Impact of COVID-19 Pandemic Lockdown on Food Intake in Nigeria

Bosede Victoria Kudaisi[†] and P. A. Olomola[‡]

Abstract
The outbreak of COVID-19 and the policy measures to halt its spread have undoubtedly changed the way consumers make food consumption and their overall livelihood choices globally. This study analysed the effect of the COVID-19 pandemic lockdown on household food intake in Nigeria. The study shows that the lockdown had a negative effect on food intake. The overall effects of the lockdown showed that 86% of the sampled respondents were greatly affected. Result showed that 51% of the respondents had their food intake declined because there was not enough food due to closure of markets, movement restrictions and paucity of funds. There was price increase and expenditures on basic food items increased. The study observed rationality theory in consumers as many people stockpiled foods items before the total lockdown, and some used personal savings to smooth consumption. The palliatives provided by the government did not get to many people especially the vulnerable. The study therefore, suggests that government should ensure equitable distribution of palliatives to support the stockpiled food items by the consumers.

Keywords: COVID-19; Lockdown; Food consumption; Food prices; Coping strategies; Nigeria
JEL Classification Codes: I31, I38, D12

[†] Corresponding Author, Department of Economics, Adekunle Ajasin University, Akungba, Ondo State, Nigeria, Email: kudaisibosede@gmail.com
[‡] Department of Economics, Obafemi Awolowo University, Ile-Ife, Nigeria, polomola@yahoo.com

1. Introduction

The outbreak of the coronavirus pandemic, popularly known as COVID-19, came like a thunderstruck to the global economy. Caused by the severe acute respiratory syndrome coronavirus **2 (**SARS-CoV-2), COVID-19was first discovered in December 2019 in Wuhan city of China. The spread of the virus was unexpected and soon became an invisible enemy to the global economy and households in Nigeria. As the virus continued to spread across the globe, on February 27, 2020, Nigeria recorded its first index case, an Italian expatriate who visited the country for consultancy services. On March 11, 2020, World Health Organisation (WHO) officially declared COVID-19 a global pandemic, which invariably put all nations on their toes to fight the invisible enemy. As at March 16, there were only three cases in Nigeria. By March 21, 2020, however, the cases had increased to twenty-two. Therefore, in a bid to contain the spread of the virus across the country, the Nigerian government issued some policies. By March 24, lockdown in some states, restriction of movement (with the exception of essential services such as food, security, medical products etc.), imposing ban on domestic and foreign travel, social gatherings, religion gatherings, land borders closure[1], "stay at home" rule for public workers, closure of schools, large markets and shops with the exception of those selling food and health-related goods, and physical and social distancing were enforced across the country.

As the pandemic unfolds across the globe, there is a great concern about the agricultural sector, food supply, prices and the global poverty level (Amewu *et al*, 2020, Stanciu, *et al*, (2020); Summer, Hoy and Ortiz-Juarez, 2020; Diwakar, 2020; Mouloudj, bouarar and Fechit, (2020); Balleer *et al*, 2020; Han, Meyer, and Sullivan, 2020). Studies also revealed that COVID-19 had greatly impacted negatively socioeconomic life of the consumers (Bai *et al*, 2020; Stojkoski *et al*, 2020; Buheji *et al*, 2020). The Government's efforts to stop the community spread of the pandemic further distorts the livelihood of the people, increases rates of unemployment, especially among employees in the private sector, small and micro enterprises and hence, agricultural system were greatly affected with profound multiplier on the consumer's food consumption patterns. Although food and agricultural commodities within the country were exempted, the "stay at home" rule and restriction of movement reduced transport services caused incessant kidnapping and banditry, thus preventing farmers to access their farmlands. These led to shortage of labourers, and food supply, as well as high wastage, especially of easily perishable goods such as vegetables. The pandemic lockdown also causes the price of goods to increase.

Besides, shortages in supply due to farmers' inability to access their farmlands and food sellers' inability to access markets also contributed to the increase in prices of foods. More so, ban on international travel resulted in a shortage of raw materials for production firms. However, the impacts of the COVID-19 on the production and distribution of foods have a strong negative influence on food consumption and insecurity across the countries. Reports show that restriction of movement and the closure of markets disrupted accessibilities and limit the supply of farm products (Ilesanmi, Ilesanmi and Afolabi, 2020). Earlier before March 2020, Food and Agricultural Organisation (FAO) predicted food shortages and insecurity for 7 million Nigeria and 13 states of the country in mid-2020 (AgroNigeria, 2020). A survey conducted by the National Bureau of Statistics (NBS) shows that 51% of the Nigerian experienced a reduction in food

[1] Prior before the pandemic, government had closed land border as an economic policy to boost locally produced products.

consumption due to the pandemic lockdown. The most vulnerable people were the poorest households and those working in commerce, service and agriculture (Awojuyigbe, 2020).

Obviously, the emergence of the pandemic and the related-policy to contain its spread has had negative influence on the food consumption patterns as well as the livelihood of the people directly or indirectly, due to its suddenness. Quiet a number of studies documented the effect of the pandemic on the household food intake and prices (Stanciu *et al*, 2020; Watanabe, 2020; Amare et al, 2020; Cavallo, 2020, Global Alliance Improved Nutrition (GAIN), 2020). Studies in Nigeria such as Balana *et al* (2020) focused on stakeholders farmers, Ilesanmi, Ilesanmi and Afolabi, (2020) on agricultural value chain, Iheme *et al*, (2020) on urban-household dwellers from six states, Obayelu *et al*, (2021) used two sample states, Andam *et al*, (2020) on aggregate economic impacts and agricultural sector others on food security (Abdul, 2020). Given the few studies in Nigeria, this study collected samples across the thirty-six states using Google form, sent to the mobile phone of the individual households. The focus is to investigate the impact of the lockdown on their food intake at the individual level during the lockdown. The objectives of this study are to (i) investigate the extent of the pandemic on the household's livelihood, (ii) assess the effects of the lockdown on food intake as well as (iii) identify the coping strategies during the lockdown. Thus the study is a contribution to knowledge on the economic implication of restriction of movement due to COVID-19 pandemic on food intake in Nigeria.

The rest of the paper is arranged as follows: section two provides a review of related literature on the effects of COVID-19; section three contains the data collection and analysis method; section four analyses the findings, while section contains the conclusion and policy recommendation from the findings.

2. Related Literature

Several studies have emerged since the emergence of COVID-19 to investigate its economic impact. All of these studies have affirmed a negative and significant impact, especially the lockdown rules on the household livelihood and the economy. Diwakar (2020) assesses the poverty implication of the coronavirus outbreak in developing countries, and envisages an increase in poverty level and food insecurity among the vulnerable poor people due to inadequate coping strategies at both household and national level. Chronopoulos, Lukas and Wilson, (2020) observe an increase in consumer spending following the announcement of the lockdown and significantly decline during the lockdown. This implies that consumer stockpiled food and reduced their spending due to the lockdown. Also, the findings show that consumer' response varies across products during the lockdown in Germany. Coibion, Gorodnichenko, and Weber (2020) note that 50% of the consumers lost their income and wealth during the pandemic lockdown while consumer spending on travel and clothing declined by 31%.

Stanciu *et al*, (2020) in Romania, reveal that restrictions on movements as a measure to protect consumers' health significantly affected their social activities, reduced food supply and induced increase in prices, difficulty in assessing financial markets and hence reduction in purchasing power of the people. Andersen et al, (2020) use the transaction data from a large bank in Scandinavia to estimate the effect of social distancing laws on consumer spending, and find a 25% drop in consumers' spending as a result of the COVID-19 social distancing laws. Similar study by Chen, Qian and Wen (2020) find a negative response of consumption to COVID-19

pandemic. Also, Baker et al, (2020) use financial transaction data drawn from household personal website to investigate the response of consumption and consumer spending during the COVID-19 pandemic, and find a sharp reduction in household spending due to the pandemic related-policy in the U.S. Watanabe (2020) in his assessment of consumption and prices during the COVID-19 and the earthquake in Tohoku, find that prices increased by 0.6 and 2.2 percent respectively resulting in a decline in consumption.

Stojkoski et al, (2020) study the socioeconomic outcome of the COVID-19 and find a heterogeneous impact of the pandemic globally due to differences in socio-economic characteristics. Jribi et al, (2020) study the impact of the COVID-19 lockdown on household food wastages in Tunisia using an online survey questionnaire, and report a significant reduction in food wastages among consumers. Mouloudj, Bouarar and Fechit(2020) observe that COVID-19 significantly impacted agricultural commodities thus disrupts food supply chain and causes food insecurity and price increase. Hobbs (2020) finds a positive relationship between food supply and COVID-19 related policy due to disruption of transport services and shortage of labour services. Cakmaklı*et al.* (2020) observe a negative effect of COVID-19 on both supply and demand chains associated with domestic and international travel restrictions.

Studies in Nigeria by Ilesanmi, Ilesanmi and Afolabi (2021) report a negative of COVID-19 lockdown on agricultural sector. Balana et al, (2020) conduct a research to investigate the impact of COVID-19 on registered stakeholder farmers from four states in Nigeria. Using phone survey method, the findings confirm a negative impact of the pandemic on the food supply chain and security. The authors observe that people reduced their food intake (66%) as strategy to cope with insufficient food during the lockdown. Iheme *et al*, (2020) in their study on the effects of COVID-19 on urban-household food consumption, find a drop in food intake during the lockdown. The authors document that people reduced their meal intake; skipped meal and consumed less expensive food to cope during the period of the lockdown. Amare *et al*,(2020) confirm an increase in food prices due to the lockdown. Obayelu *et al*, (2021) assess the long-term effects of the COVID-19 outbreak on food and dietary intake, and find a negative and significant impact of the pandemic on food intake in two selected states in Nigeria – Lagos and Oyo state.

3. Data Collection and Analysis

The research targets individual households within Nigeria. Primary data using structured questionnaire across the thirty-six states of the country including capital city, FCT, was obtained online with the aid of Google Forms sent to people's phone and email addresses. The questionnaire elicited information on demographic characteristics of the respondents including age, gender, education, marital status, household size, occupation, etc. Questions on the magnitude of the COVID-19 lockdown and food consumption patterns, food security, and the perceptions on the impact on price changes, as well as their coping strategies during the lockdown were also asked. 257 respondents was generated from the survey during the lockdown. Descriptive statistics such as frequency tables, charts, and percentages were used to analyse information obtained from the questionnaire.

4. Results and Discussion

4.1 Socio-economic Profile of Respondents

The summary statistic reported in Table 1 shows that about 49% of the respondents were women while men accounted for 51% of the total respondents. On the age structure, majority (79%) of the respondents were within the working population age– between 25 and 54 years old. The age category with the least number of respondents is 65 and above. Almost all the respondents (75%) were married. This was expected as the focused of the study was on the household consumption pattern during the movement restrictions. 22% of the total respondents were single and unmarried, while the widowed accounted for 3% of the respondents. The Table reports that two-third of the respondents (89%) were Christians, while 11% belonged to Islamic faith. Apparently from the Table, statistic shows that household size of the respondents varied from 5 to 7, suggesting that each family has an average member of between 5 and 7. This large family size has implications for food consumption during the lockdown. This large household size has an implication for food consumption during the lockdown. Half (50%) of the respondents were educated up to the postgraduate level while 40.1% of the respondents were Bachelor's degree holder. About 7% had secondary education.

Most of the respondents were salary earners. The percentage varies however, between those employed by the private and those working with government. About 45% of them were public workers while 27% were employed by the private sectors. Only 5% and 4% of the total respondents were traders and artisan respectively. The unemployed made up of 7% of the respondents. Consequently, about 35% of the respondents were within the income group of ₦150,000 and above, while 20% earned ₦30,000 and below, and 21.8% earned between ₦30,001 and ₦70,000 as monthly income/salaries.

Table 1: Summary of Respondents' Socio-economic Characteristics

Variable	Category	Frequency	Percentage (%)
Sex	Male	130	50.6
	Female	127	49.4
Age	15-24	15	5.8
	25-54	204	79.4
	55-64	30	11.7
	65 and above	8	3.1
Marital status	Single	57	22.2
	Married	193	75.1
	Widow/Widower	7	2.7
Religion	Christian	229	89.1
	Islam	28	10.9
Family size	2-4	110	42.8
	5-7	135	52.53
	8 and above	12	4.67
Education	Informal	2	0.8
	Primary	4	1.6
	Secondary	19	7.4
	Tertiary	103	40.1
	Postgraduate	129	50.2
Occupation	Unemployed	20	7.8
	Artisan	11	4.3
	Trading	39	15.2
	Private worker	69	27.0
	Public worker	117	45.7
Monthly income	No income	8	3.1
	₦30,000 and below	52	20.2
	₦30,001 – 70,000	56	21.8
	₦70,001 – 110,000	28	10.9
	₦110,001 – 150,000	24	9.3
	Above ₦150,000	89	34.6

4.2 Household Food intake Experience during COVID-19 Lockdown

An important impact of the lockdown was the effect on the household food intake. The study asked questions to investigate their food intake experience during the lockdown. Figure 1 presents the experience of the people. When asked about their food intake during the lockdown, about 47% indicated that they had enough food to eat, although not as much as they would have liked. This suggests that while the people were able to feed, eating balanced diets was out of the question. 21% of the respondents witnessed food shortages at home, whereas 32% had as much food as they wanted to eat during the movement restrictions. The survey also inquired whether the respondents ate less food due to paucity of food at home. 51% of the respondents affirmed that their food intake declined because there was not enough food at home due to closure of markets, movement restrictions and paucity of funds, whereas, 49% of the respondents answered in the negative (Figure 2). This result provides support for the findings by Obayelu *et al, (*2021), Iheme *et al*, (2020)

Besides, the respondents again were asked if they ever ran out of money to buy food during the lockdown. Figure 3 reports their responses. While half of the respondents reported that they found it difficult to buy food due to lack of enough money during the lockdown, 32% indicated they not at any time run out of money, implying that they were fully prepared before the lockdown .18% of the respondents indicate they often find it difficult to buy food due to paucity of money. This finding is in line with the finding of Balana et al (2020).

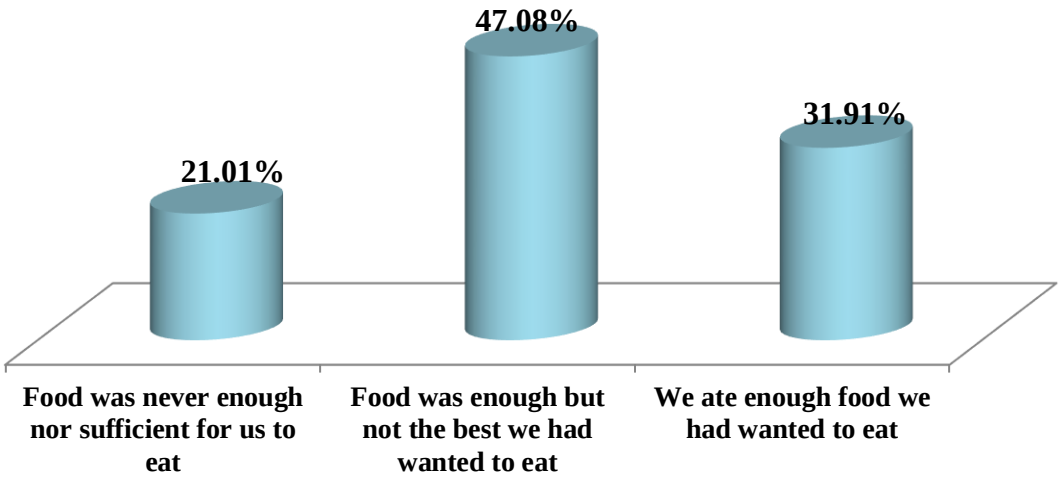

Figure 1: Food intake experience during COVID-19 lockdown?

Figure 2: Consumption declined due to paucity of fund during the lockdown

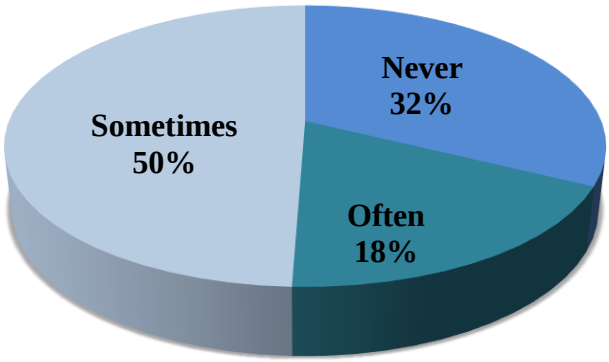

Figure 3: Access to food during the lockdown

4.3. Consumption Expenditures during the Lockdown

Usually, some households cook once or twice a day—breakfast and supper. However, people tend to consume more food when indoors than when outside the home where food is not accessible, or when they are occupied with one activity or the other and so unable to eat on time. Thus, when asked to rate their expenditure on food items during the lockdown, majority of the respondents (74%) reported an increase in their consumption of basic food items like rice, 'garri' beans and other staple foods as shown in Figure 4. The figure also shows that expenditure on refilling of cooking gas increased during the lockdown, which is expected since the frequency of food intake likewise increased. 68% of the respondents stated an increase in their internet subscription and mobile phone credit card. More than half of the respondents indicated that their expenditures on fruits and vegetables similarly increased compared to the period before the pandemic.

Table 2: COVID-19 impact on consumption expenditures by household size

		Same as before (in %)	Lower than before (in %)	Higher than before (in %)
Health care services	**2-4**	41.82	20	38.18
	5-7	56.3	16.30	27.40
	8 and above	41.67	16.67	41.66
Basic food items	**2-4**	14.55	12.72	72.73
	5-7	15.56	6.63	74.81
	8 and above	16.67	8.33	75
Cooking gas	**2-4**	31.82	14.55	53.63
	5-7	37.78	13.33	48.89
	8 and above	33.33	16.67	50
Fruits and vegetables	**2-4**	26.36	21.82	51.82
	5-7	31.85	13.33	54.81
	8 and above	25	33.33	41.67
Fueling of generator	**2-4**	18.18	54.55	27.27
	5-7	31.11	43.7	25.19
	8 and above	16.67	58.33	25
Cable TV subscription	**2-4**	49.09	16.36	34.55
	5-7	52.59	11.11	36.3
	8 and above	41.67	16.67	41.66
Internet subscription	**2-4**	20	11.82	68.18
	5-7	27.41	3.70	68.89
	8 and above	25	8.33	66.67
Recharge card	**2-4**	16.36	13.64	70
	5-7	25.19	7.41	67.40
	8 and above	33.33	8.33	58.34

A cross tabulation of the consumption expenditures and the family size (see Table 2) shows that the larger the number of household members, the higher the expenditures on food items, cooking gas and cable TV subscriptions. Households with larger members spent more on food consumption (86%), while over 70% of household size of between 2 to 4 and 5 to 7 members stated an increase in their food consumption expenditure. Apart from food items, expenditures on cooking gas, internet subscriptions and mobile phone credit cards and fruits and vegetables, expenditures on medicines also increased.

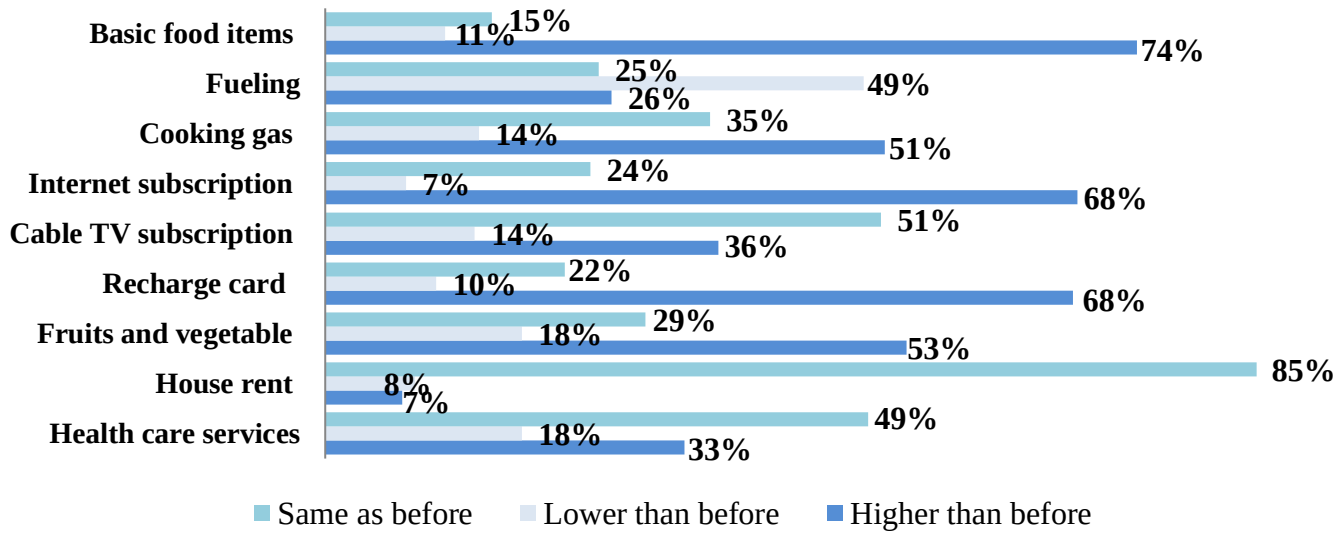

Figure 4: Consumption expenditures during the lockdown

4.4 Overall Impact of COVID-19 Lockdown

The survey asked the extent at which the lockdown affected the overall livelihood of the people household. About 83% of the respondents reported that they were greatly affected by the lockdown due to coronavirus pandemic as shown in Figure 5a, while 14% of the respondents were not affected at all by the lockdown. The household size between 2 to 4 seems to be greatly affected followed by the household size of between 5 and 7. Figure 5b shows the cross tabulation of sex and impact of the lockdown. The Figure shows that male respondents were more affected than the females.

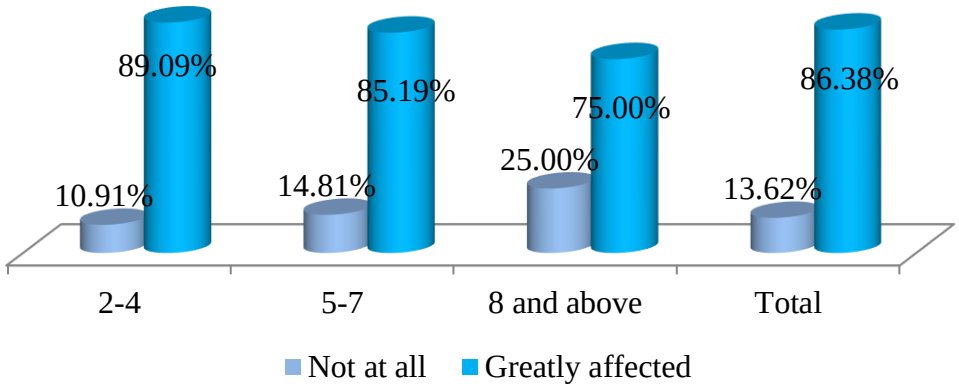

Figure 5a: Impact of COVID-19 Lockdown on the People

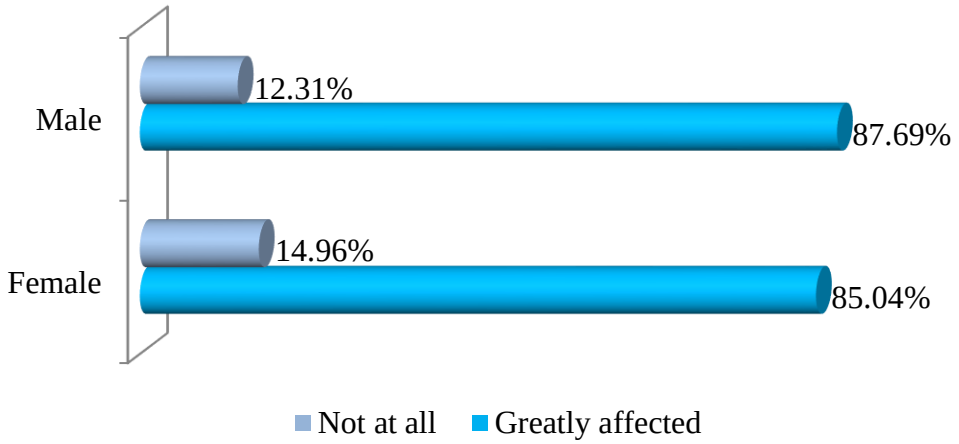

Figure 5b: Impact of COVID-19 Lockdown on the People

4.5 Coping strategies during the lockdown

The coping strategies during the lockdown vary, as reported in Figure 6. Upon the anouncement of the lockdown by the government, most respondents (71%) stockpiled food items before the total restrictions of movement and closure of markets. When the lockdown exceeded two weeks, 45% of the respondents fell back on their personal savings to smooth consumption. Surprisingly, despite the provision of palliatives by the federal governmnet, only 4% of the total respondents benefited. 3% received paaliatives from the community's Philantrpists , while most of the respondents resorted to self-managemnet as 28% of the people indicated that they reduced their daily food intake while 22% skipped meal as strategies to smooth consumption. This findings corroborate results of Balana et al (2020), Balana *et al*, (2020); and Iheme *et al*, (2020). 23% indicated that they borrowed from relatives and friends to survive druning the lockdown whereas 26% reported to be assisted by their friends and family members.Others bought on credit from the street food sellers and vendors, (14%); and got assistance from their religion organisation (21%).

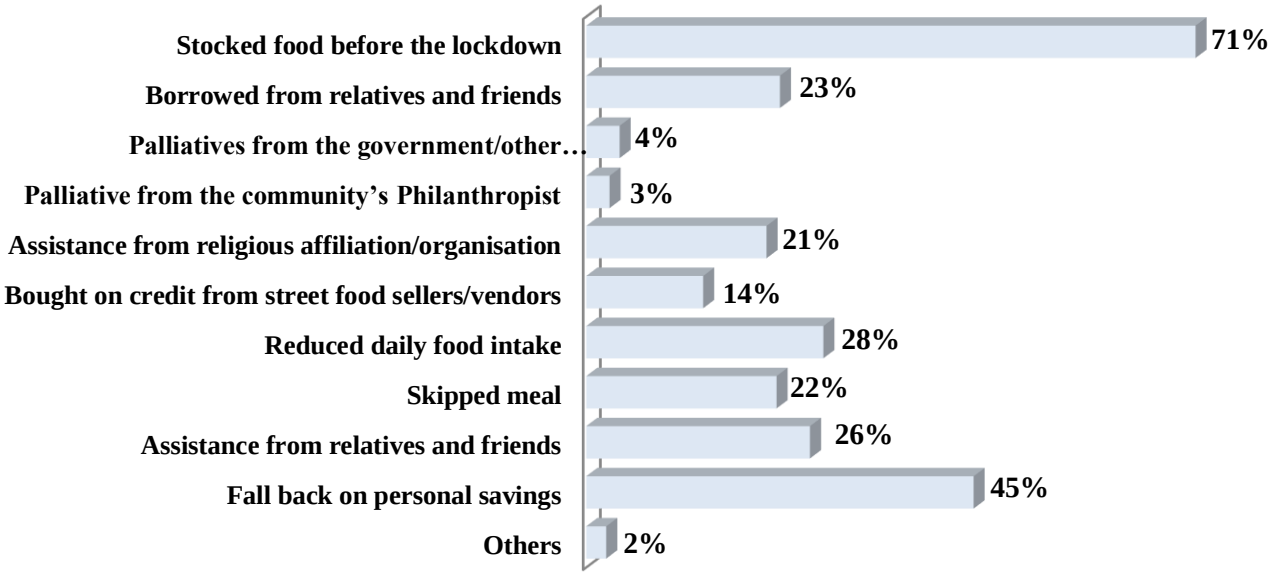

Figure 6: Coping Strategies during the lockdown

4.6 Post-lockdown Expectations about food prices

The survey further inquired whether the respondents foresaw a change in food prices after the lockdown. The general opinion was that as the government gradually eased the lockdown, significant decline would occur in food prices, and their food consumption would consequently improve. The survey further inquired whether the respondents foresaw a change in the food prices, after the lockdown. Specifically, as shown in Figure 7, a considerable number of respondents (68%) foresaw a change in food prices, as against 16% who did not expect to see any change in food prices. This finding corroborates the results by Watanabe (2020), Amare *et al*,(2020), and Balana et al (2020) for Nigeria in which 85% indicated an increase in food prices in a study conducted from four states in the country. Also, inquiry was made on the expected percentage change in the food prices. About 9% of respondents (Figure 8) expected 100% increase in food prices. Meanwhile, 26% and 23% of the respondents envisaged a 50% and 25% increase respectively in food prices after the pandemic lockdown, while 15% and 22% foresaw a decrease in food prices by 50% and 25% respectively. Others either envisaged an increase of 10%, some were not sure about the change in prices, some anchored any change in prices on exchange rate, cost of production and transportation. The finding is in line with Stanciu *et al*, (2020).

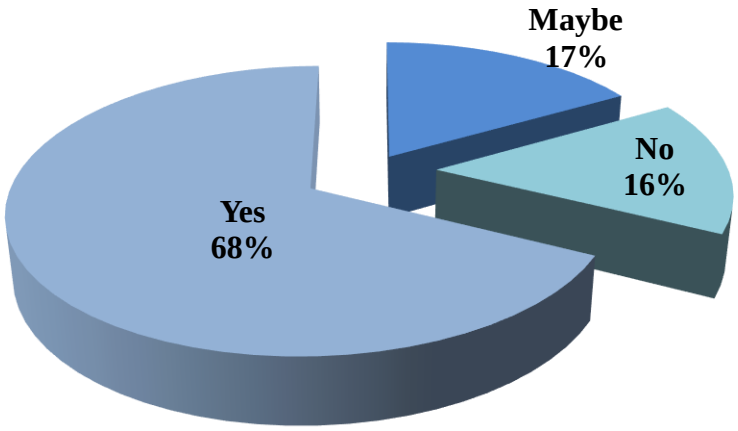

Figure 7: Post-lockdown Expectations about food prices

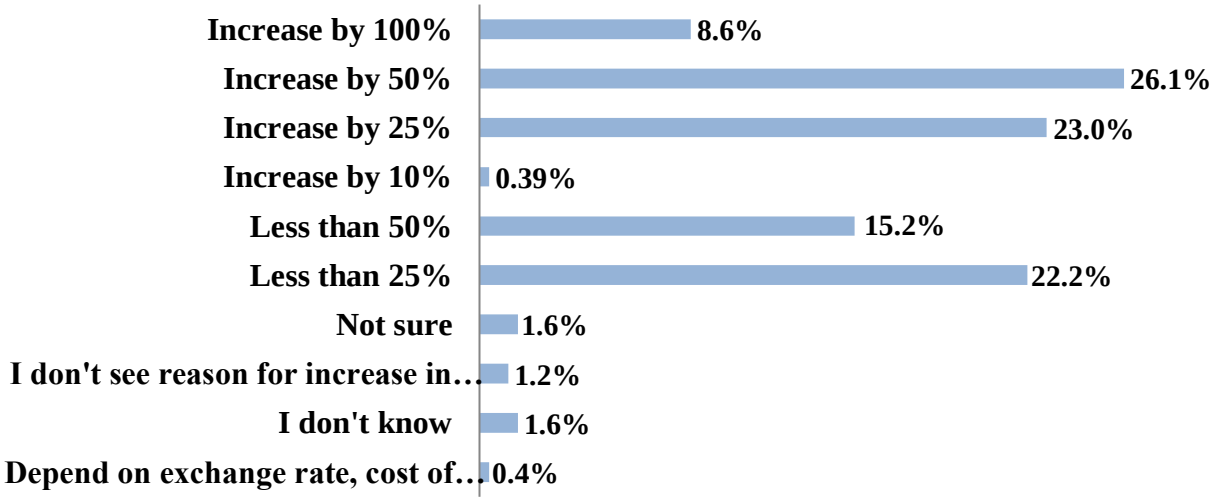

Figure 8: Expected percentage change in food prices

5. Conclusion

There is no doubt that the COVID-19 pandemic has changed the consumption pattern of the people in Nigeria. This change was caused primarily by the policy measures to contain the spread. This study, therefore, investigates the impact of lockdown as one of the policies on the food intake of households in Nigeria. The findings from the survey show heterogeneous impact of the lockdown on the people. Expenditures on basic foods increased during the lockdown. As indicated by the consumers, the increase was due to increase in food prices during the lockdown caused by shortage in supply. Despite the provision of palliatives as announced by the federal government majority of the people did not have access to it. There was also nutritional lost as most people indicated eaten less than they would have preferred before the lockdown. The study observes rationality theory in consumers as majority of the people reported stockpiled basic food items before the total lockdown

while a considerable number of the sampled respondents fell back on personal savings to smooth consumption. Based on the findings, the study suggests the followings should any pandemic emerges in the future which requires these policy measures, firstly, government should provide adequate social safety nets to ameliorate the suffering of the people especially the vulnerable and the poor in the society during the lockdown. Secondly, though government provided palliatives which are expected to be benefited by most people, surprisingly majority did not benefit due to poor monitoring, corruption and political interference. Thus there is need for government to come down to the grassroots, identify the real poor in the society and ensure equitable distribution and accountability.

Thirdly, the restriction of movement causes supply shortage which translated into food insecurity and price increase. Therefore government needs to empower small stakeholder farmers to practice commercial and mechanized agricultural system by providing funds, seedlings and other farm inputs such as tractors, plough, ridgers etc to increase food surplus. Fourthly, Year-in-year-out, government claims to fund agriculture but the impact is not realy seen because we still import most of the food we consume, therefore, there is need for proper monitoring of the funds to ensure the real farmers in the country have access to the facilities. Besides, most perishable agricultural commodities were lost due to lockdown restriction and lack of transport system and immediate consumption, hence good storage facilities is essential to reduce wastage. Also, price control and consumer protection boards seem to be ineffective in Nigeria. This is the time to revive the institutions to curb rising inflation rates which may further disrupt food consumption patterns and consumer's extortion. Over the years, Nigeria has been battling with insecurity, during the lockdown there was high rate of insecurity in the country that farmers could not access their farm, government needs to be more proactive in ensuring safety of all citizen including the farmers.

References

Abdul, I.M., (2020).' Covid-19, Lockdown and transitory food insecurity in Nigeria', *Food and Agribusiness Management (FABM), 1*(1), pp. 26-30.

AgroNigeria (2020). 16 States to Face Food Crisis Between June and August – FAO Reports.

Amare, M., Abay, K., A.., Tiberti, L., and Chamberlin, J., (2020). 'Impacts of COVID-19 on food security: Panel data evidence from Nigeria', *IFPRI Discussion Paper,* 1956. Washington, DC: International Food Policy Research Institute (IFPRI).

Amewu, S., Asante, S., Pauw, K. and Thurlow, J., (2020). 'The economic costs of COVID-19 in Sub-Saharan Africa: Insights from a simulation exercise for Ghana'. *GSSP Working Paper* ,52. Washington, DC: International Food Policy Research Institute (IFPRI).

Andam, K., Edeh, H., Oboh, V., Pauw, K. and Thurlow, J., (2020). 'Impacts of COVID-19 on food systems and poverty in Nigeria', *Advances in Food Security and Sustainability*, *5*, pp.145-173.

Andersen, A. L., Hansen, E.T., Johannesen, N. and Sheridan, A., (2020). 'Pandemic, shutdown and consumer spending: Lessons from Scandinavian policy responses to COVID-19'

Bai, H.M., Zaid, A., Catrin, S., Ahmed, K. and Ahmed, A.J., (2020). 'The socio-economic implications of the coronavirus pandemic (COVID-19): A review'. *International Journal of Surgeon.*, *8*(4), pp. 8-17.

Baker, S.R., Farrokhnia, R.A., Meyer, S., Pagel, M. and Yannelis, C. (2020). 'How does household spending respond to an epidemic? Consumption during the 2020 COVID-19 pandemic' *The Review of Asset Pricing Studies*, *10*(4), pp.834-862.

Balana, B.B., Oyeyemi, M.A., Ogunniyi, A. I., Fasoranti, A., Edeh, H., Aiki, J., and Andam, K.S., (2020). 'The effects of COVID-19 policies on livelihoods and food security of smallholder farm households in Nigeria: Descriptive results from a phone survey'. IFPRI Discussion Paper 1979. Washington, DC: International Food Policy Research Institute (IFPRI).

Balleer, A., Link, S., Menkhoff, M. and Zorn, P., (2020). 'Demand or supply? Price adjustment during the Covid-19 pandemic'. CESifo Working Paper, 8394. Center for Economic Studies and Ifo Institute (CESifo), Munich

Buheji, M., da Costa Cunha, K., Beka, G., Mavric, B., De Souza, Y.L., da Costa Silva, S.S., (2020). 'The extent of covid-19 pandemic socio-economic impact on global poverty. a global integrative multidisciplinary review'. *American Journal of Economics*, *10*(4), pp.213-224.

Çakmaklı, C., Demiralp, S., Kalemli-Özcan, Ş., Yesiltas, S. and Yildirim, M.A., (2020). 'COVID-19 and Emerging Markets: An Epidemiological Model with International Production Networks and Capital Flows', IMF Working Paper, 133. International Monetary Fund

Cavallo, A., (2020) 'Inflation with COVID consumption baskets', *NBER Working Paper Series*, 27352.

Chen, H., Qian, W. and Wen, Q., (2020). The impact of the COVID-19 pandemic on consumption: Learning from high frequency transaction data.

Chronopoulos, D.K., Lukas, M. and Wilson, J.O., (2020). 'Consumer spending responses to the COVID-19 pandemic: an assessment of Great Britain'.

Coibion, O., Gorodnichenko, Y. and Weber, M., (2020). 'The cost of the covid-19 crisis: Lockdowns, macroeconomic expectations, and consumer spending', *NBER Working* Paper, 27141.

Diwakar, D.M., (2020). From pandemics to poverty: *Hotspots of vulnerability in times of crisis. Emerging analysis and ideas.*

GAIN., (2020). *Impact of COVID-19 on Food Systems in Nigeria*. Situation Report - Edition 1. November 2020.

Han, J., Meyer, B.D. and Sullivan, J.X., (2020). 'Income and Poverty in the COVID-19 Pandemic. NBER Working Paper, 27729. National Bureau of Economic Research.

Hobbs, J.E., (2020). 'Food supply chains during the COVID-19 pandemic'. *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, *68*(2), pp.171-176.

Iheme, G., Jagun, A.O., Egechizuorom, I.M., Ogbonna, O.C., Edafioghor, L.O., Adeleke, F.A. (2020). 'Food consumption and coping strategies of urban-households in Nigeria during the COVID-19 pandemic lockdown'. *World Nutrition*, *11*(3), pp.35-50.

Ilesanmi, F.F., Ilesanmi, O.S. and Afolabi, A. A., (2021). 'The effects of the COVID-19 pandemic on food losses in the agricultural value chains in Africa: The Nigerian case study'. *Public Health in Practice*,

Jribi, S., Ismail, H.B., Doggui, D. and Debbabi, H., (2020). 'COVID-19 virus outbreak lockdown: What impacts on household food wastage?'. *Environment, Development and Sustainability*, *22*(5), pp.3939-3955.

Martin, A., Markhvida, M., Hallegatte, S. and Walsh, B., (2020). 'Socio-economic impacts of COVID-19 on household consumption and poverty'. *Economics of disasters and climate change*, *4*(3), pp.453-479.

Mouloudj, K., Bouarar, A.C. and Fechit, H., (2020). 'The impact of COVID-19 pandemic on food security'. *Les cahiers du CREAD*, *36*(3), pp.159-184.

Obayelu, A.E., Obayelu, O.A., Bolarinwa, K.K. and Oyeyinka, R.A., (2021). 'Assessment of the Immediate and Potential Long-Term Effects of COVID-19 Outbreak on Socioeconomics, Agriculture, Security of Food and Dietary Intake in Nigeria'. *Food Ethics*, *6*(1), pp.1-22.

Stanciu, S., Radu, R.I., Sapira, V., Bratoveanu, B.D. and Florea, A.M. (2020). Consumer behavior in crisis Situations. Research on the Effects of COVID-19 in Romania. *Annals of the University Dunarea de Jos of Galati: Fascicle: I, Economics & Applied Informatics*, *26*(1).

Stojkoski, V., Utkovski, Z., Jolakoski, P., Tevdovski, D. and Kocarev, L. (2020). 'The socio-economic determinants of the coronavirus disease (COVID-19) pandemic'. *arXiv preprint server*,

Sumner, A., Hoy, C. and Ortiz-Juarez, E., (2020). *Estimates of the Impact of COVID-19 on Global Poverty*. *WIDER WP*, *43* (pp. 800-809). United Nations University World Institute for Development Economics Research.

Awojuyigbe, O (2020). NBS: *51% of households reduced food consumption to cope with COVID-19 shocks. The Cable*,

Watanabe, T., (2020). The Responses of Consumption and Prices in Japan to the COVID-19 Crisis and the Tohoku Earthquake'. *Working Paper Series*, CARF-F-476. doi: 10.7916/d8-qs4v-q792

World Health Organization. (2020). Coronavirus disease 2019 (COVID-19): Situation report, 72.