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Knowledge and Acceptance of COVID-19 vaccine by Young Adults in a Selected Local Government in Oyo State, Nigeria

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Abstract

Hesitancy to accept the COVID-19 vaccine has been noted as a public health threat. Despite the benefits of the COVID-19 vaccine, young adults have remained hesitant to accept the vaccine due to insufficient knowledge. This study assessed the knowledge and acceptance of COVID-19 vaccine by young adults in Ibadan North-East local government in Oyo State, Nigeria. The research adopted a cross-sectional study design. The two-stage sampling technique was employed to select 6 wards from the local government. The purposive sampling technique and Cochran formula were used to select 422 young adults. A validated self-administered questionnaire was utilized for data collection; return rate was 90%. Data was analyzed using descriptive statistics, Pearson's correlation and linear regression at $p < 0.05$. The mean age of respondents was 24.06 ± 3.51 years. Participants had mean scores of 8.17 ± 1.92 and 5.55 ± 2.06 respectively computed for level of knowledge and acceptance of COVID-19 vaccine. Majority of respondents had a high level of knowledge (340; 88.5%) and high level of acceptance of COVID-19 vaccine (271; 70.6%). There was a significant relationship between knowledge ($r = 0.352$) and acceptance of COVID-19 vaccine ($p < 0.05$). Knowledge was a significant predictor variable of acceptance of COVID-19 vaccine ($\beta = .352$, $t = 7.357$, $p < 0.01$ There is an association between the knowledge regarding the vaccine and acceptance of the COVID-19 vaccine. Thus, vaccine education should be offered in order to sustain the knowledge regarding the vaccine and promote acceptance.

Keywords: Knowledge, Perception, Acceptance, COVID-19, Vaccine.

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Introduction

Vaccination has been recognized as one of the greatest public health interventions in the world, preventing 2-3 million annual deaths from vaccine-preventable diseases (Wang, Liang, Zhang and Yang, 2020; World Health Organization, 2016). Globally, vaccination has been recognized for its undeniable capacity of improving health outcomes (Rodrigues and Plotkin, 2020).

The detection of the coronavirus first occurred in Wuhan (the capital of China) in December 2019 (Ngwewondo et al., 2020) and on January 30, 2020, the disease was formally declared to be a public health emergency which had serious implications for global health and required instant international response and action (Nwagbara et al., 2021). The first case of the coronavirus disease was reported in Nigeria on the 27th of February, 2019. The outbreak of this disease negatively affected and changed the lives of several individuals and sectors of human development. This negative change resulted in unemployment, climate change, economic recession, lower returns for savings and rising inequality.

In order to cope with living with this virus, various measures were designed and implemented. These measures included the closure of educational establishments, closure of airports, a lockdown order and restriction of public gatherings. Public awareness was increased through key communication strategies in order to inform/alert Nigerians regarding the virus (Hassan, Hassan and Muhammad, 2022).

Importantly, the COVID-19 vaccine's development and manufacturing has been occurring at a swift rate (Yap et al., 2021) in order to put an end to the COVID-19 virus caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). In Nigeria, the first vaccination started on the 5th of March, 2021. A total of 31,391,732 vaccine doses had been administered as 27 March 2022 with over 21 million persons vaccinated with at least one dose and over 776,000 persons have received booster or additional dose (World Health Organization, 2022). As of April 7, 2022, 9.57million individuals have been fully vaccinated in Nigeria and this accounts for 4.6% of the total population (Our World in Data, 2022).

According to literature, young adults are individuals that believe that they are less susceptible to harm or adverse outcomes compared to others and this leads to them misjudging exposure to hazards (Weinstein, 1980; Popova and Halpern-Felsher, 2016). Despite the stated and proven benefits of the vaccine, young adults are still hesitant and unwilling to accept the COVID-19 vaccine and this has hindered the achievement of herd immunity (Afifi et al., 2021). Herd immunity is important as it results in the protection of the unvaccinated, who may be too young, too immunodepressed to receive vaccines or too vulnerable (Rodrigues and Plotkin, 2020).

Studies have shown that COVID-19 vaccine acceptance is significantly impacted by the knowledge of the COVID-19 vaccine (Bianco, Mascaro, Zucco & Pavia, 2019). Another study by Galle et al., (2021), showed a correlation between knowledge and vaccine acceptance. Furthermore, Al-Mohaithef and Padhi, (2020), revealed that there was higher COVID-19 vaccine acceptance among older/elderly individuals than young adults because they are more health-conscious and have a higher risk of contracting the severe form of COVID-19 which could lead to death. Understanding the knowledge regarding the COVID-19 vaccine which is a factor that influences the acceptance of the COVID-19 vaccine by young adults is essential for targeting health promotion interventions. Thus, this study sought to investigate the knowledge and acceptance of COVID-19 vaccine among young adults in a selected local government in Oyo State, Nigeria.

Methodology

Study Design

The study employed a cross sectional survey design for the collection of data in 6 local governments in Ibadan North-East, Oyo State, Nigeria. Cochran formula was utilized to derive a sample of 422 respondents who were selected using the purposive sampling technique.

Inclusion Criteria

Participants who were eligible for this study were young adults between the ages of 18-30 who were fit to respond clearly and had consented to participating in the study.

Exclusion Criteria

Participants that were excluded from this study were young adults who were not fit to respond clearly and were unwilling to participate in the study.

Research Instrument and Data Collection

A validated, reliable and well-structured questionnaire (self-administered) was used for the collection of data from April 26, 2022 to May 4, 2022. The questionnaire was pretested to ensure its reliability.

Data Analyses

Data derived from respondents in this study was coded and analyzed using version 25.0 of the IBM SPSS statistical software. Descriptive and Inferential statistics were used in the analysis of responses.

Study Variables

The independent variable used in this study was Knowledge while the dependent variable was Acceptance of COVID-19 vaccine.

Ethical Clearance (311/22)

Ethical clearance was obtained from Babcock University Health and Research Ethics Committee (BUHREC) to ensure participants' safety and regulate the performed procedure.

Results

Sociodemographic Characteristics of Respondents

The demographic distribution of the young adults as shown in Table 1 indicates that the mean age of respondents was 24.06 ± 3.51. Over half of the respondents 246 (64.1%) were between ages 18 and 25 years, 92(24%) were aged 26 to 28 years and 46 (12%) young adults were between the ages 29 to 30. Majority of the young adults were females 213 (55.5%) and Christians 224 (58.3%). A substantial number of the respondents 304 (79.2%) were Yoruba while 51 (13.3%) and 29 (7.6%) were Igbos and Hausas respectively. Lastly, the finding revealed 222 (57.8%) of the young adults attained secondary education**.**

Knowledge regarding COVID-19 vaccine

Table 2 revealed that almost all respondents 365 (95.1%) knew that there is a vaccine now available for COVID-19 infection. Most of the respondents (257 (66.9%) disagreed that the COVID-19 vaccine is not effective in preventing COVID-19. Two hundred and seventy-nine (72.7%) respondents knew that the COVID-19 infection could be prevented with the COVID-19 vaccine. Over half of the respondents (324; 84.4%). stated that the COVID-19 vaccine was not being promoted for monetary gains. Likewise, 323 (84.1%) did not agree that COVID-19 vaccine could cause unplanned future events. Three hundred and twenty-six (84.9%) young adults indicated that the vaccine does more good than harm and 322 (83.9%) agreed that the COVID-19 vaccine was safe even if it was developed too quickly. Majority of the respondents (318; 82.8%) knew that it is necessary for young adults to take the COVID-19 vaccine to protect themselves from COVID-19 disease progression. More than half of the respondents 323 (84.1%) affirmed that the vaccine was not fake and 299 (77.9%) of the respondents agreed that the COVID-19 vaccine cannot cause serious side effects.

Table 1: Distribution of sociodemographic characteristics of respondents

			Percentage	Mean ± S.D
Age of Respondents	18 years	28	7.3	
	19 years	25	6.5	
	20 years	20	5.2	
	21 years	26	6.8	
	22 years	34	8.9	
	23 years	37	9.6	24.06 ± 3.51
	24 years	31	8.1	
	25 years	45	11.7	
	26 years	26	6.8	
	27 years	33	8.6	
	28 years	33	8.6	
	29 years	25	6.5	
	30 years	21	5.5	
Gender	Female	213	55.5	
	Male	171	44.5	
Religion	Christianity	224	58.3	
	Islam	154	40.1	
	Traditional	6	1.6	
Ethnicity	Yoruba	304	79.2	
	Igbo	51	13.3	
	Hausa	29	7.6	

Education	Primary	12	3.1
	Secondary	150	39.1
	Tertiary	222	57.8

Table 2: Frequency Distribution of Knowledge responses regarding the COVID-19 vaccine

	Frequency (N)	**Percentage (%)**	**Frequency (N)**	**Percentage (%)**
Is there a vaccine now available for COVID-19 infection	365	95.1	19	4.9
COVID-19 vaccine is not effective in preventing COVID-19	127	33.1	257	66.9
COVID-19 infection can be prevented with the COVID-19 vaccine	279	72.7	105	27.3
The COVID-19 vaccine is being promoted for monetary gains	60	15.6	324	84.4
The COVID-19 vaccine can cause unplanned future effects	61	15.9	323	84.1
The COVID-19 vaccine does more harm than good	58	15.1	326	84.9
The COVID-19 vaccine is not safe because it was developed too quickly	62	16.1	322	83.9
It is necessary for young adults to take the COVID-19 vaccine to protect themselves from COVID-19 disease progression	318	82.8	66	17.2
The COVID-19 vaccine is fake	61	15.9	323	84.1
The COVID-19 vaccine cannot cause serious side effects	299	77.9	85	22.1

Acceptance of the COVID-19 vaccine

Table 3 revealed the level of acceptance of COVID-19 by young adults in a selected local government in Oyo State. The distribution of responses showed that 284 (74.0%) of the young adults stated that they would accept the COVID-19 vaccine's first dose without hesitation while more than one-third 142 (37.0%) of the respondents reported that they would consider accepting the second dose. Concerning the acceptance of more vaccines in the future against possible infection with COVID-19, 153 (39.8%) of the young adults revealed that they would accept without hesitation while 159 (41.4%) stated that they would consider and 72 (18.8%) reported that they would definitely not accept. Only one hundred and fifty-one respondents (39.3%) affirmed that they would accept the vaccine even if they had to pay for it.

Computation of Variables

Table 4 showed the summary of the descriptive statistics computed for the variables among respondents in the study where the mean ± SD for the level of knowledge and acceptance among respondents in this study was 8.17 ± 1.92 and 5.55 ± 2.06 respectively. The mean score of the knowledge regarding the COVID-19 vaccine (8.17) and acceptance of the COVID-19 vaccine (5.55) showed that the respondents had a high level of knowledge and acceptance.

Relationship between Variables

The finding of the relationship from Pearson's correlation between knowledge and COVID-19 vaccine acceptance showed a small, positive and significant relationship between knowledge (r = 0.351; p = <0.05) and COVID-19 vaccine acceptance (Table 5). The positive relationship indicated that both variables moved in the same direction (when knowledge regarding the COVID-19 vaccine increases, the acceptance of the COVID-19 vaccine also increases).

Table 3: Frequency Distribution of COVID-19 vaccine acceptance responses

	Accept Without Hesitation		I Will Consider		Definitely Not Accept	
	Frequency (N)	**Percentage (%)**	**Frequency (N)**	**Percentage (%)**	**Frequency (N)**	**Percentage (%)**
Now that there is a COVID-19 vaccine, I will accept the first dose	284	74.0	81	21.1	19	4.9
Now that the COVID-19 vaccine requires multiple doses, would you accept the second dose?	224	58.3	142	37.0	18	4.7
In the future, if there is a requirement to accept more vaccines against possible infection with COVID-19, would you accept?	153	39.8	159	41.4	72	18.8
I will accept the COVID-19 vaccine even if I have to pay to get it	151	39.3	125	32.6	108	28.1

Table 4: Computed Descriptive Statistics for Variables

Variables	Max. Score on Reference Scale	Percentage (%)	Mean	S.D
Knowledge	10	88.5	8.17	1.92
Acceptance	8	70.6	5.55	2.06

Table 5: Relationship between Knowledge and Acceptance of COVID-19 vaccine

Variable	N	df	R	P
Knowledge of COVID-19 vaccine	384	383	0.351	0.000

Table 6 showed that knowledge (β = .352, t = 7.357, p =0.000) significantly predicted COVID-19 vaccine acceptance. This indicates that an elevation in knowledge would result in an elevation in the acceptance of the COVID-19 vaccine.

Table 6: Linear Regression analysis of Knowledge and Acceptance of COVID-19 vaccine

				R^2 = 0.122 F = 54.132		95% CI	
Variable	**B**	**S.E**	**Beta Coefficient (β)**	**P-value**	**T-test**	**Lower**	**Upper**
Knowledge	.378	.051	.352	0.000	7.357	.277	.479

Discussion

This study was undertaken to provide better explanations and understanding of the link between the knowledge regarding the COVID-19 vaccine and the acceptance of COVID-19 vaccine by young adults in Ibadan North-East local government, Oyo State, Nigeria. This study is of substantial value as no such study has been published in this part of the world. The variables measured in the study were the knowledge about the COVID-19 vaccine and COVID-19 vaccine acceptance among young adults. In this study, it was hypothesized that knowledge regarding the COVID-19 vaccine would be significantly correlated with COVID-19 vaccine acceptance.

Findings of this study showed that participants (88.5%) demonstrated a high level of knowledge with regards to the COVID vaccine. This result is similar to the findings from a study by (Adetayo, Sanni and Aborisade, 2021), where it was reported that the respondents were knowledgeable about the COVID-19 vaccine. However, this is contrary to the finding by (Matthew et al., 2022), who confirmed in their study that there was inadequate knowledge among respondents concerning the COVID-19 vaccine. The high level of knowledge reported in this study could be ascribed to the participants' relatively high level of secondary and tertiary education and young adults' access to more sources of health information.

Also, this study revealed that majority of the respondents 271 (70.6%) was willing to accept the COVID-19 vaccine. This finding is strongly supported by findings from the studies of (Malik, McFadden, Elharake and Omer, 2020; Eze et al., 2021). In their studies, they revealed that most of their respondents would accept a COVID-19 vaccine. This high level of acceptance could be due to the high level of knowledge among the participants in regard to the COVID-19 vaccine as majority of the respondents knew that the COVID-19 vaccine is safe and efficacious in preventing COVID-19/COVID-19 disease progression. In contrast to this, findings by (Adetayo, Sanni and Aborisade, 2021), showed that the level of acceptance of the COVID-19 vaccine was low

as there was skepticism about the vaccine's potential adverse effects among participants.

Results from the linear regression analysis in this study revealed that knowledge regarding the COVID-19 vaccine was a significant predictor of COVID-19 vaccine acceptance. This correlates with the results of a study by (Hanna et al., 2022), who found that knowledge was a major predictor of COVID-19 vaccine acceptability.

Additionally, the results of the Pearson's correlation analysis in this study revealed a significant relationship between knowledge and COVID-19 vaccine acceptance. This finding is in line with the findings of (Galle et al., 2021), who revealed that knowledge of the COVID-19 vaccine had a significant relationship with COVID-19 vaccine acceptance. This significant relationship means that promoting acceptance of the COVID-19 vaccine would require promoting knowledge regarding the vaccine. Hence, this recapitulates the importance of developing and targeting strategies/interventions to promote knowledge regarding the vaccine in order to promote COVID-19 vaccine acceptance.

This study offers a picture of vaccine acceptance and knowledge among young adults. Findings from this study revealed that COVID-19 vaccine acceptance is dependent on the knowledge of young adults regarding the vaccine and this underlines the role/impact of correct information in promoting vaccine acceptance.

Conclusion

Acceptance of the COVID-19 vaccine has been affirmed to rely on the knowledge regarding the vaccine. It can be concluded that knowledge regarding the vaccine which is a key factor linked with COVID-19 vaccine acceptance should be sustained through targeted public health efforts/interventions.

Future Research

Further research should be carried out on the determinants of the acceptance of COVID-19 in order to develop necessary strategies/interventions where necessary.

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