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Review article

Pre-school hilly and forest-dense ethnic children nutrition

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Abstract

Child under nutrition is a serious issue and burning public health problem worldwide. Pre-school children usually require special care. It is evident that pre-school children suffer highest prevalence of mortality and sufferings of disease. If malnutrition starts in early stages of life it is difficult to recover. According to World Health Organization under nutrition of children requires immediate attention. Various ethnic communities live in Bangladesh with diverse lifestyle. This diversity makes them distinct area of study. Socio-economic characteristics and food habit are considered as strong determinant of nutritional status. It is know that Bandarban is the remotest hilly district of Bangladesh. Internally migrated people are gradually settling there from nearby districts. Geographical variation may affect their social status, dietary intake and anthropometry as well. Findings of this review are helpful for policy maker and planner to design and implement public health program specifically designed for them by using local resources.

Introduction

MNutrition and health are interrelated. Child nutrition is more important and requires attention to all. Following reviews focus its attention on socio-economic factors, dietary state and nutritional profile among ethnic and settler children. This review is a clinical analysis of various research studies on child nutritional status that has given an important insight into the factors influencing child nutritional status of preschool children. The subjects gain more importance in ethnic and settler children, due to certain adverse realities like insufficient food intake, frequent infections, and lack of access to health services, illiteracy, and adverse cultural practice. None of the studies done earlier has made an attempt to correlate food intake pattern and nutritional status of the preschool children. This review fulfills the gap that exists in the literature on assessing the nutritional status of preschool children in Bandarban sadar upazila and an attempt to determine an association between food intake pattern and nutritional status of study population.

Review

Nutrition is not a single word rather it is an integrated concept that includes ecological, economic, social, cultural and nutritional requirements as because nutritional component vary state to state, nation to nation and country to country. To measure health status of a country, nutrition and nutritional status, food security, food diversity, food pyramid has to be considered. 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 [1]. Bairagi and Chowdhury showed that mother's education, family income, sex and birth order of the children are important determinant of malnutrition [2].

Malnutrition is a prime and action-oriented issue in all developing countries [3]. In Bangladesh this is further aggressive and critical because of unbalanced diet and poverty stress. Nutritional status measurement either by anthropometry or biochemical or food value is considered as a sensitive indicator of community health and nutrition among preschool children, especially the prevalence of under nutrition that affects all dimensions of human development like physical, mental, intellectual, psychological and leads to growth faltering in early life. Considering above issues therefore, the assessment of the nutritional status of a community is one of the first steps or crucial steps for the formulation or implementation of any public health strategy to combat malnutrition or under nutrition. Ghost rightly, logically and comprehensively said that aim of such

an assessment is to determine the type, magnitude and distribution of malnutrition indifferent geographic areas and to identify the risk group and determine the contributory factors [4]. Poverty, hunger and malnutrition have immediate, intermediate and chronic effect on pre-school children which interferes school progress. It is evidence based that children who lack certain nutrients in their diet or who suffer from protein-energy malnutrition, hunger, parasitic infections or other diseases, do not have the same potential for learning as healthy and well-nourished children [5].

Hunger and food insecurity might increase the risk for lower dietary quality and under nutrition. In turn, under nutrition can negatively affect overall health, cognitive development, and school performance [6-8].

They clearly indicate that weak or ill health and poor nutrition among pre-school children diminishes or impairs their cognitive development either physiological changes or by reducing their ability to participate in learning experiences- or both and this situation is not desirable.

The ethnic groups have totally submitted themselves to the forest setting since ages [9]. Everyday millions of the poor, the ethnic groups and forest dwellers are earning their livelihood from the forest [10]. The ethnic communities could subsist for thousands of years with reasonable standard of health and abode mainly because forests provided them food etc [9]. Forests provide tribal a number of foods in the form of edible fruits, roots, tubers, leaves etc.

Miah et al. stated that Bhotiya ethnic community of India depends to a large extent on wild resources of plant and animal origin for their food security [11]. Edible wild fruits, seeds and leaves often provide food during the lean period when staple food item such as rice, buckwheat, barley are not available. In times of distress and scarcity ethnic groups mostly rely on forest produce for their subsistence [12] and in normal times their food comprises seeds also along with others collected from forests. Literature reveals that the Kandha ethnic community of Koraput, India extracts tamarind seeds to eat. Young shoots of several species of bamboos are important vegetable ingredients in the daily meals in China, Japan, Taiwan and Thailand [13].

The ethnic people of Bangladesh collect bamboo shoots from the natural forests and have been using them as one of the major food items during rainy season [13]. These young shoots, locally known as `bans koral` of Melocannabaccifera and Bambusatulda are cooked as vegetables [14]. In some cases, only one of the parts is used, in others more than one part is edible and, in some cases, the whole plant is used. Wild leaves litter fresh or dry, frequently accompany staple grain dishes [13]. Apart from herbs, many woody perennials are also consumed as greens. Many plants possess acidic leaves, which are either used or taken in form of salad and chutney. The young leaves of Albiziaprocera and wild mango are used as vegetables [15] as young shoots of bamboo and cane (golakaga) by the ethnic people of CHT, Bangladesh. They take young shoots of Daemonoropsjenkinsianus and Calamus tenuis as vegetables [14]. Mushrooms are consumed by the ethnic peoples of CHT`s as food [13]. Several variations of edible fungus like Lentinus, Shizophyllim and Jew`s Ear grow on decaying wood [13], mushrooms like Leoiota, VolvariellaVolvacea and Pleurotus are used as food, which are all, collected in the rainy season from the wild. Forest provides food in lean season and during emergency periods [16]. Menon observed that approximately 150 species of wild plants consumed in India, Malaysia and Thailand have been identified as a source of emergency food by the FAO [17]. The inflorescence of wild banana and the white soft core within the leaf sheaths are used as vegetables by the ethnic minorities of CHT`s, Bangladesh [15]. Banana core cooked with rice is used in days of food scarcity and when chopped with bran it makes an excellent fodder for pigs and cattle [15]. The Mahua plant has also been of special significance as food during the years of scanty rainfall [18]. Bamboo seeds especial Bambusaaurundinacea are collected and eaten cooked like rice especially during the famine times as scarcity foods [16]. During seeding time, the bamboo seeds are also powdered and cakes prepare for eating by ethnic inhabitants of CHT`s [15]. In the villages, south of Bamako, the capital of Mali where rainfall often limits agricultural productivity [16], non-timber forest product (NTFPs) are extremely important as food supplement and food accounts for 54% of the total products. Among the edible products leaves for sauces, fruits for sauces, nuts for oil or butter and seeds for condiments are the most important and 90% of the NTFPs are collected from the natural forests [16].

Bhattacharyya and Sarkar conducted a community-based cross-sectional observational study among three ethnic villages of the Chanchal II block of the Maldah district in West Bengal and found more than half of the study subjects (63.83%) were suffering from different grades of malnutrition but they have missed some important information like quantity and quality of food, hygiene practice, education of mother etc [19].

Ethnic people depends on traditional system of cultivation i.e. jhum cultivation or shifting cultivation especially in Chittagong Hill Tracts. Most of the ethnic people in India convey their own geographically isolated and distinct life style as like in our country [20]. Evidence supports inadequate and insufficient food habits, traditional sociocultural belief and biological activities, may lead to a large segment of child under-nutrition [20-22].

Chakrabarty & Bharati revealed that children from forest regions had the highest prevalence of under-nutrition followed by rural and urban counterparts, 33.87%, 24.62% and 20.16%, respectively [23]. This is an important finding for policy maker. It would be better if we carry out a research considering our context because of scanty information on ethnic children live in deep dense forest hilly area [23].

Bangladesh Demographic and Health Survey (BDHS) 2014 showed national figures for stunting (36%) and underweight (33%) but separate findings on specific tribe was absent. Bisai et al found that overall prevalence of thinness, normal weight and overweight in India were 67.2%, 31.9%, and 0.8 %, respectively [24]. On the basis of these findings they suggested to initiate effective public health policies to combat the child malnutrition not only in India but also adjoining countries.

Chakma et al. carried out a study in the Baigachak area in 2002-2003 and found that about 61% of the pre-school children were underweight; out of them 24.3% children were severely underweight. Stunting and wasting were seen in 44.3% and 37% children respectively. The reason behind wide prevalence of under nutrition was that children consumed cereal based diet whereas other foodstuff was lower than the Recommended Dietary Allowance (RDA) [14].

United Nations Development Programme (UNDP) and Helen Keller International showed that prevalence of underweight among under-5 children was over 30%, and more than 7% of these children exhibited signs of severe malnutrition in Chittagong Hill Tracts [18]. They also predict that if this livelihood and food insecurity continue or worsen with seasonal fluctuations, moderately undernourished children and mothers can fall into categories of more severe

malnutrition. But no inferential statistics were used which results concrete association between variables was absent [18].

Anderson et al. showed that certain parental feeding practices are more likely to promote healthy eating patterns in children, while others are more likely to lead to unhealthy or disordered eating [25]. For example, parental feeding practices associated with the development of healthy eating such as repeated exposure to healthy and novel foods, positive reinforcement for healthy food choices, positive social modeling and monitoring of highly-palatable, low nutrient foods [26]. Parental feeding practices linked to weight gain, disordered or unhealthy eating behaviors include: restriction by either reducing child dietary intake or limiting snack food intake [27], pressure to eat, and non-nutritive instrumental practices, such as using food as a reward or to pacify [26]. While parents tend to use these latter strategies with positive intentions, to encourage healthy eating or protect against weight gain, they can have unintended consequences on a child's food preferences, behavioral inhibition and self-regulation. Such feeding practices are therefore useful targets for preventive interventions aimed at improving parents' ability to foster healthy eating and healthy weight maintenance in their children [28].

Tjeuw stated that a key part of adopting a healthy lifestyle involves children seeing dietary attitude changes manifested positively and wholeheartedly by the people most important in their lives particularly mother or care giver. Just as important as implementing good habits is that adults have conversations with children and provide opportunities for them to learn about eating nutritious foods and how that contributes to good health [29].

A cross sectional study on nutritional status was made by Sharma et al. on Raj Gond (ethnic community of Central India) preschool children in the Waratola village of Balaghat district of Madhya Pradesh, India and results revealed that there was high prevalence of underweight (37.4%), stunting (46.3%), wasting (41.5%), poorer nutritional status was also reflected through high prevalence of sparse hair (18.7%), conjunctival xerosis (18.7%), angular stomatitis (32.5%) and other nutritional deficiency signs [30]. All these observations recommended that preschool children need better nutrition to combat the problem of protein energy malnutrition. They also suggest conducting further studies to identify the factors responsible [30].

Rao et al. conducted a health and nutrition survey on tribes in three ecological zones of Madhya Pradesh namely Jhabua, Bastar and Sarguja. Jhabua pre-school children were worse in terms of consumption of both foods and nutrients compared to Bastar and Sarguja [21]. In addition to this protein energy malnutrition and other vitamin deficiency were significantly low.

A cross sectional study on 101 mothers and their last child (58 males and 43 females) aged up to 5 years was undertaken among Shabar tribal community in Khurda and Cuttack districts of Orissa [31]. Underweight were significantly ($p<0.05$) associated with age of children and undernourished mothers. Initiation of breastfeeding after 24 hours was found to be significantly ($p<0.05$) associated with male children as well as mother's occupation.

As like Bangladesh, India belongs to number of ethnic population [32]. The ethnic diet is fascinating and monotonous with little intra and inter-ethnic variations. Various myths and incorrect food habits are the important contributors for the wide prevalence of malnutrition among ethnic population [32]. Studies carried out among the Jenu Kurubas, a primitive ethnic of Karnataka revealed that low intake of various nutrients and high prevalence of nutritional anemia [32]. A cross sectional study was carried out in the Baigachak area in 2002-2003 to study the nutrition profile of the Baiga ethnic community. The intake of all nutrients except calcium was significantly lower than recommended level [33].

A community-based study about health and nutritional status of Warli ethnic children in Maharastra in India showed that health and nutritional status of ethnic children was very poor, it may be due to lack of nutritional awareness and non-availability of health services and it was worst in remote inaccessible areas [33].

Certain observational study was conducted in Madhya Pradesh of India about health and nutrition profile of pre-school children of ethnic groups [34]. They found all the ethnics' diet was cereal-based and intake of pulses was low and green leafy vegetables (GLV) consumption varies from as low as 13.5±2.7 gm/day and taking of other vegetables, roots and tubers were also not up to the mark. The consumption of oil & fat was almost negligible in all the ethnic groups [34].

Leung and Stanner have shown that some minority ethnic groups are more likely to experience poorer health outcomes compared with the mainstream population in United Kingdom. In our country Bangladesh need to explore tribal health and nutrition scenario particularly in Chittagong Hill Tracts [35]. To find out health as well as nutritional profile baseline survey should be conducted primarily. These include higher rates of cardiovascular disease (CVD), type 2 diabetes and obesity. The differences in health outcomes may reflect interactions between diet and other health seeking behaviors, genetic predisposition and developmental programming, all of which vary across different groups. As is the case for the rest of the population, the dietary habits of minority ethnic groups are affected by a wide variety of factors, but acquiring a better understanding of these can help health professionals and educationalists to recognize the needs of these groups and help them to make healthier food choices. Unfortunately, to date, there have been few tailored, well-designed and evaluated nutritional interventions in the UK targeting minority ethnic population groups. Further needs assessment and better evaluation of nutritional interventions have been recommended to enhance the understanding of the effectiveness of different approaches amongst minority ethnic groups [35].

Socio-economic baseline survey in 2009 by UNDP in CHT revealed that most ethnic peoples in CHT are not secured in relation to availability of food during most of the time in a year. The prevalence of underweight among under-5 children was over 30%, and more than 7% of these children exhibited signs of severe malnutrition [18].

Muaz et al. conducted a study in four tea gardens of Sylhet division to assess the nutritional status of 1 to 5 years children of tea workers. Result showed that prevalence of wasting was 42.3% whereas that of stunting and underweight was 80.2% and 73% respectively. Their mother's educational status and body mass index are lower than that of Bengali population [1].

Hajong tribes of North-East region of Bangladesh were completely dependent on trees of homestead and surrounding forest for their livelihood. Traditionally they have been acquired the ethno-botanical knowledge. This study had undertaken to critically analyze the ethno-botanical perception of Hajong tribe of Nalitabari Upazilla of Sherpur district [36]. The average family size 5.3 and male to female ratio was found 100:70. Most of the people were illiterate (53%) and they were Hindu religious. Their main occupation was agriculture. Their food habit as like as Bengali people. In compare to Bengali people the consumption of rice was 0.69 kg/person/day and fish

consumption was 47gm/person/day [36], instead of 0.49 kg/person/day rice consumption and 27gm/person/day of Bengali people. But meat consumption was lower than the Bengali people. The study has revealed that an average land holding was 3.4 acre of which 63% was agricultural land and 37% was homestead. The plant-based food materials were root and tuber, fruits, young shoots and leaves, inner stem, flowers and inflorescence, and seeds. Most of the fruit materials were gathered from homestead and forest. Among the fruits 72% were their own, 20% from forest and only 8% purchased from market. They used medicinal plant to cure from different diseases. They knew the name of the plant and their parts to be taken to cure from different diseases. The forest (47%) and the homestead (53%) were the major source of medicinal plant. They use branch, twigs, leaves, main stem wood, agricultural residues and cow dung for fuel. Jam (31%) and mango (25%) were mainly preferred timber species. The main sources of fuel wood and timber species were forest and homestead. For different religious festival they use different parts of plant. Homestead was occupied with diversified plant species. The main species were Mango (12%), Aanthal (10), Payara (9%), Boroi (8%) etc. The study area had lost different important species such as Ashok, Ashatha, Bot, Mahua, Pahari Simul, Raktachandan etc. The male members of the household preferred all hard works while female members were engaged with light works [36]. The major problems in the study area were lost of their traditional species, lacking of marketing facility of their product, limited employment opportunities. This study has suggested improving their living standard [36].

World Food Programme and UNICEF with the support of government and nutrition cluster partners conducted a Joint Emergency Nutrition and Food Security Assessment of the conflict-affected internally displaced population (IDP) in Central Mindanao [37, 38]. They visited 580 households and collected anthropometric measurements of 717 under five. Result showed that more than 80% of IDPs faced food insecurity. Poor food access and a direct result of disconnection of IDP households from their main livelihoods may be responsible factors. Actually, IDP households depend on only food purchases and most of them purchase on credit where some 80% of households relied on borrowing money to purchase food. It was established that some 87% of the households in the survey had to eat less preferred food and 75% were limiting their meal sizes. Hence, the dietary diversity was poor [37, 38].

Chronic malnutrition, stunting, remains a serious public health concern in Central Mindanao. The assessment found prevalence of chronic malnutrition at 41.1% based on the 1977 NCHS reference and 47.3% based on the 2006 WHO child growth standards [38].

Children living in the coastal and wetland (haor) regions in Bangladesh are 1.5 times more likely to be stunted – one of the findings from a study conducted by LANSA, led by BRAC. The study explores agricultural innovations to fight malnutrition in Bangladesh [39]. The study identified haors and the coastal belt in Bangladesh, which are geographically distinct from other parts (waterlogged and salinity affected areas, respectively), as pockets of under nutrition. Analysis showed that overall prevalence of stunting ranged from 46.6% in the haor basin to 30.9% in other parts of Bangladesh, whereas the prevalence of underweight ranged from 44.5% in the haor basin to 34.1% in other areas [39]. This is a serious cause of concern for the country. Research revealed there is a strong interrelation between crop diversity, diet diversity and nutritional outcomes. It was found that the number of people with malnutrition will decrease if we increase production of diet-diverse and nutrition-rich food items. In National Nutrition Week 2018 Honorable Health Minister stated that prevalence of underweight, stunting and wasting was 32.4%, 36.1% and 14.33% among children under five years [39].

Poor nutritional status is one of the most important health problems facing CHT community. This condition deteriorated due to inadequate sanitary condition. Kabir, et al surveyed 9000 households in CHT and found that 27% mother suffer from under nutrition and 47% of their children were stunted that means nearly half of the children belonged to low weight for age. After critical review of this paper it was found that calorie intake of each individual was absent though they showed quality of food consumption. For better representation quality and quantity of food items is necessary and traditional ethnic diet was scarce [40].

Conclusion

Evidence suggests that children who lack certain nutrients in their diet do not have the same potential for learning as healthy and well-nourished children. Literature has proved disparities in child mortality and nutritional status have association with socioeconomic factors in many different contexts. Document confirms that birth spacing, economic development and greater per capita health expenditures are beneficial for the children of disadvantaged mothers. World Health Organization stated that economic development of a country depends on improvements in a country's food supply followed by the gradual elimination of dietary deficiencies and later on improving the overall nutritional status of the country's population. Research revealed there is a strong interrelation between crop diversity, diet diversity and nutritional outcomes. Study identified geographically distinct area are pockets of under nutrition.

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