

# Predictors of Intention for Childhood Covid-19 Vaccination Among Mothers of Under Fives in A Semi-Urban Setting in Sokoto, Nigeria

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## ABSTRACT

**Introduction and Objectives:** Even though COVID vaccines are not yet widely available for children, several clinical trials are being undertaken especially as vaccinating children is a very important factor in attaining herd immunity. However, little research has been conducted to examine parents' intention to vaccinate their young children for COVID-19 in under-served countries including Nigeria.

**Materials and Methods:** A cross-sectional study conducted among mothers of under five children receiving care in health facilities as part of a study conducted on vaccine hesitancy. Responses on their vaccine intention regarding COVID-19 for their children, reasons for the negative intention and their predictors were assessed. Data was analysed using IBM SPSS version 25.

**Results:** Majority (341/406; 84%) had a positive intention to vaccinate their children. The remainder who had negative intention mainly attributed it to the lack of their husband's approval as well as not wanting to take the vaccine for a novel disease they did not understand. Fathers aged 40-49 years, mothers with no education, mother's non-ownership of phone, unemployed parents, low wealth index, vaccine hesitancy, lack of routine immunization (RIs) and previous side effects to RIs were all significantly associated with negative vaccine intention. However, significant predictors of negative intention were mothers' low educational status ( $p=0.03$ ), low wealth index of family ( $p=0.02$ ), vaccine hesitancy to RIs ( $p=0.002$ ) and side effects to previous RIs ( $p=0.003$ ).

**Conclusion:** Majority of the mothers had positive intention to vaccinate their children. However, uneducated mothers from poorer families and those who had negative sentiments to RIs were more negatively disposed to COVID vaccine.

**KEYWORDS:** COVID vaccine; Negative; Intention; Mothers; Under-Fives; Sokoto

## INTRODUCTION

Since the onset of the COVID Pandemic in 2020, there have been a lot of varying perceptions on the disease which have led to vaccine hesitancy and apathy [1]. Despite this, the government and other relevant authorities have not relented in encouraging vaccination and other protective measures among the populace [2]. Even though vaccines are not yet available for children, several clinical trials are being

undertaken especially as vaccinating children is a very important factor in attaining herd immunity [1]. However, little research has been conducted to examine parents' intention to vaccinate their young children for COVID-19 in Nigeria. With the persistence of the pandemic and discovery of newer variants, efforts are necessary to upscale vaccination especially within areas known for poor patronage of routine vaccination [1]. This study carried out amongst mothers of under five children attending health centres

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in Sokoto township, Nigeria to assess their intention to vaccinate their children against COVID-19 infection as well as to ascertain the sociodemographic predictors of vaccination intention amongst them with a view to assist relevant agencies in planning and strategizing to achieve maximal vaccine coverage.

## MATERIALS AND METHODS

### Background Information on the Study Area

The study was conducted as part of the study of vaccine hesitancy to RIs amongst under-fives attending health centres in Sokoto metropolis [3]. It was a cross-sectional study amongst mothers of under five children receiving care in some health facilities in Sokoto metropolis. The participants were selected by multistage sampling technique from 18 health facilities comprising 3 tertiary facilities, 15 primary and secondary facilities. The data was collected included age, gender of child, educational, employment status of parents, wealth index of the family, routine vaccination status of

child, vaccine hesitancy of parents, previous side effects to RIs and parents' intent to vaccinate child against COVID.

### Data Management

Data was analysed using the IBM Statistical Package for the Social Sciences (SPSS) version 25.0 software. Demographic data was presented using graphs and tables for frequencies and percentage of variables.

Bivariate analysis ( $\chi^2$ ) was used to assess association between sociodemographic variables (education, employment status) and COVID vaccine intention.

### Ethical Consideration

Approval for the study was obtained from research and ethics committee of Usmanu Danfodiyo University Teaching Hospital Sokoto and the Ministry of Health in Sokoto State. Consent was obtained from the respondents prior to recruitment and strict confidentiality was maintained of respondents' identity.

## RESULTS

### Mother's Intention to Vaccinate Child

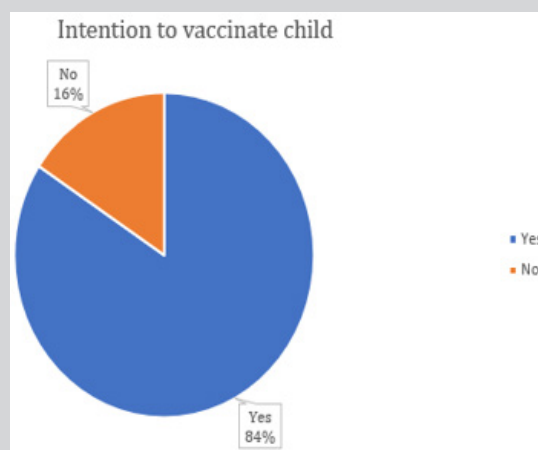


Figure 1: Mothers intention to vaccinate child against COVID.

Majority (341/406; 84%) had a positive intention to vaccinate their children while 16% (65/406) had a negative intention as shown in Figure 1. Out of the 65 respondents, about a third 33.8% (22/65) attributed their negative intention to the

father's decision while 30.8% (20/65) attributed their intention to their own personal decision as they did not believe in the vaccine. About 9.2% (6/65) were concerned about safety of the vaccine and similar proportion felt the disease did not actually exist (Table 1,2).

Table 1:

Reasons for Negative Intention	N% (n = 65)
Does not want personally	20 (30.7)
Does not believe it exists	6 (9.2)
Not sure	2 (3.1)
Father does not support	33.8
Family does not vaccinate	5 (7.7)
Safety concerns	6 (9.2)
Fear of pricks	0 (0.0)

**Table 2:** Factors associated with mother's intention to vaccinate child against COVID.

Variable	Intends to be Vaccinated		Test Statistic	p-Value
	Yes	No		
<b>Age of child</b>				
06-12	189 (84.0)	36 (16.0)	FE = 5.8	P = 0.17
13-24	95 (86.4)	15 (13.6)		
25-36	38 (100.0)	7 (0.0)		
37-48	18 (84.4)	3 (15.6)		
49-65	2 (40.0)	3 (60.0)		
<b>Gender of Child</b>				
Male	184 (84.0)	35 (16.0)	$\chi^2 = 0.017$	P = 0.90
Female	158 (84.5)	29 (15.5)		
<b>Age of Mother</b>				
18-29	221 (87.0)	33 (13.0)	FE = 4.67	P = 0.11
30-39	112 (78.9)	30 (21.1)		
40-49	9 (90.0)	1 (10.0)		
<b>Age of Father</b>				
18-29	26 (96.3)	1 (3.7)	FE = 8.53	P = 0.03
30-39	161 (84.7)	29 (15.3)		
40-49	108 (78.3)	30 (21.7)		
50 and above	45 (91.8)	4 (8.2)		
<b>Religion</b>				
Islam	304 (83.7)	59 (16.3)	FE = 0.44	P = 0.80
Christianity	35 (87.5)	5 (12.5)		
Traditional	2 (100.0)	0 (0.0)		
<b>Tribe</b>				
Hausa	244 (85.3)	42 (14.7)	FE = 9.0	P = 0.05
Fulani	44 (72.1)	17 (27.9)		
Yoruba	33 (94.3)	2 (5.7)		
Ibo	18 (85.7)	3 (14.3)		
Others	3 (100.0)	0 (0.0)		
<b>Educational Status of Mother</b>				
None	46 (65.7)	24 (34.3)	FE = 18.4	P = 0.001
Primary	37 (88.1)	5 (11.9)		
Secondary	183 (88.0)	25 (12.0)		
Tertiary	76 (88.4)	10 (11.6)		
<b>Educational Status of Father</b>				
None	20 (71.4)	8 (28.6)	FE = 3.9	P = 0.22
Primary	2 (100.0)	0 (0.0)		
Secondary	98 (86.7)	15 (13.3)		
Tertiary	222 (84.4)	41 (15.6)		
<b>Mother's Employment</b>				
Employed	68 (95.8)	3 (4.2)	$\chi^2=8.62$	P=0.003
Unemployed	274 (81.8)	61 (18.2)		
<b>Father's Employment</b>				
Employed	246 (88.8)	31 (11.2)	$\chi^2=13.7$	P = 0.00
Unemployed	96 (74.4)	33 (25.6)		
<b>Mother Owns a Phone</b>				
Yes	336 (85.7)	56 (14.3)	$\chi^2=18.7$	P = 0.00
No	6 (42.9)	8 (57.1)		

Wealth Index				
I	51 (77.3)	15 (22.7)	$\chi^2=15.4$	P = 0.00
II	137 (78.7)	37 (21.3)		
III	154 (92.8)	12 (7.2)		
Other Vaccinations				
Full & partial	289 (86.8)	44 (13.2)	$\chi^2=9.7$	P = 0.003
None	53 (72.6)	20 (27.4)		
Any Side Effect to Others				
Yes	188 (78.7)	51 (21.3)	$\chi^2=13.3$	P = 0.00
No	152 (92.1)	13 (7.9)		
Intent to Vaccinate Self				
Yes	322 (99.1)	3 (0.9)	$\chi^2=270.1$	P = 0.00
No	20 (24.7)	61 (75.3)		
Ever Hesitated to Vaccinate Child to Ris				
Yes	118 (77.1)	35 (22.9)	$\chi^2=9.4$	P = 0.002
No	224 (88.5)	29 (11.5)		

### Factors Affecting Intention to Vaccinate

The factors significantly associated with relatively high proportion of negative vaccine intention were father's age of 40 -49 years ( $p=0.03$ ), mothers with no education ( $p=0.001$ ), unemployed parents ( $p=0.003$ ), low wealth index ( $p=0.00$ ), non-ownership of phone by mother ( $p=0.01$ ), vaccine hesitancy/ no routine immunizations (RIs) ( $p=0.001$ ) and previous side effects to

RIs ( $p=0.01$ ). The factors that were not related to vaccine intention were age of mother, religion, tribe, and father's educational status. The significant predictors of negative intention were mothers' with no education) as they were 53% more likely to have negative intention, low wealth index of family as they were 60% more likely to have negative intention. Vaccine hesitancy (if present to RIs) and ever having side effects (to RIs) were about 64% more likely to have negative intention (Table 3).

**Table 3:** Logistic regression analysis on sociodemographic variables affecting vaccine hesitancy/refusal.

Variable	Adjusted Odds Ratio (aOR)	95% C.I		p - value
		Lower	Upper	
Father's Age				
(40-49 years vs others)	0.601	0.320-1.130		0.114
Mother's Educational Status				
(None vs others)	0.472	0.236-0.944		0.034
Mother's Employment Status				
(No vs Yes)	0.337	0.094-1.204		0.094
Father's Employment Status				
(No vs Yes)	0.632	0.334-1.195		0.115
Mother Owns a Phone				
(No vs Yes)	0.542	0.153-1.929		0.345
Wealth Index				
(High vs others)	0.402	0.192-0.840		0.015
Ever had Side Effects of Vaccines				
(Yes vs No)	0.312	0.153-0.635		0.001
Vaccine Hesitancy to RIs				
(Yes vs No)	0.372	0.201-0.691		0.002
Vaccination Status				
(None vs others)	0.378	0.188-0.762		0.007

Table 4:

Reasons For Negative Intention	For Self	For Child
Does not want personally	34	20
Does not believe it exists	15	6
Not sure	11	2
Father does not support	10	22
Family does not vaccinate	5	5
Safety concerns	3	6
Fear of pricks	1	0

## DISCUSSION

The proportion of negative vaccine intention among mothers of children in the semi-urban area was relatively low. Lower proportion of older fathers had negative intention to vaccinate their child. Younger mothers had more negative vaccine intention similar to Kreuters [4] finding in Florida where younger and black mothers were less likely to plan to vaccinate their children. They had more negative language towards vaccination probably due to their inexperience and low educational status. In this study also, the educational status of the mothers was also relatively lower than that of the fathers as majority had secondary education.

On the other hand, reasons for negative intention on the part of the mothers was mainly fathers' refusal of vaccination while in Kreuters study mothers were more concerned about paying bills than preventing COVID-19 [4]. In another U.S study on COVID-19 vaccination intentions, concerns, and facilitators among parents [6] about half had negative intention to vaccinate higher than this study despite being predominantly well educated. Identifying as female was associated with lower COVID-19 vaccination intention in another study by Ellithorpe [5]. The main reason given was also not unexpected which was concerns about side effects given the wider use of the vaccines in developed countries when compared to the setting in African countries and among other disadvantaged population where initially they were not readily available. Among the mothers in this study concerns for side effects were lower among those with negative intention probably due to low general uptake of the vaccine in Sokoto [6,7].

In this study, apart from the mother's educational status, other parameters as being unemployed, non-ownership of a mobile phone and low wealth index of the family were all associated with negative vaccine intention. In a similar study, non-Hispanic women who were younger, and did not have a college education showed lower willingness to immediately vaccinate children compared other parents without these characteristics. It was found that mothers who had a child with previous reactions or side effects to the RIs were negatively disposed to the vaccine as well as those who were already hesitant to receive the RIs. This was quite opposite to findings by Kreuter [4] where those who had children that recently received a shot of influenza vaccine were more likely to express COVID-19 vaccination intention for their young child. Aldakhalil reported in Saudi Arabia that vaccine hesitancy towards childhood immunizations was a predictor of mothers' non-intention to vaccinate their children against COVID-19. Another systematic

review in Nigeria found that low acceptance of the vaccine was a result of propaganda, adverse effect concerns, and conspiracy theories [8].

## CONCLUSION

This study showed majority of the mothers had positive intention to vaccinate their children. However, uneducated mothers from poorer families and those who had negative sentiments to RIs were more negatively disposed to COVID vaccine. It is advocated that greater efforts should be put in place to tackle the unwillingness of the fathers and young mothers to receive the COVID-19 vaccine. This is especially given the backdrop that it is being seriously advocated that policy makers in institutions should include African children in their COVID-19 vaccine guidelines and procurement due to their higher vulnerability to death in the face of infection.

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