all the food and drink consumed during the time period in the previous 24 hours. Thus the method is most commonly known as 24 hours recall. In some cases the time period is the past 48 years, the past 7 days or in some rare cases, the previous months. As memories of food intake may fed rather quickly beyond the most recent day or to the accuracy is laser in long recall methods.

Not only the food items consumed by the responded in past 24 hours are recorded the interviewer assist the responded in estimating portion sizes of food consumed. The interviewer may be by asking for the responded first at or trank on the last awakening. Then he is asked to the point exactly 24 hours in the past and works forward to the time of awakening. Some interviewers asked responded to recall their diet from midnight to midnight of the previous day. Asking question about the activities of the responded during the day, the interviewer can help in recalling intake.

The omission and mistake recalling may be checked by reviewing the previous days eating episodes several times. In some situation a quick list of food eaten the previous day is initially is recorded in the next phase, a detail description of food on the quick list is obtained. He may asked questions hold measures like cups, glasses, spoons, bowls, the geometric shapes of the food portion (example circle rectangle etc.) and labels are also important to measure portion size. In this method the responded may have to be contacted later by telephone or male to clarify any point or to obtained information such as brand name, preparation method and serving sizes.

CONCLUSION

The present study was aimed to correlate the Malnutrition & Nutritional status by the measuring weight for age, Height for age & weight for height of tribal pre-School children. The study was conducted in 1 to 6 years of age group tribal pre-School children in the District of Bankura in 3 Blocks in West Bengal, India.

A structured interview scheduled was used to assess the nutrition study of tribal pre-School children. The research design adopted for the study was descriptive correlation design Random sampling technique was used to selected 501 tribal pre-School children (1-6 age group) from Bankura District in Bankura.

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