

COVID-19 VACCINATION READINESS AMONG WOMEN ATTENDING CHILDREN IMMUNIZATION CLINIC

¹BADEMOSI, A., ²IJERUH, O. Y., ³ALABI A.

¹Department of Community Medicine, College of Medical sciences, Rivers State University Rivers state, Nigeria

²Department of Radiology, Rivers State University Teaching Hospital.

³Department of Paediatrics, Rivers State University Teaching Hospital, Rivers State, Nigeria.

Abstract: An assessment of the willingness to receive the COVID-19 vaccine and associated perceptions of the vaccine was carried out among 282 nursing mothers attending the children immunization clinic of the Rivers State University Teaching Hospital. A structured questionnaire was used to collect demographic information, previous vaccination history, perception of COVID-19 vaccination and the willingness to receive the COVID-19 vaccine among the participants. Data analyses showed that the mean age of the participants was 30.8 ± 6.6 years. Of the 282, 47.2% were between 30 – 39 years, 42.9% of which were between 20 – 29 years and 10% were 40 years and above. The results showed that 92.9% of the respondents have heard of the COVID-19 vaccine, only 66% have ever received any other type of vaccine and 63.5% of the respondents were willing to receive the COVID-19 vaccine. Persons whom had received any other type of vaccine prior were 2.3 times (95% C.I: 1.4 – 3.9) more likely to receive the COVID-19 vaccine. There was no significant association between age groups, monthly income, residence, and religion with the willingness to receive the Covid-19 vaccine. However, there was a significant association ($p = 0.022$) between occupation(employed) and the willingness to receive Covid-19 vaccine, (81.25%) while the unemployed were the least proportion of individuals (50%) willing to be vaccinated. The most significant perceptions influencing the willingness to receive Covid-19 vaccine include among others that “coronavirus vaccinations should be mandatory”, concerns that the COVID-19 Vaccination could cause COVID-19 infection, experiencing side effects from Covid 19 vaccination. The study showed that at least 1 in every 2 women were willing to receive the COVID-19 vaccine. However, safety concerns and concerns of contracting the infection after vaccination have significant influence on the willingness to receive the vaccine. Adequate public health education on the safety and efficacy of the vaccine is recommended to improve vaccine uptake especially among nursing mothers.

Keywords: COVID-19, Vaccines, Nursing mothers, Perception, Willingness.

1. INTRODUCTION

The COVID-19 pandemic has emerged as a major concern for global public health and socioeconomic development. This is mainly due to its considerable health sector impact combined with the deleterious effects it has been associated with in societies and economies worldwide(1–3). As vaccines have been identified as a key intervention, it is necessary for governments to expedite actions in ensuring large-scale, equitable access and distribution of COVID-19 vaccine, so as to promote sustainable public health solutions(4). Several factors however exist which threaten the utilization of this important public health tool. Vaccine hesitancy has emerged as a global challenge and there is increasing worldwide concern about a general non-acceptance of vaccines(5). In developing health system capacities and strategies necessary to combat the pandemic, it is important to undertake a robust and comprehensive engagement with factors likely to enhance the uptake of COVID-19 vaccines. Currently these efforts are currently not effective, with anti-vaccination activists

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campaigning in multiple countries against the need for vaccines. Some of them even denying the existence of COVID-19(6,7). The misinformation being spread across various platforms has the potential to negatively influence the acceptance of the newly developed COVID-19 vaccines(8–10). The accelerated development of several COVID-19 vaccines has also heightened public anxieties and could further compromise acceptance of the new interventions(11–13). The pervasive misinformation alongside the associated vaccine hesitancy could limit the response to the current crisis as well as exacerbate relevant global public health risks. For instance, wide- spread misinformation in communities can prevent the attainment of relevant immunization uptake thresholds associated with herd immunity, thereby increasing the risk of outbreak of vaccine-preventable diseases(14–16). Another factor that has emerged as critical to vaccines' acceptability as well as to immunization implementation policies, is the willingness of the population to pay for the intervention. Evidence from extant literature identified that willingness to pay for vaccines was a critical indicator of public perception and demand(17–19). Thus, the introduction of a new vaccine may require investigating public willingness to pay for it. Willingness to pay for vaccination varies depending on vaccine type and severity of disease(20–22). The recognition of this important factor has therefore emerged as an invaluable decision-making tool for policymaking in vaccination and immunization(23,24). In reducing hesitancy and improving vaccine uptake, there is need for context-specific research explicitly aimed at identifying factors associated with the phenomenon(25,26). The study assessed the perception of the COVID-19 vaccine and willingness to receive the vaccine among nursing mothers attending the immunization clinic of the Rivers state University Teaching Hospital.

2. METHODS**2.1 Study Area**

This cross-sectional study was carried out at the Rivers State University Teaching Hospital (RSUTH) in Port Harcourt, Nigeria's South-South region. RSUTH is the Teaching Hospital of the College of Health Sciences, Rivers State University. The hospital is owned and funded by the Rivers State Government of Nigeria. It is situated in the heart of Port Harcourt, the capital of Rivers State, which has a population of 5,198,716 from the last national census conducted in 2006, making it the 6th most populous state in Nigeria. The hospital is a 700-bed capacity tertiary healthcare institution with multiple specialties and serves as a referral center for other hospitals within the state and neighboring states.

2.2 Study Population

A simple random sample of 282 women that attended the child immunization clinic of the study center were selected for the study.

2.3 Data Collection

A structured questionnaire was used to collect demographic information, vaccination history, perception of COVID-19 vaccine and willingness to receive the vaccine among the respondents.

2.4 Data Analyses

The data collected was analyzed at a 95% confidence interval using the SPSS v 25 software (IBM, USA). The data was presented in frequencies, percentages and averages as appropriate. The association of demographic information and previous vaccination history was assessed with the chi-square statistic and logistic regression respectively. Multiple logistic regression was used to assess the perception of COVID-19 vaccine and the willingness to receive the vaccine among the respondents.

2.5 Ethical Consideration

Ethical approval to carry out the study was obtained from the Research and Ethics committee of the Rivers State University Teaching Hospital. A written willing informed consent was also obtained from each participant prior to inclusion into the study.

3. RESULTS

Table 1 shows the demographic distribution of the study participants. Of the 282, 47.2% were between 30 – 39 years, 42.9% of which were between 20 – 29 years and 10% were 40 years and above. The mean age of the participants was 30.8 ± 6.6 years. Details on residence, religion, income level and occupation were also presented in the table.

Table 1: Demographic distribution of respondents

Variables	Frequency (n=282)	Percent (%)
Age-groups		
20 - 29	121	42.9
30 - 39	133	47.2
40 and above	25	9.9
Mean age ± SD	30.8 ± 6.6	
OCCUPATION		
Self-employed	134	47.5
Civil Servant	39	13.8
Private employment	70	24.8
Other	15	5.3
Unemployed	24	8.5
MONTHLY INCOME		
≤20,000	44	15.6
20,001 - 40,000	122	43.3
40,001 - 60,000	39	13.8
60,001 - 80,000	27	9.6
80,001 - 100,000	17	6
100,001 - 120,000	9	3.2
>120,000	24	8.5
RESIDENCE		
Urban	208	73.8
Rural	63	22.3
Semi-urban	11	3.9
RELIGION		
Christian	275	97.5
Muslim	7	2.5

Figure 1 shows that 92.9% of the respondents have heard of the COVID-19 vaccine, while figure 2 shows that only 66% have ever received any other type of vaccine. Figure 3 shows that 63.5% of the respondents were willing to receive the COVID-19 vaccine.

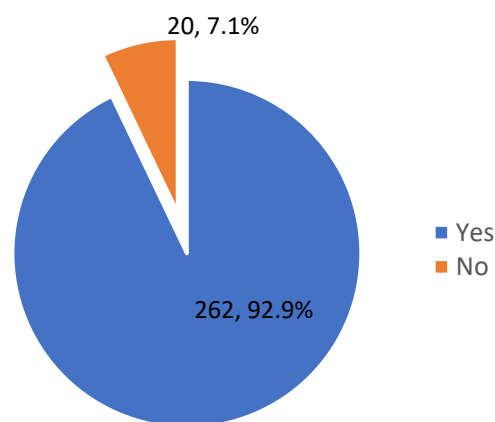


Figure 1: Heard of COVID-19 Vaccine

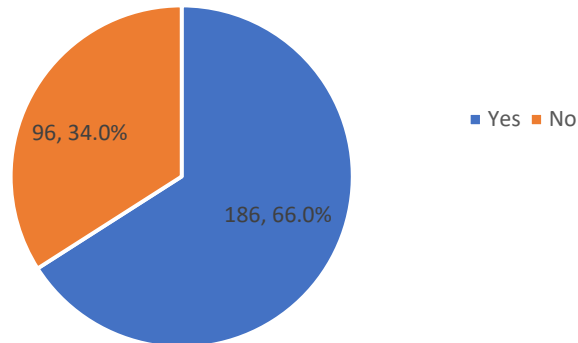


Figure 2: Received any vaccine in the past

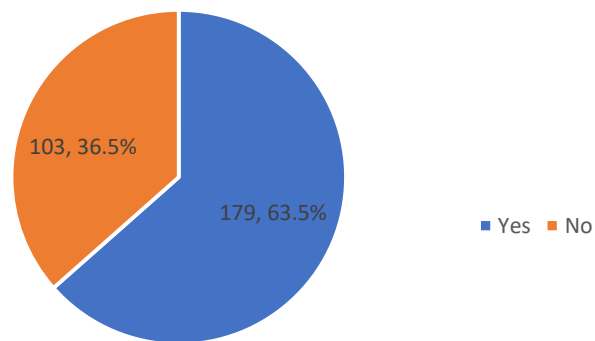


Figure 3: Willing to receive the COVID Vaccine

Table 2 shows that persons whom had received any other type of vaccine prior were 2.3 times (95% C.I: 1.4 – 3.9) more likely to receive the COVID-19 vaccine.

Table 2: Association of previous vaccination history and willingness to receive COVID-19 vaccine.

Previous Vaccination	Willing to Receive COVID-19 Vaccine		Chi-square (p-value)	OR (95% C.I)
	Yes n = 179, (%)	No N = 103, (%)		
Yes	131 (73.2)	55 (53.4)	11.39 (0.001)*	2.3 (1.4 – 3.9)
No	48 (26.8)	48 (46.6)		

*Statistically significant (p<0.05), OR: Odds ratio, 95% C.I: 95% Confidence interval

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Table 3 shows the association of the demographic distribution and the willingness to vaccinate among the respondents. There was no significant association between age groups, monthly income, residence, and religion with the willingness to receive vaccination, However, there was a significant association ($p = 0.022$) of the occupation of the respondent and the willingness to receive the vaccine especially among the employed (77.1%) compared to other categories while the unemployed were the least proportion of individuals (50%) willing to receive the vaccine

Table 3: Association of Demography and willingness to receive the vaccine

Variables	Willing to Vaccinate		Total n (%)	Chi-square (p-value)
	Yes n (%)	No n (%)		
Age-groups				
20 – 29	85(70.25)	36(29.75)	121(100.00)	5.66 (0.129)
30 – 39	75(56.39)	58(43.61)	133(100.00)	
40 – 49	19(67.86)	9(32.14)	28(100.00)	
<i>Mean age ± SD</i>				
OCCUPATION				
Self-employed	83(61.94)	51(38.06)	134(100.00)	13.14 (0.022)*
Civil Servant	20(51.28)	19(48.72)	39(100.00)	
Private employment	54(77.14)	16(22.86)	70(100.00)	
Other	10(66.67)	5(33.33)	15(100.00)	
Unemployed	12(50.00)	12(50.00)	24(100.00)	
MONTHLY INCOME				
≤20,000	29(65.91)	15(34.09)	44(100.00)	4.03 (0.672)
20,001 - 40,000	71(58.20)	51(41.80)	122(100.00)	
40,001 - 60,000	24(61.54)	15(38.46)	39(100.00)	
60,001 - 80,000	19(70.37)	8(29.63)	27(100.00)	
80,001 - 100,000	13(76.47)	4(23.53)	17(100.00)	
100,001 - 120,000	6(66.67)	3(33.33)	9(100.00)	
>120,000	17(70.83)	7(29.17)	24(100.00)	
RESIDENCE				
Urban	131(62.98)	77(37.02)	208(100.00)	1.68 (0.431)
Rural	39(61.90)	24(38.10)	63(100.00)	
Semi-urban	9(81.82)	2(18.18)	11(100.00)	
RELIGION				
Christian	175(63.64)	100(36.36)	275(100.00)	0.12 (0.725)
Muslim	4(57.14)	3(42.86)	7(100.00)	

*Statistically significant ($p < 0.05$)

Table 4 shows the perceptions most likely to influence the willingness to be vaccinated among the participants. The most significant perceptions influencing the willingness to vaccinate include; “coronavirus vaccinations should be mandatory”, concern that the COVID-19 Vaccination could cause COVID-19 infection, experiencing side effects from a coronavirus vaccination, and if similar individuals were to get vaccinated

Logistic Regression of perception and likelihood to receive COVID-19 Vaccine

Statements	Estimate	Sig.
Coronavirus vaccinations should be mandatory	-2.243	0.014*
Without COVID Vaccination, I’m likely to catch the virus	1.022	0.239
If I get a coronavirus vaccination, I will be protected against COVID-19	0.728	0.375
If I don’t get a coronavirus vaccination and end up getting COVID-19 I would regret not getting vaccinated	0.897	0.3
It would be very easy for me to get the COVID-19 vaccination	1.343	0.121
A COVID-19 Vaccination could give me COVID-19	1.856	0.009*

I would be worried about experiencing side effects from a coronavirus vaccination	1.671	0.005*
I might regret a coronavirus vaccination if I later experienced side effects from the vaccination	0.957	0.111
A coronavirus vaccination will be too new for me to be confident about getting vaccinated	0.351	0.537
Most people will get a coronavirus vaccination	0.873	0.315
Other people like me will get a coronavirus vaccination	1.877	0.018*
In general, vaccination is a good thing	0.999	0.21
I am afraid of needles	1.232	0.132
If I were vaccinated I think I would not need to observe social distancing	0.251	0.768
I know enough about the coronavirus illness to make an informed decision whether or not to get vaccinated	-0.014	0.987
I know enough about the coronavirus vaccine to make an informed decision whether or not to get vaccinated	-0.418	0.625
Only people who are at risk of serious illness from coronavirus need to be vaccinated	0.129	0.88
My family would approve of my having a coronavirus vaccination	-0.133	0.877
My friends would approve of my having a coronavirus vaccination	-0.016	0.984
If a coronavirus vaccination were recommended by a healthcare professional, I would get vaccinated	-0.587	0.47
Widespread coronavirus vaccination is just a way to make money for vaccine manufacturers	-0.827	0.337

*Statistically significant ($p < 0.05$)

4. DISCUSSION

The tremendous success in getting the COVID-19 vaccine from the laboratory to the commercial market at a remarkable speed to meet the public health need is a testament to modern scientific technology. However, it is equally important to ensure the vaccine is administered equitably to the entire population to achieve the purpose for the speed and eventual herd immunity. Findings from this study show that while a large majority of the respondents (92.9%) have heard about the vaccine, only about 63.5% indicated their willingness to receive the vaccine. This is consistent with the reports of other studies indicating that <70% of people show initial will to receive the COVID-19 vaccine(27–33). The study also revealed that only 66% of the respondents have had vaccination other than COVID-19 vaccine. Vaccine hesitancy is not exclusive to the COVID-19 pandemic.

In previous pandemics like H1N1 influenza, the acceptance rate associated with vaccines for relevant diseases ranged from 8% to 67% across different countries(23,24,34). Vaccine acceptance has therefore been identified as a complex phenomenon, with contexts varying depending on the time, place and perceived behavior of the community under study(21,22,35). In the Chinese setting, demographics and public perception were reported as predictors of vaccine acceptance(9). Disease specific evidence from Ireland revealed that healthcare workers avoided seasonal influenza vaccination as a result of their misconceptions relating to the efficacy of the vaccine(12). Further studies in the United States identified effectiveness of vaccine, social influence, and health insurance as key predictors of acceptance for the same vaccine(36). In the United Arab Emirates, a study that investigated parents' attitudes towards childhood vaccination reported that only few parents were hesitant towards childhood vaccination(20). It was observed that persons whom had received any other type of vaccine prior were 2.3 times (95% C.I: 1.4 – 3.9) more likely to receive the COVID-19 vaccine. The findings of the study revealed the association of the demographic distribution and the willingness to receive the vaccine among the respondents. There was no significant association between age groups, monthly income, residence, and religion with the willingness to vaccinate. However, there was a significant association ($p = 0.022$) of the occupation and the willingness to receive Covid 19 vaccine especially among self-employed persons (77.1%) compared to other categories while the unemployed were the least proportion of individuals (50%) willing to receive the vaccine. Similar results have been reported from multiple studies, and our results suggest that younger individuals perceive risk of infection to be less than the risk posed by vaccination(17,18).

The most significant perceptions influencing the willingness to receive Covid 19 vaccine among the study participants include; “coronavirus vaccinations should be mandatory”, concern that the COVID-19 Vaccination could cause COVID-19 infection, experiencing side effects from a coronavirus vaccination. Evidence in the literature suggests that this may be due to the accelerated development of the vaccine(11–13). Other contributory factors may include several negative campaigns targeted at discrediting the vaccines and querying its safety [18]. A similar finding was also reported in Israel

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where majority of participants in that study indicated that they were worried about the side effects of COVID-19 vaccines [19]. This finding was however reported prior to that country's authorization and consequent widespread utilization of the vaccine. The development and commercialization of vaccines usually take more than a decade, especially due to the various trials necessary to ensure short-term and long-term safety and efficacy(37,38). However, though the present cohort of COVID-19 vaccines were developed expeditiously, there is little or no evidence that suggests that safety had been sacrificed for speed(39). Nevertheless, given the accelerated development of these vaccines, concerns expressed in this study are logical and if not properly addressed, could increase hesitancy. A failure to address these concerns could delay or prevent the achievement of herd immunity alongside other possible public health consequences.

5. CONCLUSION

Literature on the willingness to accept COVID-19 vaccine and subsequent hesitancy have been mixed. Additional research is needed on sex, parenthood, and family structure for COVID-19 vaccine uptake in the light of influential factors such as risk perception, attitudes and beliefs. Differential COVID-19 vulnerability and increased risk with comorbidity among patients should be taken into consideration amidst pre-existing vaccine hesitancy, safety and efficacy concerns. Therefore, adequate public health education on the safety and efficacy of the vaccine is important to improve vaccine uptake especially among nursing mothers who will eventually educate the whole family.

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