

Nutritional Deficiencies: Major Public Health Problem in Nepal

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Abstract Nutritional deficiency is a major public health challenge in Nepal. Nutritional deficiencies are occurring varying degree of manifestations and have tremendous impact not only on the health of vulnerable population but to the national economy too. Even though quite adequate government policies and guidelines have been prepared, over the years, basic nutrition promotion strategies haven't been applied seriously at the community level. The major causes of nutritional deficiency in developing country like Nepal is poverty, lack of food security and nutrition education. Combating the deficiency seems a big challenge hence Government should develop more integrated and practical approaches to combat the deficiency. Nutrition promotion and support efforts should be ensured to reach specially to the needy, marginalized populations. Mere policy and strategy cannot yield foreseeable results. There is a strong need to improve the health service delivery systems which can ensure the desired change. This review study is an attempt to draw attention of concerned authorities and public health researcher, to explore more information which can be helpful in revising the current approaches and in turn helps in achieving government's desired goal: eradication of hunger and malnutrition from the country.

Keywords: *Nutritional Deficiency, Underlying Causes, Poverty, Nutrition Education*

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1. Introduction

There are many nutritional problems which affect vast segments of our population. Nutritional deficiency is a global challenge; hence Nepal is not the exception. Under nutrition is one of the major causes of disability, morbidity and mortality in the country. The problem under nutrition has many social and cultural lineages. Nepal has 21% prevalence of low birth weight [1]. According to a survey; protein energy malnutrition in Nepal is 43%, anemia 48% [2]. Nepal Micronutrient Status Surveys 1998 has revealed that 32% children below 5 years of age are being affected by vitamin A deficiency [3]. Only forty-seven percent of children age 6-23 months consumed foods rich in vitamin A daily. Similarly 27% population of Nepal are still are in risk of developing iodine deficiency disorders because iodized salt hasn't been reached to those population [4]. Since low birth weights are the beginning of nutritional problems in a child's future life, vicious cycle of poverty, illiteracy, lack of food security etc further aggravating the situation. Since a malnourished child is to suffer from multiple deficiencies, the chance of dying because of nutritional deficiencies always increases when a child goes through under nutrition.

Unlike protein energy malnutrition (PEM) and low birth weight (LBW), micronutrient deficiencies (MND) are less visible and are the result of vitamins and minerals

deficiencies. When people don't have enough food supply to eat, they become malnourished and they are malnourished let alone getting MNDs. Therefore, MND can be regarded as a subset of malnutrition. Fat soluble vitamins, iron and zinc deficiencies are specially common, other water soluble vitamins, minerals and trace elements are also deficient. An individual's cognitive, physical, mental and development gets affected due to these deficiencies. Most common nutrition problem in the world is Iron deficiency [3].

2. Prevalence of The Problem

Low birth weight is major public health problem in developing countries. Globally >20 million infants, representing about 16% of all births, are born with LBW of which 95.6% of them are in developing countries [5]. In Nepal the percentage of low birth weight varies regionally from a high of 15% in the mountains to 13% in the hills and 12% in the terai [4]. National prevalence is around 21%.

In children under five years of age in Nepal, protein energy malnutrition is a common problem. In Nepal forty-one percent of children under five years of age are stunted, 11 percent are wasted, and 29 percent are underweight [4]. Stunting is more common in the mountain and hilly areas while wasting and underweight are more common in terai areas. Eighteen percent of women are malnourished, that

is, they fall below the body mass index (BMI) cutoff of 18.5. Likewise Forty-six percent of children age 6-59 months and thirty-five percent of women age 15-49 are anemic [4].

3. Causes

The causes of nutritional deficiencies are multiple and are interrelated. This conceptual framework (Figure 1.) originally developed by UNICEF in the late 1980s to explain the causes of under nutrition can be applied here to describe the cause of nutritional deficiencies. These may be grouped at the levels at which they:

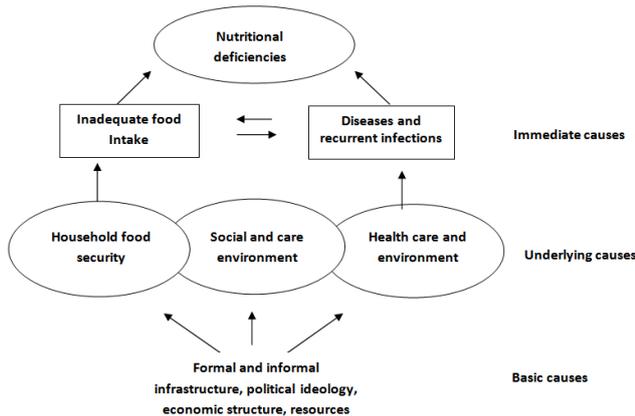


Figure 1. Interrelation between Nutritional Deficiency and Its Causes in Nepal

3.1. Immediate Causes

The very first immediate cause of nutritional deficiency is inadequate dietary intake in terms of quality and quantity. The usual Nepalese diet usually consists of chiefly carbohydrates but not enough protein and other micro nutrients. Not all Nepalese are privileged to have meat, eggs, milk, legumes, fruits, vegetables. Even if they do, they do not consume regularly. Recurrent infection like acute respiratory infection, gastroenteritis, worm infestations further aggravates the problem. Figure 2 illustrates the relationship between malnutrition and infection. This relationship is cyclical; nutritional deficiency can make an individual more susceptible to disease, while disease contributes to nutritional deficiency. All of this adds up to an increased risk of dying.

3.2. Underlying Causes

The underlying cause of nutritional deficiency disorders are lack of household food security, lack of proper social and care environment and lack of health care and healthy environment. 70% of the population of Nepal are involving in agriculture but still not growing enough food grains. Average household food production can meet their food needs for only about four months [6]. Likewise, ineffective and insufficient health care services, improper care practices, inadequate or delayed treatment of childhood illnesses, lack of proper environmental sanitation, lack of proper care of vulnerable group of populations, lack of nutrition proper education are other main contributing factors for the problems. These

underlying causes are not discrete causes but interact in important ways, as shown by the overlapping circles in the Figure 1. Rapidly changing social and political environment is creating insecurity among socially marginalized populations. The marginalization or oppression of particular social or ethnic groups can be the root cause of their nutritional vulnerability.

3.3. Impact of Nutritional Deficiencies

Although malnutrition is usually not the final cause of death, it weakens the immune system and makes children more susceptible to fatal infections. In this way under nutrition is an indirect cause of an estimated 60% of child deaths, including deaths due to pneumonia and diarrhea. [7,8] Nutritional deficiency always causes negative effects in physical, mental and social wellbeing (Figure 2). It lowers the productivity and hinders the social progress.

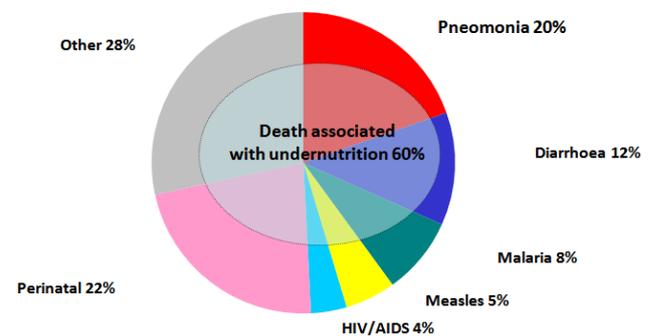


Figure 2. Nutrition and Child Survival: Cause Specific Mortality [7]

In Nepal 21% babies have low birth weight. High maternal and child mortality are one of the consequences of nutritional deficiencies. Low birth weight babies are always in risk of developing disease and chances of dying always greater. One in every 22 Nepalese children dies before he/she reaches one year of age 1, and one in every 19 does not live up to his or her fifth birthday [4]. Socio demographic factors are key determinants to LBW in developing countries [5]. Short maternal stature, very young age, high parity, smoking, small birth intervals are some factors responsible for low birth weight. In Nepal study showed that neonatal deaths are high for babies whose mother has short stature. [9]. Nepal has high level of under nutrition with wasting level 11% and mean age of marriage is 19.2 years [2,10]. 20-60% children living in third world countries are physically stunted. Nutritional deficiencies are responsible for causing various disabilities too. In Nepal one child goes blind and another dies because of vitamin A deficiency. Iodine deficiency alone is responsible for lowering children's IQ by 10-15 points. In Nepal 27% people are still lack iodized salt and about 200,000 babies a year will be born with mental impairment [11].

According to the United Nations Food and Agriculture Organization (FAO) global economic output may be lost up to five per cent due to malnutrition [12] In Nepal, about 2-3% of GDP is lost every year because of micronutrient deficiencies alone [12]. The cycle of poverty, disease and illness will aggravate this situation. Undernourishment will cause children to start life at sub optimal mental levels. This becomes a serious threat in development [13]. The growing age children who aren't getting enough nutrition means future fork force of the country will

obviously be incapable. In country where lots of social, political unrest has occurred recently, where the economic growth is dwindling further down, huge number of populations are likely to suffer more because of under nutrition.

4. Prevention and Control

Since the nutritional deficiencies have multiple causative factors, various methods should be applied as an intervention to prevent and control the problem.

4.1. Food Supplementation and Fortification

Vitamin A supplementation is the only fully government funded supplementation program in Nepal. Supplementation of vitamin A (retinol palmitate) is being carried out through the country with the help of female community health volunteers [14]. But iron/folic acid supplementation program hasn't been successful because of limited coverage and lack of resources [15]. In Nepal 43% children below 5 years of age are suffering from some sort of protein energy malnutrition [2]. But the super flour (high protein food) supplementation program hasn't been effectively applied throughout the country. United mission to Nepal started to rehabilitated severely malnourished children in Nepal decades ago in some small pocket areas of Lalitpur District, Nepal and other hilly region. Government has built few nutrition rehabilitation centers in the country but because of lack of resources other managerial dysfunctions the severe protein energy malnutrition cases often go unnoticed. Government of Nepal has adopted universal salt iodization as a sole policy to prevent and control Iodine deficiency disorders in Nepal [1]. But there are lots of challenges to combat IDD problems, ranging from lack transport facilities to rural areas to lack awareness regarding importance of use of iodized salt in the community people. Community based rehabilitation program are being run by some non-governmental organization like Nutrition Promotion and Consultancy Services, Kathmandu with the financial support of Japan International Cooperation Agency and Child Fund Japan [22]. But these efforts aren't enough to cover all the severely malnourished children throughout the country.

4.2. Nutrition Education

Educating mothers, family and community as a whole regarding the importance healthy food and living a healthy life can be the best way to control and prevent the nutritional deficiency disorder. School health nutrition program started in Nepal with the help of different International Non Governmental Organizations like UNICEF, JICA, Helen Keller International etc and Non Government Organization like NPCS, NEWAH. These social organization started working in partnership with government of Nepal's nutrition department on promoting food based approach to combat malnutrition and other nutritional deficiency disorders in various districts of the country. A project called capacity building of health workers for nutrition support in Nepal started in 6 districts of Nepal in 2006 by Nepal, which was aimed to promote nutrition education through community health workers

and rehabilitate the severely malnourished children in the community [16]. These nutrition education program aren't enough are in need to expand up to the far corner of the country where mostly poor and marginalized people are living and who are more likely to suffer from nutritional deficiency.

4.3. Employment Generation and Poverty Eradication

Nepal living standard survey 2011 says, 25.6% people are still leaving below poverty line. As per the report, an individual earning less than Rupees 14,430 per year is below the poverty line. It also says that households led by agricultural. Since the nation is witnessing less than 2% poverty reduction annually, it shows Nepal has to make lot of social progress in order to alleviate poverty as it is mentioned in very first millennium development goal [17]. In Nepal, the unemployment rate that stood at 2.69 per cent in 2013, 2.71 per cent in the year 2014 and this is projected to increase to 2.72 per cent a year in 2015 [18]. This all means that Nepalese people will have a poor purchasing power and hence poor nutrition situation on the future to come. Globally out of total LBW babies born, 96% are in developing countries, and in Nepal 21% babies born have weight less than normal [3]. Though the government of Nepal has started some integrated methods like integrated management of childhood illnesses, safer motherhood program, integrated management of acute malnutrition program for preventing morbidity and mortality, these efforts aren't being effectively implemented to targeted populations.

5. Discussions

Nepal has one of the highest LBW rate in the world (21%). Malnutrition prevalence is still very high (43%). Micronutrient deficiencies prevalence still ranges from 6.2% to 59%. Only 73% people have access to iodized salt. [2,3,4] In Nepal the actual prevalence of nutritional deficiencies are yet to be explored because there are very limited research are being carried out on such topics. Inadequate dietary intakes along with recurrent infections are the main cause immediate causes of nutritional deficiency. A child having inadequate dietary intake both in terms of quality and quantity is likely to suffer from infections because his/her body is less immune to infections. Higher prevalence of intestinal infections was found in children with lower height for age and weight for age than in normally nourished children [18].

Other underlying causes of nutritional deficiencies are lack of food security, lack of care health environment and care services for malnourished population (figure1). In developing countries children and women are suffering from under nutrition mainly because of lack of food [19]. It is important to be aware of the important influence of all three groups of underlying causes and not just focus on the food security aspects of the nutritional deficiency problem. If food based approaches are linked to interventions aimed at the health and care-related factors, then the overall effectiveness and efficiency of the combined actions is likely to be significantly enhanced. For an individual to be adequately nourished all three of

these conditions need to be present in a positive manner. Malnourished children are less likely to attain mental, physical and social development. A study in China showed lower nutritional status (particularly height-for-age) was found to affect school performance adversely [20]. Children who are malnourished are more likely start school late, to perform below normal in academia, and are likely to drop the school untimely [21].

Provision of nutrition education may play a pivotal role in improving the nutritional status particularly of children and women of the rural community. A study in Mexico showed that nutrition education to low income pregnant mothers showed that there were significant increase in mean intake of protein and other micronutrients [22]. In study done in Nepal, there have been substantial increments in dietary intake vegetables that are grown in their own kitchen garden, consumption of protein rich food and other healthy living practices due to a nutrition promotion program in some selected study community of Nepal [16]. Program like food fortification and supplementation needs government's active participation in the form of policy guideline preparation, resource allocation and manpower mobilization. In Vietnam after the intervention of iron folic acid and de-worming among pregnant mothers, hookworm prevalence fell from 76% to 22% and serum ferritin level increased from 23.9 µg/L to 52 µg/L [23]. According to WHO, to improve the haemoglobin concentration and iron status and to reduce the anaemia risk, intermittent iron folic acid supplementation in menstruating women who are living in areas where anaemia is highly prevalent, should be implemented [24].

Apart from this the basic causes of nutritional problems occur in national and international level and are related to the quantity and quality of resources available, who controls them and who uses them. The political ideology of the ruling government and their commitment to preventing nutritional deficiency and its underlying causes affects the health of people. A rapidly changing social and political arena often characterizes situations of social insecurity and social unrest. The marginalization or oppression of particular social or ethnic groups can be the root cause of their nutritional vulnerability. Hence government should formulate appropriate nutrition policy to address those ultra poor and vulnerable populations of the country. Nutritional deficiency is the outcome of poverty. The determinants of malnutrition operate from household, community and national level [25]. Poverty reduction is another method to combat nutritional problems like malnutrition and micronutrient deficiency.

6. Conclusion

The very first goal of Millennium Development Goals (MDGs) eradication extreme poverty and hunger, clearly states the priority given to alleviate poverty and promote nutrition by the government [26]. Despite the government's various efforts in partnership with line agencies to combat the nutritional problems, significant positive outcomes results hasn't been observed. There is strong need for scientific information collection regarding the burden of the problem. On the basis of proper observation and problem analysis, need and problem

based planning can occur. The planning should reflect need of citizen with special focus to poor, marginalized population who are unexposed and unfortunate in the society. Furthermore, there should be effective management functions at all levels of government health services. Since causative factor of nutritional problems are multi factorial in nature, at policy level government should carefully coordinate with other sectors like agriculture, education, local development, women and welfare and national planning commission.

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