

Perceived risk, knowledge, and adherence to COVID-19 preventive measures: The case of Ariara market traders in Aba, Abia State, Nigeria

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Abstract

Perceived risk of becoming infected and knowledge about COVID-19 as potential predictors of adherence to COVID-19 preventive measures were assessed among Ariara international Market traders in Aba, Abia State, Nigeria. A purposive sampling technique was used to select a sample of two hundred (100 male, 100 female) traders after the lockdown order in the State. Respondents' age ranged between 19-60 years with a mean age of 35.16 (STD= 11.17). Three instruments were used to assess perceived risk, knowledge, and adherence among respondents. The cross-sectional survey design was adopted and Generalized Linear Models (GLM) was used for data analysis via SPSS version 21. The findings showed a general low adherence to COVID-19 preventive measures. Overall, the GLM result showed that all the variables combined, were significantly associated with adherence ($X^2(190) = 1911.75, p < .01$). Perceived risk was significantly associated with adherence ($X^2(1) = 225.68, p < .01$), with a significant regression coefficient of 0.82. While knowledge and the control variables were not significantly associated with and could not predict adherence to COVID-19 preventive measures among the traders. Despite the strong association between the perceived risk of becoming infected and adherence among the traders, adherence to COVID-19 preventive measures remained dangerously low. It is recommended that COVID-19 monitoring agencies show greater presence and conduct regular testing in this population.

Keywords: *Abia State, Adherence, COVID-19, Cross Sectional Survey, Generalized Linear Model, International, Prevention, Purposive Sampling.*

Introduction

The COVID-19 pandemic has presented a massive global health crisis. The pandemic is not yet over, because according to Africa Centre for Disease Control and Prevention (2020), there are new variants of the virus that has also been discovered in Nigeria, which was first discovered in the United Kingdom (UK). These new variants have resulted in an increase in the number of new cases and deaths recorded on daily basis (NCDC, 2022). Although appropriate measures have been made in limiting the devastating effect of the disease, which include frequent hand washing hygiene using soap and water, use of alcohol-based sanitizer, keeping a physical distance of about 6 feet from others, quarantine for those who are exposed, use of face masks, and avoiding the touch of the face with unwashed hands (Udomah *et al.*, 2021). The use of vaccinations has been stipulated as a stringent measure. In Nigeria, it is observed that the COVID-19 pandemic left nothing untouched including education, health, social, and economic sectors. In an increasingly interconnected world, no state or community is immune to its ravaging effect; there are no safe havens as it were. The virus does not recognize race, color, gender, economic and social status, political boundaries, or religious affiliations (WHO, 2020).

Nigeria recorded her first case of corona-virus attack on 27th February 2020. It was an imported case from an Italian national who came to Lagos (NCDC, 2022). From that date, despite efforts at testing, contact tracing, implementations of various prevention and treatment guidelines, within months, the incidents of confirmed cases have spread like wide fire. As of August 2022, two hundred and sixty-three thousand, three hundred and twenty-two (263,322) cases have been confirmed, two thousand nine hundred and twenty-one (2,921) active cases, and three thousand four hundred and eight (3,148) deaths have been recorded in 36 states and the Federal Capital Territory. So far, Abia State has recorded two thousand, two hundred and thirty-nine cases (2,239), thirteen (13) active cases and thirty-four (34) deaths (NCDC, 2022).

Abia State like every other state laid out massive public health measures to prevent the spread

of the virus, such measures included majorly enlightenment on the need for physical/social distancing, regular hand washing, use of hand sanitizer, wearing face masks in public. These measures are important because covid-19 is known to be transmissible from symptomatic and asymptomatic individuals via physical contact, and even infected surface or objects. Hence, the need for social/physical distancing and regular hand washing. Also, another primary route of transmission of COVID-19 is likely via respiratory droplets, and that brought about the need for wearing face masks in public. A high level of compliance with prevention guidelines, such as those issued by the World health organization (WHO), is necessary to “flatten the curve” and slow the spread of the virus (Anderson, *et al.*, 2020). It could be said that the spread of the disease is influenced by people's risk perception, knowledge, and willingness to adopt precautionary and preventive health guidelines.

Covid-19 risk Perception simply means the extent to which a person believes that the novel coronavirus poses a serious threat (Nejc & Bojan, 2020).

People's response to preventive health behaviors depends largely on their knowledge and how they perceive the existence of the pandemic. It has been observed with utmost bewilderment that most of these measures put in place to contain the spread of the virus have been flouted by the populace, especially traders in various markets. Could this non-adherence be related to their perception of COVID-19 pandemic? Their knowledge of covid-19 mortality rate? Or are there other variables that are militating against adherence to preventive guidelines? There are studies that show that there is very little link between infectious disease awareness and actual participation in precautionary (Phillips, *et al* 2015; Seimetz, *et al* 2016; De Buck, *et al* 2017). Some studies also indicate that certain variables, including risk perception, are often mediated by the path from information or understanding to actual involvement in precautionary actions (Taglioni, *et al* 2013., Vijayaraghavan, & Singhal, 2020). Abdelrahman (2020) and Zhang, *et al* (2020) argued that the course of an infectious disease could be traced to the actions of the person, and the perception of the risk factors by the individual. Therefore, it is necessary to investigate COVID-19 knowledge/awareness to precautionary behavior and the mediators and moderators that may be on this path. This will help in curbing the spread of the virus in Nigeria and beyond. This study explores traders' levels of risk perception of covid-19, knowledge of COVID-19 preventive measures as

correlate of adherence to preventive guidelines. Given the importance of perception and knowledge in precautionary activities to curb the spread of this novel COVID-19, it is important to research on people's risk perception and knowledge of Covid 19 mortality at this period of the pandemic.

Hence, when the individual perceives that Covid-19 is real and here with us, and has knowledge of ways one can contract it, and knowledge of its mortality, this will elicit actions to prevent the spread or cut the slope of the virus by adhering to preventive guidelines which are for the interest of all.

Statement of the Problem

Covid-19 pandemic has shocked and is still shocking the world in terms of deaths, economic hardships, and even social factors. Nigeria is not left out of the impact of covid 19 pandemic. Nigeria is said to be a vulnerable country given that the healthcare system could be said to be weak; some communities in many states are without healthcare facilities and/or scarcity of health workers. Some of these communities have markets, for example, Ariara International Market at Aba, Abia State, with large populations. Therefore, precautionary measures to combat the spread of this virus in these areas are needed. The challenge is not having a laid down precautionary measures to fight the spread of this virus, this is because World health organization (WHO) and Nigeria Center for Disease Control (NCDC), have laid down these measures. The problem often is the knowledge and awareness level of traders in Ariara International Market, Aba about the COVID-19 saga and whether such knowledge will translate into precautionary behavior as it is also possible that their knowledge and awareness may be gotten from myths and sacred narratives that they hold and this may be negatively affecting involvement in precautionary behavior. Thus, the need for this study. The findings of this study will help government, health organizations etc in the understanding of variables that contributes to further spread of the Covid-19 virus in Nigeria and other parts of the globe.

Review of Related Literature

This work is anchored on Disease Perception Model by Howard (1997, as cited in Kingsley, Nuworza, & Samuel, 2014). which focuses on the perceptions, constructions, or representations one has about experience with a disease, its identity, consequences, treatment,

causes, duration, and cure. The conception of a disease influences one's interpretation of the symptoms and is conditioned by experience and knowledge with previous pathologies, as well as by the social and cultural context (Rudell, Bhui, & Priebe, 2009; Kingsley, Nuworza, & Samuel, 2014).

Thus, one's perception and knowledge of a disease depends on the interpretation of experience, the transition of that interpretation to actual behavior, the response to social reactions and the moral sense assigned to the experience.

Therefore, in this imminent alarm situation in which global society is now embroiled with, the advent of COVID-19, its impact on health and the interpretation that an individual has will have significant impact on the person's adjustment to the preventive measures given.

Iorfa, *et al.*, (2020) explored the relationship between COVID-19 knowledge, risk perception and precautionary behavior amongst Nigerians from all geo-political zones. They recruited 1,554 participants with mean age of 27.43, SD= 9.75 through social media platforms using snowball sampling technique and the result showed that risk perception was associated with COVID-19 knowledge and precautionary behavior. The result of the study informed us that having adequate knowledge of COVID-19 mortality rate was linked to higher involvement in precautionary behavior. The study also found out that half of the respondents perceived COVID-19 as not being real or a way that the government wants to make money. Others identified contact with airborne droplets via breathing, sneezing, or coughing as the most common mode of transmission; most respondents agreed that regular hand washing and social distancing was a way of preventing infection.

It is expected that individuals who view COVID-19 as a mere biological weapon will not adhere to preventive measures. But those who see it as real, and who identified possible means of transmission, will likely adhere to guidelines to prevent the spread.

Nejc and Bojan (2020) carried out a study on modeling compliance with COVID-19 prevention guidelines. Their study aimed to develop and test a multivariate model to identify individual characteristics that make a person more or less likely to comply with COVID-19

preventive guidelines. They used 525 participants who completed their online survey. The results of the structural equation modeling (SEM) showed that COVID-19 risk perception and trust in science both independently predict compliance with COVID-19 prevention guidelines. Rutjens and Van (2020) in their study on compliance to COVID-19 preventive measures, found out that conspiracy thinking and religious beliefs have significant impact on compliance to COVID-19 preventive measures. Dryhurst, *et al.*, (2020) in their study on risk perceptions of COVID-19 around the world used a total number of 6991 participants in 10 countries across Europe, America and Asia using national samples. The result of the study showed that risk perception correlated significantly with reported adoption of preventive health behaviors in the 10 countries. This means that the more individuals perceive COVID-19 as a threat to health, the more the likelihood of achieving good compliance to preventive guidelines. While on the other hand, individuals who do not perceive any risk or who do not believe in the existence of COVID-19 have less compliance with WHO guidelines on prevention. These findings thus provide empirical support for the present study and underline the importance of perception and knowledge in compliance with COVID-19 prevention guidelines.

Purpose of the study:

The main purpose of this study is to.

1. Investigate the association of the level of risk perception on the adherence to COVID-19 containment guidelines among traders in Ariara International Market, Aba.
2. Investigate the association of the knowledge of COVID-19 mortality rate on the adherence to COVID-19 containment guidelines among traders in Ariara International Market, Aba.
3. To assess the influence of age on the adherence to COVID-19 containment guidelines among traders in Ariara International Market, Aba.
4. To ascertain the influence of gender on adherence to COVID-19 containment guidelines among traders in Ariara International Market, Aba.

5. To find out if marital status will influence adherence to COVID-19 containment guidelines among traders in Ariara International Market, Aba.
6. To investigate the influence of educational level on the adherence to COVID-19 containment guidelines among traders in Ariara International Market, Aba.

Hypotheses

1. There will be no significant influence of risk perception and adherence to COVID-19 containment measures among traders of Ariara International Market, Aba
2. There will be no significant influence of knowledge of COVID-19 and adherence to COVID-19 containment measures among traders of Ariara International Market, Aba
3. There will be no significant influence between age and adherence to COVID-19 containment measures among traders of Ariara International Market, Aba
4. There will be no significant influence of gender and adherence to COVID-19 containment measures among traders of Ariara International Market, Aba
5. There will be no significant influence of marital status and adherence to COVID-19 containment measures among traders of Ariara International Market, Aba
6. There will be no significant influence of educational level and adherence to COVID-19 containment measures among traders of Ariara International Market, Aba.

Method

Participants

The sample comprised two hundred (200) (100 male and 100 female) respondents who were randomly selected from Ariara International Market in Aba metropolis through purposive sampling method. They were aged 19-60years with a mean age of 35.16 (SD=11.17). Of the 200 respondents 51(25.5%), 79 (39.5%), 38 (19%), and 32 (16%) were from Imo, Abia, Enugu, and Anambra State respectively and all were Christians. When age was categorized 111 (55.5%) and 89 (44.5%) younger and older adults respectively.

Instrument

Three instruments were developed and pilot study was conducted to ascertain the validity and

reliability of these scales for the purpose of the study. They are COVID-19 Risk Perception Questionnaire (C19RPQ), COVID-19 Knowledge Inventory (C19KI), and COVID-19 Preventive Measures Adherence Questionnaire (C19PMAQ). The C19RPQ was used to assess respondents' perceived risk of becoming infected with the COVID-19 virus. It is a 5-item inventory with a 4-point likert scoring pattern, 1= Always, 2=Often, 3=Rarely and 4=Never. Therefore, the higher the scores the lesser the perceived risk. The psychometric properties are a Cronbach alpha reliability coefficient of 0.93, norm=6.27 and discriminant validity ($r = -0.11, p > .05$) was ascertained following content validation by correlating items on the Risk Perception Questionnaire with items of the Knowledge inventory. The second instrument C19KI was used to assess the extent of respondents' knowledge about COVID-19 virus and mortality rate. It is a 13-item inventory with a 3-point likert scoring pattern, 1= True, 2=False, and 3=I don't know. Therefore, the higher the scores the lesser the knowledge. The psychometric properties are a Cronbach alpha reliability coefficient of 0.88, norm=31.66 and discriminant validity ($r = -0.11, p > .05$) was ascertained following content validation by correlating items on the Risk Perception Questionnaire with items of the Knowledge inventory. The third instrument C19PMAQ was used to assess the degree to which respondents' behaviours followed the COVID-19 preventive measures stipulated in the state. It is an 8-item inventory with a 3-point likert scoring pattern, 1= I am not sure, 2= No, and 3=Yes. Therefore, the higher the scores the higher the degree of adherence or compliance. The psychometric properties are a Cronbach alpha reliability coefficient of 0.71, norm=17.10 and concurrent validity ($r = 0.14, p > .05$) was ascertained following content validation by correlating items on the Risk Perception Questionnaire with items of the Knowledge inventory.

The following socio-demographic characteristics (age, gender, educational level attained, marital status, state of origin and religious affiliation) were collected as categorical variables.

Procedure

Ethical approval for the study was given by the 12-man Taskforce and Committee on COVID-19 in Ariara International Market, Aba, which was set up by Abia State Government. The researchers trained four (4) research assistants that assisted during data collection, organization, and presentation for analysis. The participants were purposively selected from

various lines of the markets. In view of the respondents' occupation as marketers, online survey was considered inappropriate since most might not have the right devices, nor have the technological know-how to efficiently respond to an online survey, hence, data collection was conducted remotely. To effectively carry out the remote data collection process, the researchers observed all the preventive measures put forth by the state government and World Health Organization (WHO). The researchers, research assistants and respondents were provided with a washable face mask and an alcohol-based hand sanitizer and were made to follow the COVID-19 protective protocols like sitting or standing two meters apart. The data collection process began with the introduction of the person administering the assessment kit to the respondent and creation of rapport. Then, a concise informed consent form is read out to the respondents who gave verbal consent with any affirmative statement (e.g., I will answer your questions) and written consent by ticking on the "I Agree" box provided in the form. The informed consent form highlighted the purpose of the study, informed them of the confidentiality conditions, explained that they were free to withdraw from the exercise at any time without any penalty, and concluded with a note of appreciation of their valued time and willingness to participate. Administration of questionnaires was done without any time limits or constraints. Following a successful completion of each set of instruments, respondents were thanked and a ₦200 worth of airtime was given as a token for taken out time to respond to the items. All the participants correctly filled and returned their questionnaires.

Design and Statistics

This is a descriptive study; the cross-sectional survey design was utilized. After recoding all variables into categorical forms, the multilevel logistic regression was carried out using the generalized linear models (GLM) (Rabe-Hesketh & Skrondal, 2005); this allows for the simultaneous assessment of the difference in association between the independent variables, covariates, and adherence. Data analysis was conducted using SPSS version 21.

Ethics

Ethical approval for this study was gotten from the COVID-19 committee put in place in Ariara International Market, Aba. The ethical issues of anonymity, confidentiality, debriefing,

informed consent, do no harm and beneficence which are based on the Declaration of Helsinki were considered and covered in this study as explained above. The study, by its nature, did not pose any extra physical or psychological harm to respondents, as it focused only on their perception, knowledge, and compliance to COVID-19 preventive measures.

RESULT

Table I: Summary of Descriptive Statistics for Demographics and COVID-19 Variables

Variable		% (n)	
Dependent Variable	Adherence Level	Not Adherent	95(190)
		Adherent	5(10)
Independent Variables	Knowledge	Poor	2.5(5)
		Good	97.5(195)
	Perceived Risk	Low	20.5(41)
		High	79.5(159)
Covariates	Age	Younger	55.5(111)
		Older	44.5(89)
	Gender	Male	50(100)
		Female	50(100)
		None	1(2)
	Educational Level	Primary	15.5(31)
		Secondary	56.5(113)
		Tertiary	27(54)
	Marital Status	Single	24.5(49)
		Married	73(146)
Widowed		2.5(5)	
State of Origin	Abia	39.5(79)	
	Anambra	16(32)	
	Enugu	19(38)	
Religion	Imo	25.5(51)	
	Christian	100(200)	

Table I above shows an adherence rate of 5% among traders in Ariara International Market, Aba at the time of this study. It also shows 97.5% good knowledge and a high perceived risk rate of 79.5%. Males and females were equally represented, and they were all Christians. Majority of the respondents 56.5% were secondary school leavers, most 73% were married, while they were all from South-East Zone of Nigeria, many 39.5% were from Abia State where the market is domiciled.

Table II: Summary of Multivariate Logistic Regression Analyses Showing Predictors and Covariates of Adherence

Parameters	B	SE	95% Wald CI	Wald X^2	df	Sig.
(Intercept)	6.22	2.75	0.83, 11.61	5.12	1	.02
Knowledge (Poor/Good)	19.42	33662.31	-65957.49, 65996.32	0.00	1	1.00
Perceived Risk (Low/ High)	-2.90	0.84	-4.55, -1.24	11.80	1	.000
Age	-1.93	0.93	-3.75, -0.10	4.28	1	.04
Gender	-0.29	0.74	-1.74, 1.16	0.15	1	.67
Educational Level	-0.08	0.54	-1.14, 0.99	0.20	1	.89
Marital Status	1.08	0.90	-0.67, 2.84	1.47	1	.23

From Table II above, traders with good knowledge are more likely to adhere to COVID-19 preventive measures $\beta = 19.42$. However, this finding is not significant and so, the hypothesis that knowledge will not significantly predict adherence is accepted. Traders with high perceived risk were more likely to adhere to COVID-19 preventive measures $\beta = 2.90$. This is significant at $p < .001$, therefore, the hypothesis that perceived risk will not predict adherence is rejected.

Again, the table shows that older traders were less likely to adhere to COVID-19 preventive

measures $\beta = -1.93$. This finding is significant at $p < .04$, therefore, the hypothesis that age will not predict adherence is rejected. Age is a good predictor of adherence. On the other hand, male traders were found to be more likely to adhere to COVID-19 preventive measures $\beta = -0.29$. This finding is not significant at $p < .05$, so the hypothesis that gender will not predict adherence to preventive measures is accepted. Also, traders with higher level of education were less likely to adhere to COVID-19 preventive measures $\beta = -0.08$. This is not significant at $p > .05$. Hence, the hypothesis that educational level will not predict adherence to preventive measures is accepted. Finally, traders who are still or have been married were found to be more likely to adhere to COVID-19 preventive measures $\beta = 1.08$. This finding is not significant $p > .05$ therefore, the hypothesis that marital status would not predict adherence is accepted.

Summary of Findings: A multivariate logistic regression was conducted using 2 binary predictors and 4 covariates to predict adherence to COVID-19 preventive measures. Overall, the model was significant with adherence (Pearson $X^2 = 19.75$, $p < .001$). Two major predictors were identified- perceived risk of becoming infected and age; with higher perceived risk as a better predictor of adherence, followed by being a younger trader. However, adherence to COVID-19 preventive measures was found to be generally minimal.

Discussion

This study proves that adherence to COVID-19 preventive measures is very low among traders in Ariara International Market, Aba, Abia State. It also showed that traders had good knowledge of COVID-19 as well as a high perceived risk of becoming infected. The first hypothesis that knowledge of COVID-19 will not significantly predict adherence to COVID-19 preventive measures was accepted. This finding deviates from the finding of Iorfa, *et al.*, (2020) that COVID-19 knowledge is significantly related to greater precautionary behavior. This deviation could be due to the population studied. Traders in Ariara International Market, Aba, operate in peculiar circumstances that may not allow judicious practice of the preventive measures without some enforcement, especially as they perform proactive behaviours to get their wares sold. It is possible that they perceive practices like use of face mask and maintenance of 2 meters distance with customers as obstructive to the success of their business, hence, the low level of adherence to COVID-19 preventive

measures despite good knowledge level. The second finding showed that the high perceived risk of becoming infected significantly predicted adherence to COVID-19 preventive measures. This result confirms the findings of Iorfa, *et al.*, (2020) of significant relationship between higher risk perception and greater precautionary behaviours, Nejc and Bojan (2020) finding that COVID-19 risk perception independently predicts compliance with COVID-19 prevention guidelines, and Dryhurst, *et al.*, (2020) report that risk perception correlated significantly with adoption of preventive health behaviours.

The third finding showed that older traders were less likely to adhere to COVID-19 preventive measures. Therefore, the hypothesis that age will not predict adherence was rejected. Indicating the Age is a good predictor of adherence. This significant in age could be that younger people have more desire to live longer, as they believe that they have more opportunities in life than older people. It could also be because of health conditions of older people that made them less adherent to Covid-19 preventive measures, such as wearing of nose mask. On the other hand, male traders were found to be more likely to adhere to COVID-19 preventive measures, therefore, the fourth hypothesis that gender will not predict adherence to preventive measures is accepted. The fifth hypothesis that educational level will not predict adherence to preventive measures was accepted. Hence, there was no significant difference of adherence between those who are graduates and those who had basic education. Finally, the sixth hypothesis that marital status would not predict adherence is accepted. Indicating no significant difference of adherence among married and single.

The present finding shows that traders in this study do have high value for human life and would want to preserve, at least to continue with their business. Again, becoming infected or knowing a close acquaintance that became infected with COVID-19 may serve as a jolt for better adherence to COVID-19 preventive measures.

Implications of the Study

1. Rate of non-adherence points to the likelihood of undetected spread of COVID-19 in the market and State by extension.
2. It is evident that having knowledge of COVID-19 on its own is not a protective factor for traders.
3. Considering the elevated level of perceived risk and extremely low adherence, traders

have not fully translated this perception to behaviour.

4. Younger people are at a lesser risk of becoming infected with COVID-19 than older people.

Conclusion and Recommendations

The study concludes that adherence to COVID-19 preventive measures of Ariara International Market traders, at the time of this study is extremely low.

COVID-19 campaigns in metropolitan markets like Ariara should focus more on enforcing adherence measures especially among female and older traders.

The study recommends that government and non-governmental agencies should increase COVID-19 sensitization programs.

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