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Original Artide

COVID-19 Pandemic: A Survey of its Knowledge and Risk Perception among Nigerians

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Abstract

Background: The effect of the current COVID-19 pandemic on economies and health systems has been profound. Knowledge of the virus continues to evolve over time. This study aimed to assess the knowledge and the factors associated with the perceived risk of contracting COVID-19 infection during the pandemic.

Methodology: This was a cross-sectional study conducted in different parts of Nigeria which were stratified into east, north, and west. A self-administered questionnaire that contained questions related to socio-demographics, medical history, knowledge of COVID-19 (knowledge of viral transmission and infection symptoms), and risk perception of contracting COVID-19 among consenting individuals. The information was extracted and analysed electronically, descriptive variables were summarized in simple proportions and a chi-square test was used to test for association between dependent and non-dependent variables. The level of significance was set at p-value <0.05.

Results: The study had 350 participants with 189 (52.8%) females while almost 50% (171) were aged less than 30 Years. Over 90% of participants had good knowledge of viral transmission while 37.7% and 47.2% respectively had good symptom and risk perception scores. The socio-demographic factors – education and geographical location had an association with risk perception (p = 0.02 and 0.04 respectively).

Conclusion: Participants had good knowledge of viral transmission but poor symptom and risk perception scores. This could have implications for their health habits. However, proper education remains the most viable tool for bridging the existing gaps.

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Quick Response Code:

Introduction

The COVID-19 Pandemic is caused by the Severe Acute Respiratory Syndrome Coronavirus-2 (SARSCoV-2). It was first reported in Wuhan, China in 2019 before it later spread to other parts of the world in 2020.[1] Many countries have experienced several waves of the disease due to different variants of the SARSCoV-2 virus as a result of mutations.[2] The outbreak of SARSCoV-2 led to disruptions in health, economics, politics, and social activities across the world[3]. The initial rapid spread of COVID-19 around the world was largely due to the poor knowledge of the disease which also affected its risk perception by the populace.[3] As the knowledge of SARS-CoV-2 and the risks of contracting the infection became vastly abundant, the novel coronavirus was renamed SARSCoV-2 by the World Health Organization (WHO) and guidelines and information regarding the pandemic were disseminated.

Over 527 million cases of COVID-19 have been confirmed worldwide and over six million deaths due to the COVID-19 pandemic have been recorded as of 1st June, 2022.[4] Since the first reported case of COVID-19 in Nigeria in February 2020, four waves of the pandemic have been recorded in Nigeria with 256,028 confirmed cases and 3,143 deaths recorded as at 1st June, 2022.[5]

The knowledge of COVID-19's origin and spread across the world, as well as its pathophysiology (entry, incubation, symptoms, and prognosis) through information dissemination, helps the populace to understand the disease and the risks associated with contracting it.[2,3] Also, risk perception of COVID-19 influences the behavior of individuals toward acceptance of vaccines for COVID-19 and other precautionary measures.[3] Therefore, it is important to study the level of knowledge of COVID-19 and its risk perception by the populace.

There are a few studies already on knowledge and risk perception of COVID-19 in Nigeria with varying degrees of knowledge and perception of COVID-19 pandemic.[2,3] This study also focused on the knowledge and risk perception of COVID-19 among Nigerians. It is very imperative to assess the level of knowledge of COVID-19 as well as understand their risk perception of COVID-19 in order to help take informed decision by the Nigerian government in formulating relevant and efficient policies regarding prevention of COVID-19 spread.

The purpose of this study was to assess the knowledge and the factors associated with the perceived risk of contracting COVID-19 infection during the pandemic. We also explored some socio-demographic factors and vaccine acceptance related factors in relation with perceived risk of being infected with COVID-19.

Methodology

Study Area

This study was conducted across Nigeria, the most populous country in Africa, with an estimated population of about 206 million people.[6] Nigeria has 36 states, which are broadly divided into three ethnic regional blocs: Eastern, Northern, and Western Nigeria.

Study Design and participants

We conducted a cross-sectional study across Eastern, Northern, and Western Nigeria over a period of three months from November 2020 to January 2021. We used the open EpiR package (Emory) to generate the required minimum sample size of 340 for a population of one million and above.[7] We recruited 360 participants in total, 120 from each zone. Our recruitment was targeted at people in residential areas, corporate organizations, schools, recreational areas, faith-based institutions, and marketplaces. We did this by using Google Maps to list the sites in two major states of each zone (north, west, and east). We then organized the list on Microsoft Excel version 16.54 (Microsoft Corp., Redmond, WA) and used the *Rand* function to randomize each site list, and then we selected two sites for the recruitment. For the institutions, we contacted the human resources or desk offices to grant permission to visit and interview eligible

participants in these sites. For the residential areas, we repeated the same. Microsoft Excel was used to randomize and select local government areas (counties) in the two states in each zone and residences to visit. Consenting individuals who were 18 years and older at the time of data collection were eligible to be included in the study. Our exclusion criteria were people below 18 years and those who did not fully understand the reason for the study even after our explanations.

Study Tool

Our data collection instrument was a pretested, self-administered questionnaire formulated from a similar study in the United States adapted to suit the Nigerian setting.[8] The questionnaire was divided into five sections comprising participants' socio-demographics, medical history, knowledge of COVID-19 (knowledge of viral transmission and infection symptoms), and risk perception on contracting COVID-19.

Scales of Measurement

Three multiple-choice questions (totalling 10 options) were asked to assess respondents' knowledge about the transmission of the COVID-19 virus. The scale was called the viral transmission knowledge scale (Cronbach's alpha = 0.62). A maximum score of 10 was achievable. These responses had reverse meaning; higher scores reflected poorer knowledge of viral transmission.

We assessed the knowledge of participants on 11 common symptoms and signs of COVID-19 culled from the Nigeria Centre for Disease Control (NCDC).[9] This formed the symptom knowledge scale (Cronbach's alpha = 0.86). A maximum score of 19 was attainable and higher scores depicted better knowledge of features of the disease.

A previous study had assessed COVID-19 risk perception among adults in the United States using a "perceived risk perception scale" (Cronbach's alpha = 0.72).[8] This risk scale was validated for the study and locally adapted. Thereafter, respondents completed the validated perceived risk perception scale (Cronbach's alpha = 0.63), which had 10 survey items (five-point Likert scale: 0 = strongly disagree/disagree/neutral; 1 = agree/strongly agree). The scoring of the perceived risk perception scale, which ranges from 0 to 10, was calculated by summing the participants' responses of "Agree" and "Strongly Agree" to 10 survey items. The greater the number a participant receives on this scale, the greater their perceived risk of COVID-19.

Data Analysis

The Statistical Package for Social Sciences (SPSS, Inc. Chicago Illinois USA) version 22 was used for data analysis. We reviewed and cleaned the data before the analysis. Variables were summarized using simple frequencies, proportions, and percentages. Chi-square test was used to assess associations between perceived risk of contracting COVID-19 infection and socio-demographic factors, knowledge of viral transmission and COVID-19 prevention measures. The 95% confidence interval and a significance level set at $p < 0.05$ was adopted.

Ethical Consideration

The study was approved by the Ethical Committee of the Research and Statistics Department of Katsina State Ministry of Health, Nigeria with the study protocol code: MOH/ADM/SUB/1152/1/16. Written informed consent was obtained from each study participant before the questionnaire was administered.

Results

There were 189 (52.8%) females study participants and 171 (47.8%) participants had age less than 30 years. Majority (74.9%) of the study respondents had tertiary level of education just as most (79.3%) of them were Christians. Table 1 summarizes socio-demographic factors assessed in this study.

Table 1: Sociodemographic factors of study participants.

Variable	Frequency (N=358)	Percentage (%)
Sex		
Male	169	47.2
Female	189	52.8
Age group (years)		
< 30	171	47.8
30 -49	100	27.9
40 -49	50	14
50 -59	27	7.5
60+	10	2.8
Level of Education		
No formal	14	3.9
Secondary or less	76	21.2
Tertiary	268	74.9
Religion		
Christianity	284	79.3
Islam	73	20.4
Others	1	3
Geographical Location by Region		
South	128	35.8
East	111	31
North	119	33.2

Table 2 is a representation of groups in terms of knowledge of viral transmission, knowledge of COVID-19 symptoms and COVID-19 risk perception. One hundred and eighty-nine (52.8) participants had poor perception of their risk of contracting COVID-19 whereas 223 (62.3%) participants had poor knowledge of COVID-19 symptoms.

Table 2: Showing the knowledge of viral transmission, symptom score and risk perception of COVID-19

	Frequency (N/%)		
	Good	**Poor**	**Cumulative (N/%)**
Knowledge of viral transmission	326 (91.0)	32 (8.9)	358 (100%)
Symptom score	135 (37.7)	223 (62.3)	358 (100%)
Risk Perception	169 (47.2)	189 (52.8)	358 (100%)

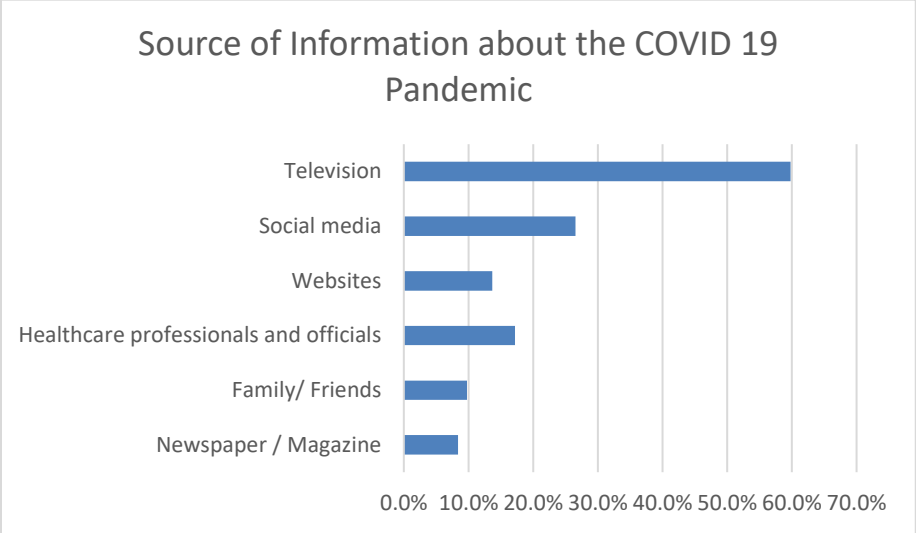

Figure 1: Sources of COVID-19 related information among respondents
As show in figure 1, television was the most common source of information about the corona virus infection to the study participants.

Factors associated with risk perception.
The association between level of education and risk perception was statistically significant (p-value 0.02), in that having secondary education or less was significantly associated with poor risk perception. In addition, the geographical location of the study participants was statistically associated with poor risk perception (p-value 0.04). Other details of the associations assessed are summarized in table 3.

Table 3: Association between risk perception and socio-demographic characteristics, knowledge of viral transmission and COVID-19 symptom score of the participants.

Variable	**Score**		**Chi square value**	**p-value**
	Poor (N/%)	Good (N/%)		
Sex				
Male	92 (54.4)	77 (45.6)	0.35	0.56
Female	97 (51.3)	92 (48.7)		
Age group (years)				
< 30	85 (49.7)	86 (50.3)	3.15	0.53
30 -49	57 (57)	43 (43)		
40 -49	26 (52)	24 (48)		
50 -59	17 (63)	10 (37)		
60+	5 (40)	6 (60)		
Level of Education				
No formal	7 (50)	7 (50)	7.94	0.02*
Secondary or less	51 (67.1)	25 (32.9)		
Tertiary	131 (48.9)	137 (51.1)		
Religion				
Christianity	156 (54.9)	128 (45.1)	3.76	0.15
Islam	32 (43.8)	41 (56.2)		
Others	1 (100)	0 (0)		
Geographical Location by Region				
West	70 (54.7)	58 (45.3)	6.69	0.04*
East	67 (60.4)	44 (39.6)		
North	52 (43.7)	67 (56.3)		

Viral transmission knowledge				
Poor	15 (46.9)	17 (53.1)	0.49	0.48
Good	174 (53.4)	152 (46.6)		
COVID-19 Symptom Knowledge				
Poor	119 (53.4)	104 (46.6)	0.08	0.78
Good	70 (51.9)	65 (48.1)		

*p value significant < 0.05

Discussion

This was a cross sectional study that assessed the knowledge of COVID-19 viral transmission, symptoms of the viral infection, associated factors, and perceived risks of COVID-19 infection among a nationally representative sample of Nigerians. Majority of participants (91%) scored well in terms of knowledge of the transmission of the COVID-19 virus. This is similar to another study conducted in Nigeria which indicated that 90.3% of study participants had good knowledge of the virus.[2] It shows that the health promotional campaign about COVID-19 embarked on by the Nigerian Ministry of Health at the peak of the outbreak was effective in educating Nigerians about the viral transmission. The good knowledge of the viral transmission reported may also be attributed to the prevalent sources of health information among Nigerians during the pandemic. Specifically, our study sample reported television (59.8%) and social media (36.5%) as the main sources of health-related information regarding COVID-19 infection. This is most likely due to the media (conventional and social) publicity the disease had during the period. The word corona virus was quite popular on the lips of all to the extent that it altered the livelihood of people due to the stringent movement restrictions causing people to predominantly stay indoors watching news, jingles and other programs from the various media outlets as well surfing the internet to access COVID-19 related information. Furthermore, we report a relatively young group of study participants about half of whom were < 30 years old and majority (75%) had tertiary education. Age and level of education are important factors that influence health-related information, and these could have played some roles in the knowledge of participants concerning COVID-19 viral transmission.

From our study, knowledge of viral transmission and knowledge of symptoms of COVID infection had no association with risk perception ($p>0.05$) with less than half (47%) of our study sample reporting good risk perception score. This is close to figures reported by another nationwide study conducted in Nigeria at 55% but differs from another study in Ondo state that reported high risk perception scores .[10,11] This could be attributed to the fact that the Ondo study is not representative of the overall Nigerian population. A possible reason for the below average risk perception is misinformation which was a major issue faced by health workers during the peak of the pandemic (during the lockdowns), from the barrage of conspiracies, wrong online narratives, and the different unscientific perspectives.[12-14] These online sources did not provide technical depth about the virus. Also, the distrust from the masses towards the government may have contributed to this poor score.[15,16] These (misinformation and mistrust) could also explain some challenges experienced in the field during data collection where many people who already formed an impression regarding COVID–19 were not willing to listen to the researchers and their assistants who administered questionnaires.

A seemingly good knowledge of the disease determines the attitude and practice of an individual in terms of prevention and treatment. Though there was acceptable knowledge score in this study, it did not reflect in the symptom and risk perception score. This suggest that merely identifying it as a viral disease and its mode of infection did not guarantee knowledge of how it causes illness and ways of preventing it, else the level of acceptance previously reported by other studies[1,2] would have shown a level of vaccine acceptance comparable to the high knowledge score. However, only 66% of people were willing to accept a vaccine if well informed by a health professional.[1]

The level of education and geographical location had significant effect on the risk perception of the COVID-19 disease ($p=0.02$, $p=0.04$) respectively. This corresponded with an earlier report where location (residing

in the north) and educational status were found to have positive association with willingness to accept corona virus vaccine.[1]

The issue of poor risk perception and attitude towards diseases in Nigeria does not only apply to COVID–19. It is the reason why there is a high burden of disability from many diseases in Nigeria. Though this work focused on COVID-19, it highlights the need for massive community-based approach for disease prevention in our environment. Stakeholders should not relent in their efforts to educate the society on the right disease prevention practices.

Conclusion

This study demonstrates an apparent good knowledge of corona virus in the study population, which did not translate into good symptom and risk perception score. There was a significant association of risk perception with level of education and residing in the north. Correct mass education remains the reliable way of bridging the knowledge and perception gap related to the COVID–19 pandemic.

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