



Strategies to Mitigate the Impact of COVID-19 on Food Security and Malnutrition in Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author HO designed the study, structured and wrote the first draft of the manuscript. Authors SA, AA, OO and CA worked on the literature review, synthesized the articles downloaded and assisted in the design of the work. Authors IA and OCE supervised the work from the design of the study to the write up and editing of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

As a developing nation and the most populous nation in Africa, Nigeria has faced challenges associated with meeting the food needs of its expanding population over the years. This is due to the nation transitioning from a net exporter of foods to being dependent on food imports, leading to many people suffering from stunting and severe malnourishment. The COVID-19 pandemic has compounded this food insufficiency within the country with its attendant global impacts. The restrictions in the movement of people and goods in the country, due to the current pandemic, have affected access to food and agricultural input, heavily affecting the financial ability of families. This

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mini-review highlights the impact of COVID-19 on the country's nutritional status, the rising incidence of food insecurity and proposes approaches that can be employed to mitigate these adverse effects. Approaches to improving food security and the nutritional status of the country during the pandemic and post-pandemic era will involve deliberate policies of the government which focuses on increasing funding to local food producers, lifting restrictions on the transport of food commodities, encouraging markets for the retail of locally produced foods and more importantly instituting nutritional intervention programmes for children and the vulnerable within the community.

Keywords: COVID-19; malnutrition; food insecurity; nutrition status; Nigeria.

ABBREVIATIONS

COVID-19 : *Coronavirus Disease 2019;*
SARS-CoV-2 : *Severe Acute Respiratory Syndrome Coronavirus-2;*
FAO : *Food and Agricultural Organization;*
USAID : *United States Agency for International Development;*
MNT : *Medical Nutrition Therapy.*

1. INTRODUCTION

COVID-19, a respiratory disease caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has become a reality of today's world, causing various human health complications and far-reaching consequences across the globe. This has resulted in some form of lockdown in almost all countries of the world. This global lockdown has affected all strata of life, including education, health, finance, leisure, and nutrition, amongst others, leading to an increase in inequalities, hunger and loss of livelihoods [1]. Because of the global lockdown, the world has recorded an unprecedented and rapidly changing situation in its nutritional status. The Food and Agricultural Organization (FAO) of the United Nations has highlighted that the effects of the pandemic on the entire food supply chain can be disastrous and lead to a collapse in food security and nutrition globally [2]. Nigeria had her first case of the SARS-CoV2 virus on the 27th of February 2020 [3]. Since then, the number of cases and deaths has continued to rise, and the second wave of the pandemic is currently being witnessed. As of the 20th of February 2021, Nigeria records 150,908 cases of COVID-19 in Nigeria, with 1,813 deaths [4]. With the continual spike in the number of COVID-19 cases and the resulting socioeconomic impacts, the COVID-19 pandemic has triggered a crisis in various aspects of life in the country, including agriculture, health, education, government, and manufacturing. According to the United Nation's

World Food Programme Hunger map, the number of Nigerians with insufficient food consumption in July 2020 was estimated as 35.9 million, an increase of 6.49 million from April [5]. Within West Africa, it is estimated that the impact of the coronavirus pandemic could increase the number of people at risk of hunger and food insecurity from about 17 million to 50 million by the end of 2020 [6]. Until the current pandemic is contained, these figures can be expected to increase further.

The effectiveness of approaches employed in the management of COVID-19 across the world and in developing countries is still a subject of debate as the crisis progresses. Several factors influence the spread of the COVID-19 in Nigeria, most notably the extremely congested living conditions associated with numerous poor neighbourhoods in several cities. Also, the high prevalence of co-morbidities, including chronic malnutrition, endemic malaria coupled with current measles, cholera and Lassa fever outbreaks, can complicate efforts to effectively contain the pandemic and result in severe implications on the transmission pattern and health of the community [7]. In Nigeria, much attention is given to different facets of life affected by the COVID-19, however, little is known about the impact of the pandemic on the nutritional status of the Nigerian population.

2. OVERVIEW OF FOOD SUPPLY AND NUTRITIONAL STATUS IN NIGERIA

Agriculture and food production are important facets of the Nigerian economy, accounting for a significant proportion of total employment in the nation and is the main source of livelihood for many Nigerians living outside the cities [8]. In the early years after the country's independence (1960-1974), Nigeria was self-sufficient in meeting the nutritional needs of the population. However, a surge in population growth, without a proportional increase in food production, led to a

reduction in self-sufficiency, leading to the nation switching from a net exporter of food to dependence on food imports [8]. As an agricultural exporting country, Nigeria had comparative advantages over many countries within Africa, with food and agro resources in abundance without resort to importations. In recent times, food security has become a significant issue of concern, especially in Northern Nigeria, where accessibility to food by households has significantly deteriorated due to the disruption in agriculture. The major disrupting factors are insecurity, drought and farmer-herder clashes, leading to a hike in food prices [9]. Therefore, it is not surprising that Nigeria is now listed by the Food and Agriculture Organization (FAO) among nations that are technically unable to meet their food needs [8,10]. This, in many ways, has influenced the nutritional status of individuals within the country. The United States Agency estimates for International Development (USAID) that about 37% of children under the age of 5 are stunted [11]. Stunting, malnutrition and food insecurity increases human suffering and is estimated to account for about 60% of all childhood deaths in the developing world [12]. Compared to other nations of the world, the number of stunted children due to malnutrition in Africa has not decreased significantly.

Locally, Nigeria is ranked as the African nation with the largest number of children suffering from absolute hunger and stunting (11 million) and second globally (after India) due to undernutrition [13]. With the population of Nigeria estimated to reach a record 440 million in 2050, making the country the third most populous country globally. Thus it becomes more important and urgent that the country achieve food self-sufficiency to feed this teeming population. Persistent undernutrition and malnutrition have far-reaching consequences, especially in children who are left weak, stunted, wasted and vulnerable to diarrhoea, measles, malaria and acute respiratory infections. Importantly, malnutrition in adolescents and adults could lead to decreased energy levels, growth failure, decreased ability to resist infections and a cut in life expectancy [8]. Regarding women's nutrition, the statistics are worrying as 11% is undernourished in 2013, while 25% are overweight or obese, indicating a very poor nutritional status for women in the country [11].

The cause of malnutrition and food insecurity in the country is a result of the interplay of several

factors, including those that affect food production directly, such as irregular rainfall, armed conflicts and poverty, and other factors which are more social, including lack of access to health care, water, sanitation and high unemployment rate [14].

3. NUTRITION IN A CHANGING PUBLIC HEALTH ENVIRONMENT

Malnutrition is a major factor responsible for increased morbidity and mortality in a population. It is also a key indicator of how an individual or population will fare in the outbreak of a disease. Thus, historically, pandemics and malnutrition are intertwined. For instance, the Zika virus spread rapidly in countries with high rates of malnutrition, protein-energy malnutrition or a micronutrient deficiency [15]. This highlights the importance of maintaining a healthy dietary life within the pandemic period [16] as compelling evidence showed that dietary habits are affected by conditions of stress, distress, and emotional disturbance, whereby elevated distress levels are associated with the unhealthy dietary pattern and poor quality of the diet [17] which can have negative consequences to health.

4. EFFECTS OF COVID-19 PANDEMIC ON NUTRITION IN NIGERIA

As noted earlier, before the outbreak of the COVID-19 pandemic, many people's nutritional status in Nigeria was already precarious. There is a high rate of stunting and wasting amongst children and women, with the attendant deficiencies in micronutrients which can compromise public health. Thus, as there is a strong correlation between nutrition and health, it becomes more important to improve the nutritional wellbeing of the vulnerable population in the country to mitigate and reduce the adverse effects of the COVID-19.

As a result of the global COVID-19 pandemic lockdown, several activities related to the food supply chain's sustenance have been disrupted. Adopted measures such as the shutting down of 'non-essential facilities' including farms and process facilities, ban on interstate travel, which is usually utilized for the transportation of foods, will inherently lead to food scarcity in the country. These measures have severe repercussions on both food access and utilization [18]. Thus, to prevent the looming food crisis, proactive steps to be taken to limit the lockdown restrictions on the food production sector through stimulus

packages and interventions. In line with this, the Federal Ministry of Health, in conjunction with other stakeholders on nutrition, developed a COVID-19 Pandemic Response Plan, which offers strategies for nutritional intervention and develops action plans for the management of the nutritional statuses of the vulnerable to reduce the impact of the lockdown on food systems [14]. To facilitate transportation of foods and food products to increase food availability, exemptions and rights of a passage should be given to food transporters. Similarly, the establishment of special markets for retail food activities should be made a priority to make products that are produced locally more readily available. In addition to this, there should be a facilitation of general education and awareness of food choices during periods of confinement and general wellbeing [19].

5. STRATEGIES FOR COMBATING MALNUTRITION DURING THE COVID-19 PANDEMIC

In Nigeria, controlling the pandemic's impact on individuals' nutritional status can be achieved through several areas, including government policies, health, and economic interventions. These are focal points that must be addressed to forestall a nutrition and food security crisis.

5.1 Government Policies

In response to the pandemic, a series of executive orders from Federal and State levels of Government have been issued on the restriction of movement, lockdown and social distancing. These strict measures without any public welfare cushion, coupled with the second wave of the pandemic, have led to adverse economic effects with a tightening of credit access to farmers and other challenges such as limited access to transport services, move food products and border closures limiting food imports. These constraints are beginning to have a ripple effect on food production and transportation, leading to a hike in food prices and reducing access to nutritious food [20]. Government institutions need deliberate effort to cushion the effect of these developments. A systematic analysis of the far-reaching impacts of these policies on the citizens is required. Although these policies can be effective in mitigating the spread of the virus, it comes at a great economic and human cost, including loss of food diversity and food insecurity.

Interestingly, malnutrition and other co-morbidities (for example, HIV, tuberculosis) are considered a risk factor for complications in people with COVID-19 due to a compromised immune system [14]. Thus, it is imperative to make nutritious foods and supplements readily available. Therefore, nutrition must be integrated into COVID-19 planning, response and recovery actions through making provisions for feeding infants, young child and other vulnerable members of the populations, including the old, internally displaced and people living with pre-existing malnutrition and infectious diseases such as HIV/AIDS and other non-infectious diseases such as diabetes. Furthermore, as the country's largest-ever immunization program is around the corner [21], nutrition incentives should also be incorporated into the COVID-19 mass immunization program. These incentives will help close the nutrition gap among low-income Nigerians by boosting their purchasing power and access to fruits and vegetables. This is important as an individual's nutritional status plays a significant role in disease prognosis [22]. Consumption of a balanced diet guarantees the development of a strong immune system which is necessary to combat a viral infection [23]. This may be challenging during a pandemic as the difficulties in food production, distribution, and delivery may lead to hoarding, making food unavailable and creating uncertainty/volatility in the market [24]. Therefore, to mitigate this, government at all levels should focus policies on managing the dynamics of food supply and demand.

5.2 Economic Standpoint

The disease outbreak has led to economic disruptions globally. The Nigerian economy, in which a vast proportion is based on agriculture and crude oil, has been severely affected. It is estimated that two-thirds of Nigeria's population is involved in one form of agriculture or the other, thus serving as a source of livelihood for the people [10]. This important source of income has been severely affected due to the crash in the global economy, with a resultant loss in individuals' livelihood. This has led to a decrease in gross household income which will indirectly lead to malnutrition cases as food cannot be afforded by people, especially in the rural areas of the country.

Furthermore, most farmers consume their products. Thus, policy direction should be focused more on supporting smallholder and medium enterprise farmers who do not need much manpower but sustains the bulk of

agricultural production in the country. This sector (small scale farmers) are the largest employers of labour within the country and play a pivotal role in stabilizing the national economy, showing resilience in withstanding several economic shocks and transformations [25]. However, agricultural productivity is heavily capital intensive, with an inverse relationship between crop yield and farm size [26]. Thus to effectively serve as a stimulus for economic growth and in the same instant help in improving food security, nutrition and the maintenance of public health, capital injection by the government through financial institutes in the form of agricultural stimulus packages, loans, and grants need to be increased. This will be of greater impact in recovering from the downturn of the Covid-19 instigated lockdown as it has been shown that small farms have overall higher land productivity when compared to bigger farms. This can be attributed to the close-knit nature of such farms and the higher incentive for productivity [27].

5.3 Health Management

Impacts due to COVID-19 have had far-reaching effects, with many health challenges attributed directly to the Novel SARS-CoV2 virus. However, a significant disease burden arises from malnutrition due to inadequate availability and economic access to food. Currently there is no accepted nutrition guideline for individuals at risk of obtaining the Novel SARS-CoV2 virus or for treatment and management of confirmed patients. It is imperative that awareness should be raised together with other strategies about the role medical nutrition therapy (MNT) can play in the prevention and treatment of malnutrition. This will, in turn, lead to better dietary intakes that will boost the immune system, reducing chances of infection or if infected, increasing chances of survival. It has been shown from emerging literature that nutrition can predicate the outcome of COVID-19 amongst patients [22]. Because Covid-19 is usually associated with acute respiratory distress syndrome (ARDS) with damage to the respiratory epithelium and associated inflammation, dietary approaches can be utilized in the control of this inflammatory “cytokine storm” as it has been shown in previous literature that the use of foods rich in some fatty acids can moderate excessive host reaction in cases of ARDS [28]. Overall, effective health management through dietary supplementation, dosage regulation and, when incorporated into clinical practice, will help in the

amelioration of disease condition caused by the Novel Coronavirus.

6. CONCLUSION

The COVID-19 pandemic has negatively affected various aspects of life in Nigeria and the world over. Nutrition plays an important role in the health of a population and can determine the prognosis of a disease condition such as COVID-19. Historically, the nutrition status of most inhabitants of Nigeria is poor, with stunting in children and overweight in a vast proportion of adult females. Therefore, it is necessary to maintain a general positive nutrition status of citizens of the country through the integration of medical nutrition therapy in the awareness and treatment of COVID-19 and, more importantly, amend policy decisions of the government which will ensure the availability, accessibility and affordability of safe, nutritious foods all year round.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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