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Research Article

NATIONAL NUTRITIONAL BANK AND FOOD CENTRE: PANACEA FOR MALNUTRITION & FOOD SCARCITY IN INDIA?

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ABSTRACT
India is fighting with one of the most alarming and challenging public health issues of Malnutrition. Malnutrition is the most complex problem which affects children and women at their reproductive age. Furthermore, geriatric population who suffers from deteriorated health conditions are adversely affected by hazardous impact of malnutrition. Malnutrition leads to defects in physical and mental development. Furthermore, under nutrition among pregnant women causes growth retardation in new born and mortalities and morbidities among children. Moreover, lack of nutrition takes a toll on woman's health resulting to anaemia, iodine deficiency and infertility. It is believed that main cause for malnutrition is poverty and hunger. Furthermore, economic developments post - independence brought trend change in the sectors of agricultural, animal husbandry and food processing and production. However, disparity in distribution is observed among the low income population. Moreover, the present review paper is not only addressing this gap but also identifies the impact of malnutrition among vulnerable population. This is the first review paper with a concept note on 'Nationalised Nutritional Bank and Food Centre' for all lower and middle classes. In addition, paper stresses on providing national nutritional insurance along with national health insurance.

INTRODUCTION
Background
Malnutrition can be defined as a lack of nutritional elements essential for human health (Hunger notes, 2013). Malnutrition is characterised by both under nutrition and over nutrition (Blössner and de Onis, 2005). According to UN's Standing Committee on Nutrition (SCN), the largest single contributor to disease in the world is malnutrition (World Food Programme, 2014). It is considered as one of the most vital priority under MDG in the developing country like India. This review will consider aspects of under nutrition among people of India. It is not only confined to children but also adolescent parous females; which is alarming. In India, among half of the children relatively 60 million are underweight, 75% are anaemic, about 45% are stunted, and 57% are Vitamin A deficient (The World Bank, 2013). Malnutrition has deleterious effect on physical and cognitive development among children and adolescent women. It is estimated that, there exist an imbalance between sufficient food production and lack of resource of food distribution among the vulnerable population is the leading cause for malnutrition. Food intake alone does not affect malnutrition in children; it is also influenced by care for the child, and pregnant mother, access to health services, as well as good hygiene practices (UNICEF, 2013). In addition to this there are evidences which suggest that, poverty is the leading cause for malnutrition in low income and middle income countries. India indicates that, 21.9% of people below poverty line in the year 2011-12 (India Sanitation Portal, 2011). This suggests that in both rural and urban areas, there is indeed a vast number of people remain undernourished.

The vicious cycle of poverty and hunger and vice versa adds to increasing number of malnourished population. According to the report of Association of Voluntary Agencies for Rural Development (AVARD) 2012, India possesses a surplus production in good grains from agriculture; which is believed to be a largest occupational source in India, and also the country is over burdened with dense population of hungry and malnourished citizens (Krishnamurthy *et al.,* 2014). However, due to inequity and socioeconomic differences, food scarcity is observed among poor masses. In order to address this issue the national nutrition policy was framed in the year 1993. Under this policy, Integrated Child

Development Services (ICDS) program was formulated. This program involves growth monitoring of children and promote immunization, improve mother's feeding and caring' practices, provide supplementary food to nursing mothers, pregnant women and children under three years of age as well as delivers pre-school education to children for taming nutritional outcome (The World Bank 2013). UNICEF collaborated with GOI to enhance the effectiveness of ICDS, with funding ☐ 6,000 – 8,000 per village per year (UNICEF, 2007). Moreover, the budget allocation by government to ICDS was ☐424 billion in the 11th five year plan, despite of this, ICDS is insufficient in addressing malnutrition (Mohamand, 2012).

MATERIALS AND METHODS

Methodology

To gather credible and authentic information journal articles, book report, seminar/conference proceedings and e-data base was explore. Extensive review of nutritional E-data was done. Selection criterion of journal article was based on the key parameters such as malnutrition, economic consequences, adverse outcome of malnutrition considering maternal and child health with equal importance given to the elderly population. E-article form JSTOR, PubMed, Springer Link, Science Direct, Scopus, Google scholar, Francis and Taylor and statistical data base was obtained from IndiaStat.com. As core focal area is concentrated on economic impact of malnutrition on health of vulnerable group, thus resources were selected based on relevant problems. Study duration was six months from March 2014 till August 2014. Two months of extensive resource search and e-data collection and the remaining period was used for analysis of secondary data and writing of the report. The researcher had to optimize their scientific work as per availability of data and time frame.

Impact of Malnutrition on Vulnerable Population of India

Malnutrition is complex and dynamic problem. It mainly affects the vulnerable group comprising of elderly, women, children, migrants, labourer involve in heavy manual work and strenuous job as well as majorly affects families of low income status (Bakan, 1970). Nutritional insufficiencies have deleterious impact on body mass index, mental ability, physical capability and individual immunity as well as have cumulative effect on work and productivity, thus adequacy in supplementary sources essential nutrition is necessary for wellbeing and work productivity (Saunders, 2010). Nutritional varies according to age, sex, work-environmental factors, diseases condition, demography as well as climatic conditions, thus to assess malnutrition among adult body mass index is measured (Bakan, 1970).

Effects of Malnutrition on Maternal and Child Health

Women being socio-economical supressed group in developing countries are adversely affected in their reproductive and adolescent age which also causes fluctuation in the health indicators. National survey in the year 2005-2006 revealed that; among developing countries India; holds highest proportion of malnourished women in reproductive and adolescent age group, anaemia prevalence in the population is core indicator regarding nutritional parameter to judge malnourished status among women (Jose, 2008). An approximate estimation suggest that about 70 to 75% women at their reproductive age group suffers from iron-deficiency anaemia, which have its silent correlations with social disparities and discrimination, poverty and complex social norms practiced against women (Jose, 2008). Crude analysis of NFHS data year 2005-2006 suggested that women age group 15-19 years have higher proportion of anaemia 63.1% whereas widowed, separated or divorces women up to 60% of them are anaemic, cast system also have its dynamic perspective on anaemia prevalence it is higher among ST than SC and OBC (R, 2004) (Saunders, 2010). Malnutrition is high among women living rural and urban slums of India. Malnutrition among women also depicts country economic efficiencies along with status of poverty; social freedom needed healthy life among gender (Jose, 2008). Vicious cycle exists between malnourished mother and their children health status, thus nutritional status among mother greatly affects the health condition of her child (Women's Health Problems, 2000)

Improper nutrition during reproductive age among women causes various health consequences resulting in infertility, menstrual problems, lack of calcium intake causes early menopause and osteoporosis at later

age, iodine deficiencies is associated with mental retardation among adolescent girls and also associated with goitre whereas in severe case of iodine causes reproductive problems resulting in increased abortions rate, still birth and even congenital anomalies among new born (Mason *et al.*, 2005). Lack of balances antioxidants and fat in diet leads to heart diseases and even cancers. Malnutrition during pregnancy increases risk of maternal morbidity and mortality; it also affects foetal growth and development (Pelletier *et al.*, 1995). Malnutrition among pregnant mothers causes low birth weight babies, premature birth, intrauterine death, postpartum haemorrhage, hypertensive disorders and accounts 20 % of maternal morbidity in India. Deficiency of Vitamin A during pregnancy causes of childhood blindness (Mason *et al.*, 2005).

Childhood malnutrition is serious health problem attributes to childhood mortality and morbidity in developing countries (Pelletier *et al.*, 1995). Nutritional deficiencies in categorised into mild, moderate and severe malnutrition where 85% related malnutrition death among children is due to mild and moderate malnutrition rather than severe malnutrition.

Protein energy malnutrition kwashiorkor and marasmus among children causes retardation of growth and development resulting in severe wasting of muscles, lower in IQ level, lack of cognitive growth, abnormal anthropometric measurements (Bakan, 1970). Iron deficiency anaemia and folate deficiency in children below two years of age effects mental ability and brain activity leading to poor learning capability.

Iron-deficiencies among pre-school children and children below 5 years causes impairment of cognitive development, deficiency of Zinc among children causes childhood diarrhoea and lower immunity and increases susceptibility to infectious diseases as well as increases of pneumonia, Vitamin A deficiency causes vision defect among children. As per World Health Organization's (WHO) report top 10 leading causes of death in developing countries is due deficiencies of iron, vitamin A and zinc. To assess nutritional assessment among children anthropometric measures of age, weight and height computed, weight-for-age (underweight), height-for-age (stunted) and weight-for-height (wasted).

Chronic deficiency indicator suggests stunted growth, acute under-nutrition indicated by wasted, whereas under-weight measures of both chronic and acute under-nutrition. Proportion of Malnutrition is higher among children living in rural area. Malnutrition is more prominent in child labours. Children with mild to moderate malnutrition have impaired cell-mediated immunity and phagocytic functions; whereas those suffer from severe malnutrition have altered immune response**.**

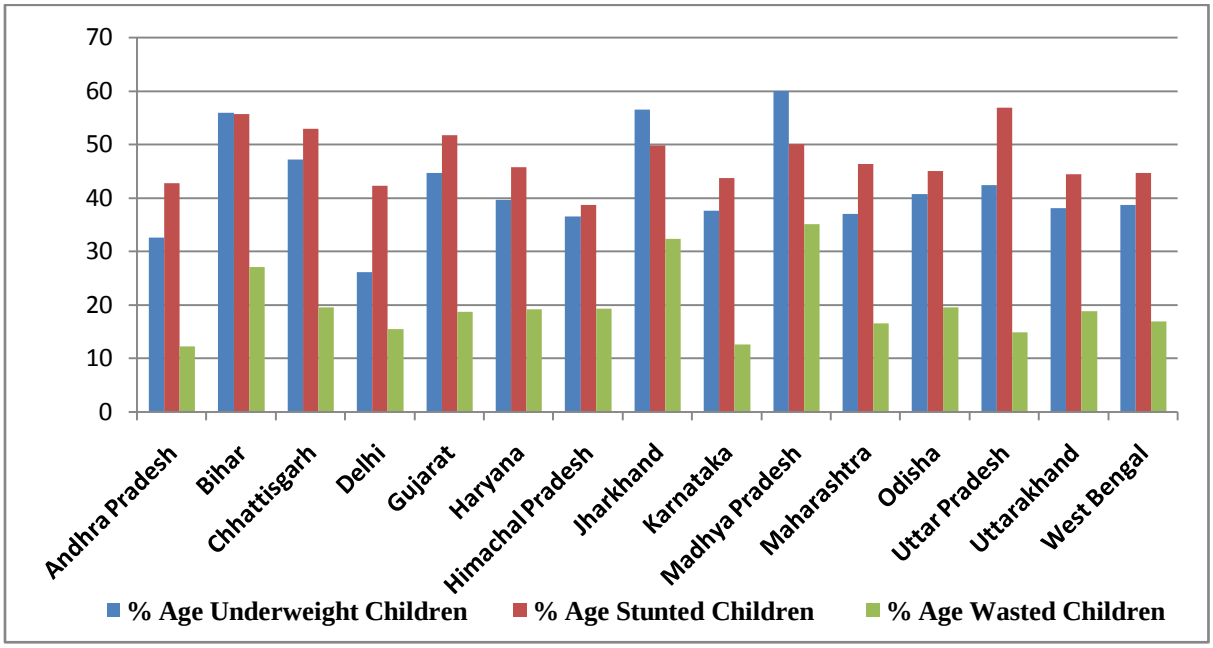
Various epidemiological studies have generated evidences that malnutrition is leading cause of childhood mortality and morbidity in developing countries. Early stage of life brain growth is rapid and thus their requires adequate and essential nutrition for proper intellectual development of brain, clinical studies have revealed that prolong deficits of protein in diet causes impairment in intellectual development and IQ level (Seckler, 1980). Long term effects of malnutrition among children result in deprivation in learning, energy and physical activities leading social set back (Bakan, 1970; Seckler, 1980).

Effects of Malnutrition on Work

Research conducted has shown evidences that malnutrition among labour class affects physical strength and performance, diseases resistibility, mental activity as well as increases sickness absenteeism among them resulting to loss of productivity and income. Poor nutritional intake affects those workers who are performing strenuous physical work likes construction, coolie, rickshaw pulling and all those who are doing hard manual work thus the dietary parameter is greatly affected as per the daily work and energy demand as per gender.

Figure below illustrates malnutrition among children below 5 years of age, selected states of India having highest proportion, stunted, underweight and wasted children in India. Madhya Pradesh, Jharkhand and Bihar showed highest proportion underweight children, whereas Uttar Pradesh, Bihar, Chhattisgarh and Gujarat have highest proportion of stunted children.

Equal Proportion of stunted children was from Madhya Pradesh and Jharkhand. Highest proportion of wasted children was from Madhya Pradesh, Jharkhand and Bihar.



Source: Indiastat.com, Available: http://www.indiastat.com/health/16/nutrition/192/stats.aspx

Figure 1: Malnutrition among children below 5 years of age (Indian states with highest malnutrition)

Concept of Nationalised Nutritional Bank: Pooling and Sharing the Risk (National Food Centre)

Modern world we are availing insurance and other social security schemes for house, health care, car, life, which provides sense of security and safety; thus slowly various insurance policies are launched in Indian market. Health care industry is flourishing in India and health insurance is slowly gripping families of all classes and sects. In order to get insurance, a fixed amount of premium is paid to avail insurance services, thus risk is distributed equally among all insured person. Imparting knowledge among the communities regarding nutritious meal, balance diet and need for essential vitamins and minerals in the supper as per the work, body type, gender, age, and daily requirements will not solve malnutrition burden in India in the families with lower household monthly income. All families with lower monthly household income or joint families where it become difficult to affording nutritious meals three times daily, thus these vulnerable families with lower income can pool the risk together. This can be achieved if, all the families or selected families from urban slums venture together and deposit their small portion of monthly household earning to make budgetary planning for nutrition fulfilment and monthly food requirements. 'National Nutritional Bank and National Food Centre' is the concept proposal for lower income household or families living in urban slums that; will pool the small proportion of income and distribute the risk malnutrition among them. Thus this plan can be successful with joint collaboration of government and NGO working to combat malnutrition in India.

Recommendation

The burden of malnutrition can be mitigated through educational awareness and providing knowledge on nutritional benefits as well as by deeply understanding the necessity of budgetary planning in the family with low income. Thus to fulfil the unmet needs one should not compromise with the nutrition. In the modern era, where India is promoting various public private partnerships to fight against major public health problems, why government of India fails to promote advantages of insurance in risk management considering, malnutrition being the risk for economic growth and development. With the sound understanding of successful PPP models like Yeshaswini Scheme in Karnataka, Rasthriya Swastha Bhima Yojna for BPL card holders we can institute this strategy of insurance to provide nutritional stability and

standards in the country. Nationalised nutritional bank can bring revolutionary changes in India and modify the global scenario of India's vision to overcome the battle of malnutrition.

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