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Knowledge of Childhood Immunisation and its associated factors among pregnant women in Imo State

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Abstract

Introduction: Mother's vaccination practices may be influenced by their views and amount of information about child vaccinations. Misconceptions or rumours about the safety of vaccinations, poor awareness or wrong perception about vaccinations, and a lack of understanding or information about vaccinations are major barriers to high coverage of children. The aim of this study was to assess the knowledge of childhood immunisation and its associated factors among pregnant women.

Methods: This descriptive community based cross sectional study was carried out among 290 expectant mothers in Imo State, Nigeria. The participants were selected using a multistage sampling technique. The data was collected using a semi-structured interviewer administered questionnaire. The data was analysed using SPSS version 25. Chi square analysis was used to determine the relationship between variables at $p<0.05$.

Results: The result showed that 138(47.6%) were between the ages of 20-29 years, 256(88.3%) were married, 215(74.1%) attained secondary level of education and 171(59.0%) of the respondents had good knowledge of immunisation. The factors associated with immunisation were fathers' education level <0.001, mothers employment status $p=0.006$ and family income $p<0.001$.

Conclusion: The study showed that most of the mothers had knowledge of immunisation although they still had some misconceptions with regards to child immunisation. More health education is needed especially among mothers to improve the knowledge and acceptance of immunisation.

Keywords: Immunisation, mothers, knowledge, Imo State

Background

Approximately 14.3 million children worldwide were not vaccinated in 2022, and 20.5 million children were either under vaccinated or unvaccinated. An estimated 4.4 million deaths have been avoided each year because of immunisation. [1] In Nigeria, over 6.2 million children have not had a vaccine in the previous five years. [2] Children in Sub-Saharan Africa continue to have the highest rates of mortality in the world at 74 (68–86) deaths per 1000 live births. [3] Children are more susceptible because of the poor immunity that often accompanies infancy, and the primary causes of death for children under five are infectious malaria, pneumonia, diarrhoea, pertussis, measles, and meningitis.[4] In health care, prevention of disease is always better than cure. It is undeniable that vaccines have been an important part in preventive medicine based on their successes in controlling vaccine-preventable diseases in the developed world. [5] The process of vaccination increases a person's life expectancy and helps prevent, control, or eradicate a variety of paediatric infectious illnesses. By boosting the immune system, a vaccine shields a person against bacterial, viral, or fungal infections or illnesses in the future.[5] The goal of proper vaccination is to improve immunisation in both adults and children in order to prevent infectious or communicable diseases. Additionally, vaccines may slow the spread of illness in the general population.[6]

Immunisation is established tool for checking and eradicating dangerous infectious diseases and is estimated to avoid between 2 and 3 million deaths annually.[7] Immunisation is a top priority for newborns and children as it has eliminated several infectious illnesses that formerly caused a significant portion of the population to die. Since parents are the ones who decide the majority of the health decisions for their children, their general vaccination practices and knowledge have a significant influence on their children's immunisation status.[8]

Globally, mothers have been shown to lack sufficient information on childhood immunisation. [9–11]In South-West Nigeria, more than half of the mothers had poor knowledge of child hood immunisation.[12]Similarly, among mothers in Edo State, Southern Nigeria, report suggested that they have a poor knowledge of childhood immunisation.[13] In Imo State, South-East Nigeria, evidence suggests that some of the under-five children are not fully immunized, [14] previous studies in Imo State have also shown mothers lack adequate information about childhood immunisation.[15] Several factors like maternal age, receiving antenatal care,[1] maternal occupation, [16] maternal education, economic status, distance to health facilities and cultural beliefs could affect maternal knowledge and compliance to immunisation.[17]

The aim of the study was to evaluate maternal knowledge of childhood immunisation and its determinants among mothers in Imo State, Nigeria.

Method

Study Area

This study was conducted in Imo State Nigeria. Imo State is located in South-East, Nigeria. It comprises of 27 Local governments Areas. Owerri is the capital of the state. Imo State has a population of over 4.8 million with population density that varies from 230 persons per sq. km.

The state is rich in natural resources including crude oil, natural gas, lead and zinc. Economically exploitable flora like the iroko, mahogany, obeche, bamboo, rubber tree and oil palm predominate.

Study Population

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The study was conducted among women in Imo State. All pregnant women in the second to third trimester of pregnancy in Imo State. pregnant women who had miscarriage will be excluded from the study. Pregnant women who had pre-term delivery will be excluded from this study

Sample Size Determination

The sample size was The sample size will be calculated using Cochran sample size formula for calculating sample size of a single proportion, n $=\frac{Z^2pq}{e^2}$. [18]

Where n = Sample size to be obtained

Z = the normal curve, 1.96 at 95% Confidence Interval

e = margin of precision (5%)

Proportion of women with knowledge of immunisation in previous studies which was 76% [19]

q=1-p= 0.24

The minimum sample size to carry out this study was 280

Sampling Technique

The participants were selected using a multistage sample technique. First a simple random sampling was used to select six LGAs from the 27 LGAs in the State. Owerri West, Ideato North, Ideato South, Mbano, Mbaitololu and Owerri North were selected at this stage. Two wards each were selected from each of the selected LGAs using a Simple random sampling. A simple random sampling was used to select six communities from the list of all the communities in the selected wards, Ihiagwa, Umuaghobe, Umuezegwu, Mbieri, Asaruabo and Umuakam communities were selected at this stage. The selected communities were divided into three clusters and simple random sampling was used to select two clusters. One for the intervention and one for the control arm. A systematic sampling method was used to select pregnant women in each of the selected clusters.

Study Instrument

The study was conducted using a semi-structured questionnaire adapted from previous studies. The questionnaire comprised of sections for social demographic characteristics, medical history and knowledge of immunisation. The questionnaire was validated by pre-testing it in a population different from the selected sites. The questionnaire was interviewer administered.

Data Analysis

The data was coded and entered into Microsoft excel, the data was then imported into SPSS version 25 for analysis. The data was summarized using mean, standard deviation and proportions. Chi square analysis was used to determine the relationship between variables at a p-value of <0.05.. The knowledge of the mothers on immunisation was determining by assigning a score of 1 to a question answered correctly and a score of 0 to a question wrongly answered. The percentage correct score was then computed and categorized into different level of knowledge. A score of <50% was categorized as poor knowledge, 50-79.9% was categorized as fair knowledge, 80-100% was categorized as good knowledge.

Ethical Consideration

The University of Port Harcourt research ethics committee reviewed and approved this study. Written informed consents were obtained from the participants of the study prior to commencements of the study. The data obtained from this study were treated with confidentiality. The names and personal information of the participants in this study were not reported.

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Results

Table 1: Social Demographic Characteristics

Variable	Frequency n=290	Percent
Mother age		
<20	4	1.4
20-29	138	47.6
30-39	132	45.5
40-49	13	4.5
≥50	3	1.0
Marital Status		
Single	18	6.2
Married	256	88.3
Cohabiting	3	1.0
Separated	6	2.1
Divorced	2	0.7
Widowed	5	1.7
Religion		
Christian	272	93.8
Islam	8	2.8
Others	10	3.4
Education		
No formal education	1	0.3
Primary	19	6.6
Secondary	215	74.1
Tertiary	55	19.0
Partner Education		
No formal education	6	2.1
Primary	6	2,1
Secondary	165	56.9
Tertiary	113	39.0
Employment status		
Employed	59	20.3
Self-employed	172	59.3
Unemployed	59	20.3
Father Employment status		
Employed	26	9.0
Self-employed	253	87.2
Unemployed	11	3.8
Family Income		
0-50,000	244	84.1
50,001-100,000	38	13.1
100,001-150,000	3	1.0
>150,000	5	1.7
Owerri west		
Ideato north	61	21.0
Ideato south	47	16.2
Mbano	40	13.8
Mbaitolu	65	22.4
Owerri north	40	13.8

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Table 1 shows that 138(47.6%) of the respondents were between the age of 20-29 years, 256(88.3%) were married, 272(93.8%) of the respondents were Christians and 215(74.1%) attained secondary level of education. Also. 165(56.9%) of the fathers attained secondary level of education, 172(59.3%) were self-employed, 253(87.2%) of the fathers were self-employed and 244(84.1%) had a monthly income of 50,000naira or less, 65(22.4%) were from Mbaitolu LGA and 61(21.0%) were from Ideato north.

Table 2: knowledge of Immunisation

Variable	Frequency n=290	Percent
Immunisation can prevent infectious disease		
Yes	290	100.0
Infant should start immunisation immediately after birth		
Yes	285	98.3
No	5	1.7
Immunisation is harmful		
Yes	13	4.5
No	277	95.5
Giving more than one vaccine at a time could harm the child		
Yes	29	10.0
No	261	90.0
Side effect of immunisation can kill a child		
Yes	156	53.8
No	134	46.2
Age child expected to take BCG vaccine		
At birth	270	93.1
At 3 months	18	6.2
At one year	2	0.7
Age child expected to take yellow fever vaccine		
At birth	6	2.1
At 3 months	14	4.8
At 9 months	265	91.4
At one year	5	1.7
Age child expected to take Measles vaccine		
At birth	3	1.0
At 3 months	16	5.5
At 9 months	260	89.7
At one year	12	4.1

The result shows that 290(100.0%) of the respondents reported that immunisation can prevent infectious diseases, 285(98.3%) reported that infant should start immunisation immediately after birth, 13(4.5%) reported that immunisation is harmful, 29(10.0%) reported that giving more than one vaccine at a time could harm the child, 156(53.8%) reported that the side effect of immunisation can kill a child, 270(93.1%) reported that BCG vaccine should be giving at birth.

Table 2b: knowledge of Immunisation

Variable	Frequency n=290	Percent
Number of PENTA vaccine a child is expected to take		
1	9	3.1
2	32	11.0
3	236	81.4
4	8	2.8
5	5	1.7
End period of child immunisation		
No time	3	1.0
At birth	2	0.7
At one month	1	3.4
At 3 months	1	3.4
At 6 months	7	2.4
At one year	276	95.2

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Furthermore, 236(81.4%) reported that a child is expected to take three doses of PENTA vaccine and 276(95.2%) reported that childhood vaccination ends at one year.

Table 3: Level of Knowledge of Immunisation

Variable	Frequency n=290	Percent
Poor	14	4.8
Fair	105	36.2
Good	171	59.0

The result shows that 14(4.8%) of the respondents had poor knowledge, 105(36.2%) had fair knowledge and 171(59.0%) had good knowledge of immunisation

Table 5: Factors Associated with Knowledge of Immunisation

Variable	Knowledge		X^2(p-value)
	Poor/Fair n(%)	Good	
Mothers age			
<30	56(39.4)	86(60.6)	0.294(0.588)
≥30	63(42.6)	85(57.4)	
Marital Status			
Single/Separated/Divorced	10(32.3)	21(67.7)	1.105(0.293)
Married/cohabiting	109(42.1)	150(57.9)	
Religion			
Christian	111(40.8)	161(59.2)	0.092(0.761)
Others	8(44.4)	10(55.6)	
Mother education			
<Tertiary education	91(38.7)	144(61.3)	2.735(0.98)
Tertiary education	28(50.9)	27(49.1)	
Father education			
<Tertiary education	58(32.8)	119(67.2)	12.828(<0.001)
Tertiary education	61(54.0)	52(46.0)	
Mother employment status			
Employed	104(45.0)	127(55.0)	7.460(0.006)
Unemployed	15(25.4)	44(74.6)	
Father employment status			
Employed	113((40.5)	166(59.5)	0.863(0.353)
Unemployed	6(54.5)	5(45.5)	
Family Income			
≤50,000	111(45.5)	133(54.5)	12.631(<0.001)
>50,000	8(17.4)	38(82.6)	

The results show that father education level p<0.001, mother employment status p=0.006 and family income p<0.001 were significantly associated with the knowledge of immunisation. (Table 5)

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Discussion

One of the greatest advantages that any nation can provide to its citizens is protection against illness. Vaccines are unquestionably a vital component of a health system, a successful means of disease control in many nations worldwide, and the most economical method of preventing morbidity and mortality that enables individuals to better defend themselves against specific bacteria and viruses. Parents, especially mothers, play a significant role in ensuring that children are immunized. The understanding of mothers about childhood immunisation and its importance goes a long way in influencing their decision to make their infants available for immunisation.

In this study, more than half of the mothers had adequate knowledge of immunisation. Most of the women were aware that immunisation can prevent infectious diseases and infants should start immunisation immediately after birth. Similar observations were reported in previous literature..[7,20] The findings differed from what was observed in a study among mothers in Edo State, Nigeria, where less than half of them had sufficient knowledge of childhood immunisation. [21]

In our study, few of the respondents thought that immunisation is harmful to the newborn baby; some of them thought that giving a child more than one vaccine at a time could harm the child, and more than half of the respondents had strong reservations regarding the side effects of immunisation; they felt that it could kill the child. The public health implication of these findings is that the women who have these reservations and misconceptions may not want to make their children available for immunisation, and this will have a negative impact on the growth and well-being of the children. Similar misconceptions were observed among mothers and carers in Cross River State, Nigeria[22] and in Kazakhstan. [23] This was unlike the study in Anambra State, Nigeria, where all the mothers had no misconceptions about childhood immunisation.[24]

Furthermore, some of the respondents do not know the appropriate time certain vaccines are given to children. A similar finding was reported in Osun State, Nigeria [19] and in Oyo State, Nigeria. [12] The implication is that the mothers, even though they may have the intention to get their children vaccinated, could miss the immunisation appointment of their children. The education level of the father was significantly associated with maternal knowledge of immunisation. The knowledge of immunisation was better among respondents whose fathers of the babies attained secondary education or below when compared to those who attained secondary education. This may be because the mothers are mainly involved in taking the children to the hospital; hence education of the fathers may not necessarily translate to better knowledge of childhood immunisation among the mothers. This was different from what was observed in a study in Ethiopia where literates' parents had better knowledge of immunisation, although the study was conducted among both parents; hence the maternal knowledge may have played a significant role in the assessment. [11] Although in our study and a previous study in Lybia,[25] maternal education level was not associated with the knowledge of immunisation; several studies have shown that higher maternal level of education is associated with improved knowledge of immunisation.[12,19,26] Mothers who are more educated will certainly have the advantage of having better knowledge of immunisation because they are the ones who mainly bring the babies for clinical appointments and receive the relevant health education given in the health facilities.

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The employment status of the mothers was significantly associated with the knowledge of immunisation. Mothers who were unemployed exhibited better knowledge of immunisation when compared to mothers who were employed. The possible explanation for these finding is that mothers who are unemployed have more time at their disposal to go for health education talks at the health facilities. Also, being unemployed, they may also have the luxury of time to make their personal research about immunisation.

The family income of the respondents was significantly associated with maternal knowledge of immunisation. The knowledge of immunisation improved with higher family income. This could be due to the ability to access health information due to better advantage. The respondents with a high level of income will be more able to afford the cost of health care, including indirect costs like transportation to the health facilities to access health care information. Also, they are more capable of affording educational materials that provide insight into healthy lifestyles. This was similar to what was observed in India, where the results suggested that higher income levels were associated with improved knowledge of immunisation among the mothers[27] The impact of socioeconomic status on health-seeking behaviours was also evident in a study among mothers in South-West Nigeria, where higher socioeconomic status was associated with better health-seeking behaviour. [28] In several studies across Nigeria and all over the world, it was observed that mothers with higher socioeconomic status were more likely to get their children fully vaccinated when compared to mothers with lower socioeconomic status. [1,29–31]

Conclusion

The goal to achieve full immunisation coverage may still be hampered by several misconceptions about immunisation. Although mothers in this study were informed of the importance of immunisation, many of them were still worried about the side effects of immunisation on their children and the number of vaccines a child receives. Furthermore, some mothers are not still conversant with the immunisation schedules for infants. Health talks in the health facilities should place more emphasis on correcting these misconceptions as well as highlighting the schedules for immunisation. Intervention strategies such as community-based health education among mothers could improve that knowledge of immunisation and the immunisation coverage in general.

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