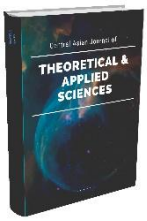


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# Factors Affecting the Utilization of Vaccines Among Children Undedr Five Children in Ikenne Local Government of Oyo State, Nigeria

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***Abstract:***

***Introduction***

*The Routine Immunization coverage for Ogun State, Nigeria was 82% for BCG and 85% for the third dose of the pentavalent vaccine (Penta3), which serves the measure for RI coverage in the country. This was lower than the expected national coverage of 90% set by the Global Vaccine Action Plan (GVAP) launched by WHO to increase global vaccination coverage by 2020 (Ijarotimi, 2018).The low immunization coverage documented in the literature among children both in urban and rural areas, indicates the need for strategies to address the situation (Adedayo et al. 2015). This study examined factors affecting the utilization of vaccines among under 5 children atIkenne local government area of Oyo state. Mothers and caretakers of under-5 children were selected for the study. A semi-structured questionnaire was administered to 402 women. A multistage sampling techniques was adopted for the selection of respondent Both descriptive such as the frequency tables, percentages, mean and standard deviation were obtain as well as analytical statistics such as chi square was used to determine the level of association between some selected independents and dependents variables were obtained at p-value less than 0.05.*

*This study revealed majority of the children had incomplete vaccine utilization status. 92.5% of children have received oral polio vaccine at one time or the other. Majority of these children had immunization cards. More than half of the mothers have good knowledge of vaccination. To analyse the utilization of the specific vaccines; frequency and proportion was used and their utilization was found to be BCG*

 

*(83.1), DPT (88.6%), HBV (88.6), Hib (88.6), OPV (92.5) respectively. Factors affecting the utilization of vaccines among selected variables were analyzed using bivariate and multivariate statistics. The multiple logistic regression was further used to investigate factors that were significant at 5% level of significance. Education of mothers, occupation of mother, Religion, Locus of decision making power, Wealth index, Antenatal care attendance, Distance to health centers, long waiting hours, vaccine availability. In the multivariate analysis children whose mother completed secondary education were fifteen times more likely than those whose mother had no formal education to utilize vaccine (OR=14.72, 95% CI=2.46-87.98).*

***Conclusion***

*In this study, the total vaccine utilization was found to be 88.3% and immunization card is the gold standard for obtaining immunization coverage and vaccine utilization. Although this figure is higher than those from other studies: Odusanya et. al, 2008 = 64.2% (Determinants of vaccination coverage in rural Nigeria) Adedire et. al, 2016 = 71.4% (Current trends of Immunization in Nigeria: prospects and challenges)Uzochukwu et. al, 2017 =78% (inequity in access to childhood immunization in Enugu. Nigeria). However, it is concluded that the utilization of immunization was inadequate because the goal is at least 90% and above therefore, awareness vaccination should be intensified in Ikenne local government.*

***Keywords:*** *Vaccine, Utilization,Ikenne, immunization.*

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## INTRODUCTION

Utilization of a vaccine is said to be achieved when the targeted population, actually receives it. Oral polio vaccine is administered to children under the age of five years. The utilization of vaccine varies according to geographic location. A cross sectional study conducted on immunization coverage and its determinants among children aged 12 to 23 months in Atakumoisa west district, Osun state Nigeria revealed that only 57.9% of the children have been fully vaccinated (Adedire et al 2016). In another study, prevalence of vaccine preventable diseases and utilization of routine immunization services by parents of under-one children in a semi urban community of Sokoto State, Nigeria. It revealed proportion of fully vaccinated children to be 4.75%, on further investigation on the factors responsible for the low utilization, factors like place of delivery, educational level of parents, occupation and father's refusal were strongly associated with low utilization (Yahaya et al 2017).

Borus (2004) examined missed opportunities and immunization coverage among children below two years in the slum areas in Nairobi, Kenya whereby, on overall, 84% of the children were fully immunized with only 75% vaccinated against Polio. Although the overall coverage levels were above the recommended 80%, DPT3 coverage levels was far below the threshold. Insufficient vaccines in the stock, underweight child, child is under age, not appropriate day for vaccination and including syringes out of stock were among many other reasons cited as leading to failure of getting full vaccination. However, scarcity of vaccine greatly contributed to missed opportunities for full vaccination. Also mother knowledge of immunization was identified has a factors responsible for the utilization rate.This study determines the total vaccine utilization among under 5 years' children. It shows the specific vaccines utilization and their schedules and also determines the factors associated with vaccine utilization among under-5 children in Ikenne LGA of Ogun State.

## MATERIALS AND METHODS

### Study Population

The study population were comprised of mothers or caretakers with one or more child aged 0–59 months old at Akinyele community. A sample of 402 mothers was selected and informed consent was obtained from all participants after providing adequate information about the purpose of the study.A descriptive cross-sectional study design was used. It involves a single examination of a population at a given time. The design was considered ideal for this study because it describes as well as examines factors associated with vaccine utilization. The advantage of this study design is that in general it is quick and cheap. Since there was no follow up, less resources was required to conduct the study.Data were collected using a semi-structured questionnaire which consists of forty five (45) questions structured to elicit information on socio-demographics characteristics of mothers, child immunization history, mother's knowledge of immunization, ANC attendance, vaccine availability and attitude of health care workers. The questionnaire was developed in English thereafter translated in Yoruba for easy use since the majority of the target population speaks Yoruba, which is their traditional language.

## RESULT

### Demographic Variables

Four hundred and three (402) women participated in this study. The table below shows the socio-demographic characteristics of the parent. The mean age of mother was 32.05±4.084. Majority of the parent (64.9%) lives in the rural part of Ikenne local government. 84.9% of the mothers were Yoruba and about 67% of them completed secondary school or less, also the majority (63.4%) of the fathers completed secondary school or less. 44.4% and 36.5% respectively of mothers and fathers were entrepreneur. More than three-quarter (79.9%) of mothers earned below 40000 naira as a monthly income and more than half (57%) of fathers earned below 40,000 naira as a monthly income. Majority of the mothers were Christians (54%) and the remaining (46%) were islam, less than half (47.2%) of the parent own a house and more than half of them own a car.

**Table 1: Socio-demographics characteristics of parent (N=402)**

| Variable | Frequency | Percentage % |
|---|---|---|
| **Type of location** | | |
| Rural | 250 | 64.9 |
| Semi-urban | 128 | 33.2 |
| Urban | 7 | 1.8 |
| **Mothers age** | | |
| <35 years | 277 | 71.8 |
| ≥35 years | 109 | 28.2 |
| **Number of children** | | |
| ≤3 | 271 | 72.3 |
| >3 | 104 | 27.7 |
| **Mothers tribe** | | |
| Yoruba | 326 | 84.9 |
| Igbo | 34 | 8.9 |
| Hausa | 18 | 4.7 |
| Others | 6 | 1.6 |
| **Mothers education level** | | |
| No formal education | 91 | 23.6 |

| | | |
|---|---|---|
| Secondary or less | 255 | 66.1 |
| Tertiary education | 40 | 10.4 |
| **Fathers education** | | |
| No formal education | \24 | 6.3 |
| Secondary or less | 243 | 63.4 |
| Tertiary | 116 | 30.3 |
| **Mothers occupation** | | |
| Private | 129 | 35.5 |
| Entrepreneur | 161 | 44.4 |
| Civil servant | 47 | 12.9 |
| Others | 26 | 7.2 |
| **Fathers occupation** | | |
| Private | 96 | 25.4 |
| Entrepreneur | 138 | 36.5 |
| Civil servant | 90 | 23.8 |
| Others | 54 | 14.3 |
| **Mothers income** | | |
| Less than 40000 | 290 | 79.9 |
| 40,000 above | 73 | 20.1 |
| **Fathers income** | | |
| Less than 40000 | 199 | 57 |
| 40000 and above | 150 | 43 |
| **Religion** | | |
| Christian | 209 | 54.1 |
| Muslim | 177 | 45.9 |

**RESULTS BY OBJECTIVES:**

**1. To determine the vaccine utilization status.**

The result of the bivariate chi square analysis was shown in table 4.5. It was revealed that complete utilization of vaccine was significantly higher among children whose fathers completed tertiary education (44%) compared fathers with no formal education (8.3%) and secondary or less education (39%) ($X^2$ =11.408 p=0.001). Complete utilization was significantly higher among children whose father earned 40,000 naira (48%) or more compared to those who earned less than 40,000 naira (20.1%) ($X^2$=30.549, p<0.0001).Vaccine utilization was significantly higher among child whose parent delivered in government hospital (51.8%) compared to those whose parent delivered in private hospital (28.3%) and traditional birth centers (20%) ($X^2$=53.536, p<0.0001). It was observed that complete Vaccines utilization was significantly higher among child whose mother attend ANC during pregnancy (43.7%) compared to mothers who did not attend (14%) ($X^2$.=29.815, p<0.0001). Complete utilization of vaccine was observed to be significantly higher among child whose mothers have no problem with transportation (46.5%) compared to those who have transportation problem (30.4%) ($X^2$=7.844, p=0.005). In this study majority of the respondents (80.3%) have experienced vaccine stock out in the health facility where their child was being immunized while only 19.7% never experienced vaccine stock out. This is a very high percentage.

 

**Table 4.5: Determination of relationship between vaccine utilization status by various characteristics**

| Variables | Vaccine utilization status | | | |
|---|---|---|---|---|
| | Complete (%) | Incomplete (% ) | $X^2$ | P value |
| **Mothers Age** | | | | |
| <35 years | 105(37.9) | 172(82.1) | 2.497 | 0.114 |
| ≥35 years | 32(29.4) | 77(70.6) | | |
| **Mothers education** | | | | |
| No formal education | 3(3.3) | 88(96.7) | 54.502 | <0.0001* |
| Secondary or less | 118(46.3) | 137(53.7) | | |
| Tertiary | 16(40.0) | 24(60.0) | | |
| **Fathers education** | | | | |
| No formal education | 2(8.3) | 22(91.7) | 11.408 | 0.003* |
| Secondary or less | 84(39.0) | 159(65.4) | | |
| Tertiary | 51(44.0) | 65(56.0) | | |
| **Fathers income** | | | | |
| <40000 | 40(20.1) | 159(79.9) | 30.549 | <0.0001* |
| ≥40000 | 72(48.0) | 78(52.0) | | |
| **Child birth position** | | | | |
| First | 39(36.8) | 67(63.2) | 0.108 | 0.743 |
| Last | 98(35.0) | 182(65.0) | | |
| **Proximity to health facility** | | | | |
| Far | 89(34.2) | 171(65.8) | 0.640 | 0.424 |
| Near | 48(38.4) | 77(61.6) | | |
| **Where they seek treatment** | | | | |
| Government facility | 81(34.2) | 156(65.8) | 1.131 | 0.568 |
| Private facility | 42(39.6) | 64(60.4) | | |
| Others | 14(32.6) | 29(67.4) | | |
| **Ever experienced stock out** | | | | |
| Yes | 103(36.4) | 195 (65.4) | 3.632 | 0.057 |
| No | 34(46.6) | 39(53.4) | | |
| **Childs place of birth** | | | | |
| Government health facility | 107(51.8) | 66(38.2) | 53.536 | <0.0001* |
| Traditional birth attendant | 17(20.0) | 68(80.0) | | |
| Private health facility | 32(28.3) | 81(71.7) | | |
| **Transport problem** | | | | |
| Yes | 31(30.4) | 71(69.6) | 7.844 | 0.005* |
| No | 125(46.5) | 14453.5) | | |
| **Long waiting hour** | | | | |
| Yes | 26(25.0) | 78 (75.0) | 6.845 | 0.009* |
| No | 111(39.4) | 171(60.6) | | |
| **Decision taker** | | | | |
| Husband | 96(36.8) | 165(63.2) | 0.595 | 0.743 |
| Wife | 25(32.5) | 52(67.5) | | |
| Husband and wife | 16(33.3) | 32(66.7) | | |

 

| | | | | |
|---|---|---|---|---|
| **ANC attendance** | | | | |
| Yes | 122(43.7) | 157(56.3) | 29.815 | <0.0001* |
| No | 15(14.0) | 92(86.0) | | |
| **Sex of child** | | | | |
| Male | 81(34.5) | 154(65.5) | 0.275 | 0.600 |
| Female | 56(37.1) | 95(62.9) | | |

**2. To determine the specific vaccine's utilization**

The utilization of vaccines was shown in table 4.3. The result revealed that majority (64.9%) of the children had incomplete vaccine status. It was revealed that 92.5% of children have received oral polio vaccine at one time or the other. 83.1%, 88.6% and 53.5% respectively received BCG, pentavalent (DPT, HiB& HBV) and yellow fever vaccine at one point in time.

**Table 2: Specific Vaccine utilization of under-5 children**

| Vaccines | Frequency | Percentages (%) |
|---|---|---|
| **Vaccine status** | | |
| Complete | 137 | 35.1 |
| Incomplete | 253 | 64.9 |
| **OPV** | | |
| Yes | 357 | 92.5 |
| No | 29 | 7.5 |
| **BCG** | | |
| Yes | 323 | 83.1 |
| No | 62 | 16.9 |
| **DPT** | | |
| Yes | 341 | 88.6 |
| No | 44 | 11.4 |
| **HiB** | | |
| Yes | 341 | 88.6 |
| No | 44 | 11.4 |
| **HBV** | | |
| Yes | 341 | 88.6 |
| No | 44 | 11.4 |
| **Yellow fever** | | |
| Yes | 206 | 53.5 |
| No | 179 | 46.5 |

**3. To determine the factors associated with vaccine utilization.**

Variables significant at 5% level on chi square analysis were entered into a multiple logistic regression model and the result were shown in table 4.7. Children whose mother completed secondary education were fifteen times more likely than those whose mother had no formal education to utilize vaccine completely (OR=14.72, 95% CI=2.46-87.98). Children whose father earned 40,000 naira or more were two times more likely than those whose father earned less than 40000 naira to completely utilize vaccine (OR=2.38, 95% CI=1.28 – 4.45). Also, children whose mother never experienced long waiting hour in immunization clinics were four times more likely than those whose mother had experienced long waiting hour (OR=4.26, 95% CI=1.81-10.04).

**Table Multiple Logistic Regression of factors associated with Vaccine utilization**

| Variables | ADJ OR | 95% confidence interval | | P –value |
|---|---|---|---|---|
| | | Lower | Upper | |
| **Mothers education** | | | | |
| No formal education | Ref | | | |
| Secondary or less | 14.721 | 2.463 | 87.979 | 0.003* |
| Tertiary | 0.546 | 0.228 | 1.305 | 0.136 |
| **F athers education** | | | | |
| No formal education | Ref | | | |
| Secondary or less | 1.140 | 0.103 | 12.578 | 0.915 |
| Tertiary | 0.930 | 0.930 | 1.667 | 0.807 |
| **Fathers income** | | | | |
| <40000 | Ref | | | |
| ≥40000 | 2.383 | 1.278 | 4.446 | 0.006* |
| **Transport problem** | | | | |
| Yes | Ref | | | |
| No | 1.138 | 0.598 | 2.191 | 0.698 |
| **Long waiting hour** | | | | |
| Yes | Ref | | | |
| No | 4.258 | 1.805 | 10.043 | 0.001* |
| **ANC attendance** | | | | |
| Yes | 1.702 | 0.776 | 3.733 | 0.185 |
| No | Ref | | | |

## DISCUSSION

The study revealed that the following factors were found to significantly affect vaccine utilization. Vaccine availability, Parents level of education, Occupation of Parents, Access to health facility, Ante natal attendance and Distance to health facility.

Majority of the parents were from rural settings ofIkenne local government. Most of the woman (66.1%) attained secondary level of education. This is because of the type of settings where Ikenne local government is located. Most of the mothers were of 32 years of age which is similar to the result gotten from other studies (Olorunsaiye 2016).

Most of the parents were traders as Ikenne community is known for trading activities. Father's income was shown to be related to utilization of vaccine as children whose father earn higher income were two times more likely to utilized vaccine compared to children whose father earned low income. It was revealed that complete utilization of vaccine was significantly higher among children whose fathers completed tertiary education (44%) compared fathers with no formal education (8.3%) and secondary or less education (39%) ($X^2$ =11.408 p=0.001). This can be because income status of individual strongly control the behavior of individual thereby controls health seeking and ultimately child survival. In a study in Ethiopia, Lakew et al., 2015 showed that children born from fathers of higher income were more likely to have received full vaccination status compared with children born from father of low income.

It was observed that children born from mothers who attended antenatal care during pregnancy or who gave birth at the health facility were more likely to be fully vaccinated. This can be explained by the fact that women who attend ANC and give birth at health facility antenatal clinic is a means for women to be aware of immunization programme. Similar findings were seen on other studies. Odusanya et al 2003.

 

(Determinants of vaccination coverage in rural Nigeria). Babalola et a l2012. (Report on factors influencing immunization uptake in Nigeria) and Oyefara et al 2014, (Women's level of education and full immunization status of their children). This could also be as a result of the Nigeria primary health centers care approach which now offer a range of preventive and curative services including immunization programs which have been strengthened by the global polio eradicating initiative programme over the recent past.

Geographical accessibility to health facilities offering routine immunization services is known to be a major determinant of vaccine utilization in many areas of Nigeria and most parts of sub-Saharan Africa, as demonstrated by other studies (Jagrati et al., 2008). Children whose mother were living close to health facilities were more likely to complete their vaccinations compared to those living far away from the health facilities This is because visibility of a clinic may attract a parent attention and act as a reminder of the parent of the immunization status of their child.

In this study, children whose mothers experienced long waiting hours were more likely not to completely vaccinate their children this is because the amount of time a patient waits to be seen is one factor which affects utilization of healthcare services. Patients perceive long waiting times as barrier to actually obtaining services and keeping patients waiting unnecessarily can be a cause of stress (Oche et, al 2013)..

## CONCLUSION

This study has shown that the proportion of complete vaccine utilization is 35.1% a figure which is lower compared to the national vaccine coverage among under five children. The utilization of immunization services was low in this study. Hence, awareness of vaccination should be intensified in Ikenne local government

There are several limitations to this study. Since this study investigated a cross-section of the study population, data can be specified only to the studied sample population. The results cannot be applied to all under 5 children in other local government or states in the country. Since the study design was cross-sectional hence, causality cannot be established. The use of self-reported data means the accuracy of the data cannot be ascertained especially when the sensitive nature of the subject is considered such as fear of victimization. Also, the measurement of knowledge about immunization in the study was not all encompassing.

This study is also from mother's perspective only, further research is needed to assess health workers perspectives to identify related factors in order to inform policy and foster promotion of immunization and complete vaccine utilization.

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