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# Examining Perceptions and Awareness of the Third Wave of COVID-19 in Ibadan, Nigeria: A Household Survey

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***ABSTRACT***
*This study investigates the awareness and perception of COVID-19 among the general population in Agbowo metropolis, Oyo State, Nigeria. A questionnaire was administered to households in the Agbowo area, Ibadan north, and data were analyzed using R software. Frequencies and percentages were used for categorical variables, and chi-square tests were conducted to examine the relationship between perception and practices to prevent COVID-19. Confirmatory factor analysis and sequential equation modeling were also used to determine the perception and preventive measures observed by Agbowo residents.*
*The results show that 46% of respondents had heard of the first wave of COVID-19, 28% had heard of the second wave, and 26% had heard of the third wave. The chi-square test revealed a significant association between sex and knowledge of the respondents, with males being more aware of the first and second waves, and females being more aware of the third wave. The confirmatory factor analysis revealed that "residents are permanently migrated to their base" and "borrowed money to cover living expenses" had a significant impact on the perception and preventive measures of COVID-19 in Agbowo, Ibadan north. Sequential equation modeling showed that education and grade level were significant factors in determining the perception and observation of COVID-19 preventive measures.*
*Overall, the study provides valuable insights into the awareness and perception of COVID-19 among the general population in Agbowo, Ibadan north, and highlights the importance of education and socioeconomic factors in determining preventive behaviors.*

***Keywords:*** *Covid-19, Third wave, House-hold Survey, Ibadan North LGA, Oyo State*

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## I. INTRODUCTION

All across the globe, the most effective way of delaying the spread of infections, especially in times when vaccines are not yet available, has been the adoption of precautionary behaviors (Tang et al.,2012; Ebrahim and Memish, 2020; Sjödin et al., 2020). Studies now suggest that the path from knowledge/awareness to actual precautionary behavior is often mediated by certain factors such as risk perceptions/worry (Brug et al., 2004; Taglioni et. al., 2013), self efficacy (Rimal, 2000) attention, information surveillance and elaboration (Raza et al., 2020), etc. Vartti et al. (2009) reported that people who are more knowledgeable about the related etiology of the disease, tend to worry more about being infected and therefore suggesting a link between knowledge and risk perception. It is worthy of note also that the trajectory of an infectious disease is often determined by thebehaviour of individuals, and the behaviour is in turn related to individuals' risk perception. (Abdelrahman, 2020; Vijayaraghavan and Singhal, 2020; Zhang et al., 2020) and beliefs about the disease (Janz and Becker, 1984).Zuo and Liu (2014) in their study "effect of awareness programmes asdriven by media on the prevention of an infectious disease" found that when there is increasing rate of awareness on an epidemic it is likely there is a reduction in the proportion of infected population. Theysubmit that media is germane for influencing people's behavior towards an epidemic and that throughawareness programmes on media, people are likely to take positive steps towards not being infected.

Ferretti, Wymat, Kendell and Zhao (2020) express strongly in their study that SARS COV-2 is more infectious than the earlier SARS-COV-1 which started in China in 2002. They opined that with no effective treatment found; the spread of the epidemic can be reduced if not stopped through adequate information dissemination regarding the various ways of the transmission of the disease and that good plans of action should be put in place to cure and control the spread of the disease. M. O. Adedokun et al (2020) carried out a study to examine the compliance of people to awareness programmes/preventive measures on COVID-19. The study was carried out in Ibadan North Local

Government Area of Oyo State with the population being the residents of Ibadan North Local Government area. The study showed that there existed a strong relationship between awareness programmes/preventive measures on COVID-19 and compliance of Ibadan North Local Government area citizens; that there existed a low significant relationship between medium of information and compliance of people to awareness/preventive measures on COVID-19.

Coronavirus which is tagged covid-19 is the trending pandemic in the nations of the world, biting hard on both the young and the old, the rich and the poor. It is neither age bound nor boundary. Specific and unfortunately with no specific cure for it at the moments, though people carry a lot of rumors about its cure using some medications such as hydroxychloroquine, Azithromycin, Zinc sulphate among others. Some other people believe in the use of herbal mixtures for its cure. such as a mixture of lemon, with ginger and garlic, taking hot water at intervals and many news about its cure trending on social media. Coronaviruses are a family of viruses that can cause illnesses such as the common cold, severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS) (Moyo Clinic Staff, 2019). The new trending disease since 2019 is called the Severe Acute Respiratory Syndrome Coronavirus of (SARS-COV 2). It was in March 2020 that the World Health Organization (WHO) declared the COVID-19 outbreak, a pandemic (World Health Organization,2020) and this was followed by close monitoring of the spread of the disease by Public Health groups in all nations of the world including the U.S. Centre for Disease Control and Prevention (CDC), World Health Organization and the Nigeria Centre for Disease Control (NCDC) in Nigeria. To make the monitoring effective, each state of the Nigeria sets up its own arm of the NCDC, while WHO reports updates daily. Nigeria, through NCDC makes its updates known to Nigerians to disinfect their minds of the rumour that COVID-19 is not real.

The World Health Organization (WHO) made some points clear about COVID-19 to lessen the spread of the disease. This includes statements about the signs and symptoms of the disease which include, headache, dry cough, fever, tiredness and difficulty in breathing, sore throat, loss of taste and smell among others. It was stated that the virus could spread through droplets from infected persons to others, touching surfaces and not maintaining adequate social distancing and which could lead to a lot of other complications like heart and liver failure and other organ failures especially among people with underlying diseases before contacting the COVID-19. This explanation is important in a country like Nigeria where social gathering and events occur regularly. Steven K. Iorfa etal (2020) explored the relationship between COVID-19 knowledge, risk perception, and precautionary behavior among Nigerians. The study also sought to determine whether this relationship differed for men and women. Moderated mediation analysis of the data showed that risk perception mediated the association between COVID-19 knowledge and precautionary behavior and this indirect effect was in turn moderated by gender. Results indicate that having adequate knowledge of COVID-19 was linked to higher involvement in precautionary behavior through risk perception for females but not for males.It was also noted that awareness campaigns and psychological intervention strategies on COVID- 19 related activities may be particularly important for males more than females.

The first case of COVID-19 in Nigeria was announced on 27th February with an Italian testing positive for the virus in Lagos (Maclean, Ruth, & Dihir, 2020). A second case was found in Ewekoro, Ogun State in a Nigerian citizen who had contact with the Italian citizen (PM News, 2020). These cases were put in isolation and by their testing positive, they were quarantined. Prior to the discovering of these COVID-19 patients, the Federal Government of Nigeria had made concerted efforts towards containing the disease by setting up various committees that would work towards its containment by setting up the Nigeria Centre for Disease Control (NCDC) (Odunsi, 2020). On 22 March, the first case of coronavirus surfaced in Oyo State, Nigeria (Ala, 2020). Ever since this first date of the confirmed case, there had been an increase in the number of cases discovered in Oyo State with many of the cases coming from Ibadan, the capital city of Oyo State.

There is no gainsaying that COVID-19 was a deadly pandemic ravaging the world since 2019. However, considering the demographic drivers of the ever-increasing Agbowo community is the major reason for the selection of this community. Also, we noted that no platform existed for conscious awareness programs and preventive measures to be put in place in this community during the pandemic. Hence, this study aimed to investigate the level of awareness and perception of COVID-19 among dwellers in Agbowo metropolis, Oyo State, in Nigeria.

## II. METHODOLOGY

The methodology employed in achieving the objectives of this study were descriptive statistics, used for the pre-analysis, inferential statistics including decomposition analysis which was used in the main analysis. Stratified random sampling method was used to select 5 EAs from the 132 EAs in the entire agbowo community.

The 132 EAs were divided into 5 strata, the elements in each stratum were selected according to the number of buildings in each enumeration area as stated in table 1 below.

**Table 1: House-hold sizes across 5 strata in Agbowo Community, Ibadan**

| A | B | C | D | E |
|---|---|---|---|---|
| 26 | 26 | 26 | 27 | 27 |

The 5 Strata Proportionate stratified random sampling formula:

$$n_i = (N_i/N) * n$$

was used to calculate the number of enumeration areas to be selected.
Approximately one enumeration area was selected randomly from each stratum. The total number of enumeration areas used for the survey was 5. In each of the selected EA, a certain number of households were chosen randomly according to the number of buildings in each of the enumeration areas for the study as detailed in table 2.

**Table 2: Number of Household selected across enumeration areas**

| **Enumeration Areas** | **No of household selected** |
|---|---|
| ACE Publishers | 20 |
| Chancellor's Lodge | 30 |
| Mr. Eleto | 20 |
| Mr. Amole | 10 |
| Pam Clinic And Maternity | 20 |
| **Total** | **100** |

The questionnaire extracted from National Bureau of Statistics (NBS) from abridged quarterly labour force survey under COVID-19 was used for this study to understand the perception and awareness of the Agbowo residents on the third wave of Covid-19. The sample size of 100 was calculated using the Leslie Kish formula for sample size determination for a single proportion as follows:

$$n = Z_\alpha^2 \, p \, (1 - p)/d^2$$

where:
n = Minimum desired sample size
Z = the standard normal deviate, usually set as 1.96 which corresponds to 5% level of significance.
p = 50% was to be used
d = Degree of accuracy (precision) set at 7% (0.07)

$$n = 1.962 \times 0.5 \times (1 - 0.5)/0.07\text{^}2 = 100$$

Data were analyzed with R software. Frequencies and percentages were used for categorical variables. Chi-square test was conducted between the perception of the COVID-19 and practices to prevent COVID-19. Confirmatory data analysis was used to determine perception and preventive measures observed by the Agbowo residents. P-values < 0.05 were accepted as significant. Structural equation modeling is a multivariate statistical analysis technique that is used to Analyze structural relationships. This technique is the combination of factor analysis and multiple regression analysis, and it is used to analyze the structural relationship between measure variables and latent constructs. This method is preferred by the researcher because it estimates the multiple and interrelated dependence in a single analysis.

Structural Equation Model (SEM) is a multiple regression method of analysis for testing Hypotheses about the relationship among observed and unobserved, latent variable which was invented and had its roots in path analysis by Wright,1918.

**POPULATION DISTRIBUTION AND HOUSING DENSITY IN AGBOWO**

Based on the 1991 population census figure which was adjudged to be the most reliable, the projection was made for Agbowo for the year 2017 by using National Population Commission (1991 and 2006) growth rate of 2.83% and 3.18% respectively and a compound interest formula.

**Table 3: Sex Distribution in Agbowo Community**

| Sex | Population (1991) | Projected Population (2017) | Percentage |
|---|---|---|---|
| Male | 22,440 | 48,289 | 49.7 |
| Female | 22,738 | 48,930 | 50.3 |
| **Total** | **45,178** | **97,219** | **100.0** |

The population of Agbowo drastically rose from 45,178 to 97,219 as stated in table 3 above, which implied that the population of Agbowo has increased sporadically by 52,032 from 1991 to 2017. This is very significant and has resulted in traffic congestion, poor housing condition, inadequate social amenities and environmental pollution. Occupancy rate formula was used to determine the existing occupancy rate in Agbowo. This was carried out by dividing the existing population with the result gotten when multiplied the total number of residential buildings by National Population Commission (2006) ideal occupancy rate of two people per room. The result revealed that the existing occupancy rate in Agbowo is 2.6. This implies 3 people per room which is against the ideal occupancy rate of 2 people per room and also attests to the manifestation of rapid urbanization in Agbowo community.

Since majority of people in Agbowo are casual workers, artisans, traders, vendors, and students. There is no logical way these people could work remotely or from home as their occupations involve them to be in direct contact with their customers thus making physical or social distancing unfeasible. The nature of their occupation didn't make the stay-at-home order to be effective as it should be and enforcing restrictions would not do any good either as the locals won't be able to meet their needs and have a source of income. The only way to solve this problem is to educate them the more, to adhere strictly to the preventive measures of COVID-19.

## III. DISCUSSION OF RESULTS

**Correlation Analysis**

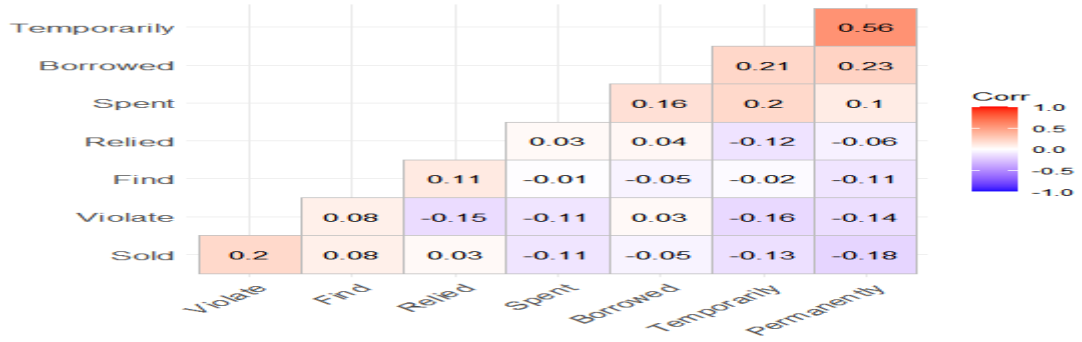


Figure 1: **Correlation Analysis on the responses of the Impact of Covid-19 on Household**

Figure 1 above shows the correlation of the responses on impact of Covid- 19, the chart shows that the correlation between temporarily migrated back to their original home place and permanently migrated back to their original base is 0.56 which shows there is a strong positive correlation. The chart also shows the correlation between Borrowed money to cover expenses and permanently migrated back to their original base to be 0.23 which shows there is weak positive and also shows the correlation between Borrowed money to cover expenses and temporarily migrated back to their original home place to be 0.21 which shows there is a weak positive correlation.

The chart also shows the correlation between Spent savings to cover living expenses and permanently migrated back to my original base is 0.1 which shows there is strong positive correlation, it shows the correlation between Spent savings to cover living expenses and temporarily migrated back to my original home 0.2 which shows there is strong positive correlation, and it also shows the correlation between Spent savings to cover living expenses and Borrowed money to cover expenses is 0.16 which shows there is strong positive correlation.

The chart also shows the correlation between relied on the help of the extended family members to cover living expenses and permanently migrated back to my original base is -0.06 which shows there is a weak negative correlation , it shows the correlation between relied on the help of the extended family members to cover living expenses and temporarily migrated back to my original home is -0.12 which shows there is weak negative

correlation , , it shows the correlation between relied on the help of the extended family members to cover living expenses and Borrowed money to cover expenses is 0.04 which shows there is weak positive correlation and it also shows the correlation between relied on the help of the extended family members to cover living expenses and Spent savings to cover living expenses is 0.03 which shows there is a weak negative correlation.

The chart also shows the correlation between Find another job/occupation and permanently migrated back to my original base is -0.11 which shows there is a weak negative correlation, it shows the correlation between find another job/occupation and temporarily migrated back to my original home is -0.02 which shows there is a weak negative correlation, it shows the correlation between find and Borrowed money to cover expenses is -0.05 which shows there is a weak negative, it shows the correlation between find another job/occupation and Spent savings to cover living expenses is -0.01 which shows there is a weak negative correlation, it shows the correlation between find another job/occupation and relied on the help of the extended family members to cover living expenses is 0.11.

The chart also shows the correlation between Violate containment measures to maintain a living and permanently migrated back to my original base is -0.14 which shows there is a strong negative correlation, it shows the correlation Violate containment measures to maintain a living between and temporarily migrated back to my original home is -0.16 which shows there is a strong negative correlation, it shows the correlation between Violate containment measures to maintain a living and Borrowed money to cover expenses is 0.03 which shows there is a weak positive, it shows the correlation between Violate containment measures to maintain a living and Spent savings to cover living expenses is -0.11 which shows there is a strong negative correlation, it shows the correlation between Violate containment measures to maintain a living and relied on the help of the extended family members to cover living expenses is -0.5 which shows there is a strong negative correlation and it also shows the correlation between Violate containment measures to maintain a living and relied on the help of the extended family members to cover living expenses is -0.5 which shows there is a strong negative correlation.

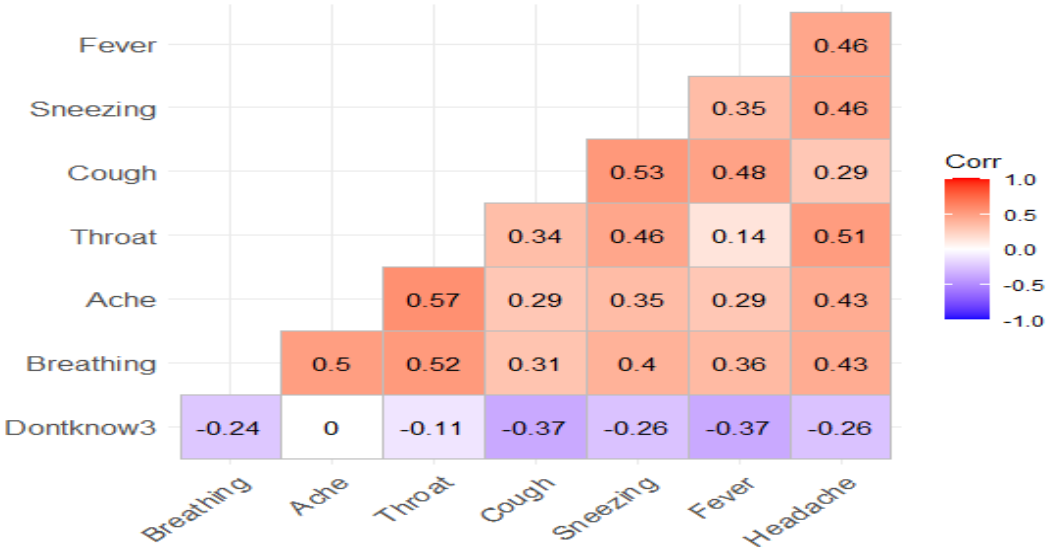


**Figure 2: Correlation of the responses on the knowledge of symptoms of Coronavirus.**

Figure 2 above shows the Correlation of the responses on the knowledge of symptoms of coronavirus. The chart shows that the correlation between fever and headache is 0.46, which shows that there is a weak positive correlation between them. The correlation between Sneezing and Fever is 0.35, which shows that there is a weak positive correlation between them. And also the correlation between Sneezing and Headache is 0.46, which shows that there is a weak positive correlation between them. The correlation between Cough and Sneezing is 0.53, which shows that there is strong positive correlation between them. And also, the correlation between Cough and Fever is 0.48 which shows that there is a weak positive correlation between them. And the correlation between Cough and Headache is 0.29 which shows there is a weak positive correlation between them. The correlation

between Throat and Cough is 0.34, which shows that there is weak positive correlation between them. And also, the correlation between Throat and

Sneezing is 0.46 which shows that there is a weak positive correlation between them. And the correlation between Throat and Fever is 0.14 which shows there is a weak positive correlation between them. The correlation between Throat and Headache is 0.51 which shows there is a strong positive correlation between them. The correlation between Ache and Throat is 0.57, which shows that there is strong positive correlation between them. And also, the correlation between Ache and Cough is 0.29 which shows that there is a weak positive correlation between them. And the correlation between Ache and Sneezing is 0.35 which shows there is a weak positive correlation between them. The correlation between Ache and Fever is 0.29 which shows there is a weak positive correlation between them. The correlation between Ache and Headache is 0.43 which shows there is a weak positive correlation between them.

The correlation between Breathing and Ache is 0.50, which shows that there is strong positive correlation between them. And also, the correlation between Breathing and Throat is 0.52 which shows that there is a strong positive correlation between them. And the correlation between Breathing and Cough is 0.31 which shows there is a weak positive correlation between them. The correlation between Breathing and Sneezing is 0.40 which shows there is a weak positive correlation between them. The correlation between Breathing and Fever is 0.36 which shows there is a weak positive correlation between them. The correlation between Breathing and Headache is 0.43 which shows there is a weak positive correlation between them.

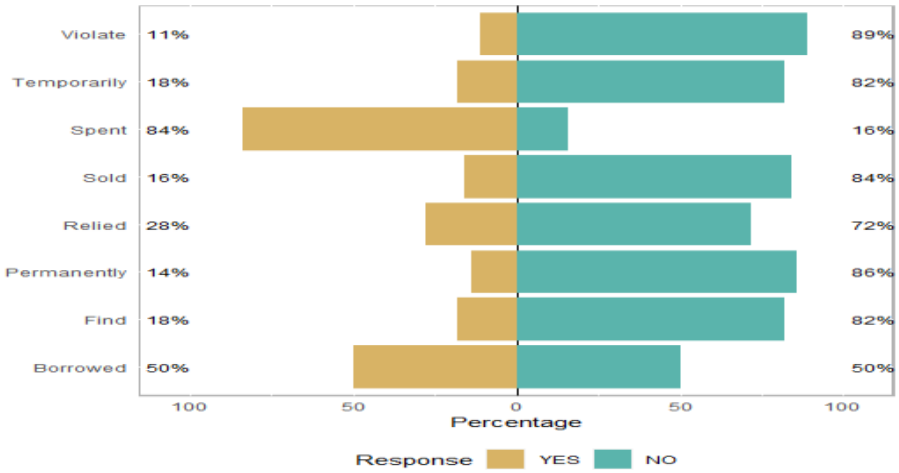


Figure 3: Frequency distribution of the impact of Covid-19

Figure 3 shows the frequency distribution of the impact of Covid-19 on households. The response on those who "violate containment measures to maintain a living" for YES has 11% and NO has 89%. The response on those who "temporarily migrated back to their original home place" are 18% YES and 82% NO. The response on those who "spent savings to cover their living expenses" are 84% YES and 16% NO. The response on those who "sold assets to cover living expenses" are 16% YES and 84% NO. The response on those who "relied on the help of extended family members to cover living expenses" are 28% YES and 72% NO. The response on those who "permanently migrated back to their original base" are 14% YES and 86% NO. The response on those who" find another job/occupation" are 18% YES and 82% NO. The response on those who "borrowed money to cover living expenses" are 50% YES and 50% NO.

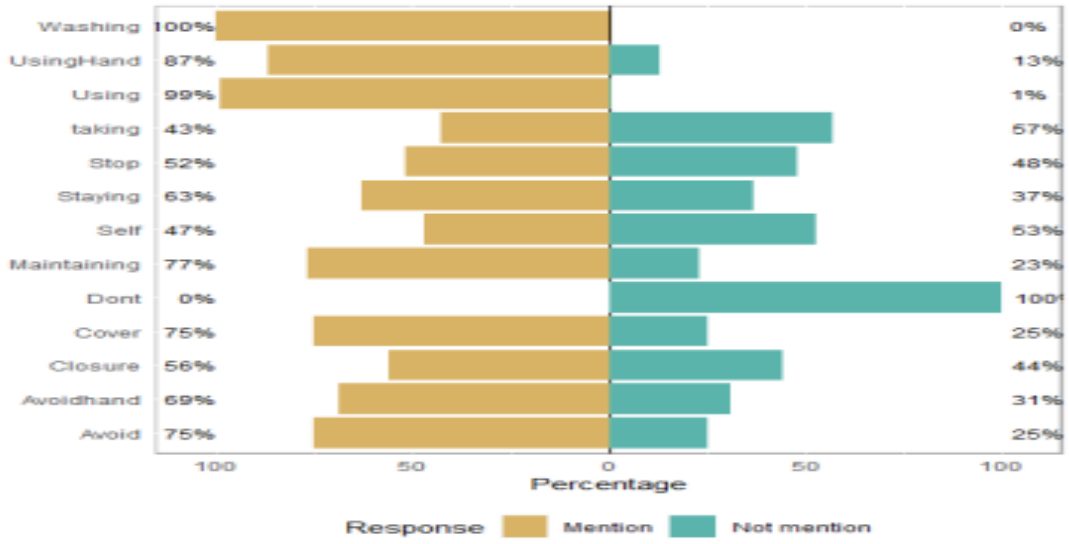


**Figure 4: Frequency distribution of the knowledge of protective measures from Coronavirus**

Also, figure 4 shows the frequency distribution on the response of the knowledge of protective measures from coronavirus. 100% mentioned "washing hand with soap and water" as a protective measures. 87% mentioned "using hand sanitizer" while 13% used nothing as preventive measures. 99% mentioned "using face mask" while 1% did not use face mask as a preventive measure. 43% mentioned "taking of covid-19 vaccine" while 57% did not see it as a preventive measure. 52% mentioned "stop going to work" while 48% did not. 63% mentioned "staying /working from home" while 37% did not see working at home as preventive measures against covid. 47% "self-quarantined" while 53% did not, 77% "maintained social distancing" while 33% did not. 75% agreed that "covering your mouth and nose when coughing" was a preventive measure while 25% disagreed. 56% of the respondents agreed that "closure of school" was a good preventive measure while 44% disagreed.

The cross tabulation between impact of COVID-19 and knowledge of COVID-19 shows the count between the first wave, second wave and the third wave of COVID-19 against the impact of COVID-19. It also shows their Chi-square and P-value. The response of those that temporarily migrated back to their original home place who said YES for the 1st wave was 6, 2nd wave 9, and 3rd wave 3. For those who said NO for the 1st wave was 40, 2nd wave 19, and 3rd wave 23. The chi-square and p-value results (Chi-square = 5.296, P-value 0.071) was not significant in this context. 1st wave is 43, 2nd wave is 20, 3rd wave is 23. The chi-square and p-value results give (Chi-square = 7.205, P-value = 0.027). The response of those that spent saving to cover living expenses who said YES for the 1st wave is 37,2nd wave is 25, 3rd wave is 22. For those who said NO for the 1st wave is 9, 2nd wave is 3, 3rd wave is 4. The chi-square and p-value results give (Chi-square =1.024, P-value = 0.599). The response of those that borrowed money to cover living expenses who said YES for the 1st wave is 21, 2nd wave is 17, 3rd wave is 12. For those who said NO for the 1st wave is 25, 2nd wave is 11,3rd wave is 14. The chi-square and p-value results give (Chi-square = 1.787, P-value=0.409). The response of those that sold assets to cover living expenses who said YES for the 1st wave is 12, 2nd wave is 3, 3rd wave is 1. For those who said NO for the 1st wave is 34,2nd wave is 25,3rd wave is 25. The chi-square and the p-value results gives (chi-square = 6.922, p-value = 0.031).

The response of those that relied on the help of extended family members to cover living expenses who said YES for the 1st wave is 14, 2nd wave is 8, 3rd is 6. For those who said NO for the 1st wave is 32, 2nd wave is 20, 3rd wave is 20. The chi-square and P-value results give (chi-square = 0.452, p-value = 0.798). The response of those that violate containment measures to maintain a living who said YES for the 1st wave is 8, 2nd wave is 1, 3rd wave is 2. For those who said NO for the 1st wave is 37, 2nd wave is 27,3rd wave is 23. The chi-square and P-value results give (chi-square = 3.846, p-value = 0.146).

**Table 4: Confirmatory Factor Analysis on the impact of Covid-19 on Household.**

| | Estimate | Std.Err | z-value | P(>\|z\|) | Std.lv | Std.all |
|---|---|---|---|---|---|---|
| **f =~** | | | | | | |
| **Temporarily** | 1.000 | | | | 0.293 | 0.763 |
| **Permanently** | 0.865 | 0.238 | 3.630 | 0.000 | 0.253 | 0.730 |
| **Find** | -0.129 | 0.154 | -0.842 | 0.400 | -0.038 | -0.099 |
| **Spent** | 0.285 | 0.151 | 1.889 | 0.059 | 0.083 | 0.227 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Borrowed** | 0.496 | 0.210 | 2.364 | 0.018 | 0.145 | 0.291 |
| **Sold** | -0.281 | 0.150 | -1.864 | 0.062 | -0.082 | -0.224 |
| **Relied** | -0.150 | 0.180 | -0.836 | 0.403 | -0.044 | -0.098 |
| **Violate** | -0.224 | 0.128 | -1.752 | 0.080 | -0.066 | -0.210 |
| | | | | | | |
| **Variances:** | | | | | | |
| | Estimate | Std.Err | z-value | P(>\|z\|) | Std.lv | Std.all |
| **.Temporarily** | 0.062 | 0.024 | 2.601 | 0.009 | 0.062 | 0.418 |
| **.Permanently** | 0.056 | 0.018 | 3.062 | 0.002 | 0.056 | 0.467 |
| **.Find** | 0.146 | 0.021 | 7.046 | 0.000 | 0.146 | 0.990 |
| **.Spent** | 0.127 | 0.018 | 6.932 | 0.000 | 0.127 | 0.948 |
| **.Borrowed** | 0.229 | 0.033 | 6.834 | 0.000 | 0.229 | 0.916 |
| **.Sold** | 0.128 | 0.018 | 6.936 | 0.000 | 0.128 | 0.950 |
| **.Relied** | 0.200 | 0.028 | 7.047 | 0.000 | 0.200 | 0.990 |
| **.Violate** | 0.094 | 0.013 | 6.954 | 0.000 | 0.094 | 0.956 |
| **F** | 0.086 | 0.029 | 2.952 | 0.003 | 1.000 | 1.000 |

Table 4 above shows that the result of the impact of Covid-19 on the Agbowo residence are "permanent migrated back to my original base" and "Borrowed money to cover living expenses" as these two produced a p-value of 0.000 and 0.018 respectively which is less than 0.005.

**Table 5: Confirmatory Factor Analysis on the Symptoms of Covid-19 on Household**

| | **Estimate** | **Std.Err** | **z-value** | **P(>\|z\|)** | **Std.lv** | **Std.all** |
|---|---|---|---|---|---|---|
| **f =~** | | | | | | |
| **Fever** | 1.000 | | | | 0.209 | 0.532 |
| **Cough** | 1.081 | 0.257 | 4.212 | 0.000 | 0.226 | 0.575 |
| **Breathing** | 1.607 | 0.348 | 4.619 | 0.000 | 0.335 | 0.672 |
| **Sneezing** | 1.402 | 0.305 | 4.600 | 0.000 | 0.293 | 0.667 |
| **Headache** | 1.509 | 0.323 | 4.676 | 0.000 | 0.315 | 0.687 |
| **Ache** | 1.501 | 0.337 | 4.458 | 0.000 | 0.313 | 0.631 |
| **Throat** | 1.606 | 0.343 | 4.676 | 0.000 | 0.335 | 0.687 |
| **Dontknow3** | -0.620 | 0.220 | -2.824 | 0.005 | -0.129 | -0.337 |
| | | | | | | |
| **Variances:** | | | | | | |
| | Estimate | Std.Err | z-value | P(>\|z\|) | Std.lv | Std.all |
| **.Fever** | 0.110 | 0.017 | 6.519 | 0.000 | 0.110 | 0.717 |
| **.Cough** | 0.103 | 0.016 | 6.379 | 0.000 | 0.103 | 0.669 |
| **.Breathing** | 0.137 | 0.023 | 5.913 | 0.000 | 0.137 | 0.549 |
| **.Sneezing** | 0.107 | 0.018 | 5.943 | 0.000 | 0.107 | 0.555 |
| **.Headache** | 0.111 | 0.019 | 5.810 | 0.000 | 0.111 | 0.528 |
| **.Ache** | 0.148 | 0.024 | 6.141 | 0.000 | 0.148 | 0.602 |
| **.Throat** | 0.126 | 0.022 | 5.809 | 0.000 | 0.126 | 0.528 |
| **.Dontknow3** | 0.131 | 0.019 | 6.893 | 0.000 | 0.131 | 0.886 |
| **Covid-19** | 0.044 | 0.017 | 2.636 | 0.008 | 1.000 | 1.000 |

Table 5 shows that the symptoms of Covid-19 above considered are all significant meaning that they are all considered as the symptoms of Covid-19 by the Agbowo residents.

**Table 6: Sequential Equation Modeling For Demographic Variables**

**Latent Variables**

| | **Estimate** | **Std Err** | **z-value** | **P(>\|z\|)** | **Std lv** | **Std.all** |
|---|---|---|---|---|---|---|
| **Covid19 =~** | | | | | | |
| **Sex** | 1.000 | | | | 0.127 | 0.256 |
| **Age** | 11.676 | 13.042 | 0.895 | 0.371 | 1.481 | 0.102 |
| **Relationship** | -0.478 | 1.492 | -0.320 | 0.749 | -0.061 | -0.034 |
| **Marital** | 0.998 | 0.866 | 1.152 | 0.249 | 0.127 | 0.138 |
| **Attendance** | -1.093 | 0.749 | -1.459 | 0.145 | -0.139 | -0.189 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Educational** | -14.013 | 6.035 | -2.322 | 0.020 | -1.777 | -0.909 |
| **Grade** | -18.391 | 7.651 | -2.404 | 0.016 | -2.333 | -0.841 |

Variances:

| | **Estimate** | **Std.Err** | **z-value** | **P(>\|z\|)** | **Std.lv** | **Std.all** |
|---|---|---|---|---|---|---|
| **Sex** | 0.230 | 0.033 | 6.999 | 0.000 | 0.230 | 0.935 |
| **Age** | 209.226 | 29.632 | 7.061 | 0.000 | 209.226 | 0.990 |
| **Relationship** | 3.097 | 0.438 | 7.070 | 0.000 | 3.097 | 0.999 |
| **Marital** | 0.831 | 0.118 | 7.052 | 0.000 | 0.831 | 0.981 |
| **Attendance** | 0.519 | 0.074 | 7.034 | 0.000 | 0.519 | 0.964 |
| **Educational** | 0.663 | 0.683 | 0.970 | 0.332 | 0.663 | 0.173 |
| **Grade** | 2.248 | 1.209 | 1.860 | 0.063 | 2.248 | 0.292 |
| **Covid19** | 0.016 | 0.013 | 1.215 | 0.224 | 1.000 | 1.000 |

Table 6 shows that the demographic characteristics of the respondents on Covid-19 above shows that all the considered demographic characteristics are not significant except educational and grade which are significant with p-value 0.020 and 0.016 respectively Meaning, the more educated you are, the more you take the precautionary measure.

## IV. CONCLUSION

Our study revealed that COVID-19 knowledge predicted precautionary behavior and risk perception significantly predicted precautionary behavior. Moreover, age and gender emerged as important variables associated with precautionary behavior. Older people readily showed a heightened tendency toward precautionary behavior than young persons. Females had higher likelihood of exhibiting precautionary behavior compared to males. In the area of mediation, risk perception aided the relationship between COVID-19 Knowledge and Precautionary behavior. In other words, knowledge influenced precautionary behavior through the perception of risk. The test for moderation indicated that gender (in this case, being female) was important as a precautionary index in risk perception than being male. Specifically, our results show that gender moderated the indirect path from COVID-19 Knowledge to precautionary behavior. It was also noted that awareness campaigns and psychological intervention strategies on COVID-19 related activities may be particularly important for males than females. Drawing from the health belief model, we recommend that COVID-19 awareness campaigns should target raising more awareness of the risks associated with the infection to make individuals engage more in precautionary behaviors. This research also showed that the economic activities are not yet back to normal since some people are using their savings and others borrowing money to survive.

## V. RECOMMENDATION

Sensitisation programmes should be intensified by the three tiers of the government- local, state and federal governments of Nigeria, since this research shows that knowledge on covid-19 has significant influence on precautionary measures. Government should provide essential personal protective equipment like running water, soaps, sanitizers and simple needed medications to boost people's immunity especially to indigent people and communities. Citizens should be educated the more to comply with hygienic behaviour. People should be educated to disregard fake news concerning COVID-19 and listen to authentic news and seek verifiable information on the disease.

People should have the right frame of mind on the issue of COVID-19 so as to stay safe. Leslie Martin, a Professor of Psychology at California's La Sierra University states in Markam (2020): "We have found that many people who live through hard times went on to live long even though their lives were not stress free by any means… this ability to think about the hard things one goes through as ultimately beneficial whether to ourselves or to people we care about or to the society at large seem to be important."

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