







## Article

# Counting the Cost: The Effect of COVID-19 Lockdown on Households in South East Nigeria

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**Citation:** Ogunji, J.; Iheanacho, S.; Ogunji, C.V.; Olaolu, M.; Oleforuh-Okoleh, V.; Amaechi, N.; David, E.; Ndukauba, O.; Ikegwu, T.M.; Biamba, C.; et al. Counting the Cost: The Effect of COVID-19 Lockdown on Households in South East Nigeria. *Sustainability* **2021**, *13*, 12417. <https://doi.org/10.3390/su132212417>

Academic Editor: Hossein Azadi

Received: 2 September 2021

Accepted: 4 November 2021

Published: 10 November 2021

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**Abstract:** The present study measured household hunger in South-East Nigeria amidst the COVID-19 lockdown. A total of 1209 households (urban and rural locations) were sampled. Household hunger was determined using the Radimer–Cornel hunger scale. Results show that before the COVID-19 lockdown, hunger prevalence in the urban areas was 85.5%, whereas prevalence in the rural areas was significantly lower, at a prevalence of 79.9% (7.3% level of association— $X^2 = 6.499$ ,  $p = 0.012$ ). During the COVID-19 lockdown, the prevalence of hunger in the urban areas rose to 98.0% and 99.2% in the rural areas (4.9% level of association was  $X^2 = 2.888$ ,  $p = 0.089$ ). It was also observed that the COVID-19 lockdown significantly affected food prices. The major coping strategy employed by households was relying on less expensive foods (81.14%). High household hunger was identified as a short-term cost of the COVID-19 lockdown in South-East Nigeria. Only a few households (16.3%) benefited from the food aid programs and 16.9% from the government palliative cash transfer. It is recommended that the government setup a formidable unit that will develop physical and digital plans for effective implementation during a COVID-19 lockdown situation or other emergencies.

**Keywords:** food insecurity; food insufficiency; household hunger; coping strategy; COVID-19; pandemic

## 1. Introduction

The novel coronavirus disease (COVID-19) outbreak emerged in late 2019 [1]. In the month of March 2020, it was declared a pandemic by the World Health Organization [2]. Consequently, governments were beckoned to take aggressive and urgent steps towards suppressing and controlling its spread [3]. Containment of the spread of the COVID-19 pandemic in Nigeria necessitated the initiation and implementation of diverse strategies by the various levels of government [4]. The strategies included mass orientation on improved

personal hygiene, travel bans/restrictions, social distancing, and partial/total lockdown in many countries. The partial/total lockdown lasted from March to June 2020 in Nigeria. Some of these measures, especially the partial/total lockdown, impaired daily economic activities. As the pandemic ravaged, the people and food system interaction changed with indescribable alacrity, hence impacting the choice of diet and nutrition in general [5]. During the lockdown, people were obligated to stay at home for safety, and could only go out to meet the most urgent needs, like buying food [6].

Coincidentally, the lockdown and social distancing implemented by the governments brought about the following: shutdown of marketplaces, ban of vendors from selling, limits on the number of shoppers, and the development of long queues at points of food purchase. Empty shelves unfortunately have become visible signs of the coping mechanisms many adopted [5], as citizens bought out commodities in shops and supermarkets. The grounding of economic activities occasioned by the COVID-19 pandemic consequently threatened household food security and elevated hunger exponentially in the society [7,8]. The Global Network Against Food Crises noted that the impact of the COVID-19 pandemic on livelihoods, the national budget, the supply chain, and trade would compound the problems of food security and increase the effect of hunger globally [8]. The food production and supply chain, especially in sub-Saharan Africa, suffered a serious crack, caused by economic contraction and diverse cushiony policies geared towards mitigating the impact of the COVID-19 pandemic [9]. A survey on the impact of COVID-19 on food systems in sub-Saharan Africa revealed significant effects on livelihood, food security, and socio-economic dispositions of both farmers and non-farmers in the region. Kansime et al. [10] reported a negative implication of COVID-19 on household incomes and food security in two East African countries—Kenya and Uganda. Impacts of the COVID-19 pandemic have also been reported in various African nations, including Nigeria [11].

Nigeria is one of the countries located within the sub-Saharan African region, with a growing population of over 200 million people [12]. The country is geopolitically divided into six zones, and the South-East includes a teeming population of over 20 million people [12]. The South-East region is an important economic zone, characterized by diverse economic activities such as agriculture, aquaculture, e-commerce, mining, artisanship, craftsmanship, etc. The COVID-19 lockdown crumbled many economic activities, especially small and medium enterprises (SMEs), thereby constraining individuals' and households' income flow and consequently weakening their financial ability to purchase food items, which may have negatively impacted nutrition and food security in general. Food security, according to the World Food Summit [13], is a concept that includes economic and physical accessibility of food by man to the extent that it meets not only dietary needs but also food preferences. Deitchler et al. [14] went further to outline the three basic elements on which food security is based, and they are as follows: satisfactory availability of food, ability of households to obtain adequate quality and quantity of food needed by members that meet their nutritional requirements for healthy living, and suitable consumption and utilization of food. Faye et al. [15] indicated an important consideration about food insecurity, demonstrating that the food security experience is not static, but dynamic. They posited that levels of food insecurity vary from doubt and apprehension about food availability to an acute case of hunger. Hunger therefore stands for the more rigorous form of food insecurity.

The objective of this study was to measure the intensity of household hunger in South-East Nigeria aggravated by the COVID-19 lockdown using the Radimer–Cornell hunger scale. The key potency of the Radimer–Cornell scale is that it is well conceptualized and based on a thorough understanding of the food insecurity experience in households [16]. Henjum et al. [17] confirmed that each set of questions on food insecurity and hunger in the Radimer–Cornell Scale addresses a diverse degree of severity that illuminates the varied levels. Welch et al. [18] observed that the Radimer–Cornell scale has been attested to have a decisive factor-related legitimacy in that socioeconomic and demographic characteristics associated with hunger are highly linked to the hunger status of households. Radimer

and his collaborators deployed the perception of food insecurity to develop an index for hunger by qualitatively interviewing women from poor households [19]. The index has been proved to be effective, dependable, and consistent in the framework for which it was developed [20]. This study also assessed possible interventions provided by the government. The coping strategies of households were also evaluated.

**Research HypothesisHo:** *The COVID-19 lockdown did not significantly increase household hunger in South-East Nigeria.*

## 2. Materials and Methods

### 2.1. Study Area

All households in South-East Nigeria made up the study population. The South-East has five (5) states, which are Abia State, Anambra State, Ebonyi State, Enugu State, and Imo State. There are six geopolitical zones in Nigeria, and the South-East is one. The South-East lies within 5° N to 6° N latitude and 6° E to 8° E longitude. The land mass of the zone measure about 11 million hectares, and has a population of about 16 million [12]. The climatic condition of the zone is that of atropical rainforest and favors agriculture. The zone has two prominent seasons, which are the dry season and the wet seasons. The zone experiences the wet season from the month of April to October. The dry season runs from November to March. The daily temperature average throughout the year falls between 25 °C and 35 °C. The annual rainfall ranges from 1600 mm to 2500 mm. The zone is made up of a large demography, whose occupational status includes farming, fishing, craftsmanship, etc.

### 2.2. Survey/Sampling Technique

The survey took place after 5 weeks of the COVID-19 lockdown, which started on 20 March 2020 in Nigeria [4]. All five states in South-East Nigeria were purposively selected. Four (4) local government areas (LGAs) were selected from each state (20 in total). A purposive sampling was used to sample two town communities (one rural and one urban) from each LGA. These were within the subpopulations of rural and urban communities. In all, a total of 40 communities was selected. In each community, 30 households were sampled using simple random sampling. This gave a total of 1209 households selected and used for the study.

### 2.3. Instrument and Adaptation

The instrument for this study was a questionnaire designed to measure the level of hunger and food security in households. The study made use of an adapted version of the Radimer–Cornell tool in assessing hunger and food security [18,21]. The questionnaire items were in line with the Household Food Insecurity Access Scale (HFIAS) and the Household Hunger Scale (HHS), developed by the Food and Nutrition Technical Assistance Project [22]. Following the protocol of Ballard et al. [21], a 4-week (30-day) recall period was used for data collection and 4 Radimer–Cornell hunger items out of the 9 Radimer–Cornell food security items were administered to the research population during the lockdown.

The questionnaire was structured into three sections, which included socioeconomic information, the Radimer–Cornell hunger scale, and coping strategies. The questionnaire was designed to have two parts (A and B). Part A addressed household hunger before the lockdown, whereas Part B addressed household hunger during the lock down. The questionnaire was developed and administered in the English language. The mode of administration was through a printed questionnaire by both researchers and assistants across the five states. Researchers were aware of the health risk involved by adopting the questionnaire as the instrument for the study, especially during the COVID-19 lockdown period. However, the need to understand the hunger situation among households (including those in the most remote rural locations, who lack socio-infrastructure amenities such as Internet), especially during the period, necessitated the choice of instrument.

#### 2.4. Data Collection

Volunteers were engaged as respondents. Research assistants who had good idea of the research area were used for data collection. They were also experienced in nutrition counselling and were able to speak the local dialect of the communities. Prior to data collection, research assistants were trained online using the nutrition baseline survey interview guide and quality control procedure for interviewers [23]. The research assistants took advantage of the limited intra-state movement allowed by the state governments to collect data during the lockdown.

#### 2.5. Precautionary Measures

Due to the COVID-19 pandemic, the research assistants conducted the survey while observing the social distancing (at least 2–3 m away from contacts) as directed by the Nigerian National Centre for Disease Control (NCDC), the Ministry of Health, and the World Health Organization (WHO). In addition, the research assistants were armored with personal protective equipment such as face masks, hand gloves, and hand sanitizer, and avoided bodily interaction/close contact such as hand shaking, hugging, etc. The respondents also complied by cooperating with the research assistants regarding health safety measures.

#### 2.6. Analysis of Data

Household hunger levels were determined by adopting the methods of Welch et al. [18], Ballard et al. [21], and Frongillo et al. [24]. Data analysis was executed using frequency counts and percentages. Chi-square tests of independence were employed to test for associations between household hunger values and the location of respondents. A Cramer's V test was further used to ascertain the extent of association between them. The software used was SPSS version 20. Values were determined to be statistically significant at  $p < 0.05$ .

### 3. Results

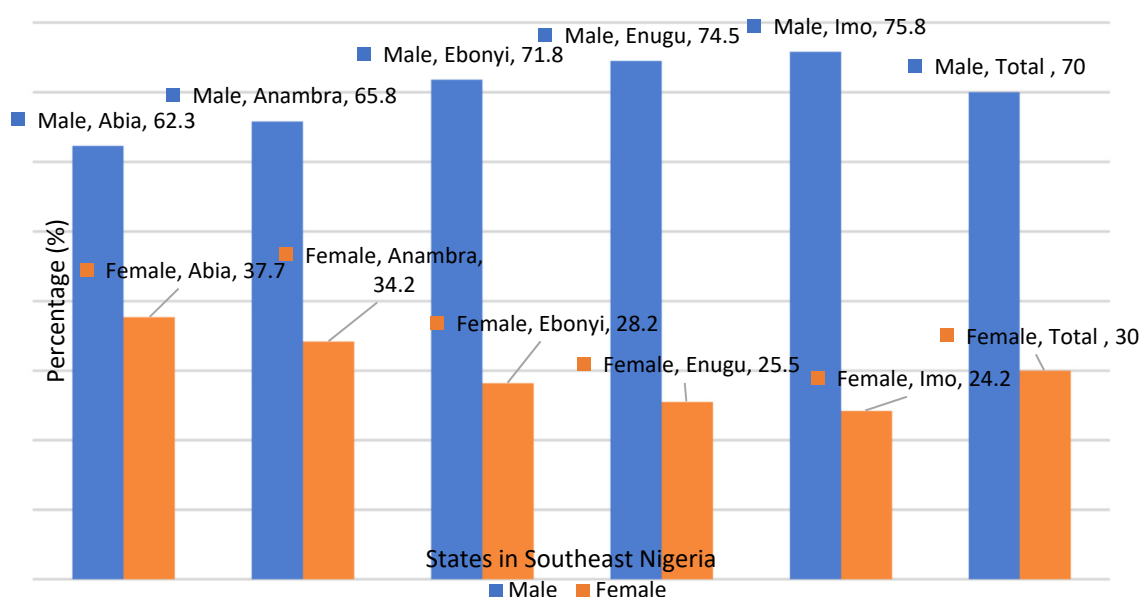
#### 3.1. Sample Characteristics

The South-East states, which are among the confederating states in Nigeria, were all equally sampled, but a few states had one or two copies of the questionnaire that were filled in poorly, and as such were not used. The socio-demographic characteristics of the respondents were appraised during the study (Table 1). The studied sample comprised 1209 households. The results show that half (50.1%) of the households used for this study were households in urban areas, whereas the other half (49.9%) were rural dwellers. The majority (65%) of these households had married household heads whose marriages were monogamous, whereas only 3.6% were divorced. A greater proportion (43.2%) had heads of household who had completed at least secondary school education. Thirty-two percent (32%) of the household heads had post-secondary school education.

Conversely, the percentage distribution of the sex of heads of household across the states in South-East Nigeria were considered in this study (Figure 1). A greater percentage of household heads across all states of the South-East sampled were males. Only 37.7% in Abia State, 28.2% in Ebonyi State, 25.5% in Enugu State, 34.2% in Anambra State, and 24.2% in Imo State were female heads of household (test of association between the sex of heads of household and state;  $X^2 = 109.130$ ,  $p < 0.000$ ; Cramer's  $V = 0.300$ ).

**Table 1.** Distribution of the sample's socio-demographic characteristics.

Variables	Option	Frequency	Percentages
States	Abia	252	20.8
	Ebonyi	238	19.7
	Enugu	239	19.8
	Anambra	240	19.9
	Imo	240	19.9
	Total	1209	100.0
Location	Urban	606	50.1
	Rural	603	49.9
	Total	1209	100.0
Marital Status	Married monogamy	786	65.0
	Married polygamy	101	8.4
	Widowed	153	12.7
	Divorced	44	3.6
	Single	125	10.3
	Total	1209	100.0
Level of Education	No schooling		
	Primary school education	99	8.2
	Secondary school education	201	16.6
	Post-secondary school education	522	43.2
		387	32.0
	Total	1209	100.0

**Figure 1.** Percentage distribution of the sex of heads of household across the states in the South-East (test of association between the sex of heads of household and state;  $X^2 = 109.130$ ,  $p < 0.000$ ; Cramer's  $V = 0.300$ ).

### 3.2. Household Hunger Measurement

A total of 1209 households were surveyed using the Radimer–Cornell hunger scale (Table 2). The Radimer–Cornell questionnaire has been judged a valid and reliable instrument to measure household food insecurity and classifies individuals on the basis of household and individual hunger [18]. The results showed an 82.7% prevalence of hunger among households before the COVID-19 pandemic, whereas during the COVID-19 lockdown, it rose to 98.6%. On hunger item no. 1 (I am worried whether food will run out before the household gets money to buy more food), it was observed that 42.1% of



households were worried before COVID-19, and that value increased to 92.5% during the COVID-19 lockdown. A similar trend was observed on item no. 2 (the food I bought just did not last and I did not have money to get more). Before COVID-19, 39.5% of households gave an affirmative response, whereas during the COVID-19 lockdown it rose to 93.6%.

**Table 2.** Household hunger prevalence and hunger items before and during the COVID-19 lockdown ( $n = 1209$ ).

Items	(%)	
	Before the COVID-19 Lockdown	During the COVID-19 Lockdown
Household Hunger Prevalence	82.7	98.6
1. I am worried whether food will run out before I get money to buy more (qualitative).	42.1	92.5
2. The food I bought just did not last and I did not have money to get more (quantitative).	39.5	93.6
3. I ran out of the foods needed to put together a meal and did not have money to get more food (quantitative).	77.3	93.1
4. I worry about where the next day's food is going to come from (qualitative).	36.5	76.3

From the foregoing, a tabular illustration of hunger prevalence (Table 3) shows that a significant number of households in South-Eastern Nigeria (1000; 82.7%) were already in a hungry state before the COVID-19 lockdown. Furthermore, more households (an additional 192 households, amounting to 98.6%) became hungry during the lockdown. This implies that 19.2% additional households were added to the already high hunger status (82.7%) in existence in South-East Nigeria. A test of association between the hunger status of these households showed a significant association ( $X^2 = 10.688$ ,  $p$ -value for exact = 0.004). The Cramer's V test showed a 9.4% strength of association between household hunger before and during the COVID-19 lockdown in South-East Nigeria. The Cramer's V coefficient, though low, was statistically significant, implying that the hunger level during the COVID-19 lockdown is associated with hunger status before the lockdown.

**Table 3.** Test of significant change in household hunger before and during the COVID-19 lockdown in South-East Nigeria <sup>^</sup>.

Household Hunger Per Period	Households		Pearson Chi-Square Value	Cramer's V/Phi Test Coefficient	Fisher's Exact Test $p$ -Value
	Frequency	Percentage			
Before the COVID-19 lockdown	1000	82.7 <sup>^^</sup>	10.688	0.094	0.004 *
During the COVID-19 lockdown	1192	98.6 <sup>^^^</sup>			
Household hunger changes	192	19.2 <sup>^^^^</sup>			

<sup>^</sup>  $n = 1209$ ; <sup>^^</sup>  $= 1000/n \times 100$ ; <sup>^^^</sup>  $= 1192/n \times 100$ ; <sup>^^^^</sup>  $= 192/1000 \times 100$ ; \* Significant  $p < 0.05$ .

The current study appraised the test of association between prevalence of household hunger and location of households (urban or rural) before and during COVID-19 (Table 4). The results show that before COVID-19, the prevalence of hunger in the urban areas was 85.5%, whereas the prevalence in the rural areas was significantly lower, at a rate of 79.9%. The test showed a 7.3% level of association ( $X^2 = 6.499$ ,  $p = 0.012$ ). This quantified the relationship between household hunger before and during the COVID-19 lockdown. During COVID-19 lockdown the prevalence of hunger in the urban areas rose to 98.0% and 99.2% in the urban and rural areas, respectively. The test showed no significant association between household location and prevalence of household hunger during the COVID-19 lockdown. The level of association was 4.9% ( $X^2 = 2.888$ ,  $p = 0.089$ ). This means the situation was not any different whether in rural or urban areas during the COVID-19 lockdown with respect to hunger, though that was not the case before COVID-19. In addition, household

hunger significantly increased in the South-East. The null research hypothesis is therefore rejected.

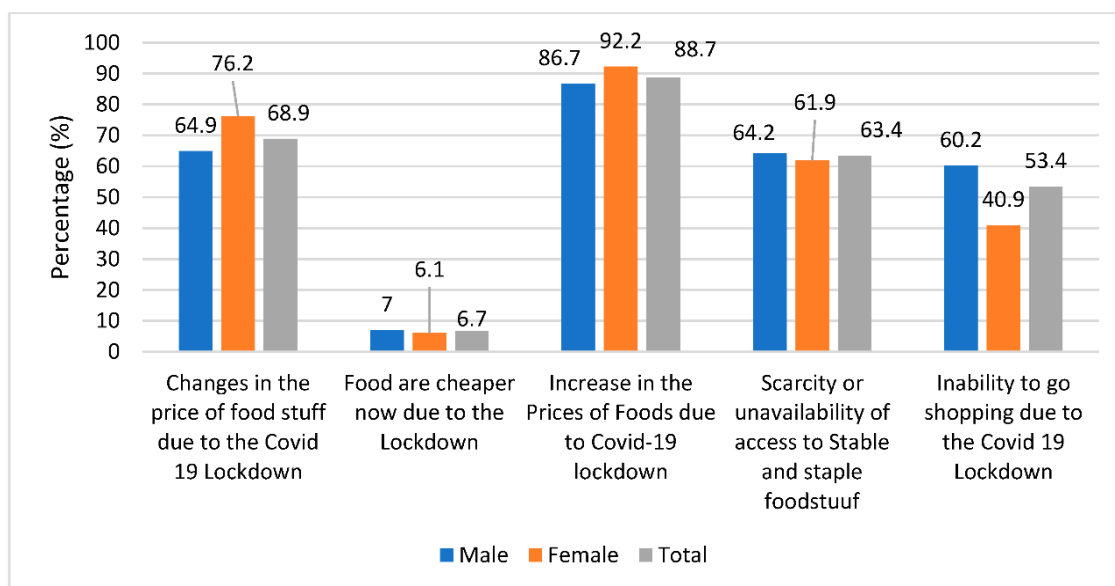
**Table 4.** Association between prevalence of household hunger and location of dwelling before and during COVID-19.

Responses	Location		Chi-Square	Cramer's V	p-Values
	Urban	Rural			
Before COVID-19					
No hunger	88(14.5%)	121(20.1%)	6.499	0.073	0.012 *
Yes hunger	518(85.5%)	482(79.9%)			
Total	606 (100.0%)	603 (100.0%)			
During COVID-19 Lockdown					
No hunger	12 (2.0%)	5 (0.8%)	2.888	0.049	0.089
Yes hunger	594 (98.0%)	598 (99.2%)			
Total	606 (100.0%)	603 (100.0%)			

\* Significant  $p < 0.05$ .

### 3.3. Food and Government Safety Net Accessibility by Households

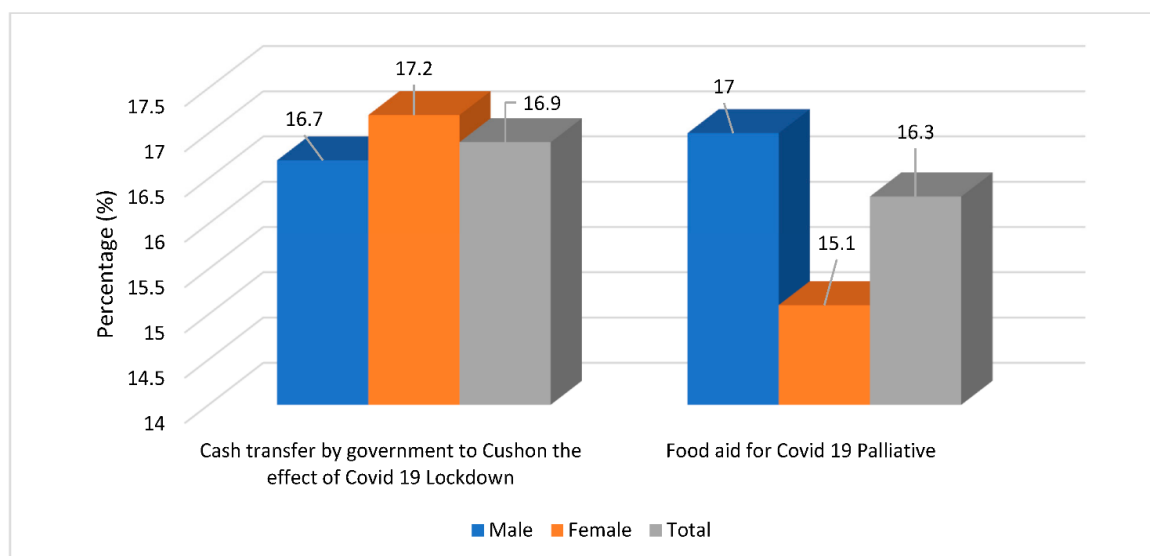
The opinion of respondents (percentage distribution) about factors affecting food access and price increase during lockdown were considered during the study (Figure 2). Responding to the questionnaire item about reasons for hunger situation faced by households, up to 68.6% of households in South-East Nigeria opined that there were changes in the prices of foodstuffs due to the COVID-19 lockdown. A significant percentage of households (88.7%) reiterated that the COVID-19 lockdown had led to an increase in the price of foodstuffs. About 63.4% of households concurred that changes in the price of foodstuffs were responsible for the scarcity or unavailability of essential and staple foodstuffs, while 53.4% of these households had the view that the COVID-19 lockdown did not allow them go out to buy foodstuffs.



**Figure 2.** Percentage distribution of factors affecting food access and price increase during lockdown.

Figure 3 shows the percentage distribution of households' participation in government interventions on hunger and food security during the COVID-19 pandemic. It depicts that the government intervention programs were not popular among households across South-East Nigeria. Only 16.9% of the households benefited from the government cash

transfer program during the COVID-19 lockdown. Only 16.3% of households benefited from the government COVID-19 palliative food-aid program.



**Figure 3.** Percentage distribution of households' participation in government interventions on hunger and food security during the COVID-19 pandemic ( $n = 1209$ ).

### 3.4. Coping Strategies

Households employed different coping strategies to lessen the effects of food scarcity (Table 5). The top three strategies used by households to cope during the lockdown were the use of less expensive foods (81.14%), skipping meals (69.3%), and reducing the size of food served at mealtimes in the family (66.7%). The least adopted strategies were to send out household members to beg (1.8%) and sending household members to eat elsewhere (5.1%).

**Table 5.** Percentage distribution of coping strategies of respondents by gender of household heads.

Coping Strategies	Male	Female	Total
Relied on less expensive foods	78.7	85.6	81.1
Skipped meals	69.0	69.9	69.3
Limited portion size at meal times	67.5	65.2	66.7
Restricted consumption of adults for small children to eat	39.7	39.3	39.5
Purchased food on credit	34.9	34.6	34.8
Casual labor	18.2	15.5	17.3
Borrowed food from a friend or relative	18.1	14.8	17.0
Made handicrafts to raise money for food	15.7	16.5	16.0
Consumed seed stock held for next season	15.2	11.3	13.8
Household head migrated to work	10.7	8.2	9.8
Gathered wild food, hunted, or harvested immature crops	10.7	7.1	9.4
Sent household members to eat elsewhere	4.2	6.8	5.1
Sent household members to beg	2.2	1.2	1.8

## 4. Discussion

This study measured household hunger in South-East Nigeria during the COVID-19 lockdown. The study also verified the cost of the lockdown in terms of the household hunger situation, and information regarding the accessibility of governments' safety-net actions by households and the households' adopted coping strategies were considered. It generated information from respondents about factors supporting household hunger



in South-East Nigeria. The demographic characteristics of respondents in this study showed that 50.1% and 49.9% of the households were located in urban and rural areas, respectively. Furthermore, 43.2% of heads of household had completed at least secondary school education. With reference to previous research reports, it is important to note that household food security and hunger status are affected by a cocktail of socio-economic and demographic factors compared to location alone [22,25,26]. It has been reported that the level of education of household head impacts household food security [27,28].

In this study it was observed that the prevalence of hunger among South-East Nigerian households before the COVID-19 pandemic was already very high (82.7%), but the COVID-19 lockdown heightened household hunger (98.6%). Similar to this finding, Tiensin [29] stated that before the COVID-19 outbreak, food insecurity and hunger among households were already highly problematic. More than 820 million people do not have adequate food to eat [30]. Out of these, 113 million are surviving with hunger so severe that it poses an immediate menace to life and living [31]. The economic impact of COVID-19 will bring about a radical increase in the number of people who are food insecure and hungry. Tiensin [29] posited that the most susceptible groups are poor people in urban areas, those living in remote areas, migrants, casual workers, individuals living in areas of conflict, and other vulnerable groups. Akerele et al. [32] reported that many Nigerians are surviving on less than USD 1 per day (70%), and the prevalence of food insecurity and hunger in poor urban households and rural areas stands at 79% and 71%, respectively. A high rate of food insecurity and hunger has also been reported previously among surveyed households in the South-East Nigerian states of Imo and Anambra [33]. The result of this study has provided real data to show the household hunger situation in South-East Nigeria. It has also showcased the actual negative impact of the COVID-19 lockdown on households in the area.

This study also observed a greater increase in household hunger in rural areas (99.25%) relative to urban areas (98%) during the lockdown. It has been reported that about 33% of rural people globally live in small farm households and are working on land plots smaller than 2 hectares [34,35]. Many of these people are poor and are disposed to food insecurity that is made worse due to limited access to markets and services [36]. The lockdown heightened this situation. In addition, the demand-induced scarcity during the COVID-19 lockdown played a significant role [37]. The fact that most rural people do not produce all they need for food meant that the shutdown of marketplaces, the ban on vendors from selling [5], and imposed sit-at-home orders made it difficult for the households to make additional money by selling farm products or buying needed food items. The lockdown situation also affected off-farm employment as a diversifying income source, which should have complemented farm income and contributed towards food security cum poverty alleviation [36]. It should also be noted that the lockdown period coincided with the planting season in South-East Nigeria. As such, many farmers had an overall shortage of cash because of their investment in farm cultivation.

The adverse hunger situation faced by South-East Nigerian households, as emphasized by the respondents in this study, was attributed to changes in the prices of foodstuffs due to the COVID-19 lockdown, increase in prices, scarcity or unavailability of essential and staple foodstuffs, and inability to go shopping due to the lockdown (Figure 1). These factors are similar to the observations by Mousa and Freeland-Graves [38], whose research respondents ascribed their hunger situation to lack of food, shortage of resources, and inability to travel to shops that sell good-quality foods or the needed types. UNSCN [5] observed that food environment disruptions, which in most cases affect food security and hunger situation, are caused by both external and personal dimensions. External dimensions include food availability, prices, and vendors, whereas personal dimensions include geographical access, affordability, convenience, and desirability. Agyei-Holmes et al. [9] affirmed that the total or partial lockdown policies initiated by the government, in the form of preventive measures to curb the spread of COVID-19, exerted significant influence on household economic activities in the region. They limited household purchasing power,

narrowed access to food items, restrained people from selling and buying, and subjected households to a certain diet lifestyle with obvious nutrition and health implications [11].

To assist families under food pressure, the Nigerian government reportedly embarked on COVID-19 lockdown intervention programs. Unfortunately, the results from this study show that the government intervention programs were not popular among households (Figure 2). Only a few households benefited from the food-aid programs and other forms of palliatives. Eranga [39] confirmed a trail of lamentations about the lopsided distribution of government palliatives by citizens in Nigeria. In Nepal, Singh et al. [40] praised the government efforts in responding to the food crisis during the COVID-19 pandemic. They nevertheless pointed out that favoritism, nepotism, poor coordination, and partiality made it difficult for the food-relief distributions to get to vulnerable groups that needed it. Mousa and Freeland-Graves [38], however, reported that pre-enrolment difficulties can hinder beneficiaries from accessing government food-assistance programs. It should be noted that the present study was carried out after five weeks of COVID-19 lockdown, when the government may have been fine-tuning the plans to reach out to the households, hence this observation. However, it has been posited [36] that in the long run there may be some groups of people (e.g., newly employed individuals) who will still lack the capacity to purchase food when the government intervention program ends.

The results of this study show the serious effects of the COVID-19 lockdown on household hunger in South-East Nigeria. The sampled households employed the following coping strategies more frequently than others: (i) purchase and use of less expensive foods (81.14%), (ii) skipping meals (69.3%), and (iii) reducing the amount of food served to family members (66.7%). Among the least-employed strategies was households sending members out to beg (1.8%). In addition, few sent household members to eat elsewhere (5.1%). This finding was similar to observations made in earlier studies carried out in other countries. The following strategies were the most selected ones: depending on less favored and/or low-cost food, borrowing food, borrowing money, and requesting help from friends or relatives for food. Others were keeping to a budget and reducing food portions, skipping meals, and purchasing food on credit [25,41–44].

This study used a quick assessment method to determine the household food security situation of families, which is important for policy decisions and prompt intervention at a time when the world is in crisis. Many procedures in use may be expensive to carry out in respect to time and funding. They may present a delay and other bottlenecks that reduce their practicality and efficiency for both the short and long term, planning, and particularly for emergency situations in which immediate targeting of food aid is needed [45].

However, the results from this study should be interpreted bearing in mind the following limitations. First, this study was conducted during the very fearful period of the COVID-19 lockdown. This affected robust sampling and data collection. Secondly, the study focused on the qualitative aspects of food insecurity. It monitored the accessibility, availability, and utilization of food by households as reported by heads of households. Thirdly, the results present the situation of food insecurity during the COVID-19 lockdown period and may not represent the conditions in normal times. Nevertheless, it underlines the vulnerable conditions of South-East Nigerian households in terms of food insecurity. More detailed studies are recommended.

## 5. Conclusions

A situation of household hunger was observed in this study. This has become an extreme pointer to food-insecure households [15] in South-East Nigeria. This unexpected cost of the COVID-19 lockdown became possible because families were unsure about how to get food and they were uncertain about the quantity and the kind necessary to meet their nutritional needs as such hunger set in. An additional lingering cost of the lockdown may be serious health challenges. Enduring unfavorable physical and mental health effects have been observed among children not receiving adequate food [46–48]. A lot of work is

needed world over; more effort should be employed by governments to stem the tide of the geometric increase in acute hunger, as predicted by the World Food Program [49].

Urgent social interventions have become necessary in order to cushion the post-impact of the COVID-19 lockdown on households in the region. These include food aid/basic-needs packages, cash transfers, support for businesses, tax reduction or postponement, farm input subsidies or distribution, food-price controls, price support to farmers through procurement or regulation, and unemployment benefits [9], among others.

Due to the fact that the prevalence of hunger among South-East Nigerian households before the COVID-19 pandemic was already very high, governments must implement programs to solve household food-security problems. Such policy interventions to promote food security and thus reduce hunger should target food production cum supplies as well as improving access to food. The following are suggested:

1. The government should seriously focus on measures to boost the mechanization of agriculture, and provide quality input delivery and accessibility. Climate-smart agricultural practices should be canvassed.
  - (a) South-East Nigerian governments are encouraged to embrace international and national food-security interventional funded programs wholeheartedly. They should show a strong commitment to drawing counterpart funding from the central government (from part of that state's share).
  - (b) The area of value chain development should be seen as very important by the governments. There is a need to formulate guidelines by the government for the development of value chains of various farm produce to ensure value addition and infrastructural development are put in place for the support of value-chain development.
  - (c) To avoid uneven distribution of items and materials among households during situations like the COVID-19 lockdown, the government should setup a formidable unit that will develop physical and digital plans for effective implementation.

**Author Contributions:** All authors made a contribution to the study concept, design, methodology, data collection, and data entry. Conceptualization, J.O. and C.B.; data curation, S.I., C.V.O., O.N., T.M.I. and D.C.; data analysis was performed by J.O. and M.O.; formal analysis, C.V.O., M.O., V.O.-O., N.A., E.D. and D.C.; methodology, M.O., V.O.-O., O.N. and T.M.I.; Software, N.A. The first draft of the manuscript was written by J.O. and S.I., and all authors made copious input to standardize the manuscript. All authors contributed to the correction of the manuscript. The final revised version of the manuscript was harmonized by J.O., S.I., and M.O. All authors have read and agreed to the published version of the manuscript.

**Funding:** Not applicable.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Not applicable.

**Acknowledgments:** The authors appreciate all research assistants and household heads, who were very helpful in the collection of data for this study during such a challenging time as the COVID 19 lockdown. We are highly indebted.

**Conflicts of Interest:** The authors declare that they have no conflict of interest.

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