

Comparative Analysis of Maternal Knowledge, Attitude and Uptake of Routine Immunization in ‘Sabo’ and ‘Non-Sabo’ Communities in Awka, Nigeria

Chidebe O Anaekwe¹, Adaeze N Anaekwe¹, Chinomnso C Nnebue^{1,2,*}, Kamtochukwu M Obi¹, Amobi L Ilika^{1,3}

¹Department of Community Medicine, Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria

²Department of HIV Care, Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria

³Department of Community Medicine and Primary Health Care, College of Medicine, Nnamdi Azikiwe University, Awka, Nigeria

*Corresponding author: nnebnons@yahoo.com

Received August 19, 2018; Revised October 11, 2018; Accepted October 26, 2018

Abstract Background: Immunization remains a cost effective public health intervention strategy in improving on poor health indices linked with vaccine preventable diseases. Maternal knowledge, attitude and factors such as migration could be key in achieving this goal. **Objective:** To determine and compare the maternal knowledge, attitude and uptake of routine immunization in ‘Sabo’ and ‘Non-Sabo’ communities in Awka, Anambra state. **Materials and Methods:** A comparative study of 420 mothers and caregivers in Sabo and non-Sabo communities in Awka selected by multistage sampling, was conducted between July and October 2015. Data were obtained via semi-structured interviewer administered questionnaires and analysed using IBM/SPSS version 22.0. Statistically significant differences were determined using student’s t, chi square, Fisher’s exact and Yates correction tests, with significance level set at p value of ≤ 0.05 . **Results:** The mean age groups were 32.54 ± 7.35 years for Sabo and 32.64 ± 6.88 years for non-Sabo communities ($p = 0.125$), while 209 (99.5%) in Sabo compared to 206 (98.1%) in non-Sabo communities, had good knowledge of immunization ($p = 0.368$). Equal numbers, 205 (97.6%) respondents in both communities had good attitude, 166 (79%) in Sabo compared to 205 (97.6%) in non-Sabo communities, had good uptake ($p = 0.000$). The relationships in both communities are as follows: rates of child illness ($p = 0.000$); relocation ($p = 0.000$); adverse effects of immunization ($p = 0.000$); distance to centre ($p = 0.000$); availability of vaccinators ($p = 0.000$) and waiting time ($p = 0.000$). **Conclusions:** From our study findings, there were good knowledge and attitude towards routine immunization in both communities. However, uptake of routine immunization was better in non-Sabo than in Sabo communities. We recommend that stakeholders improve on sustained behavior change communication targeted at reasons for poor uptake of routine immunization.

Keywords: knowledge, attitude, uptake, Awka Nigeria, routine immunization, Sabo communities

Cite This Article: Chidebe O Anaekwe, Adaeze N Anaekwe, Chinomnso C Nnebue, Kamtochukwu M Obi, and Amobi L Ilika, “Comparative Analysis of Maternal Knowledge, Attitude and Uptake of Routine Immunization in ‘Sabo’ and ‘Non-Sabo’ Communities in Awka, Nigeria.” *Journal Name*, vol. 6, no. 5 (2018): 227-236. doi: 10.12691/ajphr-6-5-4.

1. Introduction

Immunization is the process whereby a person is made resistant to an infectious disease, typically by the administration of a vaccine. Vaccines stimulate the body’s immune system thus protects the person against subsequent infection or disease [1]. It is documented that currently immunization averts an estimated 2.5million deaths every year in all age groups, from diphtheria, tetanus, pertussis and measles [2,3]. Nonetheless, with about three million deaths yearly, vaccine preventable diseases remains the commonest cause of childhood mortality [4].

The scenario painted above could be multifactorial in origin. Uptake of immunization services is dependent not only on availability and provision of these services, but

also on factors including knowledge and attitude of mothers [5,6]. Presently, primary health care (PHC) services in Nigeria are highly ineffective and have deteriorated over time due to poor quality as evidenced by lack of investment in personnel, facilities, drugs and poor management of the existing resources [2]. Then, linking routine immunization services to a failed program, the PHC implied that routine immunization services are ineffective [2]. The pace of progress has been far from satisfactory, falling below the benchmark of development policy [7].

In an era of globalization also, migration has been an issue of wide discuss globally. The term ‘migrants’ includes the categories of migrant workers and their families, short-term and long-term immigrants, refugees and asylum seekers, victims of human trafficking amongst others [8]. Currently, Nigeria has a lot of migrant

communities due to communal and religious clashes, unrests, natural disasters, etc. Migrants often have to deal with poverty, marginality, stigmatization and unequal access to social benefits including health care services. Disparities in the access to health care and denial of the migrants' right to health have become key issues [9]. Vaccination coverage is hampered by difficulty in accessing medical care, costs, complex transport and storage requirements, and by user characteristics, such as low education, parental knowledge, attitude and family poverty [10,11,12,13,14]. The migration of children from one region to another had been found to be associated with low vaccination coverage [15]. Less than 70% migrant children of one to three years of age complete their immunizations [16].

Preliminary reports from the 2013 Nigeria National Demographic and Health Survey (NDHS) shows zonal differences in immunization rates in the Country. Comparatively, 10% of children has been vaccinated in the North West as against 52 % in the South East. In the North East, 45% of children are reported not to have received any immunizations at all with the highest rates of non-vaccination being in Borno and Yobe states [17]. From the forgoing, this study would help to determine if this scenario is being replicated in these communities down in the South East, with Awka as a case study. Or if there has been a dilution of the same picture in immunization as a result of their interactions with a different culture and environment.

Comparative studies exploring the maternal knowledge, attitude and uptake of immunization by different ethnic groups and their effects on the broad immunization picture in the locations under study are few. It is thus believed that the findings of this study would help to fill this gap. The findings would also serve as a tool for policy makers in developing and implementing sound and feasible policies. These would help to improve immunization coverage and utilization in these areas. It is based on this backdrop that this study was designed to determine and compare the maternal knowledge, attitude and uptake as well as the reasons for poor uptake of routine immunization in 'Sabo' and 'Non-Sabo' communities in Awka, Anambra state

2. Materials and Methods

2.1. Study Design

This was a community-based comparative cross-sectional study.

2.2. Study Setting

This study was conducted between July and October 2015 in Awka, Nigeria. Awka is the headquarters of Awka South LGA as well as the capital of Anambra State. It has a population of 167,738 people as of 2006 Nigerian census [18,19]. Immigrants mainly from northern Nigeria, Delta State, Enugu State, the Cameroun and Ghana now comprise about 60% of this population [19]. There are 33 villages and 8 political wards (Awka wards 1-V111) that

make up Awka. Each of these wards has a primary health center except Awka ward V111 which has a health post. However, all these facilities offer immunization services. Sabon Gari means 'strangers quarters' or literally 'new town' in the Hausa language, plural Sabon Garuruwa [20]. Sabo communities in this study is a colloquial term describing the Hausa communities living in Awka and comprise the Awka wards 1V-V111. The non-Sabo communities consist of other residents in Awka, aside the Hausa community. They comprise Awka wards 1, 11, 111 and V11. The occupation of Sabo communities are mainly cattle rearing, tailoring, security, bureau de change operations, trading on jewelleries and clothing. The non-Sabo residents are mainly civil servants, traders, artisans and craftsmen [21].

Data collection was done by interview using a semi structured questionnaire adopted and adapted from that used by Odusanya *et al.*, for the determination of vaccination coverage in rural Nigeria [22]. Pretesting of the questionnaire was carried out in Mobile Police (Mopol) Base and Fulani settlement of Onitsha ward V111 for Sabo communities while Umunzekwe settlement of Nibo (a nearby town to Awka) ward 11 was used for non-Sabo communities.

To ensure data quality, training of data collection team and field monitoring of data collection were done. Data collection team met at the end of every day to share experiences, submit completed forms and solve field problems.

2.3. Study Participants

The population comprised mothers or female caregivers of households in both communities, with children aged 12 to 23 months [23]. Households included in this study must have lived in the community for a minimum of one year. This is based on the third phase of integrating new culture which is the adjustment phase. Time period for this phase is usually 6 to 12 months. Firstly, it involves getting accustomed to the new culture and developing routines. Secondly, knowing what to expect in most situations and the host community no longer feels all that new. The third stage is becoming concerned with basic living again and things become more "normal" Lastly, is developing problem-solving skills for dealing with the culture and beginning to accept the cultural ways with a positive attitude. The culture begins to make sense, and negative reactions and responses are reduced, thus averting culture shock [24].

2.3.1. Eligibility Criteria

Households whose members had lived in the community for a minimum of twelve months [24]. Households with children between 12 to 23 months of age [23]. Mothers or female caregivers of the eligible households who provided immunization records either by immunization card or history [23].

2.3.2. Non-Eligibility Criteria

Temporary residents of the community. The mothers or female caregivers of the eligible households who declined voluntary consent to participate.

2.4. Variables

These comprise: a) Sociodemographic variables of Sabo and non-Sabo communities such as respondents' age, marital status, type of marriage, religion, highest educational qualification, highest educational qualification of spouse and occupation; b) maternal knowledge, attitude and uptake of routine immunization of respondents in both communities and c) reasons for poor uptake of routine immunization in both communities.

2.5. Data Sources/measurement

2.5.1. Scoring and Grading of Outcome Variables

Scoring and Grading of Knowledge: Two marks for each correct option, one mark for partially correct option and no mark for wrong option. Good knowledge was ≥ 5 points. Poor knowledge was < 5 points. **Scoring and Grading of Attitude:** One mark for each correct option and no mark for wrong option. Good attitude was ≥ 7 points. Poor attitude was < 7 points. **Scoring and Grading of Uptake:** One mark for each correct option, and no mark for wrong option. Good uptake was ≥ 4 points. Poor uptake was < 4 points.

2.6. Bias

Reporting bias could result from the sensitive nature of the questions. This we overcame by using anonymous questionnaires and assuring the respondents that their answers would be strictly confidential and specifically for research purposes.

2.7. Study Size

2.7.1. Sample Size Determination

The sample size formula for comparison of two independent groups as presented in the WHO immunization coverage cluster survey reference manual, was used [25].

$$n(\text{per group}) = n \left(\frac{Z_{1-\alpha} \sqrt{2P(1-P)} + Z_{1-\beta} \sqrt{P_1(1-P_1) + P_2(1-P_2)^2}}{(P_1 - P_2)} \right)^2$$

Where n = Estimated number of households size per group; $Z_{1-\alpha}$ = Standard normal deviate corresponding to a significant level of 5% = 1.96; $Z_{1-\beta}$ = Standard normal deviate corresponding to a statistical power of 90% for a two-tailed test = 1.28 (this is to reduce to 10% the possibility of a 'false negative' result). P_1 = Immunization coverage in non-Sabo community with 70% based on DPT3 coverage rates reported in the 2008 NDHS and the 2010 NICS survey as Anambra is one of the states with persistently high coverage [26]. P_2 = Immunization coverage in Sabo

community with 50% based on DPT3 coverage rates reported in the 2008 NDHS and the 2010 NICS survey as some northern states have persistently low coverage (26). $P = 60\%$ [mean of the two proportions = $(P_1 + P_2)/2$].

$$n = \left(\frac{\left[\frac{1.96\sqrt{2(60)(100-60)} + 1.28\sqrt{70(100-70) + 50(100-50)^2}}{(70-50)} \right]}{1} \right)^2 = 124 \text{ Subjects.}$$

A design effect/correction factor of 1.5 was considered in the cluster sampling technique used. This made the sample size. $n = 1.5 \times 124 = 186$. Generally, if there was no previous information about design effect in the same area, 1.5 can be used as a default [27]. Assuming anticipated response rate to be 90%, to compensate for non-response, the study sample size was calculated as

$\frac{n}{1-f}$ where f = % of non-response = 10% [27]. Allowing a non-response rate of 10% therefore $(10\% \times 186 = 18.6)$, $n = 186 + 18.6 = 205/\text{group}$ The minimum sample size for each group was 205, which was rounded up to 210, Thus the total sample size for both groups = 420.

2.7.2. Sampling Technique

A multistage sampling technique was used to select the households.

Stage One: The eight political wards in Awka, were stratified thus; Awka 1V, V, V1, V11 (the Sabo communities) and Awka 1, 11, 111, V11 (the non-Sabo communities).

Stage Two: Using this classification as sampling frame, two wards were selected (Awka V, V1) from the Sabo communities while two wards were also selected (Awka 1, 11) from the non-Sabo communities, using simple random sampling technique by balloting. Then proportionate allocation of subjects was done using the formula below [26].

$$n_h (\text{number of household in settlement}) = \frac{\text{Population of selected wards}}{\left(\frac{\text{Total population of selected (two) wards in each community.}}{1} \right)} \times 210.$$

The number of households selected from the wards were;

$$\begin{aligned} \text{Awka V} &= \frac{21369}{36259} \times 210 = 123.76 = 124; \\ \text{Awka V1} &= \frac{14890}{36259} \times 210 = 86.23 = 86; \\ \text{Awka 1} &= \frac{21573}{47926} \times 210 = 94.53 = 95; \\ \text{Awka 11} &= \frac{26353}{47926} \times 210 = 115.47 = 115. \end{aligned}$$

Sabo communities		Non-Sabo communities	
Wards	Number of Households	Wards	Number of Households
Awka V	124	Awka 1	95
Awka V1	86	Awka 11	115

Stage Three: A list of all the settlements was obtained for both the Sabo and non-Sabo communities. Noting the selected wards, in the Sabo communities a mapping of a random sample of selected settlements gave an average of about 50 eligible houses that were well delineated per settlement, while in non-Sabo communities a mapping of a random sample of selected settlements also gave an average of 50 eligible houses that were well delineated per settlement. With this assumption therefore, the number of settlements required, from each of the selected wards in the Sabo and non-Sabo communities was determined as follows;

Awka V= 124 houses gave 3 settlements (given that 50 eligible houses per settlement)

Awka VI= 86 houses gave 2 settlements (given that 50 eligible houses per settlement)

Awka 1 = 95 houses gave 2 settlements (given that 50 eligible houses per settlement)

Awka 11 = 115 houses gave 3 settlements (given that 50 eligible houses per settlement)

Sabo communities		Non-Sabo communities	
Wards	Number of Settlements	Wards	Number of Settlements
Awka V	3	Awka 1	2
Awka VI	2	Awka 11	3

In Sabo communities, Awka V has 7 settlements and using this sampling frame, 3 settlements were selected. Awka VI has 6 settlements and using this sampling frame, 2 settlements were selected, both by simple random sampling technique via balloting. In non-Sabo communities Awka 1 has 4 settlements and using this as sampling frame, 2 settlements were selected. Awka 11 has 7 settlements and using this as sampling frame, 3 settlements were selected, both by simple random sampling technique via balloting.

Stage Four: The houses from each settlement were selected by systematic random sampling technique. The enumeration list from National Programme of Immunization unit (NPI) of Awka South LGA served as the sampling frame.

2.8. Quantitative Variables

Continuous variables were displayed as means \pm standard deviation (SD).

2.9. Statistical Methods

Data cleaning and editing was done manually and with the computer. All identified errors were checked against the original questionnaire and corrected. Descriptive and analytical statistics of the data were carried out using International Business Machine/statistical package for social sciences (IBM/ SPSS) Windows version 22.0. [28] Descriptive data were presented as tables, simple frequencies and percentages. Associations and reasons for poor uptake were tested using student's t, chi square (χ^2), Fisher's exact (F) tests and Yates correction (b) tests with statistical significance set at p value ≤ 0.05 .

3. Results

Table 1 shows the socio-demographic characteristics of Sabo and non-Sabo communities. The commonest age group was 30- 39 years, 84 (40%) in Sabo and 104 (49.5 %) in non-Sabo, while the mean age groups were 32.54 ± 7.35 in Sabo and 32.64 ± 6.88 in non- Sabo communities ($t = -0.151$; $p = 0.125$). Also, all and 186 (88.6%) in Sabo and non-Sabo communities respectively were married women. Monogamy was more in the non-Sabo 181(86.2%), while polygamy was more in the Sabo communities. All respondents in non-Sabo communities 210 (100%) were Christians, while in Sabo communities, Islam 145 (69%) was the predominant religion.

Table 2 shows maternal knowledge of routine immunization of respondents in Sabo and non-Sabo communities. Nearly half 103 (49%) of respondents in Sabo compared to 164 (78.1%). of those in non-Sabo communities knew immunization is commenced at birth. More than half 133 (63.3%) of respondents in Sabo communities compared to less than half 104 (49.5%) of respondents in non-Sabo communities were able to mention three vaccine preventable diseases. Two hundred and five (97.6%) respondents in non-Sabo compared to 102 (48.6%) in Sabo communities cited disease prevention as the reason for immunization. Overall, there were good maternal knowledge of immunization, 209 (99.5%) in the Sabo compared to 206 (98.1%) in the non-Sabo communities ($b = 0.810$; $p = 0.368$; $df = 1$)

Table 3 shows maternal attitude towards routine immunization in Sabo and non-Sabo communities. The same number 207(98.6%) respondents in both communities respectively, reported that immunization do not cause infertility. While 210 (100%) in Sabo and 209 (99.5%) in non-Sabo communities reported they would recommend immunization to others and there was no sex preference on immunization. Overall, there were good maternal attitude towards immunization in both communities ($b = 0.810$, $p = 0.368$, $df = 1$).

Table 4 shows maternal uptake of routine immunization between Sabo and Non-Sabo communities. One hundred and eighty nine (90%) respondents in Sabo and 86 (41%) in non-Sabo communities could not provide their immunization cards ($\chi^2=52.984$, $p = 0.000$, $df=1$). Overall, there were good maternal uptake of immunization, 166 (79%) respondents in Sabo communities versus 205 (97.6%) in non-Sabo communities ($\chi^2= 35.141$, $p = 0.000$, $df = 1$).

Table 5 highlights reasons for poor uptake of routine immunization in Sabo and non-Sabo communities. There were statistically significant differences in the reasons cited for poor uptake of routine immunization between respondents in Sabo and non-Sabo communities with respect to: rates of child illness ($F = 55.872$; $p = 0.000$; $df = 2$); relocation ($\chi^2 = 18.806$; $p = 0.000$; $df = 1$); adverse effect of immunization ($\chi^2 = 20.285$; $p = 0.000$; $df = 1$); distance to center ($\chi^2 = 12.353$; $p = 0.000$; $df = 1$); availability of vaccinators ($\chi^2 = 15.244$; $p = 0.000$; $df = 1$) and waiting time ($\chi^2 = 12.488$ b; $p = 0.000$; $df = 1$).

Table 1. Socio-demographic Characteristics of Sabo and non-Sabo Communities in Awka, Nigeria from July to October 2015

Characteristics	Sabo n (%)	Non-Sabo n (%)	Test statistic	p- value	Degree of freedom	
Age group	< 20 years	0 (0.0)	2 (100.0)	58.53(x ²)	0.001	3
	20- 29	79 (52.3)	72 (47.7)			
	30- 39	84 (44.7)	104 (55.3)			
	40- 49	47 (59.5)	32 (40.5)			
	Mean	32.54	32.64			
	Standard deviation	±7.35	±6.88			
Marital status	Single	0 (0.0)	4 (100.0)	29.04(f)	0.000	3
	Married	210 (53.0)	186 (47.0)			
	Divorced	0 (0.0)	1 (100.0)			
	Widowed	0 (0.0)	19 (100.0)			
Type of marriage	Monogamy	125 (40.8)	181 (59.2)	42.94(x ²)	0.000	1
	Polygamy	85 (77.3)	25 (22.7)			
	Ibo	2 (1.1)	183 (98.9)			
Ethnicity	Hausa/Fulani	208 (100.0)	0 (0.0)	560.16(f)	0.000	2
	Others	0 (0.0)	27 (100.0)			
Religion	Muslim	145 (100.0)	0 (0.0)	221.46(x ²)	0.000	1
	Christian	65 (23.6)	210 (76.4)			
	Non formal	7 (87.5)	1 (12.5)			
Highest educational qualification	Primary	101 (99.0)	1 (1.0)	243.99(f)	0.000	3
	Secondary	102 (44.9)	125 (55.1)			
	Tertiary	0 (0.0)	83 (100.0)			
Spouse highest educational qualification	Non formal	8 (100.0)	0 (0.0)	97.78 (f)	0.000	3
	Primary	30 (83.3)	6 (16.7)			
	Secondary	163 (57.2)	122 (42.8)			
	Tertiary	9 (9.9)	82 (90.1)			
Occupation	Housewife	4 (10.5)	34 (89.5)	123.99(x ²)	0.000	2
	Self Employed	206 (65.8)	107 (34.2)			
	Public servant	0 (0.0)	69 (100.0)			

t = student's t test, F = Fisher's exact test, χ^2 = chi-square.

Table 2. Maternal Knowledge of Routine Immunization in Sabo and non-Sabo Communities in Awka, Nigeria from July to October 2015

Characteristics	Sabo n (%)	Non-Sabo n (%)	Test statistic	p- value	Degree of freedom	
Time to commence immunization	At birth	103 (38.6)	164 (61.4)	72.03(x ²)	0.000	2
	Few days after birth	49 (51.6)	46 (48.4)			
	One week after birth	58 (100.0)	0 (0.0)			
	6 VPD	0 (0.0)	0 (0.0)			
	5 VPD	0 (0.0)	8 (100.0)			
Knows Vaccine preventable disease	4 VPD	2 (2.7)	71 (97.3)	229.94 (F)	0.000	5
	3 VPD	41 (28.3)	104 (71.7)			
	2 VPD	133 (85.3)	23 (14.7)			
	1 VPD	28 (93.3)	2 (6.7)			
Reasons for immunization Card	Don't know	6 (75.0)	2 (25.0)	51.92(x ²)	0.000	3
	For Next appointment	152(51.9)	141(48.1)			
	For Health facility demand	13 (22.8)	44 (77.2)			
	Health workers demand	45 (80.4)	11 (19.6)			
	Don't know	0 (0.0)	14 (100.0)			
Purpose of immunization	Prevent diseases	102 (33.2)	205 (66.8)	166.49 (F)	0.000	4
	Government advice	14 (77.8)	4 (22.2)			
	Health facility advice	93 (100.0)	0 (0.0)			
	Social media advice	1 (100.0)	0 (0.0)			
Immunization is harmful	Don't know	0 (0.0)	1 (100.0)	7.57 (F)	0.007	2
	Yes	0 (0.0)	4 (100.0)			
	No	210 (51.0)	202 (49.0)			
Immunization is costly	Don't know	0 (0.0)	4 (100.0)	2.58 (F)	0.248	2
	Yes	0 (0.0)	1 (100.0)			
	No	210 (50.4)	207 (49.6)			
Maternal knowledge of immunization	Don't know	0 (0.0)	2 (100.0)	0.81 (b)	0.368	1
	Good knowledge	209 (50.3)	206 (49.7)			
	Poor knowledge	1 (20.0)	4 (80.0)			

χ^2 = Chi-square, F = Fisher's exact test, b = Yates correction.

Table 3. Maternal Attitude towards Routine Immunization in Sabo and non-Sabo Communities in Awka, Nigeria from July to October 2015

Characteristics		Sabo (%)	Non-Sabo (%)	Test statistics(χ^2)	p-value	Degree of freedom
Does Immunization cause infertility	Yes	0 (0.0)	0 (0.0)	0.00 (b)	1.000	1
	No	207(50.0)	207(50.0)			
	Don't know	3 (50.0)	3 (50.0)			
Polio is all that is needed for immunization	Yes	0 (0.0)	2 (100.0)	2.04(F)	0.623	2
	No	208(50.1)	207(49.9)			
	Don't know	2 (66.7)	1 (33.3)			
Does Immunization spread HIV	Yes	0 (0.0)	0 (0.0)	0.13(b)	0.721	1
	No	207(50.2)	205(49.8)			
	Don't know	3 (37.5)	5 (62.5)			
Does Immunization decrease child mortality	Yes	176(48.1)	190(51.9)	6.99 (F)	0.270	2
	No	5 (41.7)	7 (58.3)			
	Don't know	29 (69.0)	13 (31.0)			
Will recommend immunization	Yes	210(51.0)	209(49.9%)	0.00 (b)	1.000	1
	No	0 (0.0)	1(100.0%)			
	Don't know	0 (0.0)	0 (0.0%)			
Do you have Sex preference on immunization	Yes	0 (0.0)	2 (100.0)	2.58 (F)	0.248	2
	No	210(50.4)	207(49.6)			
	Don't know	0 (0.0)	1 (100.0)			
Consent of spouse before immunization	Yes	207(53.1)	183(46.9)	23.21(F)	0.000	2
	No	3 (10.3)	26 (89.7)			
	Don't know	0 (0.0)	2 (100.0)			
Maternal attitude towards immunization	Good attitude	205(50.0)	205(50.0)	0.00(χ^2)	1000	1
	Poor attitude	5 (50.0)	5 (50.0)			

χ^2 = Chi-square, F = Fisher's exact test, b = Yates correction, nth VPD = respondents mentioned nth Vaccine Preventive Disease

Table 4. Uptake of Routine Immunization in Sabo and non-Sabo Communities in Awka, Nigeria in Awka, Nigeria from July to October 2015

Characteristics		Sabo (%)	Non-Sabo (%)	Chi-square statistic(χ^2)	p-value
Place of birth	Health facility	167(44.5)	208(55.5)	41.84	0.000
	Home	43 (95.6)	2 (4.4)		
Birth BCG & OPV with card	Yes	115 (51.6)	108 (48.4)	0.47	0.494
	No	95 (48.2)	102 (51.8)		
Six wks OPV & Penta with card	Yes	111 (52.3)	101(47.7)	0.95	0.329
	No	99 (47.6)	109 (52.4)		
Ten wks OPV & Penta with card	Yes	116 (51.1)	111(48.9)	0.24	0.624
	No	94 (48.0)	99 (52.0)		
Fourteen wks OPV & Penta with card	Yes	116 (50.9)	112 (49.1)	0.15	0.695
	No	94 (49.0)	98 (51.0)		
Nine month measles and YF with card	Yes	114 (52.8)	102 (47.2)	1.37	0.241
	No	96 (47.1)	108 (52.9)		
Birth BCG & OPV	Yes	97 (47.8)	106 (52.2)	0.77	0.380
	No	113(52.7)	104 (47.3)		
Six wks OPV & Penta	Yes	101 (50.1)	102 (49.9)	1.15	0.283
	No	109 (52.7)	98 (47.3)		
Ten wks OPV & Penta	Yes	108 (50.2)	107 (49.8)	0.01	0.922
	No	102 (49.8)	103 (50.2)		
Fourteen wks OPV & Penta	Yes	105 (49.8)	106 (50.2)	0.01	0.922
	No	105 (50.2)	104 (49.8)		
Nine month measles & YF	Yes	104 (46.8)	118 (53.2)	1.87	0.171
	No	106 (53.5)	92 (46.5)		
Presences of immunization card	Have	21 (19.6)	86 (80.4)	52.98	0.000
	Don't have	189(60.3)	124(39.7)		
	Good uptake	166(44.7)	205(55.3)		
Overall uptake of immunization	Poor uptake	44(89.8)	5 (0.2)	35.14	0.000

χ^2 = chi-square.

Table 5. Reasons for poor Uptake of Routine Immunization in Sabo and non-Sabo Communities in Awka, Nigeria from July to October 2015

Characteristics		Sabo (%)	Non-Sabo (%)	Test statistic	p-value	Degree of freedom
Has faith in immunization	Yes	0 (0.0)	5 (100.0)	5.84(x ²)	0.061	2
	No	209(50.5)	205(49.5)			
	Don't know	1 (100.0)	0 (0.0)			
Awareness to Return for immunization	Yes	2(18.2)	9 (81.8)	4.57(x ²)	0.032	1
	No	208(50.9)	201(49.1)			
	Yes	0 (0.0)	18 (100.0)			
Relocation	No	210 (52.2)	192(47.8)	18.81(x ²)	0.000	1
	Yes	1(4.3)	22 (95.7)	20.29(x ²)	0.000	1
Adverse effect of immunization	No	209(52.6)	188(47.4)	55.87 (F)	0.000	2
	Yes	201(58.1)	145 (41.9)			
	Don't know	0 (0.0)	1 (100.0)			
Distance to center	Yes	0 (0.0)	12 (100.0)	12.35(x ²)	0.000	1
	No	210 (51.3)	198(48.7)	15.24(x ²)	0.000	1
Availability of vaccinators	Yes	16 (26.7)	44 (73.3)	44.41(x ²)	0.000	1
	No	194(53.9)	166(46.1)			
Availability of vaccines	Yes	33 (25.6)	96 (74.4)	7.27 (b)	0.007	1
	No	177(60.8)	114(39.2)			
Time convenience	Yes	0 (0.0)	9 (100.0)	12.49(b)	0.000	1
	No	210 (51.1)	201(48.9)			
Waiting time	Yes	0 (0.0)	14 (100.0)	1.18(x ²)	0.277	1
	No	210 (51.7)	196(48.3)			
Child on native medication	Yes	115 (47.5)	127 (52.5)	1.00(x ²)	0.605	2
	No	95 (53.4)	83 (46.6)			
Mother's illness	Yes	93 (50.0)	93 (50.0)	2.15(x ²)	0.143	1
	No	117 (50.0)	116 (49.8)			
Father's refusal	Yes	102 (46.4)	118 (53.6)			
	No	108 (54.0)	92 (46.0)			

χ^2 = chi-square, F = Fisher's exact, b = Yates correction.

4. Discussion

This comparative study determined and compared maternal knowledge, attitude and uptake of routine immunization in 'Sabo' and 'non-Sabo' communities in Awka. It also determined the possible reasons for poor uptake of routine immunization at the community level in 'Sabo' and 'non-Sabo,' Awka town of Anambra state. The findings of the index study showed that the proportion of respondents in Sabo communities who knew that immunization is commenced at birth was (38.6%) compared to (61.4%) respondents in non-Sabo communities. Also reported, was that respondents in Sabo communities who go for immunization with their immunization cards to know the next date of appointment was (51.9%) compared (48.1%) the respondents in non-Sabo communities. The differences in compared variables as stated in these reports were statistically significant.

Our study findings showed that the proportion of respondents in the non-Sabo communities who knew the purpose of immunization is to prevent diseases was (66.3%) compared to (33.2%) respondents in Sabo communities. Our study also revealed that respondents from 'Non-Sabo', were better aware of vaccine preventable diseases as (3.8%) mentioned five VPDs, (33.8%) mentioned four VPDs compared to Sabo respondents who could not mention up to five VPDs, while only (1.0%) mentioned four VPDs. The differences in the compared variables as presented in these reports were statistically significant and could be related to the level of enlightenment of routine

immunization of mothers by health workers in Sabo communities, where migrant mothers had less knowledge of routine immunization. These findings are consistent with the findings of the study done on immunization of children in rural area of north Kashmir Pakistan, where mothers had good knowledge about importance of vaccination but their knowledge about VPDs was limited [29]. They are also consistent with the findings of many other studies like the one done on impact of national immunization days on polio related knowledge and practice of urban women in Bangladesh [30].

From our study, only two in a hundred mothers knew about protective role of BCG. Also, health workers were the main source of information (88%). Similar findings were reported in other studies where paramedics were the main source of information [31,32]. Of these, a quantitative study conducted in six states in Nigeria in 2004 on community and systematic factors affecting the uptake of immunization reveals that incorrect knowledge was a factor [32]. In rural Enugu, diarrhea, fever, convulsion, vomiting and malaria were believed to be vaccine preventable diseases (VPDs), while in rural and urban Kano, malaria, teething problems, vomiting, convulsion and pneumonia were listed [33].

Findings of the current research showed that respondents in Sabo communities who waited for consent from spouse before they went for immunization was (53.1%) compared to (48.9%) in non-Sabo communities. This lack of women's autonomy was more in Sabo communities as they depended on their spouses for transportation fare to

immunization centers and many of them were illiterates and petty traders cum self-employed [34,35]. The index study also showed that 53.1% of mothers in Sabo communities and 46.9% of mothers in non-Sabo communities did not take decisions regarding immunizing their children without the consent of their spouses. Studies have also reported in tandem, that maternal autonomy may enable mothers to achieve better health outcomes for their children [34,35].

From our study findings, the respondents in Sabo communities (95.6%) who were delivered of their babies at home were more compared to (4.4%) respondents in non-Sabo communities. Also few respondents in Sabo communities (19.6%) went for immunization with immunization card compared with more of the respondents in non-Sabo communities (80.4%) who went for immunization with immunization card. The respondents in Sabo communities (89.8%) had less uptake of routine immunization compared with respondents in non-Sabo communities (10.2%) with few poor uptake of routine immunization. The differences in these reports were statistically significant and are in keeping with the reports of the 2013 Nigerian National Demographic Survey (NDHS) [17].

The findings of our study showed that Child illness was the commonest possible reason for incomplete immunization in Sabo communities (58.1%) compared to non-Sabo communities (41.9%). Other such reasons were: unavailability of vaccines, absence of vaccinators and fear of adverse effects. These are contrary to the findings of other published studies [34,35]. The variation in findings may be due to differences in methodologies such as study areas, study subjects, number of samples, sampling procedures and data collection techniques. However, the findings of another study also was in tandem with those of ours on fear of adverse effect of immunization, where parents or religious bodies, more especially in the northern part of this country, had fear of adverse effect regarding routine immunization (36). Other sources of fear have been reported and include: attempts by Non-governmental Organizations (NGOs) sponsored by unknown enemies in developed countries to reduce the local population and increase mortality rates among Nigerians [36], belief in a secret immunization agenda determined to impose population control [37].

Generally from the present study, the overall knowledge and attitude towards routine immunization was good in both Sabo and non-Sabo communities, but the overall uptake of routine immunization was poor in the Sabo communities. This finding on knowledge and attitude is contrary to the expected perception that the knowledge and attitude of the Sabo communities would be poor due to the characteristics that are known to have national impact on immunization, such as ethnicity, religion, highest educational attainment and migration [9-15]. This could imply that there has been acculturation of the Sabo communities by their host communities. However, the issue of uptake in the Sabo communities is still poor and this needs to be addressed. This finding suggests a unique opportunity to enhance the uptake by improving the knowledge of mothers by improving the knowledge of health workers via regular trainings and awareness programs.

Limitations of the Study: Ethno- religious, cultural and language barriers were overcome through an interpreter, Hajjia, Seriki and Otochalu of the communities. Accessing the female households in the Sabo communities who were in purdah was a bit problematic, but was overcome through a caregiver who provided the immunization card or history of the child's immunization.

5. Conclusions

Results of the current study validate previous research findings indicating that maternal knowledge, attitude and uptake of routine immunization services across the country still constitute maternal and child health problems and need to be addressed. In this study there were still inequities among the Sabo communities and non-Sabo communities on their knowledge of routine immunization. Within the context of this study, the different communities were representatives of different ethnic and religious groups in Nigeria where the Sabo were the migrant communities while the non-Sabo were the host communities. There were still inequities among the ethnic groups and religious groups among the migrants and host community on their attitude towards routine immunization. There were different reasons for poor uptake routine immunization at the community level in Sabo and non-Sabo community. More Sabo mothers do not go for immunization when their child is ill. They felt the immunization would further worsen the illness. This action resulted in many incomplete immunization.

From our findings, there were good knowledge and attitude towards routine immunization in both communities. However uptake of routine immunization was better in non-Sabo than in Sabo communities. Based on the findings in this study, we recommend that the position and the state of the nation's immunization coverage should be strengthened by creating awareness down to the grassroots and encourage more community participation. More emphasis should be placed on developing holistic and comprehensive immunization programs for mothers especially those migrants who are not yet socially connected with the health workers and the health facilities in their host communities. Women empowerment is very important, government should employ and create an enabling environment for women to work and earn their livelihood and not to depend on their spouses. Maternal autonomy is very vital in preventing incomplete immunization. Government should encourage community participation, involve religious and community leaders as this would help to stop misperception, suspicion, myths and rumors surrounding immunization. The stakeholders should improve on sustained behaviour change communication targeted at reasons for poor uptake of routine immunization.

Ethical Consideration

The study has been examined and approved by the Nnamdi Azikiwe University Teaching Hospital Ethics Committee. A written informed consent was obtained from each participant for the conduct and publication of this research study and assurance of confidentiality given.

The purpose and objectives of the study were explained to each participant prior to interview. Study participants were free to refuse or withdraw from the study at any time without penalty. All authors are in agreement to be accountable for all aspects of the work in ensuring that questions to the accuracy or integrity of any part of the work are appropriately investigated and resolved. We hereby declare that the study has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

Source of Support or Funding

None.

Conflict of Interest Statement

Authors have declared that there are no interests.

Acknowledgements

This is part of dissertation successfully defended at the National Postgraduate Medical College of Nigeria in partial fulfillment of the requirements for the award of the fellowship of the College in Public Health in May, 2017.

References

- [1] World Health Organization (WHO), World TB Day, Health topic-immunization [Online] Available @ www.who.int/topics/immunization/en/. Accessed 24th March 2014.
- [2] Abdulkarim AA, Ibrahim RM, Fawi AO, Adebayo OA, Johnson A. Vaccine and immunization: The past, present and the future in Nigeria. *Nigerian Journal of Pediatrics* 2011; 38(4): 186-94.
- [3] Center for Global Development. Making markets for vaccines: from ideas to actions. Center for Global Development; 2005: Washington DC. [Online] Available @ www.cgdev.org/pdf. Accessed 18th August 2013.
- [4] Matsumura T, Nakayama T, Okamoto S, Ito H. Measles vaccine coverage and factors related to uncompleted vaccination among 18month old and 36month old children in Kyoto, Japan. *BMC Public Health* 2005; 5: 59.
- [5] Torun SD, Bakirci N. Vaccination coverage and reasons for non-vaccination in a district of Istanbul. *BMC Public Health* 2006; 6:125.
- [6] Anand S, Barnighausen T. Health workers and vaccination coverage in developing countries: an econometric analysis. *Lancet* 2007; 369: 1277-85.
- [7] Wiysonge CS, Uthman OA, Ndumbe PM, Hussey GD. Individual and contextual factors associated with low childhood immunization coverage in sub-Saharan Africa. *PLoS ONE* 2012; (5): e37905.
- [8] World Health Organization. Health of migrants. [Online] Available@URL: http://www.who.int/hac/techguidance/health_of_migrants/B122_1_1-en.pdf. Accessed on 5th February 2015.
- [9] Biswas T, Mandal PK, Biswas S. Assessment of health, nutrition and immunisation status amongst under -5 children in migratory brick klin population of periurban Kolkata, India. *Sudanese J Public Health*, 2011; 6; 7-11.
- [10] Williams IT, Milton JD, Farrell JB, Graham NM. Interaction of socioeconomic status and provider practices as predictors of immunization coverage in Virginia children. *Pediatrics*. 1995; 96(3 Pt. 1):439-44.
- [11] Hutchins SS, Jansen HA, Robertson SE, Evans P, Kin-Farley RJ. Studies of missed opportunities for immunization in developing and industrialized countries. *Bull World Health Org.*, 1993; 71: 549-60.
- [12] Bardenheier B, Gonzalez MI, Washington ML, Bell BP, Averbhoff F, Massoudi MS. Parental knowledge, attitudes, and practices associated with not receiving Hepatitis A vaccine in a demonstration project in Butte County, California. *Pediatrics.*, 2003; 112: 269-74.
- [13] Luman ET, McCauley MM, Stokley S, Chu SY, Pickering LK. Timeliness of childhood immunizations. *Pediatrics.*, 2002; 110: 935-9.
- [14] Klevens R, Luman ET. US children living in and near poverty risk of vaccine-preventable diseases. *Am J Prev Med.*, 2001; 20 (4 Suppl.): 41-6.
- [15] Sun MP, Liu DW, Liu AH. Investigation of immunization coverage rate of children living in floating population area and affecting factors. *Chin J Vaccines Immun.*, 2002, 8 91-4.
- [16] Liu DW, Sun MP, Liu WX, Fan CH, Lu L, Liu DL. Comparative study on immunization coverage rates of nine vaccines between local and floating children. *Chin J Vaccine Immun.*, 2007; 13: 165-9.
- [17] Nigeria Demographic and Health Survey 2013 - preliminary report. [Online] Available @ www.dhsprogram.com/PR41.pdf. pg 23 Accessed 26 March 2014.
- [18] Federal Republic of Nigeria Official Gazette (15 may 2007). "Legal Notice on Publication of the Details of the Breakdown of the National and State Provisional Totals 2006 census (PDF) Retrieved 2007-05-19.
- [19] Anambra state, Nigeria. People, Local Government and Business opportunities in Anambra. [Online] Available @ www.ngex.com. Accessed 6th February 2014.
- [20] Anambra State Government, Ministry of Health. [Online] Available @ www.anambrastate.gov.ng. Accessed 22nd August 2013.
- [21] Historical Society of Nigeria. [Online] Available@ www.historicalsocietynigeria.org Accessed 22nd August 2013.
- [22] Odusanya OO, Alufohal EF, Meurice FP, Ahonkhai VI. Determinant of vaccination coverage in rural Nigeria. *BMC Public Health* 2008; 8: 381 [Online] Available at <http://www.biomedcentral.com/1471-2458/8/381> Accessed 6th February 2014.
- [23] Sabon Gari-Kano. Nigeria [Online] Available at www.vanguardngr.com. Accessed 24th March 2014.
- [24] Culture shock-UCI Study Abroad Center-University of California, Irvine. [Online] Available at www.cie.uci.edu. Accessed on 5th February 2015.
- [25] World Health Organization (WHO). Immunization coverage cluster survey-reference manual. WHO/IVB/04.23 June 2005. [Online] Available at www.who.int/vaccine-document/ Accessed 26th March 2014.
- [26] Wonodi C, Stokes-Prindle C, Aina M, Oni G. Landscape-Analysis of Routine Immunization in Nigeria. (NDHS 2008 National Immunization Cluster Survey 2010). [Online] Available at www.jhsph.edu. Accessed 26th March 2014.
- [27] Smart Methodology. Sampling methods and sample size calculation for the SMART methodology, 2012 [Online] Available at www.smartmethodology.org. Accessed 22nd August 2013.
- [28] Statistical Package for Social Sciences (IBM SPSS) 22.0 version. Armonk NY: IBM United States. IBM Corp. 2013.
- [29] Hamid S, Arshad S, Andrabi H, Fazli A, Jubeen R. Immunization of children in rural area of North Kashmir, India: A KAP study. *J.Health Allied Scs*, 2012; 11(1): 153-6.
- [30] Quaiyum MA, Tunon C, Hel Bagui A, Quaiyyum Z, Khatun J. Impact of national immunization days on polio related knowledge and practice of urban women in Bangladesh. *Health Policy Plan*, 1997; 12: 363-71.
- [31] Manjuranath U, Pareek RP. Maternal knowledge and perceptions about the routine immunization program: A study in a semi urban area in Rajasthan. *India J Med Sci*, 2003; 57: 158-63.
- [32] Babalola S, Adewuyi A. Factors influencing immunization uptake in Nigeria: A theory-based research in six states. Abuja: PATHS. 2005 [Online] Available @ www.nigeriahealthwatch.com Accessed 6th February 2014.
- [33] Omotara B, Okujagu T, Etatusia S, Beida O, Gbodossou E. Assessment of knowledge, attitude and practice of stakeholders towards immunization in Borno state, Nigeria: A qualitative approach. *J. Community Med and Health Education*, 2012; 2: 9-11.

- [34] Abdelsalam HHM, Sokal MM. Accuracy of parental reporting of immunization. *Clinical Paediatrics (Phila)*, 2004; 43: 83-85.
- [35] Obioha EE, Ajala AS, Matobo TA. Analysis of the performance of expanded programme on immunization (EPI) for four killer diseases under the military and civilian regimes in Nigeria, 1995-1999; 2000-2005. *Ethno Med*, 2010; 4(1): 43-52.
- [36] Babalola S, Aina O. Community and systematic factors affecting the uptake of immunization in Nigeria: A qualitative study in five states: National report. Abuja: PATHS. 2004. [Online] Available @www.ajhe.com. Accessed 6th February 2014.
- [37] Yola AW. Report on child immunization clusters (CICS): Conducted in 12 LGAs of Kano state. Lagos: BASIC11. 2003; 4: 1-3.