Review Article

Malnutrition Among Children Under Five Years in The Era Of COVID-19 Pandemic In Sub Sahara Africa: Causes and Impact

Abstract

Since the beginning of the COVID-19 era, Sub-Saharan Africa has seen a surge in malnutrition among children under the age of five. The goal of this research is to determine the factors that lead to malnutrition in young children under five (5) years in Sub-Saharan Africa. Utilizing online research journal websites and other in-context publications, a comprehensive literature review was conducted. The keyword "malnutrition among children under the age of five in Sub-Saharan Africa" was used throughout the search words for this particular study. This research was preoccupied mostly with childhood malnutrition. The study indicated that a child's nutritional intake may be influenced by a range of factors, such as the economic conditions of a nation, the mother's degree of education and income, and cultural norms and societal expectations. Malnutrition in children under the age of five is one of the top causes of mortality in sub-Saharan African states and one of the primary reasons why these nations will not be able to reach the Sustainable Development Goals during the COVID-19 timeframe. The research recommends that the governments of these sub-Saharan African nations immediately take measures to address the problem of childhood hunger during the COVID-19 era.

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1.Background
2.Purpose
3.Methodology
4.Results
5.Conclusion and policy immolations
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Keywords: Malnutrition, COVID-19, Africa

1.0 INTRODUCTION

Malnutrition in children is an issue that has long been a concern for people all over the world. At this point in time, during COVID-19, the issue of undernourishment has increased and has been a source of serious worry. The World Health Organization (WHO) defines malnutrition, more often known as undernutrition, as "a spectrum of under-and over-nutrition that affects one in nine people worldwide" [1]. According to the World Health Organization (WHO), malnutrition takes place when there is an insufficient amount of critical nutrients and energy for the body to grow, sustain itself, and complete the myriad of functions that it is responsible for. Chronic malnutrition (also known as stunting) and acute malnutrition are both types of food shortage (underweight and wasting). Also, malnutrition is a state of either not getting enough food or getting too much food. Under-nutrition happens when a person does not get enough of the nutrients their body needs to grow and develop. Eating an excessive number of calories can lead to the condition known as over-nutrition. Protein-energy malnutrition and other forms of micronutrient-deficient malnutrition are both possible names for this condition. An inadequate or excessive nutritional intake is characterized by an unbalanced composition of critical nutrients or an impaired ability to utilize nutrients [1]. The double burden of malnutrition includes not only undernutrition but also overweight and obesity, in addition to illnesses that are not contagious but caused by poor dietary choices. Undernutrition can present itself in a variety of ways, the most common of which are wasting, stunting, being underweight, and deficiencies in micronutrients. [2].

It is anticipated that out of the 1.9 billion children throughout the world who are under the age of five, 38.9 million will be overweight or obese in the year 2020, whereas 149 million will be underweight. Young children under the age of five have a high mortality rate due to hunger-related reasons (45%). They are notably prevalent in countries with a low to middle-level standard of living. At the same time, childhood obesity is on the rise in these countries as well. Around the world, malnutrition is a major issue that has far-reaching and long-lasting consequences for individual lives, communities, economies, and healthcare systems [3].

According to estimates [4,] malnutrition is the primary contributor to death in at least 45 percent of all cases where children under the age of five have been documented as having passed away. In 2015, more than 7.7 percent of children around the globe were considered to be underweight. Additionally, 24.5 percent of children were considered to be stunted, and 15 percent of children were fast losing weight. The highest prevalence of undernourishment may be seen in several parts of South-East Asia and Africa. [5]. The 2015 Millennium Development Goals (MDG) report found that one third of the total world's hungry children live in Sub-Saharan Africa (SSA). This information highlights the urgency of the situation of malnutrition in children under 5 years in SSA. Malnutrition continues to be a major public health concern for children under the age of 5 in the sub-region. [6]

According to a publication made by the Save the Children website in 2011, malnourished children have a far higher chance of being sick with and dying from things like pneumonia, measles, diarrhea, malaria, and HIV/AIDS. Malnutrition stunts a child's development and increases his or her vulnerability to disease, mortality, and a diminished capacity for learning and productive labor. A side effect of this is that it lowers productivity, is harmful to health, and even has the potential to kill individuals [7]. There is some evidence to show that malnutrition is connected with an increased risk of getting SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) [8]. The acronym for the second coronavirus responsible for severe acute respiratory syndrome is SARS-CoV-2. More severe instances of COVID-19 were seen in children who were malnourished (log-odds and 95% confidence interval: 0.094 [0.012, 0.175] for children ages 6-17 and 0.014 [0.021, 0.006] for adults) [9]. Children who were malnourished were more likely to acquire life-threatening instances of COVID-19 than their well-nourished counterparts. Malnourished children were more likely to get a severe case of COVID-19 than their healthy counterparts. Children who were malnourished were more likely to have life-threatening cases of COVID-19 than their healthier peers.

On January 12, 2020, the WHO declared that an outbreak of respiratory illnesses in Wuhan City, Hubei Province, China, was caused by a newly found coronavirus [11].COVID-19 is the name that has been given to the sickness, while SARS-CoV2 is the name that has been given to the agent of infection, which is an RNA virus. There were over five million confirmed instances of COVID-19 over the world as of the 25th of May in the year 2020, with over 300,000 people losing their lives as a result. In Africa, where over 90,000 cases have been reported, an estimated 3,000 deaths have occurred [12]. In 2019, 381 million people were undernourished, according to WHO, but just 250 million were undernourished, according to the World Bank. With 48 million people, Latin America and the Caribbean ranked third in the world in 2013[13].

This was not only a problem in Africa; in some parts of the world, the interplay of armed conflict, climatic crises, and societal precarity poses a major threat to the health of citizens' diets, especially that of children. The spread of the COVID-19 epidemic has only made matters worse [14]. The fight against child malnutrition and the realization of the WHO 2030

objectives has been slowed by poverty, climate change, and conflict [15]. While children only make up a tiny percentage of COVID-19 fatalities, it is predicted that a 50% reduction in necessary and regular health care might lead to a 45% rise in child mortality [16]. The present COVID-19 outbreak has made this approach riskier, placing at risk the most vulnerable portions of the global population for a wide variety of disastrous impacts on both their health and the economy [17].

Children in low- and middle-income countries (LMICs) in Sub-Saharan Africa are facing significant nutritional and health challenges as a direct result of the unprecedented international social and economic tragedy caused by the COVID-19 pandemic. The youth in rural areas are more susceptible to the effects of this condition. There is a higher rate of unemployment among young individuals living in rural areas compared to their urban counterparts. There is sufficient cause to be concerned about the course that this illness will take. Acute malnutrition poses a threat of death to one out of every ten children on the African continent who are younger than five years old. This is owing to the fact that infectious illnesses have a stronger impact on the health and survival of children and adolescents who are malnourished. Prior to and throughout the course of the COVID-19 outbreak, a significant number of children in Sub-Saharan Africa suffered from severe undernourishment. The under-5 age group was affected the most severely by this. The purpose of this research is to get a better understanding of the factors that contribute to COVID-19-related malnutrition in children in Sub-Saharan Africa who are under the age of five and what measures may be taken to assist individuals who are afflicted with this condition.

2.0 METHODS

The author of this piece was able to perform a comprehensive study by consulting the websites of a wide variety of online research journals in addition to other sources of background information. The keywords "effect of COVID-19 on under-5 malnutrition in Sub-Sahara Africa" were used to find material for this study. One aspect of this study that was examined was how COVID-19 affected malnourished infants under the age of five. So, a link was made between the papers that talked about the effects and potential of COVID-19 on malnutrition in kids under five.

In order to provide an explanation for malnutrition in children under the age of 5 who resided in Sub-Saharan Africa, the following is a synopsis of selected research publications that were published during the time period that was covered by COVID 19:

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No	Topic	Author(s)	Location	Method	Results
1	*"Regional Overview on the Double Burden of Malnutrition and Examples of Program and Policy Responses: African Region"*	*"Adelheid W., Onyangoa, Juddy Jean-Baptisteb, Betty Samburu and Tshimi Lynn Moeng Mahlangud"* 2019	Sub-Saharan Africa ·	This article describes talks at "*December 2018 international conference on the double burden of malnutrition (DBM) in Africa*".	To aid governments and development partners in their fight against malnutrition, the World Health Organization (WHO) is now formulating a strategy plan. This will be accomplished through increasing the use of data, bolstering policy, and improving service delivery. Making headway in reducing the DBM requires actions that are coordinated and mutually supportive.
2	*"COVID-19's Shadow on Undernourished Children (6–23 months): An Evidence-Based Study on Magnitude and its Determinants in Rajasthan"*	*"Goutam Sadhu 1and Hemangini Gandhi"* 2020	Rajasthan, India	It was decided to conduct the cross-sectional survey. It was decided to use a sampling approach with three stages. Out of all the districts in Rajasthan, three were chosen at random, and from each of those three districts, based on a systematic random sample, four rural blocks or urban slums were recruited in the research for Stage 1. Each of the blocks was randomly assigned 10 communities, or public housing projects (PSU), to represent in Stage 2. As part of the third phase of the study, a random sampling technique was utilized to choose individuals from each PSU. Six children aged 6–11 months and 12 children aged 12–23 months were each selected from that PSU's pool of possible participants.	In all three areas, men were found to be more likely to be malnourished than women. This was true regardless of the municipality one examined. The existing nutritional status of children in Rajasthan, which includes wasting, stunting, and underweight, is a matter for worry that may become much more severe as a result of the COVID-19 outbreak that is occurring right now.

3	*"Assessment of factors associated with under five malnutrition in children in Ashiedu Keteke sub metro in Greater Accra"*	*"Jonathan Yeboah Ansah"* July, 2018	Accra, Ghana	In July 2018, a hospital-based cross-sectional research evaluated the nutritional condition of 0–59-month-old infants. The study aimed to investigate local nutritional variables. There were 328 children and their caregivers that took part. The data was gathered by an interviewer using a pre-tested, organised questionnaire. The questionnaire asked about mothers' childcare routines, socio-demographics, and anthropometrics. A thorough three-week survey of caregivers was conducted. Height, weight, and mid-upper arm circumference were measured.	Based on these findings, it appears that there is a necessity to restructure the manner in which people are educated regarding the best ways to provide care for infants and young children as well as the most effective ways to feed them. Extra work, like conducting regular evaluations of existing programs, is required in order to provide additional assistance in the fight against malnutrition.
4	*"Factors influencing malnutrition among children under 5 years of age in Kweneng West District of Botswana"*	*"Yankinda Etienne Kadima"* 2012	Botswana	A case-control study was used to reach this conclusion. There were 37 underweight children less than 5 years old (cases; n=37) and 76 healthy children younger than 5 years old (controls; n=76). Children under the age of five who were regular visitors to the Letlhakeng Child Welfare Clinic were simultaneously recruited for both groups.	Low birth weight, poor Vitamin A supplementation, and early sickness have all been linked to malnutrition in children under the age of five. Having a guardian raise the child and not knowing how to properly feed a newborn or small child were also problems.
5	*"Child malnutrition in sub-Saharan Africa: A meta-analysis of demographic and health surveys (2006-2016)"*	*"John J. Hall, Blessing J. Akombi, Kingsley E. Agho, Dafna Merom, and Andre M."* Renzaho.	Sub-Saharan Africa	The research relied on information collected in 32 different countries throughout sub-Saharan Africa over the period between 2006 and 2016 as part of the Demographic and Health Surveys. The prevalence of each indication of malnutrition across Africa as a whole was calculated using a meta-analysis. This included all of Africa's four regions (East Africa, West Africa, Southern Africa, and Central Africa). Given the substantial	This research identifies the nations within SSA's sub regions that have the greatest rates of underweight, wasted, and stunted children.

				observed heterogeneity (I2 > 50%), a random effect model and sensitivity analysis were used to evaluate the influence of polling anomalies. The duplicates were called HAZ-2 and WAZ-2.	
6	*"Factors associated with malnutrition in children < 5 years in western Kenya: a hospital-based unmatched case control study"*	*"James Ransom, Edwin Gudu, Mark Obonyo, Victor Omballa, Elvis Oyugi, Cecilia Kiilu, Jane Githuku, Zeinab Gura, and Jane Githuku"* 2020.	Kenya	An unpaired case-control study was conducted by researchers at a university hospital between May and June of 2017. A case was classified as "*a child aged 6 to 59 months with a weight-for-height z-score of -2 standard deviations, a weight-for-age z-score of -2 standard deviations, or a height-for-age z-score of -2 standard deviations (z-score). Control children ranged in age from 6 months to 5 years old and were all developmentally on par with their chronological ages*". The cases were collected in a logical order, and the controls were selected at random. Epi-Info was used to do a logistic regression analysis on the gathered data from the interviews and medical records.	The study recruited ninety-four patients and two hundred eighty-one controls. In 84 percent (79/94) of the cases, malnutrition was present. Pre-lacteal feeding (OR = 1.8; 95% CI = 1.1-3.0), deworming (OR = 0.8; 95% CI = 0.4-1.2), and a lack of prenatal care visits by the mother (OR = 7.9; 95% CI = 1.5-41.2) were all associated with an increased risk of preterm birth. Undernutrition was independently associated with "*delayed developmental milestones (AOR = 13.9), low birth weight (AOR = 3.3; 95% CI = 1.4-7.5), and paternal lack of formal education (AOR = 4.9; 95% CI = 1.3-18.5).*"
7	*"Long-term effects of malnutrition on severity of COVID-19"*	*"Alec Kurtz1, Kenneth Grant, Rachel Marano, AntonioArrieta, Kenneth Grant Jr , William Feaster, Caroline Steele, & Louis Ehwerhemuepha"*	United States of America	The Cerner COVID-19 The dataset contains information on 103,099 in-patient contacts that took place between March 2020 and June 2020 at 56 different U.S. institutions. Between 2015 and 2019, individuals with a malnutrition history were identified, and random intercept logistic regression models were developed for both children and adults, taking into account variables such as age, race/ethnicity, socioeconomic status,	These results indicate that chronic starvation increases the probability of severe COVID-19 infection with age.

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				admission vital signs, and comorbidities.	

Table 1 : Synopsis of selected research publications that were published during the time period that was covered by COVID 19

3.0 RESULTS AND DISCUSSION

3.1 Causes of malnutrition of children under 5 years during COVID 19 era.

Scientists Nyaruhucha et al. [18] discovered a strong correlation between the age of the mother, the mother's level of education, and the mother's marital status, and the nutritional health of children under the age of five in Tanzania. Maternal characteristics, such as age and level of education, are key markers of the child's nutritional condition, as discovered in research by Akorede and Abiola (2013) in Nigeria and by Iram and Butt (2006) in Pakistan. Births to women under the age of 25 are associated with a higher risk of malnutrition [19, 20] because of the mothers' lack of experience and ability to provide proper care. Nikoi observed in 2011 that in Ghana, a child's nutritional condition is not affected by parental socioeconomic position (including parental education and employment) [21].

According to a study conducted by Bantamen et al. in 2014 [22], children in Ethiopia under the age of five were more likely to be underweight if their parents did not provide adequate care. Given that women are the major carers in most homes, Oyekale's 2005 study finding that education of women enhanced the quality of care supplied to children is particularly noteworthy. To give just one example, educated mothers have a better chance of finding jobs in high-paying industries where they can comfortably support their family. Children's health is much improved in cities with strong social support systems and a focus on personal hygiene.

The more educated a mother is, the greater her cognitive talents, her aptitude to learn new skills, and her willingness to change for the better [23]. The socioeconomic status of the child's family or primary caretaker is a major determinant in the child's nutritional status. This percentage highlights the importance of having regular access to nutritious food, healthcare, clean water, and proper sanitation for children. Smith et al. (2005) found that households' ability to buy food, a necessary condition for food security, is strongly correlated with their socioeconomic status. Having reliable child care options readily available is also essential. It allows for a more balanced diet and easier control of childcare needs [24]. Yimer found in the year 2000 that the occurrence of childhood stunting decreased together with the growth in household affluence. Health care, water and sanitation facilities, and the spread of knowledge all improve when family incomes rise in a community [25].

3.2 Impacts of malnutrition

This study found that the Millennium Development Goals (MDGs), which aim to reduce poverty and increase access to nutritious food, are hindered by the high rate of malnutrition among children younger than five in Sub-Saharan Africa. These goals were initially formulated back in the year 2000. In the years between 2006 and 2016, scholars paid disproportionate attention to the nations of sub-Saharan Africa. Cross-sectional research by Akombi et al. (2017) used information from several demographic and health surveys from different countries in sub-Saharan Africa [25]. According to the findings of the study, undernourishment is widespread throughout a wide variety of sub-Saharan nations and sub-regions, as assessed by a number of various indicators. This is the conclusion drawn from the data collected during the course of the research. When compared to the objective that the WHO set for the Millennium development goals in 2015[25], the incidence of malnutrition was highest within the nations that are located in West Africa and East Africa, as indicated by the figures. The effects of undernourishment on children in Sub-Saharan Africa who are younger than five years old are the focus of this study.

A study conducted by Walker JB & Watkins WA in 2008 on nutrition in pediatrics found that when children are malnourished at a young age, their physical and mental development suffers, which in turn has a negative impact on their academic achievement [26]. Malnutrition increases the risk of developing an illness or infectious disease, lowers one's level of energy, and impairs normal brain function. This risk is increased because malnutrition weakens every component of the immune system. Malnutrition also lowers one's level of nutrition. According to data compiled by the World Health Organization (WHO), malnutrition is directly responsible for 54 percent of all infant deaths globally. An individual's chance of dying from respiratory illness, diarrhea, or malaria is doubled even in minor cases of malnutrition [26]. The mortality rate from various illnesses may also be raised by malnutrition. Consistent with these results, this research confirms the detrimental effects of starvation on children younger than five during the COVID-19 pandemic.

The pandemic's indirect effects on a child's nutrition during the first thousand days of life, referred to as a "window of opportunity," can have far-reaching consequences for the child's growth and cognitive development, as well as an increased risk that the child's own children will be malnourished [27, 28]. If this does not happen, the pandemic's effects may spread even further.

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Etc.

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4.0 CONCLUSION

Malnutrition among children under five years has always been a public health concern and the era of covid 19 has made it worse. Though governments around the world are doing their best to solve this issue, the Sub Sahara African countries seen no improvement. The percentage of under-5-year-old children who are malnourished is steadily rising at an alarming rate. Nations in sub-Saharan Africa, as well as these countries, are currently dealing with the repercussions of malnutrition in this COVID 19 age. This does not mean the challenge of malnutrition among children cannot be solved. More studies on child malnutrition should be carried out to solve this problem. Also, governments in these Sub Sahara Africa countries need to take urgent steps in solving the problem of child malnutrition in this COVID 19 era.

5.0 DECLARATION OF CONFLICTING INTERESTS

Regarding the research, writing, and/or publishing of this work, the authors have said that none of these three actions entailed any plausible conflicts of interest.

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