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**RESEARCH ARTICLE**

**Attendance to Antenatal Clinic and Responses to COVID-19  
Vaccination Among Pregnant Women in South-South Nigeria**

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**ABSTRACT**

Pregnancy is a normal physiological process which occasionally, could be complicated by pathologic conditions that are dangerous to the health or life of the mother, fetus or both. Hence the need for the pregnant woman to be attending prenatal clinic for supervision and care by qualified health professionals. This study examined attendance to antenatal clinic and responses to Covid-19 vaccination among pregnant women in South-South Nigeria. The study adopted cross-sectional research design. Multistage sampling technique was used to select Edo State out of the six States that make up South-South Nigeria, and in selection of sample size of 144 pregnant women from the primary, secondary and tertiary health facilities in Edo State. The instrument used for data collection was Questionnaire on Antenatal Visits and Covid-19 Vaccination (QAVCV). The reliability of the instrument was established through split-half method using Cronbach alpha which yielded coefficient of 0.711. Data Collected were analysed using frequencies, percentages, means, Mann-Whitney U and Kruskal Wallis tests. The result showed that 76.4% of the pregnant women booked early, 84.0% attended antenatal visits in line with the appointments given by their care providers, 38.2% were afraid to

attend antenatal clinic, only few (5.6%) received Covid-19 Vaccination, some (47.2%) were of the opinion that the vaccine is dangerous to health but 55.6% indicated that the vaccine is protective. Educational level and parity significantly influenced the women's attendance to antenatal clinic respectively:  $z = 19.90$ ,  $p\text{-value} = <0.001$ ;  $z = 1817.50$ ,  $p\text{-value} = 0.003$ . Also, the result indicated that educational level significantly influenced pregnant women's opinion about Covid-19 Vaccination:  $K = 14.92$ ,  $p\text{-value} = 0.002$ . There is urgent need for health professionals to mount campaign to encourage pregnant women to respond positively to Covid-19 vaccination.

**Keywords-** Antenatal visits, Responses, COVID-19 vaccination, Pregnant women

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**INTRODUCTION**

Immunologic competency decreases during pregnancy [1]. Also, the immunological changes that take place during pregnancy subject the expectant mother to the risk of infections [2]. Presence of any pandemic will further compromise this risk of infection among pregnant women. Coronavirus disease (COVID-19) has played havoc worldwide [3]. As at 11<sup>th</sup> June 2020, active cases were 3,270,599 out of 7,495,828 infected people globally [4].

Pregnant women are at greater risk of getting sick from other respiratory viruses than people who are not pregnant, and sometimes this causes adverse outcome for the mother (Center for Disease Control and Prevention [5]. Omer et al (2020) indicated that pregnant women have a high propensity to acquire COVID-19 due to their altered physiological and immunological functions [3]. COVID-19 causes extensive alveola damage, which in turn, increases the risk of secondary bacterial infections [6]. Studies have indicated that severe acute respiratory syndrome (SARS) during pregnancy is linked with high risk of spontaneous miscarriage, preterm birth and intra-uterine growth restriction [7]. Also, studies in pregnant women with COVID-19 have indicated maternal and neonatal complications [8]. WHO (2020) have indicated that COVID-19 is spread by person-to-person contact, and that the route of transmission is primarily via respiratory droplets from infected person into the air which are then deposited onto nearby surfaces [9]. Also, the virus could potentially transfer to individuals within a distance of <2m (6 feet) of the infected person [10]. It is important to note that vaccine is now available to add to protection against the virus that causes COVID-19. Omer et al., (2020) explained that pregnant women should seek advice regularly from their care providers during Covid-19 pandemic [3]. It is against this background that the researchers conducted this study to determine pregnant women's attendance to antenatal clinic and their responses to COVID-19 Vaccination during COVID-19 Pandemic in South-South Nigeria.

### Research Questions

1. How often do expectant women in South-South Nigeria attend Antenatal clinic during COVID-19 pandemic?
2. What is the opinion of pregnant women in South-South Nigeria about COVID-19 vaccination?

3. To what extent do pregnant women in South-South Nigeria receive COVID-19 vaccination?

### Hypotheses

1. Demographic characteristics of the pregnant women in South-South Nigeria do not significantly influence the women's attendance to antenatal clinic during Covid-19 pandemic.
2. Educational level of pregnant women in South-South Nigeria does not significantly influence their opinion about Covid-19 Vaccination.
3. There is no significant difference across the primary, secondary and tertiary health facilities with regard to the opinion of pregnant women in South-South Nigeria about Covid-19 Vaccination.
4. Employment status of pregnant women in South-South Nigeria does not significantly influence their opinion about Covid-19 Vaccination.
5. Parity of pregnant women in South-South Nigeria does not significantly influence their opinion about Covid-19 vaccination.

## MATERIALS AND METHODS

### Design and Sampling

The study was a cross-sectional research design. Multistage sampling technique was used for the study. Out of the six States (Akwa-Ibom, Bayelsa, Cross-River, Delta, Edo, Rivers) that constitute South-South Nigeria, simple random sampling technique was used to select Edo State for the study. Simple random sampling technique was used to select one tertiary, one secondary and one primary health facility in Edo State. 50 pregnant women were selected from each of the primary and secondary health facilities while 44 pregnant women were selected from the tertiary health facility giving a sample size of 144 respondents that were used for the study.

### Instrument

The instrument used for data collection was questionnaire on Antenatal Visits and Covid-19 Vaccination (QAVCV). The questionnaire consisted of three (3) Sections. Section A consisted of items on demographic characteristics (age, educational level, employment status, health facility and parity). Section B comprises of items used to elicit information on the respondents' attendance to antenatal clinic during Covid-19 Pandemic (eg Antenatal Booking, Early Booking, Antenatal Visits done according to appointment given by care provider, Reporting to the clinic on suspecting signs of Covid-19 disease, afraid to attend ANC for fear of being diagnosed Covid-19 positive). Section C comprises of items used to elicit information on responses to Covid-19 Vaccination (eg Have you received Covid-19 Vaccination?, will you receive the vaccination?, the vaccine is protective). Sections B and C of the instrument required "Yes" or "No" responses for the items. Response to either Yes or No option for each item = 1 point.

The questionnaire was subjected to reliability test using split-half method to measure the reliability and internal consistency from 20 pregnant women who were selected from a health facility in Edo State which was not used for the study. The Cronbach alpha yielded coefficient of 0.711.

### Method of Data Collection

Ethical approval was obtained for the study, and informed consent was obtained from the expectant mothers. Pregnant women who indicated not to participate were not used for the study. The researchers requested assistance of the midwife care providers in the health facilities during data collection. The pregnant women were approached at the time of their visits to the antenatal clinics. Interview method was adopted during the data collection; privacy and physical distancing were maintained during the period of data collection. Confidentiality was ensured by not including the names of the health facilities and the respondents in the data collection. 144 copies of the questionnaire were administered to the respondents.

### Method of Data Analysis

Standard descriptive statistics was used to summarize the variables. Percentages were used to answer the research questions while Mann-Whitney U and Kruskal Wallis tests were adopted in testing the null hypotheses at <0.05 level of significance. Statistical Package for Social Sciences (SPSS) software version 20 was used in the data analysis.

## RESULTS

*Table 1. Socio-demographic profiles of the respondents (n = 144)*

Variable	Class	Frequency	Percentage (%)	
Educational Level	Tertiary	109	75.69	
	Secondary	27	18.75	
	Primary	4	2.78	
	No formal education	4	2.78	
Employment Status	Employed	79	54.9	
	Unemployed	65	45.1	
Health	Primary	50	34.7	

Facility	Secondary	50	34.7	
	Tertiary	44	30.6	
Parity	Primigravida	85	59.0	
	Multigravida	59	41.0	
Age	1 (Below 20 years)	1	0.69	Mean age=27.79± 5.31 years Range = 17.0-48.0 years
	2 (20-29 years)	99	68.75	
	3 (30-39 years)	37	25.7	
	4 (40-48 years)	7	4.86	

Table 1 shows that 109 (75.69%) of the respondents had tertiary education, 27 (18.75%) had secondary education, 4(2.78%) had primary education, while 4 (2.78%) had no formal education. 79(54.9%) were employed while 65 (45.1%) were unemployed. For the Health facilities, primary and secondary levels constituted 50 (34.7%) each while tertiary level constituted 44 (30.6%). Among the respondents, 85

(59.0%) were primigravidae while 59 (41%) were multigravidae. 99(68.75%) were between 20-29years, 37 (25.7%) between 30-39 years, 7(4.86%) were between 40-48 years while 1 (0.69%) was below 20 years. Mean age of the respondents was 27.79±5.31 with a range of 17.0 – 48.0 years.

**Table 2:** Pregnant women’s Attendance to Antenatal Clinic and their response to CIVID-19 Vaccination

Domain	Items	Responses (F/%)		Mean % scores of the Domains
		Yes	No	
Attendance to Antenatal clinic	Early booking	110(76.4%)	34(23.6%)	72.64
	Not at all	23(16.0%)	121(84.0%)	
	According to appointment given by care provider	121(84.0%)	23(16.0%)	
	Reporting to the clinic on suspecting Covid-19	82(56.9%)	62(43.1%)	
	Afraid to attend antenatal clinic	55(38.2%)	89(61.8%)	
Responses to Covid-19 Vaccination	Have you received Covid-19 Vaccination?	8(5.6%)	136(94.4%)	39.16
	I will receive the vaccination	54(37.5%)	90(62.5%)	
	The vaccine is dangerous to health	68(47.2%)	76(52.8%)	
	The vaccine is protective	80(55.6%)	64(44.4%)	

Key: Domain mean score of 50% and above = Positive score

### Attendance to Antenatal Clinic by pregnant women in South-South Nigeria during Covid-19 Pandemic.

Table 2 shows that 76.4% of the respondents booked early for antenatal services while 23.6% did not, 84.0% attended antenatal clinics in line with appointment given by their care providers, 56.9% reported to the clinic on suspecting that they had contacted COVID-19 and 38.2% indicated that they were afraid to attend antenatal clinic. The mean domain score for antenatal visit was 72.64%

### Responses of pregnant women in South-South Nigeria about Covid-19 vaccination

Table 2 shows that only 5.6% of the pregnant women had received Covid-19 vaccination while 94.4% did not; 37.5%

indicated willingness to receive the vaccination while 62.5% did not; 47.2% indicated that the vaccine is dangerous to health while 52.8% said no. 55.6% indicated that the vaccine is protective while 44.4% had contrary responses. The mean domain score for Covid-19 vaccination was 39.16%.

### Extent to which pregnant women in South-South Nigeria received Covid-19 vaccination

Table 2 shows that only 5.6% of the pregnant women had received Covid-19 vaccination. 94.4% did not receive the vaccination.

**Hypothesis 1:** Demographic characteristics of the pregnant women in South-South Nigeria do not significantly influence the women's attendance to antenatal clinic during Covid-19 pandemic.

**Table 3:** Mann-Whitney U test showing influence of pregnant women's demographic variables on their attendance to antenatal clinic during Covid-19 pandemic.

Variable	Class	Mean Rank	Mann-Whitney (z)	p-Value
Educational level Vs Attendance to Antenatal clinic	Tertiary	80.45	19.90	<0.001*
	Secondary	52.57		
	Primary	31.38		
	No Formal education	31.38		
Employment Status Vs Attendance to Antenatal clinic	Employed	71.36	2477.50	0.703
	Unemployed	73.88		
Health Facility Vs Attendance to Antenatal clinic	Primary	65.55	5.84	0.054
	Secondary	69.06		
	Tertiary	84.31		
Parity Vs Attendance to Antenatal clinic	Primigravida	80.62	1817.50	0.003*
	Multigravida	60.81		

\* = Significant at  $P < 0.05$

Table 3 shows that for educational level  $z = 19.90$ ,  $p$ -value =  $< 0.001$ ; for parity  $z = 1817.50$ ,  $p$ -value =  $0.003$ . The null

hypotheses were rejected. Educational level and parity of pregnant women in South-South Nigeria significantly influenced their



attendance to antenatal clinic during Covid-19 pandemic. For employment status ( $z=2477.50$ ,  $p$ -value = 0.703) and Health facility ( $z=5.84$ ,  $p$ -value = 0.054), the null hypotheses were accepted. Employment

status of pregnant women in South-South Nigeria and the level of health facilities (primary, secondary and tertiary) do not significantly influence their attendance to antenatal clinic during Covid-19 Pandemic.

**Table 4:** Kruskal-Wallis test showing influence of Pregnant Women's Demographic Variables on their Opinion about Covid-19 Vaccination.

Variable	Class	Mean Rank	Kruskal Wallis (K)	P-Value
Educational level Vs Opinion about Covid-19 Vaccination	Tertiary	77.22	14.92	0.002*
	Secondary	58.76		
	Primary	17.00		
	No Formal education	92.13		
Health Facility Vs Opinion about Covid-19 Vaccination	Primary	74.27	1.11	0.58
	Secondary	75.11		
	Tertiary	67.52		
Employment Status Vs Opinion about Covid-19 vaccination	Employed	73.53	2482.50	0.707
	Unemployed	71.19		
Parity Vs Opinion about Covid-19 vaccination	Primigravida	70.95	2376.00	0.556
	Multigravida	74.73		

\* = Significant at  $P < 0.05$

**Hypothesis 2:** Educational level of pregnant women in South-South Nigeria does not significantly influence their opinion about Covid-19 vaccination.

Table 4 shows that  $K = 14.92$ ,  $P$ -value = 0.002. Hence, educational level of pregnant women in South-South Nigeria significantly influenced their opinion about Covid-19 vaccination. The null hypothesis was rejected.

**Hypothesis 3:** There is no significant difference across the primary, secondary and tertiary health facilities with regard to the opinion of pregnant women in South-South Nigeria about Covid-19 vaccination.

Table 4 shows that  $K=1.11$   $p$ -value = 0.58. The null hypothesis was accepted. Significant difference did not exist across the primary, secondary and tertiary facilities

with regard to the opinion of pregnant women in South-South Nigeria about Covid-19 vaccination.

**Hypothesis 4:** Employment status of pregnant women in South-South Nigeria does not significantly influence their opinion about Covid-19 Vaccination

In table 4,  $K = 2482.50$ ,  $p$ -value = 0.707. The null hypothesis was accepted. Employment status of pregnant women in South-South Nigeria did not significantly influence their opinion about Covid 19 vaccination.

**Hypothesis 5:** Parity of pregnant women in South-South Nigeria does not significantly influence their opinion about Covid-19 vaccination.

Table 4 shows that  $K = 2376.00$ ,  $p$ -value = 0.556. The null hypothesis was accepted.

Parity of pregnant women did not significantly influence their opinion about Covid-19 vaccination.

## DISCUSSION

Findings from the study indicated that majority of the pregnant women in South-South Nigeria booked early and attended antenatal clinics in line with the appointments given by their health providers during Covid-19 pandemic (table 2). Omer, Ali and Babar (2020) and Liang and Acharya (2020) explained that pregnant women should inform their maternity care providers regarding their health status and seek advice regularly during Covid-19 pandemic [3, 6]. According to CDC (2019), pregnant women should not skip their prenatal care appointments, and they should talk to their healthcare provider if they are concerned about attending their appointments due to Covid-19 [5]. The implication is that attendance to antenatal clinic by pregnant women during Covid-19 pandemic is very necessary to ensure good health and wellbeing of the pregnant mother and the developing fetus.

On response to Covid-19 vaccination, findings from this study showed that only few (5.6%) pregnant women had received the Vaccination, and majority indicated unwillingness to be vaccinated (table 2). This situation would pose high risk of contacting Covid-19 disease among pregnant women because with pregnancy, immune system is already compromised [5]. According to WHO (2022), vaccines are very important in the context of easing preventive measures, and vaccination is the key to protecting people from severe illness due to COVID-19. WHO (2022) also added that vaccines are much safer way to develop immunity to COVID-19, that Covid-19 vaccine provide more reliable protection than natural immunity, and that the vast majority of people who are hospitalized due to Covid-19 are unvaccinated or under-vaccinated [11].

Findings from the study indicate that educational level and parity of pregnant women in South-South Nigeria significantly influenced their attendance to antenatal clinic during Covid-19 pandemic (table 3). This result is in line with the findings of some other researchers. Wekesa et al (2018) observed that high parity and low educational level were the factors that affect early initiation and utilization of antenatal care among women in maternal and child Health clinic in Kwale County Kenya [12].

Finally, the result of this study revealed that educational level of pregnant women in South-South Nigeria significantly influenced their opinion about Covid-19 vaccination (table 4). Ghamri et al (2022) similarly observed that educational level significantly influenced acceptance of Covid-19 vaccination among pregnant women in Saudi Arabia [13].

## CONCLUSIONS AND RECOMMENDATIONS

This study indicate that most pregnant women attended antenatal clinics during Covid-19 pandemic, but few received Covid-19 Vaccination.

Educational level significantly influenced the women's attendance to antenatal clinic and their opinion about Covid-19 vaccination. Also, parity influenced their attendance to antenatal clinic.

There is urgent need for health professionals to mount campaigns to encourage pregnant women to respond positively to Covid-19 vaccination.

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