


Prevalence and Socio-economic Impacts of Malnutrition Among Children in Uganda

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ABSTRACT: Malnutrition is one of the common problems that afflict the poor in low- and middle-income countries like Uganda. The rate of decline of malnutrition in the country has been very slow for the last 15 years. This problem is of utmost concern in this era of Sustainable Development Goals (SDGs) in which achieving the goals is imperative. The aim of our study was to review literature on the prevalence and socio-economic impacts of malnutrition among children under 5 in Uganda and provide recommendations to address identified gaps. This review assesses available evidences, including journal articles, country reports, the World Health Organization (WHO) reports, the United Nations International Children's Emergency Funds (UNICEF) reports, and other reports on issues pertaining to malnutrition among children in Uganda. Malnutrition, poverty, and chronic diseases are interconnected in such a way that each of the factors influences the presence and permanence of the other, resulting in a synergistic impact. The prevalence of acute and severe malnutrition among children under 5 is above the World Health Assembly target to reduce and maintain the prevalence under 5% by 2025. There are also limited studies on etiology of anemia as regards its prevalence in Uganda. The study presents a better understanding of the social and economic impact of child malnutrition on the families and the country's development. The study also strongly suggests that, for Uganda to achieve sustainable development goal 2, financial investments by the government are necessary to address nutrition in the early stages of an individual's life.

KEYWORDS: Malnutrition, socio-economic impacts, children, Uganda

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Introduction

Malnutrition is one of the major global health burden.¹ It is a term specifically used to describe undernutrition where an individual is not getting the required food nutrients such as calories, protein, or micronutrients. It mainly affects the young population especially those under 5 years of age as adequate nutrition is vital in ensuring their proper growth and development.^{2,3} The vulnerability and dependence of children on adults for food sets them in the risk group of the population.^{4,5} The invisible nature of malnutrition makes it the biggest threat to children's health. Unlike starvation, children who suffer from malnutrition hardly show outward signs because they suffer from milder forms. Besides, undernutrition is still a big issue.⁶ Among children under 5, undernutrition remains one of the leading causes of death and 26.9% of children under 5 diagnosed with acute malnutrition are from Sub-Saharan Africa.⁷ Recent estimates reveal that 52 million children under 5 are diagnosed with wasting, out of which 17 million are wasting severely.⁷

The world today is facing a prevalence of malnutrition with 155 million stunted and 52 million wasted children.⁸ Globally,

it is estimated that 45% of deaths in children under 5 years of age is due to undernutrition.^{9,10} Toward the end of the millennium development goals (MDGs) era, the global prevalence of underweight children was reported to have dropped from 25% in 1990 to 15% in 2015.⁶ Unfortunately, this decline was not evenly distributed because 90% of the underweight children were found in Africa particularly the Sub-Saharan region.⁵ In fact, the number of stunted children in Sub-Saharan Africa had rather increased to almost one-third between 1990 and 2013.⁵

The 2015 MDG report stated that 10% wasted, 39% stunted, and 25% underweight children were from the Sub-Saharan Africa region.⁶ Sub-Saharan Africa contributes to one-third of the global undernourished children.^{6,8} In the past 5 years, undernutrition has been the major contributor to prevalence and death rates compared with other malnutrition conditions. With nearly 41 million children being overweight, there is a simultaneous increase of both overweight and obesity conditions in the low- and middle-income regions of the world.^{8–10} The threat of the double burden is global with no exception; every country is affected with at least 1 form of



malnutrition¹ as there are various forms of malnutrition. Currently, 88% of the countries are suffering from either 2 or 3 conditions of malnutrition.⁸

As part of the nutrition strategy of improving child nutrition, United Nations International Children's Emergency Funds' (UNICEF) developed conceptual framework has been consistent with child nutrition studies that have been conducted in different parts of Sub-Saharan Africa region.⁴ In their conceptual framework, 3 broad causal factors of malnutrition are identified—food, health, and care.⁴ The framework elaborates that malnutrition results from determinants at individual, family, and societal levels, each affecting and influencing another causing a synergistic effect. The immediate causes are food insecurity among family households, poor feeding practices and care, unhealthy environment, and inadequate health services.⁵ Food insecurity has been reported to be the major contributing factor of global malnutrition. To combat this global challenge, threat incidences and prevalence must be monitored not only at the global level but also at the national and sub-national levels to ensure that no one is left behind.⁸ This article aims at reviewing the prevalence and socio-economic impact of malnutrition among children in Uganda.

Methods

This review assesses available evidences, including journal articles, country reports, the World Health Organization (WHO) reports, the UNICEF reports, and other reports on issues pertaining to malnutrition among children in Uganda. Search for relevant medical literature in biomedical databases such as PubMed, Google Scholar, and OVID was conducted with the following key terms: "Prevalence," "Uganda," "Socio-economic impact," "Sub-Saharan Africa," and "Malnutrition." Paper selections were conducted by reviewing their abstracts and titles, in addition, using supplemental references obtained from the reference lists of the papers. No date restriction was considered during the literature search.

Prevalence of Malnutrition Among Children in Uganda

During the late 1990s and early 2000s, Uganda had a strong economic growth averaged at 7% per annual gross domestic product (GDP).¹¹ This played a huge role in achieving some of the MDGs, particularly the first goal which was to reduce Uganda's poverty to half by 2015. Despite this, Uganda is still affected by all conditions of malnutrition, which the most common form is chronic malnutrition, with over one-third of children below 5 years of age stunted. The second commonest is micronutrient deficiencies, mostly iron and Vitamin A.¹¹ Uganda is ranked 13th position by UNICEF based on the number of stunted children in the country⁴ with approximately 3 in 10 children under 5 in Uganda stunted.¹² Uganda's national estimates, which the prevalence is heterogeneous across the country, indicate that 3.6% children suffer from moderate

acute malnutrition, while 1.3% have severe acute malnutrition.¹² However, all forms of malnutrition still remain largely hidden in Uganda because regular assessment is difficult in these children.¹³

The prevalence of acute malnutrition (wasting) in Uganda among children 6 to 59 months of age is 4% and 10% for West Nile subregion, refugee humanitarian settings, where refugees from South Sudan and Congo are harbored.¹² The condition varied with different regions, highest in the western region particularly Tooro subregion with 41% and lowest in the Teso subregion with 14%.¹¹ This is higher than the World Health Assembly's target to reduce and maintain the prevalence of wasting in children to less than 5% by 2025.⁸ Underweight was also mostly recorded in the rural areas particularly the Karamoja where the percentage was the highest (26%).¹² The possible reason for this in Karamoja is that it is a war zone which can affect food circulation, transportation, and cultivation. The nomadic lifestyle in the region could also be a possible contributory factor. Prevalence of stunting also varied with the mother's level of education and wealth status.¹² Children born to mothers with low-income status and low education levels were more prone to malnutrition. The proportion of households with both an overweight mother and a stunted child under 5 is increasing in both rural and urban areas. Childhood stunting and maternal overweight are common in the southwest region because mothers from the region might have been stunted in childhood.¹⁴ Childhood stunting can result in higher risk of obesity later in life which is evident in an increase in adult obesity in some of those regions, especially areas located in the southern and western part of the country where stunting is prevalent.¹³

Approximately, 4 in every 10 (37%) children born to mothers with low educational status were stunted, compared with only 1 in 10 (10%) for those with mothers who had more than high school level education.¹¹ Generally, there was a slight decrease in the prevalence of malnutrition among children in Uganda compared with the previous years where the percentage of stunted children was 33% in 2011 and 29% in 2016.¹¹ There was a 3% reduction in the number of underweight children between 2011 and 2016, and a 1% decrease in wasting between 2011 and 2016.¹¹ However, the prevalence of overweight and obesity is rising in both rural and urban areas,¹⁴ which calls for proactive approach.

Anemia, which reflects several micronutrient deficiencies, affects more than half of children (53%) under 5 in 2016,¹² which is more than the WHO cutoff ($\geq 40\%$) with little change from the prevalence of anemia in 2011. The national prevalence of severe anemia is 2.3% in 2016 which is considered low except for Karamoja with 8% prevalence.¹³ The increase in prevalence in Karamoja needs to be subjected to research, but the possible reasons could be difficulty in food reaching this region due to wars and their nomadic lifestyle. However, the prevalence of severe anemia in children 6 to 59 months remains less than 4.0% in other regions.¹³ In addition, the prevalence of

anemia is higher in children under 5 than women in their childbearing age.¹⁴ Worthy to note is that besides data for deficiency in vitamin A obtained from biochemical tests, there is currently a paucity of national data on micronutrient deficiency in Uganda. Yet, in a 2015 survey conducted among children 12 to 23 months of age in the districts of Amuria and Soroti, nearly 33% were iron deficient, 20% had iron deficiency anemia, and not more than 5% had vitamin A deficiency.¹³ A study reported that 30% to 40% of severely malnourished children admitted in Mulago Hospital's nutrition unit were HIV seropositive and another study published in 2002 also revealed that nearly half of the anemia in children were due to HIV infection, malaria, worm infestations, and other chronic diseases.¹⁴ Research on the etiology of anemia as regards its prevalence in Uganda is still largely limited.¹³

Burden and Social-Economic Impacts of Malnutrition

Like other low- and middle-income countries, despite Uganda's sustained economic growth and poverty reduction, malnutrition is still far from being over, considering the current prevalence. This is due to multiple causes that vary by each region, but the immediate reasons that cut across all regions include unavailability and little or no access to food, lack of dietary diversity, social traditions, and high poverty levels.¹¹ It should be noted that Uganda's economy has been growing slowly, hence little impact on poverty. Currently, the World Bank rates Uganda's average annual growth at 4.5%.¹⁵

The impact of malnutrition, specifically undernutrition, on the physical growth of children is clearly evident in the low-income region.⁴ The first 1000 days after conception are very vital to the cognitive and linear growth of the child. In fact, it is during this period that the brain development occurs and any physiological deficiency during this period can lead to both short- and long-term consequences.⁵ These consequences are mostly noted on the child's health, education, and future productivity. The effects influence each other ultimately, giving additive or synergistic long-term consequences on the economic growth, social integration, and the intensity of poverty in the country.^{1,16}

Education

Studies that have been conducted indicate that a child who is chronically malnourished is prone to poor visual and auditory working memory, have difficulty paying attention and concentrating, and is deficient in exhibiting executive functions⁴ while those that are adequately nourished present good working memory, selective attention as well as good executive functions. Hence, it is believed that the difference in function is due to the delayed prefrontal development among stunted children, which causes them to have impaired functioning.¹⁷ This effect has a

strong impact on the child's education by reducing the child's learning ability¹⁸ and performance in school. It also increases the child's probability to repeat grades or drop out of school, obtaining a low level of education in the end.¹⁶

Children suffering from undernutrition are more likely to repeat grades compared with adequately nourished children. Studies conducted in children from Brazil, South Africa, India, Philippines, and Guatemala showed that stunting is a predictor of grade failure.¹⁹ In addition, a report by the Ugandan Government called "Cost of Hunger in Uganda" estimated that the rate for stunted children to repeat grades was higher than the national average with a differential risk of 3.2%. The report also revealed that only 34% of stunted children managed to complete primary school compared with 50% of the non-stunted children. Trends were seen to be similar at the secondary school level as well.¹⁶

In addition to the effect on the child's education, financial costs exist for families whose children repeat. This burden is more pronounced with families whose children are enrolled in private institutions. However, the general burden is still borne by the government because the biggest number of children studies from government-funded schools. In 2009, 133 931 students who repeated grades due to malnutrition caused the government a loss of 19.7 billion Ugandan shillings in incurring costs.¹⁶ The cost associated with dropouts is measured in the rate of achievements recorded. The overall probability of a dropout to have a productive achievement is low compared with non-dropouts.^{14,16} Also, the cost of dropping-out is reflected in social integration in the society. With low education levels, dropouts are closed from job opportunities, and this not only reduces the country's productivity but also amplifies crime rates in the society.⁴

Health

Weakening of the immune system and increasing the susceptibility of the body to infections are some of the ways malnutrition affects the health of children. Uganda's population feeds mainly on staple foods, thus missing out on other nutrients. This is evident by the high prevalence of stunting children from the southwest part of Uganda that produces the country's most food.¹¹ Malnourished children are more prone to die of respiratory infections and diarrhea, hence increasing mortality and morbidity rate.¹⁸ Another effect is the impaired human function at all stages of life and reduced life expectancy.^{18,20} Nutrient deficiency is another example of a health effect caused by malnutrition. They are mainly seen as carbohydrates or protein deficiency. Marasmus arises due to energy shortage caused by prolonged starving. The condition is symptomized by the low body weight in relation to the length, very thin upper arms, thighs and buttocks, and presence of peripheral edema in the lower legs and feet, and this is due to the emerged ribs and the lost subcutaneous fat in patients.

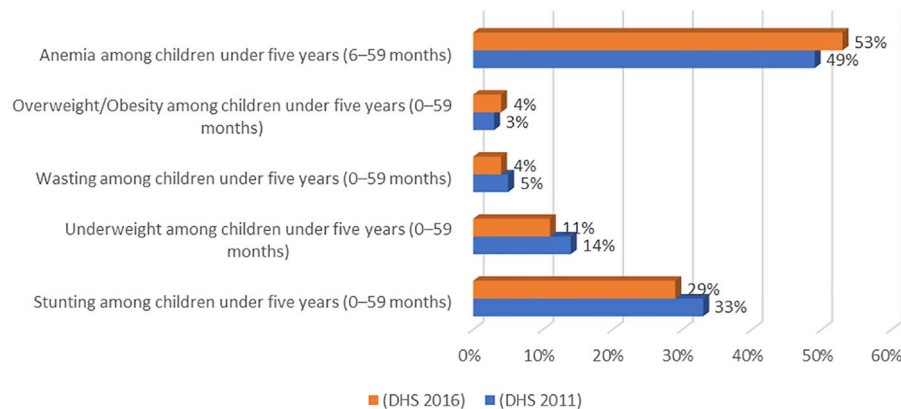


Figure 1. Comparison of Demographic and Health Survey 2011 (DHS 2011) and Demographic and Health Survey 2016 (DHS 2016). Uganda nutrition data showing prevalence of different types of malnutrition among children 6 to 59 months of age in Uganda.

Other conditions include those due to mineral deficiency like anemia. Anemia is also one of the global health problems today. Although it is caused by several factors, it should be noted that half of global anemic cases are due to malnutrition, especially low iron intake by the body. The condition affects all ages, but it is more common and presents serious impacts among children. Due to anemia, children often are affected with impaired cognitive development and stunted growth. According to Uganda Demographic and Health Survey (DHS) 2016, 53% of children ranging between 6 and 59 months of age suffer from anemia (see Figure 1).¹¹

Nutrition deficiency not only increases the child's risk of dying but also increases the mobility rate.⁴ Children suffer from various conditions and diseases resulting from low-specific nutrients, for example, blindness and neural tube defects that result from vitamin A and folic acid deficiency, respectively.⁴ Managing and treating malnourished children with their associated diseases present a burden of recurrent costs to the healthy system. Treating a severely underweight child is more expensive than preventing undernutrition and the burden doubles with the presence of companion diseases. These costs always increase at every given stage of the condition, especially when the families lack access to health services or health workers.¹⁶ In Uganda, it is estimated that 87% of the health costs of malnourished children are paid by their families. Although the largest share of the treatment cost is covered by individual families, recurrent costs still present a non-deniable expenditure on the public sector.^{4,16}

Children who are underweight are more easily affected by diarrhea and fever than healthy children^{4,16}; 18% of diarrhea cases and 10% of fever were reported among underweight children compared with well-fed children. Also, studies have revealed that acute respiratory infections are much more common among underweight children specifically those below 1 year of age with a 7% increment. The Ugandan Government report indicates that about 1.6 million episodes of illness are associated with malnutrition and 300 000 episodes recorded among HIV malnourished children.¹⁶

Malnutrition is a great influence on the child's disability, diseases, and mortality.^{4,14} Studies indicate that a malnourished child is at a greater risk of death and being affected by childhood infections like measles, malaria, and pneumonia.^{4,16} A child who is severely underweight has 9.5 times chances of dying of diarrhea than healthy children, and 4.6 times greater for stunted children.⁴ Another long-term consequence that results due to malnutrition is the disproportionate and rapid weight gain observed among people who were stunted during their childhood. The chances of a stunted child developing obesity and other chronic diseases during adulthood are higher compared with the child who was healthy during childhood.⁴

Productivity

Malnutrition negatively influences human productivity.¹⁴ Most malnourished children attain low levels of education, affecting their ability and opportunities to get good jobs, thus lowering their earning potential. This leads to a reduction in the number and strength of the workforce.^{17,18} Loss of productivity cost the government of Uganda about 1.2 Ugandan shillings in 2009, equivalent to 3.91% of Uganda's GDP.¹⁶ Malnutrition was estimated to cost Uganda nearly 19 trillion Ugandan shillings in the years 2013 and 2025.²¹

Poverty

The physical consequences of childhood stunting and impacts on cognitive function contribute to poverty by impeding the ability of an individual to live a productive life.^{14,17} According to a study done by UNICEF, it was estimated that 22% income is lost every year by an adult who suffered or is suffering from malnutrition.⁴ Given the fact that Uganda depends mainly on agriculture, a manual and intensive activity, growth restriction, and mobility due to malnutrition reduce manpower in the agricultural sector, a key requirement for productivity.¹⁴ Even though the country has managed to reduce the prevalence of malnutrition, it is still facing the long-term consequences of

malnutrition, reduced productivity, and incurring costs, which have additively deepened the country in poverty.^{14,16,22}

Conclusion and Recommendation

Malnutrition among children in Uganda is still far from over and its socio-economic impacts cannot be overlooked. If Uganda is to achieve the food-related Sustainable Development Goals (SDGs), it must urgently invest in improving nutrition. Roads, infrastructures, and information systems must be improved to enable good food saturation and availability in the country. Communal education especially of women and young people is essential to improve nutritional levels in the rural regions. Also, there needs to be an improvement of the economy of Uganda which would translate to better nutritional status due to improved income and standard of living.

Author Contributions

All the authors participated in the search for literature, article interpretation, analysis of data, conceptualization, and reading and revising the final manuscript for submission.

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