

## Commentary



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## Malnutrition and the mental health of children: the sub-Saharan Africa perspective

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## Abstract

*Child malnutrition has been a notably significant health challenge over the years especially in Africa where the prevalence is high. The World Health Organization has defined malnutrition as deficiencies or excesses in the intake of nutrients, imbalance of essential nutrients or impaired use of nutrients. Studies have further shown that the burden of malnutrition in children in Africa can be traced to the sub-Saharan region of Africa. A lot of factors are responsible for this some of which include; poverty, ignorance, inaccessibility of quality food items, among others. And although malnutrition in children is associated with a number of non-communicable diseases, it has a significant association with mental health affecting motor, cognitive and behavioural development, etcetera. Several researches have highlighted the relationship between malnutrition in children and mental health disorders. Hence, this paper discusses the relationship between malnutrition and the mental health of children in sub-Saharan Africa, the prevalence of malnutrition-induced mental health disorders in this region, factors affecting this prevalence as well as suggestions involving the government at various levels in the region, not-for-profit organizations, individuals and the entire society at large in addressing this very serious issue as it affects the future of the next generation.*

## Commentary

According to the World Health Organization (WHO), malnutrition is related to “deficiencies or excesses in the intake of nutrients, imbalance of essential nutrients or impaired use of nutrients” [1]. It covers a spectrum of 3 conditions: (i) wasting or low weight-for-height (related to lack of food or the presence of disease), stunting or low height-for-age (may be the result of chronic or recurrent malnutrition, especially in early life), underweight or low weight-for-age; (ii) deficiencies or excess of vitamins and minerals; and (iii) overweight and obesity. Worldwide, among children under 5 years, 159 million are stunted, 41

million are overweight, and 50 million are wasted [2]. Africa has the highest proportions of stunting, wasting and overweight in the world. In 2019, two out of five stunted children and ¼ of the world's wasted and overweight children under the age of 5 years lived in Africa. The estimated prevalence this year for stunting, wasted and overweight/obesity was 29.1 million, 1.8 million and 4.7 million children, respectively. Similar data were found for sub-Saharan Africa, whose estimated prevalence in 2019 for stunting, wasted and overweight/obesity was 33.0 million, 1.7 million and 3.0 million children, respectively [3]. According to the WHO, children with severe malnutrition have an 11x increased risk of dying compared to healthy children, mainly due to a higher incidence of infections, since their immune system is weakened, and greater difficulty in recovering from diseases such as pneumonia, malaria and measles. It is also important to note that inadequate nutrition and increased frequency of infections during the first 1000 days of life can cause irreversible effects on physical and cognitive development [4]. The main causes that contribute to these statistics are: the low income of the population, which makes it difficult to access foods with a high nutritional content compared to foods with a high fat, sugar and salt content, which are generally cheap; and not breastfeeding [2]. The impact of malnutrition on children's mental health starts from maternal prenatal malnutrition. In the intrauterine period occurs the development of the infant brain. The nutritional deficit during this process, which is essential to create effective neural networks, can result in long-term functional and structural brain changes, contributing to psychiatric illnesses [5]. As an example, maternal iron deficiency may be related to poor regulation of several metabolic processes that seem to be associated with schizophrenia, such as the atypical development of neural structures, and changes in epigenetics and dopaminergic functioning [5]. Additionally, the psychosocial impacts of hunger, such as chronic stress and inadequate living conditions, which also negatively impact the development of the fetal brain and the endocrine

and immune regulatory systems [5]. Hence, this paper seeks to evaluate the effects of malnutrition on the mental health of children in sub-Saharan Africa, the prevalence of malnutrition induced mental disorders among children in this region, factors that are possibly responsible for this prevalence as well as suggest ways these can be curbed.

**Effects of malnutrition on children:** malnutrition is a major contributor to mortality and is now being recognized as a cause of potentially lifelong functional disability. The problem of malnutrition in poor societies is best viewed as a “syndrome of developmental impairment,” which includes growth failure; delayed motor, cognitive, and behavioural development; diminished immunocompetence; and increased morbidity and mortality. Growth retardation is associated with other problems, such as vitamin A deficiency and anaemia. Risk of these nutritional problems increases in utero and during the first three years of life, while affecting at least a third of all young children in developing countries. Survivors of malnutrition in early childhood suffer multiple disadvantages as adults, including diminished intellectual performance, low work capacity, and increased risk of delivery complications [6]. Nutrition is probably the single greatest environmental influence both on the fetus and neonate, and plays a necessary role in the maturation and functional development of the central nervous system. Prenatal protein malnutrition adversely affects the developing brain in numerous ways, depending largely on its timing in relation to various developmental events in the brain and, to a lesser extent, on the type and severity of the deprivation. Many of the effects of prenatal malnutrition are permanent, though some degree of amelioration may be produced by exposure to stimulating and enriched environments. Malnutrition exerts its effects during development, not only during the so-called brain growth spurt period, but also during early organizational processes such as neurogenesis, cell migration, and differentiation. Malnutrition results

in a variety of minimal brain dysfunction-type syndromes and ultimately affects attentional processes and interactions of the organism with the environment, in particular producing functional isolation from the environment, often leading to various types of learning disabilities [7].

**Prevalence of malnutrition induced mental disorders among children in sub-Saharan Africa:** a study reports that overall 14.3% of children were identified as having psychopathology [8]. This evidence suggests that substantial levels of mental health problems exist among children and adolescents in sub-Saharan Africa due to lack of nutrition. One in 7 children and adolescents have significant difficulties, with 1 in 10 (9.5%) having a specific psychiatric disorder [8]. Children under the age of 5 years are especially susceptible since that is the peak time for brain development [8]. Data available from a study between 2006 and 2016 for stunting, wasting and underweight children in sub-Saharan Africa shows that stunting was highest in Burundi (57.7%) and Malawi (47.1%) in East Africa; Niger (43.9%), Mali (38.3%), Sierra Leone (37.9%) and Nigeria (36.8%) in West Africa; Democratic Republic of Congo (42.7%) and Chad (39.9%) in Central Africa. Wasting was highest in Niger (18.0%), Burkina Faso (15.50%) and Mali (12.7%) in West Africa; Comoros (11.1%) and Ethiopia (8.70%) in East Africa; Namibia (6.2%) in Southern Africa; Chad (13.0%) and Sao Tome & Principe (10.5%) in Central Africa. Underweight was highest in Burundi (28.8%) and Ethiopia (25.2%) in East Africa; Niger (36.4%), Nigeria (28.7%), Burkina Faso (25.7%), Mali (25.0%) in West Africa; and Chad (28.8%) in Central Africa [9].

**Factors responsible for child malnutrition in sub-Saharan Africa:** this is not a “one reason fits all”, it is in fact a cascade of interdependent factors, one leading to the other. First is poverty; families do not have enough to sustain themselves, let alone eat something healthy. The food that they eat is deficient in many nutrients responsible for proper cognition, brain development in children etc. Secondly, in some communities, the male gender is prioritised leading to poor nutrition in female

children and among mothers which gives rise to poor breastfeeding and no knowledge of nutritious food. Further problems arise because of droughts and floods in certain areas, where people are dependent on their harvest for their income and food. Lastly, the government is non-serious and nonchalant and often give room for fraud with the funds meant to aid nutrition. Whatever help the western world gives, is refractory to realities of socio-cultural implementation. There are grave obstacles in distribution of food from outside too, always at the mercy of vain attempts of international help. There is no means to maintain the food influx by foreign donations, hence rendering the people forever dependent on external aid [10].

## Recommendations

Recent data suggest that malnutrition of the sub-Saharan African children will keep increasing and therefore the impact it has on the mental health these children will be evident. In order to substantially reduce the incidence of malnutrition and the corresponding mental health issues among children in sub-Saharan Africa, the following need to be done: the different national governments should proceed to the formation of a plan in collaboration with the private sector and not-for-profit organizations to ensure transparency in the handling of the donations and developing facilities to store food and ensure accessibility; developing programs aimed combating poverty which is the main reason for malnutrition; the government at each level should provide aid to areas with famine tendencies or extreme poverty; creating adequate awareness on the importance of good nutrition of children as well as the elimination of the perspective of prioritizing the nutritional needs of males against those of females; urgent medical interventions should be provided for children with cases of malnutrition in order to prevent consequent mental disorders; checkups should be carried out in schools on children with poor cognitive and behavioral health in order to trace poor nutrition for possible interventions.

## Conclusion

Consistent work and proper resource allocation are required in order to reach results that can make us more optimistic and hopeful for the future.

## Competing interests

The authors declare no competing interests.

## Authors' contributions

Esther Edet Bassey conceived the idea and worked with Ana Carla dos Santos Costa, Alishba Adnan, Eleni Xenophontos, Rachana Phadke, Shahzaib Ahmad on building the manuscript while Mohammad Yasir Essar, Shoaib Ahmad and Farah Yasmin reviewed the manuscript. All the authors have read and agreed to the final manuscript.

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