

RESEARCH ARTICLE

Knowledge and Acceptance of Covid-19 Vaccine Among Adult Residents of a Rural Community in Kwara State, Nigeria

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Abstract

Background: The rapid production and approval for the use of the Covid-19 vaccine has attracted a lot of skepticism leading to hesitancy in taking the vaccine among many people globally, and in sub-Saharan Africa in particular.

Objective: This study aimed at determining the reasons behind the non-acceptance or outright refusal of the Covid-19 vaccine by the people of Ogbondoroko, a rural community in Kwara State, Nigeria.

Methods: Descriptive cross-sectional study design was employed and 568 respondents were selected using multistage sampling. IBM Statistical Package for Social Sciences was used for data analysis. Test of association was done using Chi-square at a significance level of $P < 0.05$ at a 95% confidence.

Results: The mean age of the respondents was 48 ± 18.29 years and there was a female preponderance of 408 (71.9%). Majority of the respondents were married (82%); are mostly artisans and earn less than 50 US dollars per month. About half (49.0%) of the respondents have no formal education. Most of the respondents 544 (95.8%) heard about the Covid-19 vaccine over the radio/television 260 (47.8%) and from health workers 233 (42.8%). Most of the respondents 481 (88.4%) were willing to receive the vaccine. Factors such as age, marital status, employment status, and income of the respondents were significantly associated with awareness of Covid-19 vaccine among them ($p \leq 0.05$).

Conclusion: There was a high level of awareness and acceptance of Covid-19 vaccine amongst rural dwellers in the study area. The use of audience-targeted mass media should be upheld in the dissemination of health messages in the study area in order to continue to achieve the desired results.

Keywords: Knowledge, Covid-19 vaccine, North-central Nigeria, Acceptance

INTRODUCTION

The development of vaccines is a breakthrough in medical advancement; it is perhaps the greatest breakthrough of all time. Its importance and efficacy in disease control and eradication are renowned the world over. The most recent test of the ability of vaccine is in the control of the Covid-19 pandemic. Various types of the Covid-19 vaccines were produced and millions of doses were administered worldwide (Tregoning et al., 2020). Their efficacy has also

been confirmed by the near return to normalcy in the way people interact after the lockdown and restriction to gathering observed for the greater parts of the year 2020. Like it was experienced in most periods around the release of vaccines, skepticism arose as regards the safety and efficacy of the vaccines and their overall necessity to have been produced in the first place. People's hesitancy and unwillingness to spontaneously accept vaccination have been a major hindrance to the development of herd effect and

thus the non-achievement of a desirable level of control of the dreaded disease(Dror et al., 2020). This unwillingness to receive jabs of the Covid-19 vaccine is particularly high in sub-Saharan Africa.

The resurgence and the severity of infection of the waves of the disease have been attributed to poor uptake of the vaccine (Dror et al., 2020). Nigeria, like most other less developed countries, lacks the economic strength to produce and procure quantities of vaccines that will be sufficient for building an acceptable herd immunity for her citizenry. A high percentage of the vaccines she gets are donated by the rich economies of the world. This is, however, a tip compared to the required quantity by the populace. The National Primary Healthcare Development Agency (NPHCDA), which is the custodian of vaccine management and administration, rolled out Covid-19 vaccination in four phases. The experience it garnered in the first phase was a pointer to the poor vaccine acceptance and compliance, which if continued, spells a catastrophic wastage of scarce resources.

This study was premised on the need to have a robust understanding of the reasons why the populace was hesitant or refused vaccination outright. This is necessary to design a robust strategy to reverse the trend of Covid-19 vaccine hesitancy and rejection. This same strategy was adopted in enhancing routine immunization (RI) uptake in Nigeria where prior research on reasons for low RI uptake was sought and intervention proffered(Garba et al., 2019). Therefore, this study was carried out to determine the knowledge and acceptance of Covid-19 vaccines among residents of the Ogbondoroko community in Kwara State, Nigeria.

MATERIALS AND METHODS

Kwara is one of the 36 states in Nigeria and has a projected population of 3,586,485 from the 2006 national census(National Population Commission, 2006). It is made up of 16 Local Government Areas (LGAs), each belonging to one of the three geopolitical zones of Kwara Central, Kwara North, and Kwara South. The study area, Ogbondoroko ward, is located in Asa LGA of Kwara Central. The LGA has a projected population of 196,982 with Ogbondoroko having 9,481 inhabitants(National Population Commission, 2006). One Primary Healthcare Centre in the community caters to the health needs of the people.

The study was descriptive cross-sectional in design and was carried out in October 2021. The study population consists of all adult residents of the community who are 18 years and

above. Pregnant women were, however, excluded. The sample size was calculated using the Rao soft sample size calculator (Raosoft I., 2020). The minimum sample size determined was 360. However, a sample size of 568 was used to increase the power of the study. An adapted semi-structured interviewer-administered questionnaire was used for data collection with the help of trained research assistants. The questionnaire was subdivided into 3 sections namely: sections A, B, and C. Section A contains information on the socio-demographic characteristics of the respondents. Section B assesses respondents' knowledge of Covid-19, while Section C seeks information on respondents' perception of Covid -19 and their acceptance of Covid-19 vaccination. The questionnaire was pre-tested in Ilorin East LGA using 10% of the sample size. The pre-testing helped to identify gaps in some of the questions and necessary amendments were made before the final administration of the tool.

With regards to the knowledge of the importance of Covid-19 vaccination, a score of one point was assigned to every correct response and zero for every incorrect response. The total score for each respondent was converted to percentages and graded as poor knowledge (0-49.9%), fair knowledge (50-74.9%) and good knowledge (75% and above). Respondents' perception of Covid-19 was scored by assessing the respondents' belief about vaccine safety and efficacy and their general attitude and trust. The total score for each respondent was converted to percentages and graded as: poor perception (0-49.9%), fair perception (50-74.9%), and good perception (75% and above).

The data was cleansed, edited and entered into a Personal Computer. It was analyzed using IBM Statistical Package for Social Sciences software version 25 for windows. Double data entry was done. Variables were summarized in percentages, tables, charts, mean and standard deviation. A confidence level of 95% was used and a *P-value* of <0.05 was considered statistically significant.

Ethical approval to conduct this study was obtained from the Ethics Review Committee of Kwara State Ministry of Health (with approval ID of ERC/MOH/2021/9/002). Written informed consent was sought from the respondents before the administration of the questionnaire. The aim and benefits of the study were also explained to the participants. All the information provided by the participants was treated with the utmost confidentiality.

RESULTS

- The ages of the respondents ranged from 20 to 86 years. Their mean age was 48 ± 18.29 years. Most of the respondents fall within the elderly age group 194 (34.2%) as shown in Table 1. There was a female preponderance of 408 (71.9%). A vast majority of the respondents, accounting for 82%, were married while 15% were widowed. In terms of religion, most of the respondents 535 (94.2%) were Muslims. Almost all the respondents reside in rural settlement 529 (93.1%); they were mostly artisans, traders, or farmers with about two-thirds of them earning less than 20,000 naira (50 USD) per month as shown in Table 1.

Almost half (49.0 %) of the respondents have no formal education while 17%, 18%, and 16% attained primary, secondary, and tertiary levels of education respectively as shown in Figure 1.

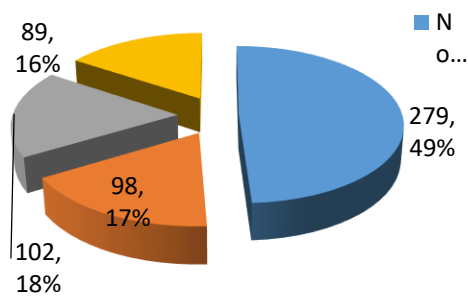


Figure 1: Level of Education of the Respondents

Most of respondents 544 (95.8%) had heard about the Covid-19 vaccine before and their most common sources of awareness were the radio/television 260 (47.8%) and during health talks 233 (42.8%) delivered by health workers, Table 2. Almost all the respondents 535 (98.3%) were aware that the vaccine is locally available in the State, most of them could not remember the names of the available Covid-19 vaccines as shown in Table 2.

Table 3 presents the respondents' perception of Covid-19 vaccination. Some 258 (45.4%) of the respondents believed that a prayer can protect them from being infected while about a third 183 (32.2%) of the respondents submitted that they will accept the vaccine, if their religious leaders encourage them to do so. About half 298 (52.5%) of the respondents admitted they would take the vaccine if it is brought to their doorstep. Although more than half 341

(60.0%) of the respondents said they would take the vaccine if it is made compulsory, more than two-thirds 400 (70.4%) of the respondents would only accept the vaccine, if it is free of side effects.

Table 1: Socio-demographic Characteristics of the Respondents

Variables	Frequency (%)
Age Groups	
< 30	111 (19.5)
30 – 39	78 (13.7)
40 – 49	101 (17.8)
50 – 59	84 (14.8)
60 – 69	80 (14.1)
≥ 70	114 (20.1)
Mean ± SD	48 ± 18.29
Gender	
Male	160 (28.2)
Female	408 (71.8)
Marital Status	
Single	9 (1.6)
Married	471 (82.9)
Separated	9 (1.6)
Widowed	79 (13.9)
Ethnicity	
Yoruba	524 (92.3)
Others	44 (7.7)
Religion	
Christianity	33 (5.8)
Islam	535 (94.2)
Employment Status	
Employed	463 (81.5)
Unemployed	105 (18.5)
Resident	
Rural	529 (93.1)
Urban	39 (6.9)
Monthly Income ('000)	
< 20	379 (66.7)
20 – 50	130 (22.9)
> 50 – 100	50 (8.8)
> 100	9 (1.6)

Most of the respondents 490 (90.1%) believed the vaccine is safe, while 499 (91.7%) felt that the vaccine should be made compulsory because it prevents the illness (14.0%) and because it is safe (18.6%) among other reasons, as presented in Table 4. More than three-quarters of the respondents 481

(88.4%) were willing to receive the vaccine as shown in Table 4.

Table 2: Respondents’ Knowledge of the Covid-19 Vaccine

Variables	Frequency (%)
Awareness of the Covid-19 Vaccine	
Yes	544 (95.8)
No	24 (4.2)
Sources of Information n=544	
Social media	14 (2.6)
Internet	12 (2.2)
TV/Radio	260 (47.8)
Family and friends	172 (31.6)
Hospital	110 (20.2)
Newspaper	15 (2.8)
Health Talk	233 (42.8)
The Covid-19 vaccine offers protection against Covid-19 infection.	
Yes	499 (91.7)
No	15 (2.8)
I don’t know.	30 (5.5)
The Covid-19 vaccine is available in Kwara State	
Yes	535 (98.3)
No	9 (1.7)

As shown in the Table 5, factors such as age, marital status, employment status and income of the respondents were significantly associated with awareness of Covid-19 vaccination among them. In other words, respondents that were aged above 30 years, were single and employed with monthly earnings of more than twenty thousand naira were more aware of the Covid-19 vaccine than their counterparts ($p \leq 0.05$).

DISCUSSION

In this study, most respondents fell within the elderly age group (34.2%) and this might be because the study area was predominantly rural. Because most of the residents are of the older population, they may have younger children living outside their environs. The vast majority of the respondents were married (82%) and this finding is in keeping with that of Haque and her co-workers in Bangladesh where they had a turnout of 67.76% married respondents (Akiful Haque et al., 2021). It is also in consonance with the report of Haile et al

(Haile et al., 2022) where 67.2% of their study participants were married.

Table 3: Respondents’ Perception of Covid-19 Vaccine

Variables	Yes (%)	No (%)
I am too busy at work, no time for vaccination.	27 (4.8)	541 (95.2)
I will take it only when royal father takes it	222 (39.1)	346 (60.9)
I will take it only when it is free.	364 (64.1)	204 (35.9)
I will take it only when it is made compulsory.	341 (60.0)	227 (40.0)
I will take it only when it is given from house to house.	298 (52.5)	270 (47.5)
I will take it only when others take it without side effects.	400 (70.4)	168 (29.6)
Job puts one at risk of contracting COVID.	169 (29.8)	399 (70.2)
One is susceptible to COVID.	121 (21.3)	447 (78.7)
The vaccine should be given to healthcare workers and the elderly.	158 (27.8)	410 (72.2)
With or without the vaccine, one is immune.	123 (21.7)	445 (78.3)
I will take it only when religious leaders ask that we take it.	183 (32.2)	385 (67.8)
It is safe to gather for religious gatherings because the God will protect us.	190 (33.5)	378 (66.5)
COVID-19 is an act of God.	243 (42.8)	325 (57.2)
With prayers and scripture reading, one will not contract COVID.	258 (45.4)	310 (54.6)
If it is God’s wish for one to contract it, one will contract it.	161 (28.3)	407 (71.7)

As regards the sources of information about the Covid-19 vaccines, radio appeared to be the most common source of awareness reaching 45.8% percent among the respondents. This is not unexpected in a rural community where the majority are more likely to listen to mass media where information is passed in their native language. This same reason could account for the low proportion of respondents who gained information via newspapers, social media and the internet; since majority of them have no formal education and, therefore, might not be able to read or use

such technology. This study also discovered that another common source of information on Covid-19 vaccine was through health talks received from healthcare workers. This is quite reasonable since health educators and instructors often speak the local language of the people. This finding is similar to the report by El-elimat *et al* (El-Elimat et al., 2021) in which they highlighted that the most trusted source of information as pointed out by the respondents was the healthcare providers. Surprisingly, almost all the respondents 535 (98.3%) were aware that the Covid-19 vaccine was locally available in the State, though most of them could not remember the names of the available vaccines

Table 5: Association between Socio-demographic Variables and Awareness of Covid-19 Vaccine Among the Respondents

Variables	Aware of Covid-19 Vaccine		χ^2	p-value
	Yes (%)	No (%)		
Age Groups			34.548	0.001
< 30	105 (94.6)	6 (5.4)		
30 – above	439 (96.1.0)	18 (3.9)		
Marital Status			98.063 ^f	0.001
Single	9 (100.0)	0 (0.0)		
Ever Married	535 (95.7)	24 (4.3)		
Education Level			2.869	0.635
None	270 (96.8)	9 (3.2)		
At least Primary	274 (94.8)	15 (5.2)		
Employment Status			5.021 ^f	0.027
Employed	448 (96.8)	15 (3.2)		
Unemployed	96 (91.4)	9 (8.6)		
Resident			3.491 ^f	0.062
Rural	505 (95.5)	24 (4.5)		
Urban	39 (100.0)	0 (0.0)		
Monthly Income ('000)			32.920	0.001
< 20	361 (95.3)	18 (4.7)		
20 – above	183 (96.8)	6 (3.4)		
Sex			1.078	0.299
Male	515 (94.4)	9 (5.6)		
Female	393 (96.3)	15 (3.7)		

Furthermore, the vast majority of the population was willing to be vaccinated as long they would be enlightened. The majority of the population (88.4%) showed their willingness to accept the vaccine, if it was brought to their homes. Since the main objective of the vaccination is to achieve herd immunity, the above percentage is well enough for the 75% vaccination coverage to reach the herd immunity, though,

Table 4: Acceptance of Covid-19 Vaccine (n=544)

Variables	Frequency (%)
There is enough information to make one accept the vaccine.	
Yes	268 (49.3)
No	276 (50.7)
I need to consult a doctor before deciding to take it.	
Yes	210 (38.6)
No	334 (61.4)
The vaccine is safe.	
Yes	490 (90.1)
No	9 (1.7)
I don't know.	45 (8.3)
I am willing to take the vaccine.	
Yes	481 (88.4)
No	48 (8.8)
I don't know.	15 (2.8)
Reasons for not taking the vaccine n=48	
Side effects	The bad
Bad news about it	14 (29.2)
Others	13 (27.1)
The vaccine should be made compulsory.	
Yes	499 (91.7)
No	45 (8.3)
Reasons for making it compulsory n=499	
For benefits of all	27 (5.4)
For protection	70 (14.0)
It is safe.	93 (18.6)
It is necessary.	23 (4.6)
To avoid death	87 (17.4)
For protection	199 (39.9)
Reasons for not making it compulsory n=45	
Side effects	31 (68.9)
It causes sickness.	14 (31.1)

herd immunity will only be possible if there are enough vaccines to cover the hard-to-reach population as well. The study participants in this area showed an impressive positive disposition to the administration of the vaccine as respondents pointed out that their willingness to receive the vaccine was influenced by their royal fathers and religious leaders. This report is consistent with the works of Kalamet al (Kalam et al., 2021) and Olomofeet al (Olomofe et al., 2021) who reported a close association between vaccine acceptance and the influence of important personalities such as religious and community leaders. This study also suggests that certain adjustments such as enforcement of the vaccine would influence an extra 59.9% of the population to get vaccinated. Also, most respondents who had second thoughts about taking the vaccine revealed that rumors of side effects from previous partakers of the vaccine influenced their decisions.

This study discovers that factors such as age, marital status, employment status and income were significantly associated with awareness of Covid-19 vaccination among the respondents. In other words, respondents that are aged above 30 years, single, and employed with monthly earnings of more than twenty thousand naira were more aware of the Covid-19 vaccine than their older counterparts ($p \leq 0.05$). Similar trends were reported in previous studies by Kalamet al (Kalam et al., 2021) and Olomofeet al (Olomofe et al., 2021).

CONCLUSION

The study revealed that there was a high level of awareness and acceptance of the Covid-19 vaccine amongst rural dwellers in the study area. Information dissemination through the use of radios and health talks delivery in the local language might have contributed to the high level of awareness. Similarly, certain socio-demographic characteristics such as marital status, age, employment status, and income were significantly associated with awareness of Covid-19 vaccination among the respondents in the study area. The findings from this study reiterated the importance of effective information, education, and communication in the fight against vaccine hesitancy. The use of audience-targeted mass media should be upheld in the dissemination of health messages in the study area in order to keep achieving the desired results. Further researches would be required to determine the knowledge and acceptance of Covid-19 vaccine among older adults residing in urban areas and among other high-risk groups.

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AHA: contributed to conception and design; participated in data analysis and interpretation and wrote the final draft

ANS: contributed to conception and design, statistical analysis, and approved the final draft.

AOR: Took part in data collection, and statistical analysis, revised and approved the final draft.

IRM: Took part in data collection, and statistical analysis, revised and approved the final draft.

OF: Contributed to statistical analysis, revised and approved the final draft.

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AKA: Contributed to statistical analysis, revised and approved the final draft.

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