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RESEARCH ARTICLE

Covid-19 Vaccine Hesitancy Amongst a Population of Black Pregnant Women: An On-The-Spot Assessment in a Nigerian Teaching Hospital

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ABSTRACT

Background: COVID-19 vaccination is generally regarded as an important preventive intervention in reducing the spread of SARS-CoV-2 which became a pandemic in March 2020. Although various excuses have been reported as reasons for vaccine hesitancy, vulnerable groups such as pregnant women have been excluded from immunization. This study sought to explore COVID-19 vaccine hesitancy amongst pregnant women receiving ante-natal care at a Nigerian teaching hospital.

Methods: One hundred and ninety-eight consecutively selected women attending the ante-natal clinic of the University College Hospital, Ibadan, Nigeria were enlisted, and a self-administered questionnaire was completed by each participant. Data was analysed using the Statistical Package for Social Sciences version 23. Descriptive analysis was generated and summarized with the aid of a pie chart, bar chart and frequency tables. Chi-square statistic was used to test for associations between categorical variables and p value was set at 0.05.

Result: The mean age of the participants was 31.78 ± 5.26 years. 152(76.8%) were gainfully employed and only 7 participants (3.5%) lacked formal education. 160 participants (83.3%) had good knowledge about the disease while 120 (62.5%) had good knowledge about the available vaccines. 46 participants (23.2%) had received their 1st vaccination prior to pregnancy and 115 (58.1%) were willing to receive the vaccine in their index pregnancy. 83 participants (41.9%), however, were unwilling to receive the vaccine and this hesitancy did not show any association with knowledge about COVID-19, educational attainment, employment status or ethnicity ($p > 0.05$).

Conclusion: There exist vaccine hesitancy amongst pregnant women in developing countries and this may stem from deep socio-cultural beliefs and taboos about care in pregnancy. There is a need for continuous education on vaccine safety and possibly incorporating COVID-19 vaccination where applicable as part of routine immunization in pregnancy.

Keywords: COVID-19, Vaccine Hesitancy, Black Pregnant Women.

Introduction

The coronavirus infection initially reported in Wuhan, China in December 2019¹ has been associated with a disastrous global health impact². It was upgraded to a pandemic by the World Health Organization on the 11th of March 2020³ and about 400 million cases of SARS-CoV-2 infection have occurred globally⁴. The coronavirus disease 2019 (COVID-19) created a global public health catastrophe through its overstretching of public health facilities resulting in mental health crises⁵ and economic disruption thereby precipitating supply chain dysfunction and eventually a global lockdown⁶.

Vaccination is an important measure aimed at reducing the incidence and prevalence of vaccine-preventable diseases such as COVID-19 and its success will largely depend on the level of uptake by the populace. Vaccination provides herd immunity through the slow transmission of diseases in the community thereby reducing the risk of infection amongst susceptible groups such as pregnant women who are at risk for severe COVID-19 illness⁷. Pregnant women with COVID-19 infection are at higher risk of intensive care admission and adverse maternal outcomes including mortality^{8,9}. With significant vaccine uptake, universal vaccination programs are expected to limit the spread of the COVID-19 disease and therefore vaccine hesitancy may pose an important set back in achieving this goal. Globally, vaccination strategies have attempted to address the cost and acceptance of the COVID-19 vaccine with the aim of promoting a cost effective and wider vaccine coverage in the pursuit of universal vaccination¹⁰.

Prior to the development of vaccines, various non-pharmacological methods were globally employed in limiting the spread of the COVID-19 infection such as personal hygiene, face masks and social distancing, however these measures were not practicable on a long-term basis¹¹. Pregnant women over the years have demonstrated reluctance to receive the COVID-19 vaccination partly due to the initial inconsistent guidelines adopted by health professionals¹². In practical terms, COVID-19 vaccines are safe in pregnancy since they do not contain any live attenuated virus¹³. A significant number of vaccines are permitted in pregnancy especially when the benefit outweighs any possible risks¹⁴, however, side effects such as malaise, fever, joint and muscle pain may ensue and must be judiciously managed in pregnancy. Three distinct types of the COVID-19 vaccines are currently available for immunization, and they include the Messenger RNA (mRNA) vaccines

(Pfizer-BioNTech, Moderna), Vector vaccines (Janssen/Johnson & Johnson, AstraZeneca) and Protein subunit vaccines (Novavax). The messenger RNA vaccines typically act locally and are quickly degraded by the lymphatic system thus lowering the chances of transplacental spread¹⁵.

Vaccine hesitancy has been reported in younger women, those of lower socioeconomic background and non-white women¹⁶. In a developing country like Nigeria, where sociocultural factors play an important role in the choice of care received in pregnancy, it is imperative to assess vaccine hesitancy amongst pregnant women as a means of evaluating public health policy impact through vaccine uptake. This study therefore sought to determine vaccine hesitancy amongst black pregnant women at a Nigerian tertiary health institution.

Materials and Methods

A cross sectional study of one hundred and ninety-eight pregnant women attending the antenatal clinic of the University College Hospital, Ibadan, Nigeria between 1st of April and 30th of June 2022. The University College Hospital, Ibadan, Nigeria's Premier Teaching Hospital located in Southwestern Nigeria, provides Tertiary Health Care Services coupled with Research and Training of both undergraduate and postgraduate students.

Each participant was consecutively selected from a random starting point on the antenatal clinic register. A self-administered questionnaire was used to obtain information from willing participants after an informed consent was obtained. Women who did not consent or those with significant language barriers were excluded from the study. Each questionnaire was grouped into three distinct sections consisting of data on sociodemographic information, knowledge about COVID-19 and willingness to accept the COVID-19 vaccine. Data obtained from the questionnaire was analysed using the Statistical Package for Social Sciences version 23 (IBM SPSS New York, version 23). Descriptive analysis generated was summarized with the aid of a pie chart, bar chart and frequency tables. Chi-square statistic was used to test for associations between categorical variables and *p* value was set at 0.05.

Results

The mean age of the participants was 31.78±5.26 years and almost all participants were in a marital relationship except 4 patients (2%) who were single (table 1). A significant proportion of the participants (76.8%) were gainfully employed, and majority (70.7%) practiced Christianity. One

hundred and fifty-eight (79.8%) had tertiary education with just 7 participants (3.5%) having no formal education. More than half of the participants

(55.6%) earned less than fifty thousand naira (65 USD) monthly (table 1).

Table 1: Sociodemographic characteristics of participants.

Variable	Frequency (198)	Percent (%)
Age		
21-30	82	41.4
26-30	104	52.5
41-50	11	5.6
>50	1	0.5
Mean±SD	31.78±5.26	
Marital Status		
Single	4	2.0
Married	194	98.0
Ethnicity		
Yoruba	148	74.7
Igbo	43	21.7
Hausa	3	1.5
Others	4	2.0
Religion		
Christianity	140	70.7
Islam	58	29.3
Employment status		
Employed	152	76.8
Unemployed	46	23.2
Education		
None	7	3.5
Primary	2	1.0
Secondary	17	8.6
Tertiary	158	79.8
Others	14	7.1
Average income		
<10,000	13	6.6
10,000-20,000	19	9.6
20,000-30,000	47	23.7
40,000-50,000	31	15.7
>50,000	88	44.4
Number of children		
0	83	41.9
1	56	28.3
2	46	23.2
3	9	4.5
4	4	2.0

One hundred and ninety-two participants (97%) were aware of the existence of COVID-19 infection and had a good knowledge about it. Majority of the study participants were informed about the COVID-19 pandemic and the most common source of information was via the television as acknowledged by 40% of the participants. This was closely followed by the internet (25%) and social media platforms (18%) (figure 1). Furthermore, 83.3% of the participants had very good knowledge about the corona virus disease, while

just about two-thirds of the study population demonstrated good knowledge about the available vaccines. However, only 46 participants (23.2%) had been vaccinated at least once. A significant proportion (58.1%) were willing to accept vaccination if offered. Reasons for their willingness included the need to protect against future COVID-19 infection (85.2%) and their desire to limit the spread of the disease in their respective communities through herd immunity (78.3%) [figure 2].

Figure 1: Participants source of information about COVID-19

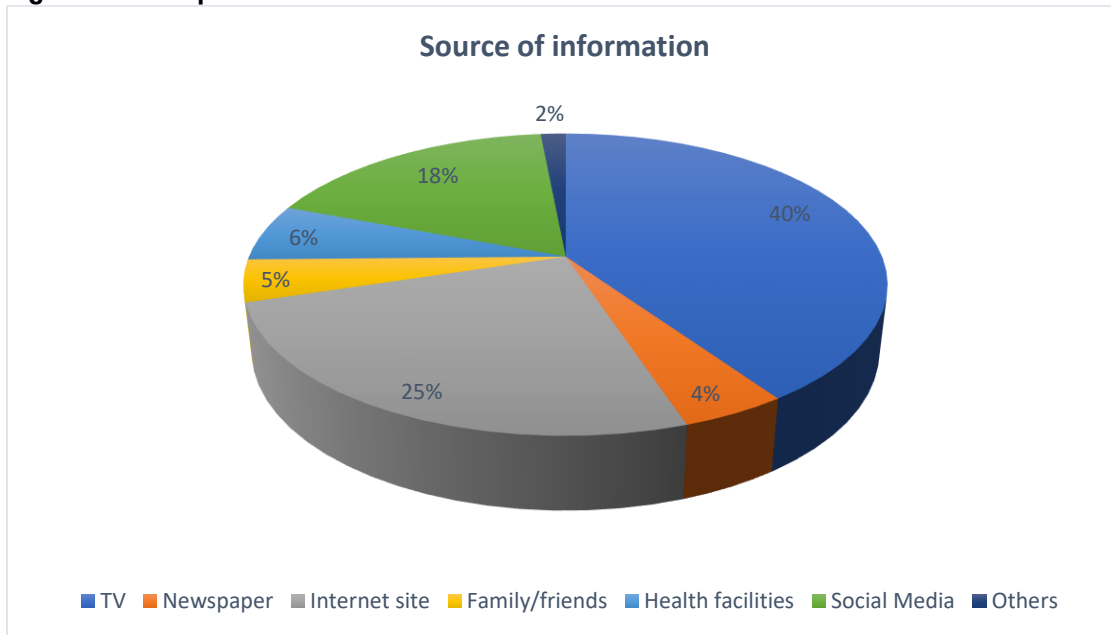
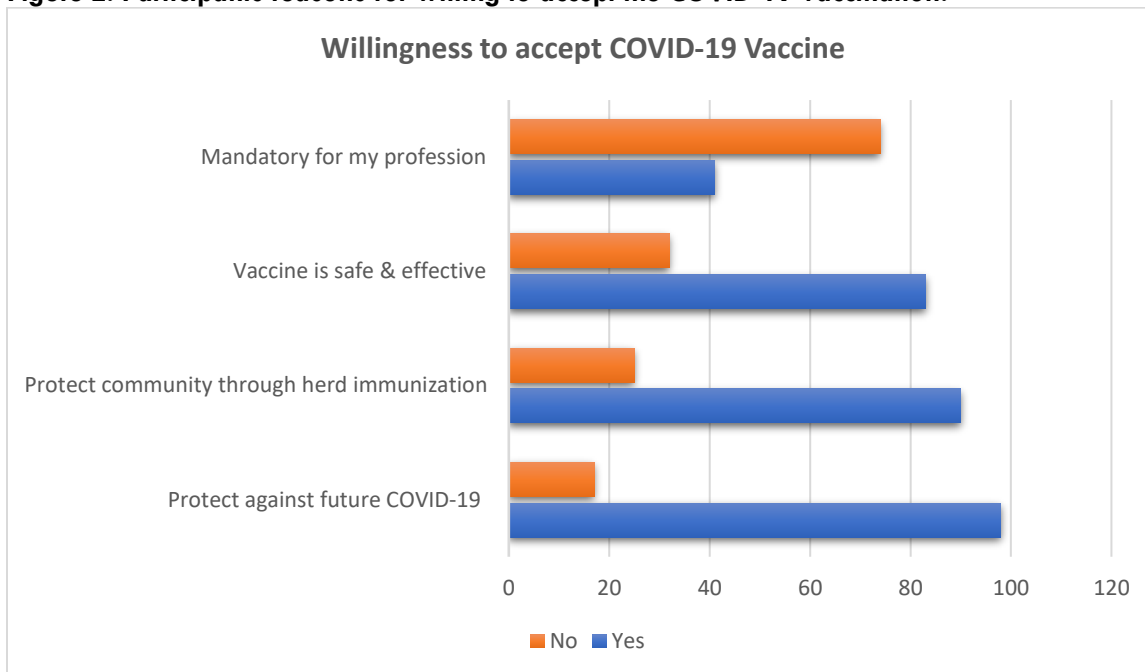


Figure 2: Participants reasons for willing to accept the COVID-19 vaccination.



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The single most important barrier to receiving the vaccine was the uncertainty about its long-term effects on pregnancy and the offspring (56.6%). Other minor concerns related to the safety and efficacy of the available vaccines (table 2). 83

participants (41.9%), however, were unwilling to receive the vaccine and this hesitancy did not show any association with knowledge about COVID-19, educational attainment, employment status or ethnicity (table 3).

Table 2: Barriers to acceptance of COVID-19 vaccine

Variable	Frequency (n=83)	Percent
I am worried about the long-term effect of the vaccine on my pregnancy and baby.		
Yes	47	56.6
No	36	43.4
I am concerned about getting the virus from the vaccine.		
Yes	10	12.1
No	73	87.9
Coronavirus infection is not serious.		
Yes	7	8.4
No	76	91.6
My religion does not permit me to take the vaccine.		
Yes	8	9.6
No	75	90.4
I don't think the vaccines work very well.		
Yes	9	10.8
No	74	89.2
I feel the vaccine is not safe because it was developed too fast.		
Yes	12	14.5
No	71	85.5
I feel the vaccine is a magnetic microchip.		
Yes	3	3.6
No	80	96.4
I feel the vaccine will make me infertile.		
Yes	5	6.0
No	78	94.0
I feel the vaccine will affect my DNA.		
Yes	8	9.6
No	75	90.4

Table 3: Association with willingness to accept COVID-19 vaccination.

Variable	Willingness to accept vaccine		Chi square	P value
	Yes (%)	No (%)		
Age				
≤31	64(55.7)	43(51.8)	0.29	0.59
>31	51(44.3)	40(48.2)		
Ethnicity				
Yoruba	88(76.5)	60(72.3)	0.46	0.50
Others	27(23.5)	23(27.7)		
Educational status				
Below tertiary	13(11.3)	13(15.7)	0.80	0.37
Tertiary	102(88.7)	70(84.3)		
Employment status				
Employed	91(79.1)	61(73.5)	0.86	0.35
Unemployed	24(20.9)	22(26.5)		
Knowledge of vaccine				
Good	72(62.6)	68(81.9)	1.49	0.08
Poor	43(37.4)	15(18.1)		

Discussion

Vaccination against the corona virus gained prominence at the height of the COVID-19 pandemic and several factors have been associated with the willingness to receive the vaccine which include anti-vaccine attitudes, distrust, and lack of clear information on the efficacy and safety of the vaccine^{17,18}. Following an improvement in global information dissemination about the disease and vaccine safety, a decline in vaccine

hesitancy through improved attitudes have been reported¹⁹. However, several studies have reported vaccine hesitancy amongst diverse ethnic groups notably people of colour, especially the Black population^{20,21,22}. This study afforded an opportunistic screening of Black pregnant women and revealed that one hundred and fifteen participants (58.1%) were willing to receive the COVID-19 vaccine. 83 participants (41.9%) unwilling to receive the vaccine expressed concerns

over the safety of the vaccine in pregnancy and were unsure if there existed potential long-term complications. Despite the existence of good knowledge in one hundred and ninety-two participants (97%), this did not translate to a greater willingness to accept the vaccine even though its safety in pregnancy has been documented. This calls to question the content and source of information obtained especially in an environment where socio-cultural factors including taboos play a prominent role in the choice of care received in pregnancy.

Vaccine related information obtained primarily from social media have been documented to negatively correlate with vaccine uptake²³. This study revealed that internet sources and social media related messages provided information to participants about the corona virus disease in 25% and 18% respectively. The content of these sources is sometimes at variance with scientific data and may have been responsible for the distrust and heightened fear about the safety of the vaccines especially in pregnancy. Vaccine hesitancy in this study did not show any association with knowledge about COVID-19, educational attainment, employment status or ethnicity of the participants ($p>0.05$). Exploring the socio-cultural factors and beliefs of black pregnant women living in a low-income country may elucidate hidden factors affecting the disposition of these women to accepting life-saving interventions. Furthermore, the impact of poverty may manifest as hesitancy to vaccination due to the unwillingness to pay out of pocket and not merely ignorance. Fortunately, COVID-19 vaccination in most countries including Nigeria have been funded by the government and international donors thus eliminating any hesitancy attributable to cost. Home grown solutions need to be encouraged through reinforcement of positive attitudes by role models in the family and society, especially where culture plays a prominent role in most social interactions.

Following the documented safety of the vaccine in pregnancy, compliance may be improved in a low-income country through incorporation of the vaccination schedule into the routine immunization program implemented for pregnant women. This would enable the health worker provide clarity through counseling about vaccine efficacy and

safety while dispelling rumours and misinformation attributable to unregulated information sources such as the social media. This is particularly important since more than one vaccination is required for immunity against COVID-19 and compliance may decrease if the patient does not perceive any value in this very important preventive strategy, a possibility in low-income countries where challenges exist in the delivery of health care services such as staffing, infrastructure and transportation. There is therefore the need for multidisciplinary synergy in health services delivery in low-income countries such that patients are provided adequate information, education, and communication materials from the right sources while mitigating barriers to accessing care through prompt, courteous and proactive health interventions. Strategies aimed at reducing hesitancy in skeptical groups such as pregnant women would include the reinforcement of vaccination benefits through audio-visuals, other information dissemination platforms and the enlistment of community role models as Public Health Ambassadors. Continuous monitoring of health care interventions especially vaccination programs in developing countries is imperative in mitigating the challenges posed by hesitancy through prompt recognition and appropriate intervention.

Conclusion

COVID-19 vaccine hesitancy has been documented globally and particularly amongst populations of colour. In this study conducted amongst black pregnant women, vaccine hesitancy was observed in 41.9% of the study population and this emanated from concerns about the long-term impact on the pregnancy and offspring. Vaccine hesitancy did not show any significant association with knowledge about corona virus disease, educational attainment, employment status or ethnicity of the participants. In many developing countries, socio-cultural norms and traditions handed over from previous generations often play a significant role in the perception of care, especially in pregnancy. Concerted efforts especially by the government and health care providers to correct misconceptions through information dissemination and institutionalization of the COVID-19 vaccination program will help demystify perceived myths and improve uptake of the vaccines.

References

1. Lu H, Stratton CW, Tang Y. Outbreak of pneumonia of unknown etiology in Wuhan, China: The mystery and the miracle. *Journal of Medical Virology*. 2020;92(4):401-402. doi:10.1002/jmv.25678
2. Yoda T, Katsuyama H. Willingness to receive COVID-19 vaccination in Japan. *Vaccines*. 2021;9(1):48. doi:10.3390/vaccines9010048
3. Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. *Acta Bio-medica: Atenei Parmensis*. 2020;91(1):157-160. doi:10.23750/abm.v91i1.9397
4. Badell M, Dude CM, Rasmussen SA, Jamieson DJ. Covid-19 vaccination in pregnancy. *BMJ*. August 2022:e069741. doi:10.1136/bmj-2021-069741
5. Diseases LI. The intersection of COVID-19 and mental health. *Lancet Infectious Diseases*. 2020;20(11):1217. doi:10.1016/s1473-3099(20)30797-0
6. Citu IM, Cîtu C, Gorun F, et al. Determinants of COVID-19 Vaccination Hesitancy among Romanian Pregnant Women. *Vaccines*. 2022;10(2):275. doi:10.3390/vaccines10020275
7. Skjefte M, Ngirbabul M, Akeju O, et al. COVID-19 vaccine acceptance among pregnant women and mothers of young children: results of a survey in 16 countries. *European Journal of Epidemiology*. 2021;36(2):197-211. doi:10.1007/s10654-021-00728-6
8. Badr DA, Mattern J, Carlin A, et al. Are clinical outcomes worse for pregnant women at ≥ 20 weeks' gestation infected with coronavirus disease 2019? A multicenter case-control study with propensity score matching. *American Journal of Obstetrics and Gynecology*. 2020;223(5):764-768. doi:10.1016/j.ajog.2020.07.045
9. Allotey J, Fernández S, Bonet M, et al. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis. *BMJ*. September 2020:m3320. doi:10.1136/bmj.m3320
10. Nguyen LH, Hoang MT, Nguyen LD, et al. Acceptance and willingness to pay for COVID-19 vaccines among pregnant women in Vietnam. *Tropical Medicine & International Health*. 2021;26(10):1303-1313. doi:10.1111/tmi.13666
11. Ayhan ŞG, Oluklu D, Atalay A, et al. COVID-19 vaccine acceptance in pregnant women. *International Journal of Gynaecology and Obstetrics*. 2021;154(2):291-296. doi:10.1002/ijgo.13713
12. Skirrow H, Barnett S, Bell S, et al. Women's views on accepting COVID-19 vaccination during and after pregnancy, and for their babies: a multi-methods study in the UK. *BMC Pregnancy and Childbirth*. 2022;22(1). doi:10.1186/s12884-021-04321-3
13. Kalafat E, O'Brien P, Heath PT, et al. Benefits and potential harms of COVID-19 vaccination during pregnancy: evidence summary for patient counseling. *Ultrasound in Obstetrics & Gynecology*. 2021;57(5):681-686. doi:10.1002/uog.23631
14. Rasmussen SA, Watson AK, Kennedy ED, Broder KR, Jamieson DJ. Vaccines and pregnancy: Past, present, and future. *Seminars in Fetal & Neonatal Medicine*. 2014;19(3):161-169. doi:10.1016/j.siny.2013.11.014
15. Saleh E, Moody MA, Walter EB. Effect of antipyretic analgesics on immune responses to vaccination. *Human Vaccines & Immunotherapeutics*. 2016;12(9):2391-2402. doi:10.1080/21645515.2016.1183077
16. Blakeway H, Prasad S, Kalafat E, et al. COVID-19 vaccination during pregnancy: coverage and safety. *American Journal of Obstetrics and Gynecology*. 2022;226(2):236.e1-236.e14. doi:10.1016/j.ajog.2021.08.007
17. Cascini F, Pantović A, Al-Ajlouni YA, Failla G, Ricciardi W. Attitudes, acceptance and hesitancy among the general population worldwide to receive the COVID-19 vaccines and their contributing factors: A systematic review. *EClinicalMedicine*. 2021;40:101113. doi:10.1016/j.eclinm.2021.101113
18. Rane MS, Kochhar S, Poehlein E, et al. Determinants and trends of COVID-19 vaccine hesitancy and vaccine uptake in a national cohort of US adults: a longitudinal study. *American Journal of Epidemiology*. 2022;191(4):570-583. doi:10.1093/aje/kwab293
19. Wang Y, Liu Y. Multilevel determinants of COVID-19 vaccination hesitancy in the United States: A rapid systematic review. *Preventive Medicine Reports*. 2022;25:101673. doi:10.1016/j.pmedr.2021.101673
20. Robertson E, Reeve KS, Niedzwiedz CL, et al. Predictors of COVID-19 vaccine hesitancy in the UK household longitudinal study. *Brain Behavior and Immunity*. 2021;94:41-50. doi:10.1016/j.bbi.2021.03.008
21. Khubchandani J, Sharma S, Price JH, Wiblehauser M, Sharma M, Webb FJ. COVID-19 Vaccination hesitancy in the United States: A rapid national assessment. *Journal of*

- Community Health*. 2021;46(2):270-277.
doi:10.1007/s10900-020-00958-x
22. Latkin CA, Dayton L, Yi G, Colon B, Kong X. Mask usage, social distancing, racial, and gender correlates of COVID-19 vaccine intentions among adults in the US. *PLOS ONE*. 2021;16(2):e0246970.
doi:10.1371/journal.pone.0246970
23. Roozenbeek J, Schneider CR, Dryhurst S, et al. Susceptibility to misinformation about COVID-19 around the world. *Royal Society Open Science*. 2020;7(10):201199.
doi:10.1098/rsos.201199