


Research Article

Food Fortification in Prevention of Micronutrient Deficiencies of Children Under 5 Years in Bangladesh and its Effects on Sustainable Development Goals

M. Karim Khan*, Mahmudul Hasan Faruque, Biswajit Chowdhury, Monjurul Ahsan, Badruzzaman, A.S.M. Ruhul Quddus

Abstract

Micronutrients, which contain vitamins and minerals, are required in minute amounts for overall growth, development, and increased immunity against diseases. Because the body is unable to synthesize them, they must be obtained from external sources. Malnutrition causes poor physical and mental development, in susceptible populations such as young children, pregnant and lactating mothers, and the elderly. By supplying important nutrients in food, food fortification is a safe and effective strategy for increasing macronutrient consumption. The lack of micronutrients has an impact on long-term developmental goals. To teach about the benefits of food fortification, the educational program is necessary to create awareness among the mass population. This article gives a detailed overview of Bangladesh's present micronutrient deficiency status among children and women. The success and present problems of existing intervention programs are also discussed in this study. Anemia affects nearly half of all pregnant and lactating mothers. Some of the key dimensions linked to high levels of deficiencies are ignorance, inadequate nutrition, poor hygiene, illness, malabsorption, and infestation. Multiple interventions are being attempted, and some progress has been made. Problems remain like coverage, quality, and compliance. Micronutrient deficiencies in Bangladesh remain a significant concern, despite the fact that current intervention programs have made some success in addressing severe deficiencies. There is a need for a more well-integrated approach to boost existing intervention programs. Furthermore, new intervention techniques for addressing and preventing particular micronutrient deficits are suggested.

Keywords: Food fortification; Deficiencies; Micronutrients; Sustainable goals; Policy & Programs

Introduction

According to the estimates of the World Health Organization Globally more than 2 billion people have deficiencies in key vitamins and nutrients, particularly vitamin A, iodine, iron, and zinc [1]. Pregnant and lactating women and young children are found to be the most vulnerable groups affected by micronutrient deficiencies. Populations from developed countries are being affected where micronutrient deficiencies co-exist [2]. Food fortification can be defined as a strategy that can prevent vitamin and mineral deficiencies and can be used safely and effectively for better health. According to WHO estimations, 190 million preschool children and 19.1 million pregnant women over the world were vitamins A deficient (serum retinol less than 0.70 mol/l) [3]. Iodine insufficiency affects nearly 100 million women of reproductive age and 82 percent of pregnant women throughout the globe do not get enough zinc to satisfy their needs [4]. Iron deficiency was common, with 1.62 billion persons anemic worldwide, with apex pervasiveness among preschool children (47%) led by pregnant mothers (42%). According to WHO data, 0.8 million people die each year as a result of iron insufficiency, and a comparable number of people die as a result of vitamin A deficiency. Nutritional deficiencies like goiter, rickets, beriberi, and pellagra can be treated through food fortification. Emergent Folic acid deficiency induces neural tube abnormalities, zinc stunts infant growth, and selenium promotes cancer, and the effects are not

Affiliation:

Department of Pediatrics, Community-based Medical College & Hospital, Mymensingh, Bangladesh

*Corresponding author:

Prof. M. Karim Khan, Director, Department of Pediatrics, Community-based Medical College & Hospital, Mymensingh, Bangladesh

E-mail: mmuk Khan@gmail.com

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Iodine Deficiency

Iodine deficiency illnesses have been recognized as a public health concern in Bangladesh for decades, although good data is difficult to come by. The nationwide prevalence of iodine insufficiency in school-aged children, as determined by mean urine iodine concentration (UIC) below 100 g/L (ICDDR, 2014), is as high as 40%, a prevalence that has remained basically stable since 1999. While there is no current data on the prevalence of severe iodine deficiency (goitre rates) in school-aged children, prior studies showed a significant reduction in goitre prevalence from 50% in 1993 to 6.3 percent in 2004-05 (Yusuf HK, 2007). Household food insecurity, lack of access to iodized packaged salt, rural residency, low levels of awareness about the health benefits of I and iodized salts, consumption of industrial salt (non-iodized), and lack of preservation knowledge about iodized salts have been identified as the major risk factors of I deficiency in the Bangladeshi population.

Anemia and iron deficiency

According to the NMS 2011-2012, 33 percent of children aged 6-59 months and 26 percent of NPWL women had anemia, defined as a Hb concentration of 120 g/l in NPWL women and 110 g/l in children aged 6-59 months. These statistics show a considerable drop from the prevalence reported in 1997-1998 (47 percent in children aged 6-59 months and 45 percent in NPWL women) and 2003 (557% in children aged 6-59 months and 45 percent in NPWL women). The deficiency of iron causes anemia and the symptoms are pale inner eyelids, nailbeds, gums, tongue, lips, and skin. Other symptoms are tiredness, headaches, and breathlessness. Pregnant women and young children are found to be at great risk. Iron deficiency can cause early neonatal mortality and maternal mortality.

Zinc deficiency

According to the NMS 2011-2012, there is a 446 percent prevalence of Zn deficiency among preschool-age children and a 573% prevalence among NPWL women, with the slums having the greatest rate. According to the International Zinc Consultative Group, Zn deficiency was defined as a serum concentration of 109 mmol/l in preschool-age children and a serum concentration of 101 mmol/l in NPWL women. Because serum Zn is homeostatically controlled and incapable of detecting marginal deficit, a large prevalence of low serum Zn is thought to be a plausible signal of a very severe deficiency. Low socioeconomic status, household food insecurity, low intake of animal sources of Zn, and high intake of a plant-based diet with a very high content of phytate (an inhibitor of Zn absorption) are the main drivers behind poor Zn nutrition.

Vitamin D deficiency

Vitamin D is essential in our bodies because it helps to maintain proper calcium and phosphate levels in the blood, which aids bone mineralization, muscular contraction, nervous system activity, and cellular functioning. Based on a blood vitamin D level of less than 50.0 nmol/L, 39.6% of preschool children and

45.5 percent of school-age children had vitamin D insufficiency. The poorest and most severely food insecure households had the highest rate of vitamin D insufficiency in preschool children. For school-aged children, however, it is highest among the wealthiest and most food-secure households. Furthermore, the National Rickets Survey in 2008 found a 1% incidence of rickets among children aged 1 to 15 years, with children under the age of five accounting for 62% of the rachitic cases. There is currently no national policy or program in place to prevent vitamin D insufficiency among the country's high-risk demographic groups. The willingness of the government to work with stakeholders, adequate sunlight across the country, adequate water bodies for fish culture, a homogeneous society, the presence of common fortification food vehicles, women's empowerment, and a potential school feeding program are all identified as possible interventions. However, considerable political commitment is necessary to improve vitamin D status at the population level. It is crucial to highlight that the WHO does not presently suggest vitamin D supplementation during pregnancy as part of standard prenatal care.

B vitamin deficiencies

To date, no data are available on the national level estimates of B vitamin deficiencies among infants and children. According to the NMS 2011-2012, 9 % of NPWL women are deficient in folate, and 23 % of these women have some degree of vitamin B12 deficiency.

Aetiology of micronutrient deficiency

The vast majority of Bangladeshis have a diet that is mostly composed of plant-based foods. They have limited dietary diversity and consume a little number of animal goods such as eggs, milk, and milk products. As a result, a poor-quality diet with low bioavailability may be the leading cause of micronutrient deficiencies in the country. A study of dietary micronutrient intake among young children and their primary female carers in rural Bangladesh found a relatively low overall mean prevalence of sufficiency of micronutrient intake in children (43%) and women (26%) based on estimated average needs. Limited diversity owing to low socio-economic status and family food insecurity, low levels of awareness in connection to an adequate diet and hygienic habits, as well as illness and infestation have all been recognized as key underlying causes of micronutrient deficiencies in the nation.

Effect on Sustainable Development Goals (SDG)

To eradicate dietary deficits in vulnerable populations, organizations such as UNICEF, the WHO, the US Centers for Disease Control and Prevention (CDC), the Global Alliance for Improved Nutrition (GAIN), and Nutrition International advocate fortification. The United Nations adopted 17 Sustainable Development Goals (SDGs) in September 2015 and fortification of grain products is the first step toward accomplishing SDGs. The SDGs can be accomplished by addressing vitamin and mineral shortages. By adding iron, zinc, and B vitamins such as folic acid, niacin, riboflavin, thiamine, B12,

