

Immunization Services Utilization among Mothers in a Tertiary Health Facility in Edo State, Nigeria

Uwaibi N.E.¹

¹Department of Community Health,
Edo University Uzairue, Edo state, Nigeria

Omozuwa E.S.²

²Department of Obstetrics and Gynaecology,
Edo University, Uzairue, Edo state, Nigeria

Abstract:- Immunization is a cost-effective approach to reduce morbidity and mortality associated with infectious diseases and still remains one of the most important public health interventions in developing countries. The main objective of the study was to assess knowledge, attitude, satisfaction and barriers affecting utilization of immunization services among women attending clinic in a tertiary institution in Edo state, Nigeria. The study utilised a descriptive cross-sectional study, using a structured face to face interviewer administered questionnaire with open and closed ended questions to obtain information on knowledge, attitude, practice and satisfaction of immunization services amongst 300 mothers attending the immunization clinic. Results from the study shows that 187 (62.3%) of the mothers had good knowledge of immunization, 238 (79.3%) of the respondents had positive attitude towards immunization, about half 66.7% didn't vaccinate their children because they didn't think it was necessary while majority were satisfied with immunization services received. Level of education, place of delivery was some of the factors affecting mother's knowledge of immunization. The knowledge of immunization among the mothers was high, there was fairly positive attitude towards immunization and majority were satisfied with immunization services. Developing and implementing age specific maternal and child health promotion campaigns targeting specific age groups may increase utilization of MCH services among women of reproductive age in the country and thus improve MCH outcomes.

Keywords:- Knowledge, mothers, immunization, satisfaction, utilization.

I. INTRODUCTION

Vaccine preventable diseases are the most common causes of childhood mortality with an estimated three million deaths each year. 1 In sub-Saharan Africa, the risk of a child dying before the fifth birthday is almost 15 times higher than the risk facing a child born in a high-income country.2 majority of these under-five deaths occur in only five countries: Nigeria, India, Pakistan, Democratic Republic of the Congo and China. 3 This has given priority to achieving immunization targets by sustainable Development Goal (SDG) 3 to reduce under five mortality rates by 2030.4 Immunization is a profitable approach that reduces infections due to vaccine preventable diseases and is one of the most important public health interventions in developing countries.

World Health Organization (WHO) with UNICEF and Rotary International as partners, in 1974 created, the Expanded Programme on Immunization (EPI), as part of the child survival programme.1 This has globally increased the level of immunization of the children from 5% to 80% in 30 years .5 Nigeria like most other countries utilises the Expanded Programme on Immunisation (EPI) which mirrors the international recommendations of the World Health Organization. The EPI considers a child fully vaccinated if she or he has received Bacille Camille Guerin (BCG) vaccination against tuberculosis; three doses of vaccine to prevent diphtheria, pertussis, and tetanus; at least three doses of polio vaccine; and one dose of measles vaccine during the first year of life. 6 Tremendous efforts aimed at improving utilization of immunization services have yielded beneficial results with most all developed countries of the world having coverage of over 90.0% 7 however, the situation is quite different for developing countries in Africa where vaccine preventable diseases contribute significantly to under-5 mortalities.8,9This is due to factors which affect utilization of immunization services, such as misinformation and myths about vaccines, adverse effects, and access to services.10 Others factors have being attributed to poor maternal knowledge, attitude and practices which are triggered by poor maternal educational status and lack of economic empowerment,6 cultural receptivity to perceived modernity, trust in health workers10,11 and satisfaction with services as a satisfied client are more likely to develop a deeper and long-lasting relationship with their medical provider, leading to improved compliance, continuity of care, and ultimately better health care outcomes.12

Immunization Coverage is the best indicator of an immunization programme's performance because it reflects the management, access, and utilization of services.13,14 Nigeria recorded fluctuations in the national routine immunization coverage with values ranging from of 12% in 2003 to triple its value of 36% in 2006 but in 2013, The National Demographic and Health Survey (NDHS), reported that, 25 percent of children were fully vaccinated while 21% of eligible children received no vaccination at all. Fifty one percent received the BCG vaccine, 42% received the measles vaccine, 51% received the first dose of the DPT vaccine, while only 38% received the third dose of DPT, reflecting a dropout rate of 25% for DPT. Overall, 21% of the children received all of the recommended vaccinations before their first birthday and in Edo state immunization coverage rate in 2013 was 52%.5 This immunization coverage values were determined by factors, such as lack of political will, lack of motivation, poor level of education and awareness and poor infrastructure.15 research has also shown that mother's knowledge and positive attitude towards immunization, is

required to achieve 90% national immunization coverage and 80% immunization coverage at ward levels.^{16, 17} Several studies from Nigeria, Ethiopia, and India have shown positive association between maternal knowledge of routine immunization with completion of childhood routine immunization and use of maternal and child health facilities.^{18,19,20}

Where accessibility and utilization of health services are low, every contact with a health facility provides an opportunity to immunize, particularly as these children are naturally at risk of vaccine preventable diseases. Considering naturally challenged immunity, current household food insecurity and unaffordable health care. Nigeria with its low coverage should leverage and capitalize on every opportunity where mother and child presents to health facilities for health services to carry out immunization activities.¹⁷ Mothers are usually the ones who take the children for these services therefore their knowledge and attitude will affect the utilization of immunization services and immunization coverage, other determinants may exist. Therefore, investigations into the factors that determine the utilization of a given sample will show the gap in the immunization coverage and provide the necessary resources for government to scale up immunization services. The main objective of this study was to assess the factors affecting maternal utilization of the services, identify reasons for incomplete immunization services in Benin city, Edo state. This study will serve as an advocacy tool to relevant stakeholders and authorities to improve the facilities and services available to clients which on the long run, will increase utilization of immunization services.

II. METHODS

The study was carried out at the infant well baby clinic at University of Benin Teaching Hospital (UBTH) Benin City Edo State. The infant well baby clinic is located at the general outpatient department of UBTH and offers immunization services to people in Benin city and its environs. This study was a descriptive cross-sectional study among caregivers/mothers of the infants who presented for well-baby clinic, immunization services and other health services such as growth monitoring and food demonstrations. Minimum sample size was calculated using the Cochran formula for single proportions²¹ where p prevalence was 81.2%, 22% which was the proportion of mother's knowledge in a study that was carried out in 2012, Enugu Nigeria,²² which gave a sample size of 262 respondents after calculating and adding a 10% non-response rate. A total of 300 mothers were however utilised for the study.

A. Sampling technique:

A systematic random sampling method was used to recruit participant for the study. A list containing the number of children who attended clinic in the past three months was compiled and this served as the sampling frame. The sampling interval was then obtained using the formula, Total population /sample size every nth mother was recruited until sample size was obtained after selecting the first respondent by a random procedure (Balloting).

As follows: over the past three months average attendance at well baby clinic was 4,352. Therefore, using the formula, total population/sample size.

$$\frac{4352}{300} = \frac{15}{1}$$

i.e. every 15th mother was recruited to get the minimum sample size, after the first was gotten by simple random sampling by balloting. This was done until the sample size is obtained.

Data collection was done face to face by the researcher and research assistants. Each eligible mother provided information on only one (index) 12 -59 months old child. Information on vaccination status was retrieved through verbal response of mother and immunization card. Every immunization day a list was generated from the mothers who presented for clinic and simple random sampling techniques was used to determine the first respondent. This was done daily until the sample size was achieved.

B. Data analysis

Quantitative data was obtained by use of a researcher administered structured standardized questionnaire designed by the researcher from review of various literatures that assessed knowledge, attitude, satisfaction of immunization services., with Close and Open-ended questions. Variables sought were in line with the objectives of the study and covered the following areas: socio-demographic data, parity of mother, age of children, maternal knowledge, attitude, satisfaction and barriers affecting utilization of immunization services.

Knowledge score of less than 49% was assessed as poor knowledge, score of 50% to 69 % was fair knowledge and greater than 70%, was good knowledge. Questions on attitude was scored on a 3-point Likert scale ranging from (agree, uncertain and disagree) and assessed as less than 5 negative attitudes and greater than 5 positive attitudes. Maternal satisfaction was assessed using a 5-point Likert scale adapted for this study. Maternal satisfaction scale was a 10-item tool using a 5-point Likert scale for scoring women's assessment of various key aspects of satisfaction. The scale enquired mother's level of satisfaction for each item in two stages: Whether or not they were satisfied with services received at the health facility. It had response of yes or no and appropriate number for her response were noted as (1) very dissatisfied, (2) dissatisfied, (3) undecided, (4) satisfied and (5) very satisfied.

The retrieved questionnaires were screened for completeness, coded and entered into the IBM statistical package for social sciences (SPSS) 21.0 software. Characteristics of mothers and children were presented in simple frequency tables (categorical data) and percentages while numerical data normal in distribution was presented as mean (standard deviation). Statistical analysis of difference between means was done by the use of the student T-test, while test of association between the variables was done with the chi-squared (χ^2 -test) and when the expected cell frequencies were less than five is more than 20%, comparison

of proportions was accomplished using the Fisher's exact test. Statistical significance was set at p -value <0.05 .

C. Ethical Considerations

Ethical clearance to conduct this research was sought and obtained from the University of Benin Teaching Hospital (UBTH) Research Ethics Committee. Permission for the study was sought and obtained from the UBTH management, the Head of the Family Medicine Department and the matrons in charge of the immunization clinic and written informed consent was obtained from each respondent (care giver) before conducting interviews.

III. RESULTS

Table 1: Socio-demographic characteristics of respondents

Variable	Frequency (n = 300)	Percent
Age (years)		
19 – 24	24	8.0
25 – 30	143	47.7
31 – 36	97	32.3
37 – 42	29	9.7
> 42	7	2.3
Marital status		
Single	6	2.0
Married	289	96.3
Widowed	2	0.7
Separated	3	1.0
Religion		
Christianity	277	92.3
Islam	20	6.7
ATR	3	1.0
Tribe		
Benin	134	44.7
Igbo	43	14.3
Esan	26	8.7
Yoruba	23	7.7
Urhobo	14	4.7
Afemai	10	3.3
Owan	9	3.0
Delta Igbo	9	3.0
Etsako	8	2.7
Isoko	6	2.0
Others*	18	6.0

Mean age = 30.7 ± 5.3 years

Others* included Itsekiri, Effik, Igalla, Ibibio and hausa

The study was conducted among 300 mothers/child pair attending the immunization clinic. All mothers approached participated in the study giving a respondent proportion of

100.0%. table 1 shows the characteristics of mothers. One hundred and forty-three (47.7%) 289 (96.3%) were married and two hundred and 277 (92.3%) were Christians.

Table 2: Place of delivery, attendance of ANC and Socio-demographic characteristics of the index children

Variable	Frequency (n = 300)	Percent
Place of delivery		
Government health facility	236	78.7
Private health facility	52	17.3
Home	12	4.0
Attendance of ANC		
Yes	233	77.7
No	67	22.3
Age (months)		
12 – 23	163	54.3
24 – 35	60	20.0
36 – 47	35	11.7
48 – 59	42	14.0
Number of children		
≤ 4	263	87.7
> 4	37	12.3

Mean age = 26.3 ± 13.7 months ANC= antenatal care

As shown in table II, 236 (78.7%) delivered in a government health facility, 233 (77.7%), had children

distributed within the age group 12 – 23 months 163 (54.3%) and a mean age of 26.3 ± 13.7 months.

A. Awareness and knowledge of immunization

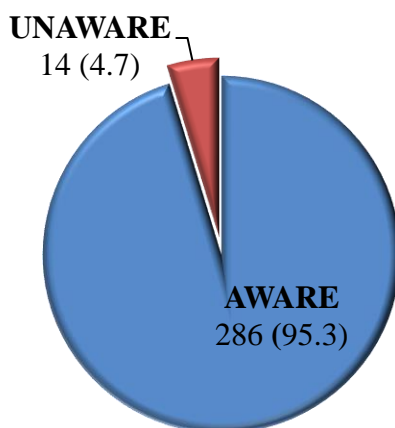


Fig. 1: Respondents’ awareness of immunization

Two hundred and eighty-six (95.3%) were aware of immunization while 14 (4.7%) were not aware.

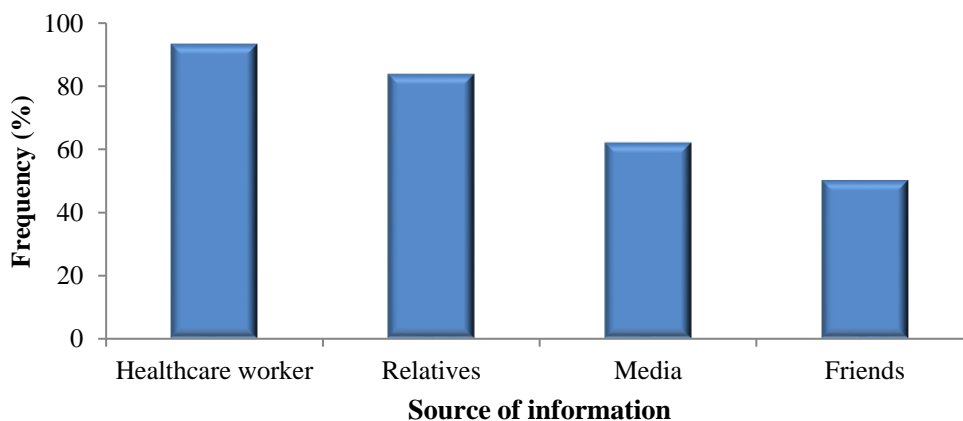


Fig. 2: Respondents’ sources of information on immunization

As shown in figures 1 and 2, 286 (95.3%) were aware of immunization and 267 (93.4%) indicated healthcare

workers as their source of information on immunization, followed by 240 (83.9%) who said relatives.

Table 3: Respondents' knowledge of immunization

Variable	Frequency (n = 286)	Percent
Knowledge of the definition of immunization		
Correct definition	229	80.1
Incorrect definition	57	19.9
Purpose of immunization		
Prevents disease	173	60.5
Prolong life	58	20.3
Make child brilliant	53	18.5
Make child grow fast	2	0.7
Number of vaccines respondents were aware of		
6	24	8.4
5	79	27.6
4	91	31.8
3	73	25.5
2	8	2.8
1	6	2.1
None	5	1.7
Knowledge of the types of vaccines		
BCG	156	54.5
OPV	139	48.6
Pentavalent vaccine	102	35.7
Measles vaccine	79	27.6
Hepatitis B vaccine	54	18.9
Yellow fever vaccine	6	2.1
Knowledge of the types of Vaccine preventable diseases		
Polio	117	40.9
Tuberculosis	95	33.2
Measles	77	26.9
Hepatitis	56	19.6
Yellow fever	28	9.8
Knowledge of the number of times needed to complete immunization		
< 7	97	33.9
≥ 7	189	66.1
Knowledge of the site of administration		
Right arm	263	92.0
Mouth	241	84.3
Right thigh	229	80.1
Left arm	201	70.3

Of the total proportion of the respondents aware of immunization, 229 (80.1%) could correctly define immunization and 173 (60.5%) stated that its purpose is to prevent diseases.

Twenty-four (8.4%) respondents were aware of 6 vaccines, and indicated BCG was the most popular vaccine with 156 (54.5%) aware of it, followed by OPV, 139 (48.6%) and pentavalent vaccine 102 (35.7%). However, when they

were asked to mention the name of the vaccine preventable diseases Polio was the most popular vaccine preventable disease with 117 (40.9%) aware of it, followed by tuberculosis and measles (95 (33.2%) and 77 (26.9%) respectively).

One hundred and eighty-nine (66.1%) reported that at least 7 visits are required for complete immunization of the child.

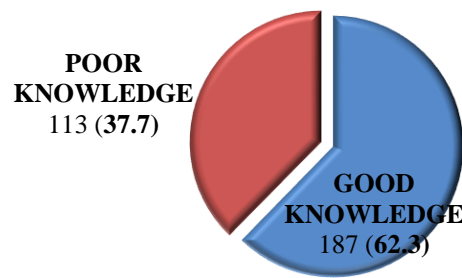


Fig. 3: Composite knowledge score of Respondents

One hundred and eighty-seven (62.3%) had good knowledge of immunization.

Table 4: Socio-Demographic characteristics and Knowledge of immunization among the respondents

Variable	Knowledge of immunization			Test statistic	p value
	Good n (%)	Poor n (%)	Total n (%)		
Age (years)					
19 – 24	15 (62.5)	9 (37.5)	24 (100.0)	$\chi^2 = 2.707$	0.608
25 – 30	88 (61.5)	55 (38.5)	143 (100.0)		
31 – 36	65 (67.0)	32 (33.0)	97 (100.0)		
37 – 42	16 (55.2)	13 (44.8)	29 (100.0)		
> 42	3 (42.9)	4 (57.1)	7 (100.0)		
Marital status					
Single	5 (83.3)	1 (16.7)	6 (100.0)	Fisher's exact = 1.958	0.657
Married	178 (61.6)	111 (38.4)	289 (100.0)		
Widowed	2 (100.0)	0 (0.0)	2 (100.0)		
Separated	2 (66.7)	1 (33.3)	3 (100.0)		
Level of education					
No formal	0 (0.0)	8 (100.0)	8 (100.0)	Fisher's exact = 199.600	< 0.001*
Primary	0 (0.0)	78 (100.0)	78 (100.0)		
Secondary	161 (87.0)	24 (13.0)	185 (100.0)		
Tertiary	26 (89.7)	3 (10.3)	29 (100.0)		
Employment status					
Employed	166 (64.6)	91 (35.4)	257 (100.0)	$\chi^2 = 3.894$	0.061
Unemployed	21 (48.8)	22 (51.2)	43 (100.0)		
Occupation (n = 257)					
Skill level I	94 (59.9)	63 (40.1)	157 (100.0)	Fisher's exact = 6.190	0.078
Skill level II	60 (69.0)	27 (31.0)	87 (100.0)		
Skill level III	2 (100.0)	0 (0.0)	2 (100.0)		
Skill level IV	10 (90.9)	1 (9.1)	11 (100.0)		
Antenatal clinic attendance					
Yes	174 (74.7)	59 (25.3)	233 (100.0)	$\chi^2 = 67.716$	< 0.001*
No	13 (19.4)	54 (80.6)	67 (100.0)		
Place of delivery					
Government HF	146 (61.9)	90 (38.1)	236 (100.0)	Fisher's exact = 9.702	0.008*
Private HF	38 (73.1)	14 (26.9)	52 (100.0)		
Home	3 (25.0)	9 (75.0)	12 (100.0)		
Age of the index child					
12 – 23	98 (60.1)	65 (39.9)	163 (100.0)	$\chi^2 = 7.331$	0.062
24 – 35	45 (75.0)	15 (25.0)	60 (100.0)		
36 – 47	17 (48.6)	18 (51.4)	35 (100.0)		
48 – 59	27 (64.3)	15 (35.7)	42 (100.0)		
Number of children					
≤ 4	167 (63.5)	96 (36.5)	263 (100.0)	$\chi^2 = 1.232$	0.267
> 4	20 (54.1)	17 (45.9)	37 (100.0)		

*Significant

Fifteen (62.5%) of the respondents who were 19- 24 years had good knowledge of immunization compared to 3 (42.9%) of those aged above 42 years. There was high tendency to have good knowledge of immunization among the younger respondents compared to the older ones. This association was not statistically significant ($p = 0.608$).

All the respondents with primary education or less had poor knowledge of immunization while 26 (89.7%) with tertiary level of education had good knowledge of immunization. This association was statistically significant ($p < 0.001$).

B. Mothers attitude towards immunization

Table 5: Respondents' attitude towards immunization

Variable	Agree n (%)	Indifferent n (%)	Disagree n (%)
Immunization is beneficial to the child	238 (79.3)	57 (19.0)	5 (1.7)
Would advise mothers to immunize their children	199 (66.3)	98 (32.7)	3 (1.0)
Immunization can cause infertility in later life	26 (8.7)	103 (34.3)	171 (57.0)
Will immunize child even if he/she has diarrhoea	132 (44.0)	64 (21.3)	104 (34.7)

Two hundred and thirty-eight (79.3%) of the respondents agreed that immunization is beneficial to their children and 199 (66.3%) agreed that they would advise mothers to immunize their children.

< 0.001). This was the case with antenatal clinic attendance as 174 (74.7%) of the respondents who attended antenatal clinic, had good knowledge compared to 13 (19.4%) of those who did not attend antenatal clinic. This association was statistically significant ($p < 0.001$).

One hundred and forty-six (61.9%) of those who delivered in government health facilities, had good knowledge of immunization compared to 38 (73.1%) of those who delivered in private health facilities. This association was statistically significant ($p = 0.008$).

One hundred and seventy-one disagreed with the opinion that immunization can cause infertility later in life and 132 (44.0%) agreed that they will immunize their children even if they have diarrhoea.

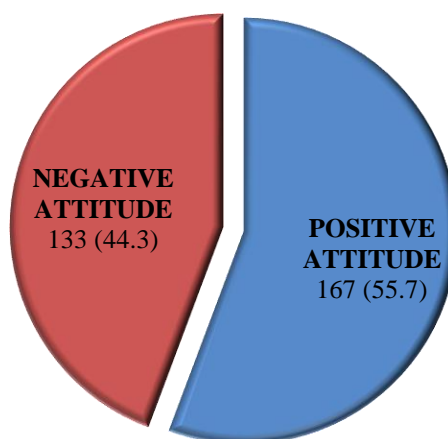


Fig. 4: Respondents' attitude towards immunization (composite score)

One hundred and sixty-seven (55.7%) of the respondents had positive attitude towards immunization.

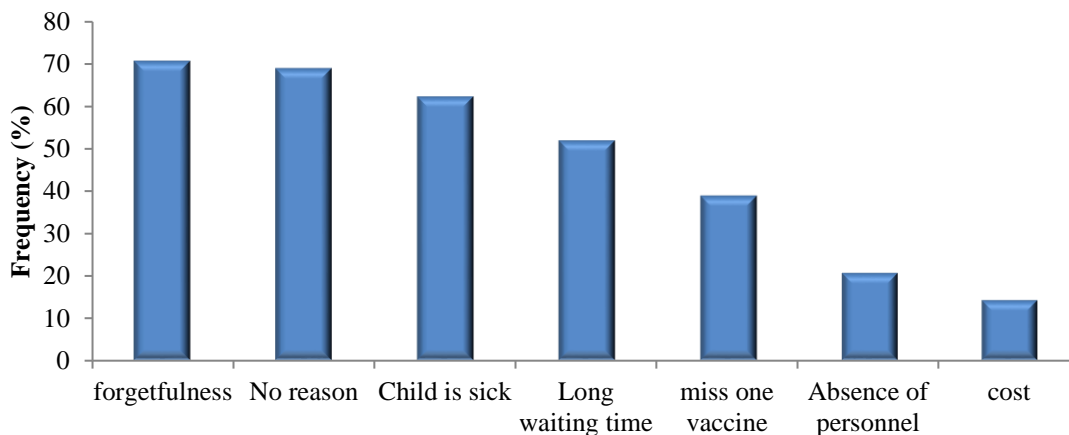
C. Reasons for non-utilization of immunization services

Table 6: Respondents' reasons why mothers don't vaccinate their children

Variable	Frequency (n = 300)	Percent
Don't think it necessary	197	65.7
Husband disapproves	57	19.0
Vaccine out of stock	31	10.3
Ignorance	15	5.0

One hundred and ninety-seven (65.7%) indicated that mothers do not vaccinate their children because they don't think it necessary while 57 (19.0%) followed by husband

disapproval, 212 (70.7%) said forgetfulness was a barrier, 207 (69.0%) stated no reason while 187 (62.3%) indicated that child's sickness.



Barriers

Fig. 5: reasons for non-utilization of immunization among the respondents

Two hundred and twelve (70.7%) indicated forgetfulness as a barrier towards immunization of their children, 207 (69.0%) stated no reason while 187 (62.3%) indicated that child’s sickness was a reason for not utilizing immunization services.

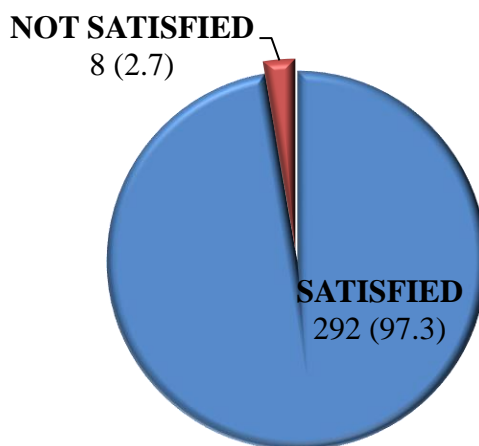


Fig. 6: Respondents satisfaction with the immunization service at the clinic

Two hundred and ninety-two (97.3%) were satisfied with the immunization service at the well clinic.

Table 7: Respondents’ satisfaction with immunization centre
N = 292

Variable	Very dissatisfied n (%)	Dissatisfied n (%)	Undecided n (%)	Satisfied n (%)	Very satisfied n (%)
General cleanliness	0 (0.0)	0 (0.0)	4 (1.3)	265 (88.3)	23 (7.7)
Reception from health staff	2 (0.7)	19 (6.3)	46 (15.3)	185 (61.7)	48 (16.0)
Attitude of health staff	2 (0.7)	16 (5.3)	51 (17.0)	186 (62.0)	45 (15.0)
Waiting time	4 (1.3)	24 (8.0)	83 (27.7)	189 (63.0)	0 (0.0)
Waiting area	0 (0.0)	0 (0.0)	122 (40.7)	101 (33.7)	77 (25.7)
Health information given	0 (0.0)	0 (0.0)	24 (8.0)	201 (67.0)	75 (25.0)
Immunization given	0 (0.0)	0 (0.0)	12 (4.0)	256 (85.3)	32 (10.7)

Two hundred and sixty five (88.3%) of the respondents stated they were satisfied with the general cleanliness of the centre, 185 (61.7%) were satisfied with the reception of the health staff, 186 (62.0%) were satisfied with the attitude of the health staff and 189 (63.0%) were satisfied with the

waiting time. One hundred and one (33.7%) were satisfied with the waiting area, 201 (67.0%) were satisfied with the health information given while 256 (85.3%) were satisfied with the immunization given.

Table 8: Respondents' perception of the hospital's immunization service

Variable	Frequency (n = 300)	Percent
Best loved element		
The clean environment	117	39.0
Professional attitude of the health workers	73	24.3
Educative health talk	57	19.0
Good equipment's and vaccines	32	10.7
Skilled workforce	21	7.0
Least loved element		
Time wasting	122	40.7
Poor attitude of the workers	79	26.3
Cost	67	22.3
Nothing	32	10.7
Recommendation of others		
Yes	289	96.3
No	11	3.7

One hundred and seventeen (39.0%) of the respondents stated that their best loved element in the immunization centre was the clean environment, 73 (24.3%) stated the professional attitude of the health workers while 57 (19.0%) stated that they loved the educative health talk best.

One hundred and twenty-two (40.7%) stated that their least loved element was the time wasting at the centre, 79

(26.3%) mentioned the poor attitude of the workers while 67 (22.3%) stated cost.

Two hundred and eighty-nine (96.3%) stated that they would recommend the health facility to others while 11 (3.7%) stated that they would not.

Table 9: Respondents' socio-demographic characteristics and their satisfaction with the immunization service

Variable	Satisfaction with immunization service			Test statistic	p value
	Satisfied n (%)	Dissatisfied n (%)	Total n (%)		
Age (years)					
19 – 24	24 (100.0)	0 (0.0)	24 (100.0)	Fisher's exact= 1.253	0.906
25 – 30	138 (96.5)	5 (3.5)	143 (100.0)		
31 – 36	95 (97.9)	2 (2.1)	97 (100.0)		
37 – 42	28 (96.6)	1 (3.4)	29 (100.0)		
> 42	7 (100.0)	0 (0.0)	7 (100.0)		
Marital status					
Single	6 (100.0)	0 (0.0)	6 (100.0)	Fisher's exact = 2.499	0.999
Married	281 (97.2)	8 (2.8)	289 (100.0)		
Widowed	2 (100.0)	0 (0.0)	2 (100.0)		
Separated	3 (100.0)	0 (0.0)	3 (100.0)		
Level of education					
No formal	8 (100.0)	0 (0.0)	8 (100.0)	Fisher's exact= 1.214	0.708
Primary	77 (98.7)	1 (1.3)	78 (100.0)		
Secondary	179 (96.8)	6 (3.2)	185 (100.0)		
Tertiary	28 (96.6)	1 (3.4)	29 (100.0)		
Employment status					
Employed	250 (97.3)	7 (2.7)	257 (100.0)	Fisher's exact= 0.022	0.999
Unemployed	42 (97.7)	1 (2.3)	43 (100.0)		
Occupation (n = 257)					
Skill level I	151 (96.2)	6 (3.8)	157 (100.0)	Fisher's exact = 6.668	0.111
Skill level II	87 (100.0)	0 (0.0)	87 (100.0)		
Skill level III	2 (100.0)	0 (0.0)	2 (100.0)		
Skill level IV	10 (90.9)	1 (9.1)	11 (100.0)		
Antenatal clinic attendance					
Yes	226 (97.0)	7 (3.0)	233 (100.0)	Fisher's exact= 0.458	0.689
No	66 (98.5)	1 (1.5)	67 (100.0)		
Place of delivery					
Government HF	229 (97.0)	7 (3.0)	236 (100.0)		0.999

Private HF	51 (98.1)	1 (1.9)	52 (100.0)	Fisher's exact=	
Home	12 (100.0)	0 (0.0)	12 (100.0)	0.128	
Age of the index child					
12 – 23	159 (97.5)	4 (2.5)	163 (100.0)	Fisher's exact =	0.230
24 – 35	60 (100.0)	0 (0.0)	60 (100.0)	3.913	
36 – 47	33 (94.3)	2 (5.7)	35 (100.0)		
48 – 59	40 (95.2)	2 (4.8)	42 (100.0)		
Number of children					
≤ 4	255 (97.0)	8 (3.0)	263 (100.0)	Fisher's exact=	0.602
> 4	37 (100.0)	0 (0.0)	37 (100.0)	1.156	

***Significant**

Five (3.5%) of the respondents aged 25 – 30 years were dissatisfied with the immunization service at the centre compared with 1 (3.4%) of those aged 37 – 42 years. There was increased tendency to be satisfied with the immunization service among the older respondents. This association was statistically significant ($p = 0.906$).

Eight (2.8%) of the married respondents were dissatisfied with the immunization service. The association between the marital status of the respondents and their satisfaction with the immunization service was also not statistically significant ($p = 0.999$).

Six (3.2%) of the respondents with secondary level of education were dissatisfied with the immunization service while all the respondents with no formal education were satisfied with the immunization service. There was an increased tendency to be satisfied among the respondents with primary level of education or less. This association was not statistically significant ($p = 0.708$).

Seven (2.7%) of the employed respondents were dissatisfied compared to 1 (2.3%) of the unemployed respondents. This association was also not statistically significant ($p = 0.999$).

Six (3.8%) of the respondents with skill level I occupations were dissatisfied with the immunization service. There was no statistically significant association between the occupation of the respondents and the satisfaction with the immunization service ($p = 0.111$).

Seven (3.0%) of the respondents who received antenatal care, were dissatisfied with the immunization service compared to 1 (1.5%) of those who did not receive antenatal care. This association was also not statistically significant ($p = 0.689$).

Seven (3.0%) of those who delivered at government health facilities were dissatisfied with the immunization service compared to 1 (1.9%) of those who delivered in private health facility. There was no statistically significant association between the place of delivery and the satisfaction with the immunization service ($p = 0.999$).

There were also no statistically significant associations between the number of children and age of the index child with the satisfaction with the immunization service at the well-baby clinic ($p = 0.602$ and 0.230 respectively).

IV. DISCUSSION

This study aimed at assessing the utilization of immunization services by mothers at the well-baby clinic, almost half of the mothers were 25 – 30 years old. The age range and mean were 19 – 45 years and 30.7 ± 5.3 years. This is due to the fact that this age range lies within the reproductive age group that is so active where these care givers are expected to have children. This mean age was higher than 29.75 ± 6.26 found in a similar study done in Lagos.²³ The latter study also found that majority of the index children were aged less than a year which was also found in this study. Most of the mothers were Christian and married, which is characteristic of the population in Southern Nigeria where this study was done. The finding that a higher proportion of the mothers are Benin owes its occurrence to the fact that the study was done in Benin City. Nearly two thirds of the mothers had secondary level of education. This might be a contributory factor to the high level of awareness of immunization found in this study. The parental knowledge on immunization contributes largely to immunization coverage.^{24,19} Most of the mothers were employed with about two thirds having skill level I and II occupations.

The major goal of antenatal care is to ensure optimal health outcomes for the mother and her baby. Antenatal care from a trained provider is important to monitor the pregnancy and reduce morbidity risks for the mother and child during pregnancy and delivery. In this study, 77.7% reported receiving ANC services. This is slightly higher than the findings of the 2013 Nigeria Demographic and Health Survey (NDHS) which reported that 61 percent of women had received antenatal care from a skilled provider.⁵ Almost all the mothers were aware of immunization which is similar to the findings in literature.^{25, 26} This is not out of place due to the extensive health education that is routinely given during antenatal and postnatal clinics. It is further supported by the finding that majority of the mothers gave birth in health facilities.

The finding that almost two thirds of the mothers knew that immunization protects against infectious diseases was slightly lower than what was reported in a study conducted among mothers dwelling in urban areas of Italy where majority of the respondents interviewed knew what immunization does.²⁵ A similar study also showed that the respondents were aware that immunization prevents disease but like in our study, a small proportion were of the view that it promotes child growth.²³

A quarter of the mothers had incorrect notions that vaccines prolong life and 18.5% felt that it makes children brilliant. This proportion is similar to that in a study done in Lagos University Teaching Hospital.¹ This is significant and it is an indication that some mothers still have poor understanding of the concept of immunization and this may go a long way to affect the uptake of immunization and thus cause a setback in the millennium development goals.

The respondents' knowledge about the different kinds of immunization was not so impressive as just above half were aware of BCG, less than half of OPV while only a smaller proportion were aware of Pentavalent vaccine, yellow fever and measles vaccinations. This is in contrast to the higher awareness found in Lagos State.²³ This difference may be due to the difference in level of development as Lagos is a major centre for trade in Nigeria. It may also be due to the difference in the literacy rates as a higher level of literacy is found in the latter study area compared to this study.⁸ However, Polio, tuberculosis and measles were the most popular VPDs which may be due to the fact that there are vaccines named after these diseases and to some extent, by the educational status of the respondents. The study conducted by Saudi Arabia²⁷ found that more than half of respondents knew about measles followed by tuberculosis. Knowledge about Hepatitis B was very less and at par in both studies.

The respondents' attitude towards childhood immunization was fairly positive as just above half of the mothers had a positive attitude. This finding is similar to what was previously documented in a study conducted on the knowledge, perceptions and beliefs of mothers on routine childhood immunization in a Georgia where 66% of the respondents showed favourable attitude towards immunization.²⁸ This could be as a result of the high level of knowledge recorded in this study and the high proportion of delivery in the government hospital that increases their awareness through the numerous health education at antennal clinics.

The present study showed that the vaccination services rendered by the centre had succeeded in generating satisfaction among majority of the mothers. The low level of satisfaction in the others may be due to influence of certain Socio-cultural and demographic factors. With increasing education, one's expectation increases, which may explain the less satisfaction among the more highly educated respondents. Apart from the differences due to these variables, the centre seems to have provided good quality of services to have achieved excellent or good level of satisfaction among majority of mothers served.

Reasons for dropouts or incomplete vaccinations includes: don't think it necessary, forgetfulness, and child is sick were reported by few of the caregivers. Similar responses have been given in other studies in Nigeria as the causes for the high number of unvaccinated children despite the availability of potent vaccines.^{19, 23} and contrary to the study done in Georgia where it was mainly due to lack of information about the immunization calendar, lack of awareness of a second and third dose. The insufficient

knowledge of the mothers requires sincere effort on the part of the health professionals and policy makers to plan and execute the IEC (information, education and communication) initiatives. However, the number of the unvaccinated children as seen in the current study is few compared to findings from other similar works in Nigeria and other parts of sub-Saharan.

V. CONCLUSION

The knowledge of immunization among the mothers was high which also translated into a high level of utilization of Immunization services. Level of education, reception of antenatal care and place of delivery were some of the factors that affected knowledge of immunization. It would have been expected that with the high rate of awareness, their attitude will be high but it was rather fair. The mother's attitude towards immunization was more than half and was Influenced by age of the caregiver, reception of antenatal care and knowledge of immunization. Most of the mother's felt immunization was beneficial to the children and that resulted in a high proportion of satisfaction with the services received.

- **Competing interests:** None, **Source of support:** None.

REFERENCES

- [1.] World Health Organization (WHO). Immunization, vaccines and biologicals: Centre for Global Development: Making Markets for vaccines: from ideas to actions. 200 Washington DC. Centre for Global Development
- [2.] Awodele O, Oreagba IA, Akinyede A, Awodele DF and Dolapo DC (2010). The knowledge and attitude towards childhood immunization among mothers attending antenatal clinic. 12(3): 1-8.
- [3.] United Nations Children Fund (UNICEF) (2014) Levels and Trends in Child Mortality. Report 2014. New York. Available at : <http://data.unicef.org/resources/childmortality> 2014. Accessed 18 Jul.15
- [4.] World Health Organization Fact Sheets (2014). Children: reducing mortality. Available at <http://www.who.int/mediacentre/factsheets/fs178/en/>. Accessed 20/2/2014.
- [5.] National Population Commission and ICF International. Nigeria demographic and health Survey (2013). Abuja, Nigeria: NPC and ICF International; 2014:92-153
- [6.] World Health Organization (WHO), vaccines and biological available at <http://www.who.int/immunization/en/> [Accessed 10/6/20]
- [7.] Zangeneh TT, Baracco G, and Al- Tawfiq JA (2011). Impact of conjugate pneumococcal vaccines on the changing epidemiology of pneumococcal infections. *Expert Rev Vaccines*.10(3): 345-353. Doi: 10.1586/erv.11.1.
- [8.] Federal Ministry of Health. National immunization policy and standard of practice. Abuja: Federal Ministry of Health, 2009:16.
- [9.] Scott S, Odotola A, Mackenzie G, Fulford T, Afolabi MO, Jallow YL, and Jasseh M (2014). Coverage and

- timing of children vaccination: An evaluation of the Expanded Programme on Immunization in the Gambia. 9(9):1-9:e107280. Doi: 10.1371/journal.pone.0107280.
- [10.] Adedire EB, Ajayi I, Fawole IO, Ajumobi O, Kassasa S, and Wasswa P (2016). Immunization coverage and its determinants among children aged 12-23 months in Atakumosa-West district, Osun State Nigeria. *BioMed Central Public Health*. 16(1):905 doi:10.1186/s12889-016-3531-x.
- [11.] Sadoh AE, and Eregie OC (2009). Timeliness and Completion Rate of Immunization among Nigerian children attending a clinic-based Immunization service. *J Health Popul Nutr*. 27(3):391-395. Doi: 10.3329/jhpn.v27i3.3381.
- [12.] Abdulraheem I, Onajole AT, Jimoh A, and Oladipo AR (2011). Reasons for incomplete vaccination and factors for missed opportunities among rural children. *Journal of Public Health and Epidemiology*. 3(4):194-203. Available online at <http://www.academicjournals.org/jphe>.
- [13.] Matua MK, Kimani-murage E, Ngomi N, Ravn H, Mwaniki PE and choka E (2016). Fully immunized child; coverage, timing and sequencing of routine immunization in urban poor settlement in Nairobi. *Kenya Tropical Medicine and Health*. 44(13):1-12. Doi.1186/s41182-016-0013-x
- [14.] Paediatric Association of Nigeria (2012). Recommended routine immunization schedule for Nigeria: PAN Advisory Committee on Immunization. *Nigerian Journal of Paediatric*. 39 (4):152-158. Doi:<http://dx.doi.org/10.4314/njp.v39i4.1>
- [15.] Adeyinka DA, Oladimeji O, Adeyinka FE, and Aimakhu C (2009). Uptake of childhood immunization among mothers of under-five in South Western Nigeria. *Internet Journal of Epidemiology*. 7(2):1-5.
- [16.] Legesse E, and Dechasa W (2015). Assessment of child immunization coverage and its determinants in Sinana districts, Southeast Ethiopia. *Ethiopia Journal of Health Science bmc paediatrics*. 15:31 doi: 10.1186/s12887-015-0345-4
- [17.] Ophori EA, Tula MY, Azih AV, Okojie R, and Ikpo PE (2014). Current trends of immunization in Nigeria: Prospects and challenges. *Tropical Medicine and Health*. 42(2): 67–75. Doi:10.2149/tmh.2013-13
- [18.] Etana B, and Deressa, W (2012). Factors associated with complete immunization coverage in children Aged 12-23 months in Ambo Woreda, Central Ethiopia. *BMC Public Health*. 12:566. <http://www.biomedcentral.com.com/1471-2458/12/566>
- [19.] Odusanya OO, Alufohai EF, Meurice FP, and Ahonkhai VI (2008). Determinants of vaccination coverage in rural Nigeria. *BMC Public Health*. 5(8):381. Doi:10.1186/1471-2-2458-8-381
- [20.] Sigh L, Rai RK, and Sigh PK (2012). Assessing the utilization of maternal and child healthcare among married adolescent women. *India Journal of Biosocial Science*. 44 (1):1-26 doi:10.1017/s021932011000472.
- [21.] Cochran WG. *Sampling Techniques*, 3rd Edition. New York: John Wiley and Son 1977.
- [22.] Tagbo BN, Uleanya ND, Nwokoye IC, Eze JC, and Omotowo IB (2012). Mothers' knowledge, perception and practice of childhood immunization in Enugu. *Nigerian Journal of Paediatrics*. 39 (3):90 – 96 doi:10.4314/njp.v39i3.1
- [23.] Abidoye AO, and Odeyemi KA (2013). Knowledge, attitude and practice of mothers to childhood immunization in Kosofe local government area of Lagos State, Nigeria. *International Journal of Basic Applied and Innovative Research*. 2(4): 66 – 72. www.arpjournal.com; www.antre.centpub.com
- [24.] Nisar N, Mirza M, and Qadri MH (2010). Knowledge, Attitude and Practices of mothers regarding immunization of one-year old child at Mawatch Goth, Kemari Town, Karachi. *Pakistan Journal of Medical Sciences*. 26(1):183-186. www.pjms.com.pk
- [25.] Omole MK, and Owodunni KO (2012). Mothers' Knowledge of Immunization Programme and Factors Influencing their Compliance at a Children Hospital in South West Nigeria. *Journal of Pharmaceutical and Biomedical Sciences*. 21 (18): 1-4. Available online at www.jpjms.info
- [26.] Alubaker EI, Ahmed AA, Yousif MA, and Abdallah MA (2014). Knowledge and attitude on childhood vaccination a survey among Saudi parents in Taif region, Saudi Arabia. *International journal of pharmacy practice and drug research*. 4(2): 92-97. Available online at www.ijppdr.com
- [27.] Verulava T, Jaiani M, Lordkipanidze A, Jorbenadze R, and Dangadze B (2019). Mothers knowledge and attitudes towards immunization in Georgia. 12: 232-237. *The open public health journal*. Doi: 10.2174/1874944501912010232. Available at <http://creativecommons.org/licenses/by/4.0/legalco>.