

**CHILDHOOD VACCINE SAFETY AND IMMUNIZATION EFFECTIVENESS:  
CONCERNS OF MOTHERS WITH UNDER FIVE CHILDREN IN AWKA SOUTH  
LOCAL GOVERNMENT AREA OF ANAMBRA STATE**

**BY**

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**Abstract**

Immunization is one of the most powerful and cost effective of all public health interventions for prevention of communicable diseases. Immunization prevents debilitating illness and disability and saves millions of lives every year. The purpose of this study was to determine vaccine safety and immunization effectiveness concerns of mothers with under five age children in Awka South LGA of Anambra State. Four research objectives and four hypotheses were developed to guide the study. The research design for the study was the descriptive research design. The sample size was three hundred and twelve (312) mothers with children under five in the selected health centers. A validated researcher-developed questionnaire with reliability coefficient of 0.94 was used for data collection. Data collated were subjected to simple descriptive statistics of frequency, percentages, mean and standard deviation and hypotheses tested using chi-square test. Probability value at  $<0.05$  was considered statistically significant. Major findings revealed that a good number of mothers (62.4%) had low concern for childhood vaccine safety, while 37.6% had high concern for childhood vaccine safety. The overall mean score for the mother's response on concern for vaccine safety was 2.43. A good number of mothers (57.8%) had high concern for childhood immunization effectiveness while the remaining 42.2% of the mothers had low concern for childhood immunization effectiveness, the overall mean score for concern for immunization effectiveness was 2.49, hospital and health centre were major places where mother received antenatal and labour care. There was significant relationship ( $p<0.05$ ) between the mothers parity, education and their concerns for effectiveness of childhood immunization. There was no significant relationship ( $p>0.05$ ) between the source of pregnancy and labour care and mothers concern for childhood vaccine safety. There was significant relationship ( $p<0.05$ ) between the source of pregnancy and labour care and mothers concerns for childhood

immunization effectiveness. Based on these findings, it is recommended that awareness of the value of vaccines among parents, health practitioners, community leaders, policy makers and the media to build trust in vaccine safety and effectiveness. Health practitioners should be advised on the susceptibility and severity of vaccine preventable diseases and about vaccine safety and efficacy. Researcher therefore suggest the following studies to: determine the uptake of childhood immunization among mothers of under five children. In conclusion, majority of the mothers in Awka South agreed that childhood vaccines are safe and effective despite their educational level, mothers in Awka South received antenatal and labour care in the hospitals and health centers which made them agree that childhood immunization is safe and effective.

### **Background to the study**

Immunization is one of the most powerful and cost effective of all public health interventions for prevention of communicable diseases. Immunization prevents debilitating illness and disability and saves millions of lives every year (UNICEF, 2013). According to World Health Organization (WHO), 2013), immunization prevents about 2 to 3 million deaths annually that could have resulted from vaccine preventable diseases (VPDs) such as diphtheria, tetanus, pertussis, and measles, it is also a key to achieving the Millennium Development Goal four (MDG 4).

Globally, vaccine preventable diseases account for nearly 20% of all deaths occurring annually among children under five of age (WHO, 2012). The World Health Organization (WHO), United Nations Children's Fund (UNICEF), and National Programme on Immunization (NPI) guidelines stipulate that a child should receive four doses of Oral Polio Vaccine (OPV), three doses of Hepatitis B vaccine, three doses of Diphtheria, Pertussis and Tetanus (DPT) vaccine and one dose each of Bacilli Calmette Guerin (BCG), Measles and Yellow fever vaccines (WHO, 2015).

Routine immunization with these vaccines is a cost effective way of reducing childhood morbidity and mortality in developing countries. Prevention of these diseases in one child also has a positive ripple effect on the population as the immunized child will not transmit the disease to another child. As immunization is administered to healthy individuals to prevent illness, expectations of vaccine safety are high. Several factors have contributed to heightened concerns for vaccine safety, including number of vaccines in immunization schedules, limited or no experience of vaccine preventable disease, and the increasing presence and influence of conflicting safety information in online or news media (Kennedy, Lavail, Nowak, Basket and Landry, 2011). Parental concerns such as the fear of potential adverse effect, refusal of recommended vaccines, concern for safety of new vaccines, misconceptions such as vaccines causing autism or too many vaccines weaken the immune system have been reported (Bean, 2011). The criteria for establishing vaccine safety must be very high before licensure is granted. Health care providers must be prepared to inform parents that although vaccines are not 100% safe, the most common side effects are usually mild and may include a low-grade fever and pain, erythema, or swelling at the injection site (Smith & Marshall, 2010). A systematic view of recent literature regarding the safety of routinely administered childhood vaccines concluded that some vaccines do have a risk of serious adverse events, however, the likelihood of these adverse events taking place is minimal (Maglione, Das, Raaen, Smith, Chan, Newberry & Gidengil,

20014). Parents should weigh the risks of immunization against the squeal of the vaccine preventable diseases.

Concerns regarding lack of involvement in the decision making process. Parents also have concerns regarding the timing of recommended childhood vaccines as recommended by the (Center for Disease Control, 2013). Following a strict vaccine administration schedule can sometimes lead to parents feeling as though they are not involved in the decision-making process (Luthy, Beckstrand & Callister, (2010). Majority of childhood vaccines are given prior to 2years of age because a child's immune system does not achieve maturity until this time. In developed countries, parents may suggest participating in alternative vaccine schedules so that vaccines can be spread out by delaying or altogether refusing certain vaccines. The desire for alternative vaccine schedules allows parents to feel that their child's plan of care is more individualized rather than standardized and may alleviate fears related to reactions for receiving too many vaccines at a time (Luthy et al., 2010). However, use of alternative vaccines schedules should be avoided because it not only increased the risk for contracting vaccine preventable diseases but forces providers to prioritize vaccines (Smith & Marshall, 2010).

Parental concerns about vaccines causing autism arose from vaccines containing a mercury-based preservative called thimerosal that was thought to affect brain development (Kuwaik, Roberts, Zwaigenbaum, Bryson, Smith, Szatmari, Brian, 2014). Thimerosal was previously used to prevent the growth of dangerous bacteria in multi-dose of influenza vaccines (Food & Drug Administration, 2014). In 1999, the CDC recommended the removal of thimerosal from routinely administered childhood vaccines as an initiative to reduce children's overall exposure to mercury, which may have fueled the speculation that this preservative is not safe for children (FDA, 2014). When thimerosal was used in vaccines, it was present in small quantities that were not shown to be harmful to the body. Nonetheless, preservatives are no longer needed in vaccines because almost all the vaccines are available in single-dose vial.

Concerns about system overload, twenty-five percent of parents across the United States believe that children receive too many vaccines and that administration of all required immunization is not healthy (Luthy et al., 2010). A recent study of parental vaccine belief indicated that 20% of parents agree that too many vaccines can overwhelm a child's immune system (Rogers, 2014). At birth an infant is exposed to thousands of antigens at any given time, regardless of vaccine exposure (Daestefano, Price & Weintraub, 2013). Controversy surrounds the safety of combination vaccines such as Measles-Mumps-Rubella-Varicella (MMRV) and the pentavalent vaccines, tetanus and diphtheria toxoid and acellular pertussis-hepatitis B-inactivated poliomyelitis vaccine (Gidengil, Lieu, Payne, Rusinak, Messonnier, Prosser, 2012). The purpose of combined vaccines is to decrease the number of injections required through the childhood immunization schedule. The main concern is that too many antigens given all at once could overwhelm the immune system and cause long- term effects seen later in life, leading some parents to individual components (Gidengil et al., 2012).

Even though vaccines were regarded as safe, parents still expressed concern about vaccines safety and effectiveness, mothers with high socio economic status seem to understand the benefits of childhood immunization, its safety and effectiveness, while those with low socioeconomic status do not comply with it ( UNICEF, 2013), so there is need to study

childhood vaccine safety and immunization effectiveness concerns of mothers with under five children in Awka South Local Government Area of Anambra State.

### **Statement of the problem**

Despite the evidence-based success in reducing vaccines preventable diseases (VPDs), morbidity and mortality, routine childhood immunization compliance is suboptimal resulting from differences in perception and behaviour changes. In spite of regulatory enforcement regarding vaccination in Nigeria, the final decision on vaccination in children is taken by their parents or legal guardians. The researcher observed during her practice as a Nurse at Chukwuemeka Odumegwu Ojukwu University Teaching Hospital Awka, when she interviewed parents on concerns about vaccine safety and effectiveness, Six out of ten parents who were interviewed, voiced concerns about the effectiveness of vaccines. The people I am aware of who have had vaccinations have developed flu, and in one case, a serious case of it. Other parents were concerned about side effects from the vaccine (High fever and vomiting), which led to vaccine refusal. These pose major disparities in immunization coverage across different population subgroups, making immunization an unfinished agenda, thereby results in low childhood vaccine uptake and immunization effectiveness to the detriment of the children. If mothers do not immunize their children as and when due, when then do they do that? What will happen during the period of delay? Could it mean that mothers do not know when to get their children immunized? These questions prompted the researcher to conduct study in order to determine the concerns of mothers in Awka South with under five children about childhood vaccine safety and immunization effectiveness.

### **Purpose of the study**

The purpose of the study was to determine childhood vaccine safety and immunization effectiveness concerns of mothers with under five children in Awka South.

### **Objectives of the study**

The specific objectives of the study were to:

1. Ascertain the mothers' concerns for childhood vaccine safety
2. Ascertain the mothers' concerns for childhood immunization effectiveness.
3. Determine the influence of received antenatal and labour care on the mothers' concern for childhood immunization effectiveness.
4. Determine the relationship between the mothers' place of birth and their concern for childhood vaccine safety.

### **Significance of the study**

The findings from the study will act as a guide to health professionals on the areas of emphasis in health education of mothers concerning vaccine safety. The result will motivate more research work in the field. Moreover, it will bring about behaviour change as it concerns vaccine compliance to mothers. The findings will also help the government and hospital authority in policy formulation regarding childhood immunization. Findings from the study will assist policy makers in understanding the best approach in dealing with mothers with low vaccine safety concerns (Mothers who do not have adequate knowledge about vaccine safety). Academically, this research findings will also add to the existing body of knowledge generated by other

researchers in related fields, the result of this study will also provide basis for further studies and local literature for references.

### **Scope of the study**

The study is delimited to concerns of mothers with under five children for childhood vaccine safety and immunization effectiveness. It is also delimited to mothers attending primary health centers in Amawbia, Amikwo, Umuokpu, Mbaukwu, Nibo, and Nise in Awka South.

### **Research design**

The research design adopted was a cross-sectional descriptive survey. The research design was deemed appropriate for this study on childhood vaccine safety and immunization effectiveness among mothers with under five children in Awka South LGA because it seeks to find out the concerns that are held, relationship that exist, effect that are evident or trends that are developing. This design was successfully used in similar studies on determinants of full child immunization among mothers in Zimbabwe (Legesse & Dechasa, 2015) and in Nigeria (Adebiyi, 2013).

### **Area of study**

The area of study is Awka South Local Government Area (LGA) which is one of the Local Government Areas located in Anambra Central Senatorial district with its head quarter at Amawbia. Awka South is bounded in the north by Awka North LGA, in the East by Oji-River LGA of Enugu State, in the South by Anaocha LGA and in the West by Njikoka LGA. Communities in Awka South include Awka, Amawbia, Ezinato, Isiagu, Nibo, Nise, Umuawulu, Okpuno and Mbaukwu. Awka South has a mixed population of blacksmiths, civil servants, farmers and businessmen. Awka town is known basically as the seat of indigenous technology and craft. Carving and iron works industry predominate the area.

Health facilities available in Awka South include Amaku State Teaching Hospital Awka, Regina Caeli Hospital, Health centers in every community, many private health clinics and maternity homes, which are being utilized by the community members. Natural resources include Agricultural produce and iron ingots.

### **Population of the study**

The target population includes all the mothers with children under five in the selected health centers who registered their children in the child welfare clinics at the time of the research in Awka South. The total number of mothers who fell within this category was estimated at 1300 (Monitoring & Evaluation unit, Ministry of Health, Anambra State,

### **Sample**

A sample of size of 312 mothers was determined using the formula for calculating sample size by Creative Research System, 2012 as follows;

$n = Z^2 P (1-P)/d^2$  Where  $n$  = sample size, (Creative Research System, 2012)

Where  $n$  = minimum sample size required

$z = 1.96$  (at 95% confidence interval)

$p = 50\%$  (0.5) prevalence rate.

$d$  = error margin i.e 0.05

**Applying the formula thus;**

$$n = 1.96 \times 1.96 \times 0.5 (1 - 0.5) / 0.05 \times 0.05$$

$$n = 0.9604 / 0.0025$$

$$= 384$$

$$n_{\text{adjusted}} = n / (1 + n/N)$$

$$384 / (1 + 384/1300)$$

$$= 297$$

Attrition rate for final sample size

$$n = n_{\text{adjusted}} / (1 - f)$$

$$= 297 / (1 - 0.05)$$

$$= 312$$

Sample size = 312

### **Sampling Procedure**

A multistage sampling technique was employed. The first stage employed the use of simple random sampling to select six health centers out of the twenty four centers in Awka South. The health centers selected were Amawbia, Amikwo, Umuokpu, Mbaukwu, Nibo, and Nise health centers. The second stage was the use of systematic sampling to select 312 mothers with under five children from the six selected health centers. Mothers were numbered from 1 to 1300. Sampling fraction was determined by dividing 1300 by 312, which resulted to 4 (approx). The starting was established from the table of random number (i.e. 2), and then mothers were selected from every 4<sup>th</sup> on the list starting with the 2nd number on the list. Therefore 2nd, 6<sup>th</sup>, 10<sup>th</sup>, 14<sup>th</sup>, 18th.....1,246<sup>th</sup>. Mothers were selected at interval until a sample of 312 mothers was obtained.

### ***Inclusion Criteria;***

- Mothers with under five children in the six selected health centers at the time of the research.
- Mothers between the ages of 15 to 49 who have under five children.
- Mothers who consent to participate.

### **Instrument for Data Collection**

The questionnaire developed by the researcher was the only tool used for data collection. The questionnaire was used to interview the mothers in order to elicit information on concerns of the mothers with under five children on childhood vaccine safety and immunization effectiveness in Awka South LGA. The total number of questions was twenty-eight. The tool was divided into three sections; section A sought information on demographic profile of the respondents, section B obtained information on childhood vaccine safety concerns while section C obtained information on childhood immunization effectiveness concerns. The questionnaire was developed from extensive literature search on childhood vaccine safety and immunization effectiveness concerns. Items were based on the four stated objectives of the study.

### **Validity of instrument**

The instrument was validated by the researcher's supervisor and two experts in the Department of Nursing Sciences. This was achieved through the critical assessment of the contents, clarity and logical accuracy of the instrument in line with research topic and objectives.

### **Reliability of instrument**

Test re-test method was used to establish the reliability of the instrument. This was done with thirty-one (31) participants from Maternal and Child Health Center Mgbakwu, Awka North as they have same characteristics of those being studied. The data obtained were collated and the result used to calculate the internal consistency of the instruments using Pearson Product Moment Correlation Coefficient formula.

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

The correlation coefficient was 0.95 for the questionnaire, which indicated the instrument to be reliable. (Appendix IV)

### **Ethical consideration**

Ethical clearance was obtained from the Anambra State Primary Health Care Development Agency Ethical Committee. Written administrative consent was obtained from the chairman, Awka South LGA. Oral informed consent was obtained from the ward heads and officers in charge of the health centers in the wards. Written informed consent was also obtained from the respondents who met the inclusion criteria before administration of the questionnaire. Confidentiality of respondents' information was strictly observed.

### **Procedure for data collection**

The letter of identification signed by the Head of Nursing Department, University of Nigeria Enugu Campus, copies of the ethical clearance and consent letter from Anambra State Primary Health Care Development Agency were used for formal introduction of the researcher to various Officers in Charge of the health centers. Formal briefing with regards to the purpose and objectives of the study was done, after which date, time and venue for the data collection were agreed upon by the researcher and the Officer in-Charge of the health facility. On the scheduled date for each facility, there was a brief explanation of the purpose of the study to the respondents before data collection.

Questionnaire was administered to the respondents who met the inclusion criteria; four research assistants who were knowledgeable about available vaccines, how they are handled were recruited and trained. Each selected and consenting respondent has only one opportunity to participate in the study. This one opportunity was controlled by a form of identification on the certificate of informed consent. Data were collected until the sample size was attained. Out of the 312 questionnaires served the respondents, 303 were completed and retrieved.

### **Method of Data Analysis**

Data collated were analyzed using descriptive statistics including frequency, percentages, mean scores and standard deviations. In order to determine the mothers' concerns for childhood vaccine safety, mean score criteria were set for the responses of the mothers on each item. The responses were weighted on 4 points Likert scale (strongly agree 4.0, agree 3.0, disagree 2.0, and strongly disagree 1.0). The item mean response of 2.50 or above was considered concern for childhood vaccine safety. Also to determine the mothers' concerns for childhood immunization effectiveness mean score criteria were set for the responses of the mothers on each item. The item mean response of 2.50 or above was considered concern for childhood immunization effectiveness.

Chi-square at 95% confidence interval was used to determine the association between the demographic characteristics of mothers in Awka South LGA and childhood vaccine safety and immunization effectiveness. Chi-square is a statistical test applied to a nominal data. This was done using the Statistical Package for Social Sciences (SPSS) (Version 20.0). The results were presented on tables, the statistical decision rule is that if  $p < 0.05$ , the association is said to be significant.

## Presentation of Results

This chapter presents results of the analysis and summary of findings. These results were presented in tables. Results contain frequency, percentage, mean, standard deviation and test statistic where hypotheses were tested. The results were based on research questions and four research hypotheses. Out of the 312 questionnaires served the respondents, 303 were completely answered and retrieved, which gave a return rate of 97.12% of the questionnaires from the respondents.

**Table1: Respondents' demographic profile n = 303**

| Variable                          | Frequency | Percent % |
|-----------------------------------|-----------|-----------|
| <b>Age</b>                        |           |           |
| 20 – 28                           | 67        | 22.1      |
| 29 – 37                           | 131       | 43.2      |
| 38 – 45                           | 105       | 34.7      |
| Total                             | 303       | 100       |
| Mean = 34.2(6.6)                  |           |           |
| <b>Marital status</b>             |           |           |
| Married                           | 286       | 94.4      |
| Divorced                          | 17        | 5.6       |
| Total                             | 303       | 100       |
| <b>Highest level of education</b> |           |           |
| No formal education               | 4         | 1.3       |
| Primary education                 | 85        | 28.1      |
| Secondary education               | 140       | 46.2      |
| Tertiary education                | 74        | 24.4      |
| Total                             | 303       | 100       |

**Occupation**

|               |     |      |
|---------------|-----|------|
| Farming       | 65  | 21.5 |
| Trading       | 60  | 19.8 |
| Civil service | 49  | 16.1 |
| House wife    | 129 | 42.6 |
| Total         | 303 | 100  |

**Religion**

|           |     |      |
|-----------|-----|------|
| Christian | 296 | 97.7 |
| ATR       | 7   | 2.3  |
| Total     | 303 | 100  |

**Income class (self ranked)**

|        |     |      |
|--------|-----|------|
| Low    | 19  | 6.3  |
| Middle | 84  | 27.7 |
| High   | 200 | 66.0 |
| Total  | 303 | 100  |

**Place of delivery**

|                   |     |      |
|-------------------|-----|------|
| Hospital          | 148 | 48.8 |
| Home              | 20  | 6.6  |
| Health centre     | 107 | 35.3 |
| Prayer house      | 18  | 5.9  |
| Traditional (TBA) | 10  | 3.4  |
| Total             | 303 | 100  |

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The above Table revealed the socio-demographic profile of 303 respondents whom are (mothers) interviewed. A good number of the respondents were between 29 - 37 years and they represent 43.2% of respondents, other respondents were in age categories of 20 – 28 years (22.1%) and 38 – 45 years (34.7%). The mean age of the respondents was 34.2 years. Most of the respondents (94.4%) were married. The respondents had 4 (1.3%) with no formal education, 85 (28.1%) with primary education, 140 (46.2%) with secondary education and 74 (24.4%) with tertiary education as their highest educational level. The respondents' occupation ranged from farming (17.8%), trading (15.9%), civil servant (12.3%) to house wife (31.3%) which was the case of a good number of the respondents. Majority of the respondents were Christians. The respondents (66.0%) were mainly reported being of high income class. The respondents used hospitals and health centers mainly as place of delivery.

**Table 2: Respondents' parity profile n = 303**

| Variable                                                      | Frequency | Percent % |
|---------------------------------------------------------------|-----------|-----------|
| <b>Parity</b>                                                 |           |           |
| 1                                                             | 36        | 11.9      |
| 2 – 3                                                         | 137       | 45.2      |
| 5–5                                                           | 111       | 36.6      |
| 6 & above                                                     | 19        | 6.3       |
| <b>No of children under 5</b>                                 |           |           |
| None                                                          | 41        | 13.5      |
| 1                                                             | 97        | 32.0      |
| 2                                                             | 144       | 47.5      |
| 3                                                             | 21        | 6.9       |
| <b>Place where ante-natal and pregnancy care was received</b> |           |           |
| Hospital                                                      | 133       | 43.9      |
| Health centre                                                 | 82        | 27.1      |
| Maternity home                                                | 45        | 14.9      |
| Traditional (TBA)                                             | 29        | 9.6       |
| Church                                                        | 14        | 4.6       |

Mother's parity range between 1 to 7 children but 2-4, 137 (45.2%) and 5-6, 111 (36.6%) children were most observed with the respondents. The respondents had mostly 2 under five children. Although respondents received ante-natal and pregnancy care from health centre, maternity home, traditional (TBA) and church, those received care from the hospital were the highest.

### **Objective one:**

#### **To determines the mothers' concerns for childhood vaccine safety**

In other to determine the mothers' concerns for childhood vaccine safety, mean score criteria were set for the responses of the mothers on each item. The item mean response of 2.50 or above was considered concern for childhood vaccine safety.

**Table 3a: Response on mothers' concerns for childhood vaccine safety**

| Item                                                                                                                  | SA<br>F<br>(%) | A<br>F<br>(%) | D<br>F<br>(%) | SD<br>F<br>(%) | Mean<br>(SD)   | P value |
|-----------------------------------------------------------------------------------------------------------------------|----------------|---------------|---------------|----------------|----------------|---------|
| Newer vaccines are not safe as older vaccines                                                                         | 58<br>(19.1)   | 16<br>(5.3)   | 19<br>(6.3)   | 210<br>(69.3)  | 1.74<br>(1.20) | 0.000   |
| Negative / unwanted reactions to vaccines and how they can be handled are not emphasized by the health care providers | 18<br>(5.9)    | 42<br>(13.9)  | 39<br>(12.9)  | 204<br>(67.3)  | 1.58<br>(0.94) | 0.000   |
| Some of the vaccines have substances that can affect the health of my child later in life                             | 227<br>(74.9)  | 28<br>(9.2)   | 31<br>(10.2)  | 17<br>(5.6)    | 3.53<br>(0.89) | 0.000   |
| There too many number of times the child is expected to receive vaccines                                              | 201<br>(66.3)  | 30<br>(9.9)   | 40<br>(13.2)  | 32<br>(10.6)   | 1.48<br>(0.84) | 0.000   |

|                                                                                           |                      |              |              |               |                        |              |
|-------------------------------------------------------------------------------------------|----------------------|--------------|--------------|---------------|------------------------|--------------|
| The vaccines make my child to get sick                                                    | 17<br>(5.6)          | 19<br>(6.3)  | 56<br>(18.5) | 211<br>(69.6) | 1.56<br>(0.94)         | 0.000        |
| The vaccine does not protect the child against the target disease                         | 21<br>(6.9)          | 32<br>(10.6) | 43<br>(14.2) | 207<br>(68.3) | 3.32<br>(1.06)         | 0.000        |
| I am not allowed to take decision on when to immunize my child                            | 152<br>(50.2)        | 25<br>(8.3)  | 25<br>(8.3)  | 101<br>(33.3) | 2.75<br>(1.36)         | 0.000        |
| I do not remember the right time to take my child to the health facility for immunization | 211<br>(69.6)        | 43<br>(14.2) | 33<br>(10.9) | 16<br>(5.3)   | 3.48<br>(0.89)         | 0.000        |
| <b>Overall</b>                                                                            | <b>MEAN<br/>(SD)</b> |              |              |               | <b>2.43<br/>(1.35)</b> | <b>0.000</b> |

From Table 3a above, the responses on mothers' concerns for childhood vaccine safety were expressed as 'Some of the vaccines have substances that can affect the health of my child in later life (mean score = 3.53(0.89))', 'The vaccine does not protect the child against the target disease (mean score = 3.32(1.06))', 'I am not allowed to take decision on when to immunize my child(mean score = 2.75(1.36))' and 'I do not remember the right time to take my child to the health facility for immunization (mean score = 3.48 (0.89))'.

The overall mean score for the mothers' response on concerns for childhood vaccine safety was 2.43(1.35). This means that the mothers did not agree on some of the concerns for childhood vaccine safety. Based on the set criteria, the mothers' concerns were rated as 'low concern' or 'high concern' and presented in table 4.2b below.

**Table 3b: Mothers' concerns for childhood vaccine safety rating**

| Rating       | Frequency | Percentage |
|--------------|-----------|------------|
| High concern | 114       | 37.6       |
| Low concern  | 189       | 62.4       |
| Total        | 303       | 100.0      |

The Table 3b revealed that 189 (62.4%) of the mothers had low concern for childhood vaccine safety while the remaining 114 (37.6%) of the mothers had high concern for childhood vaccine safety.

#### **Objective two:**

##### **To determine the mothers' concerns for childhood immunization effectiveness**

In other to determine the mothers' concerns for childhood immunization effectiveness mean score criteria were set for the responses of the mothers on each item. The item mean response of 2.50 or above was considered concern for childhood immunization effectiveness.

**Table 4a: Response on mothers' concerns for childhood immunization effectiveness**

| Item                                          | SA<br>F<br>(%) | A<br>F<br>(%) | D<br>F<br>(%) | SD<br>F<br>(%) | Mean<br>(SD) | P value |
|-----------------------------------------------|----------------|---------------|---------------|----------------|--------------|---------|
| I do not know the names of all the vaccine my | 63             | 28            | 15            | 197            | 1.85         | 0.000   |

|                                                                                                                                              |             |        |        |               |        |              |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------|--------|---------------|--------|--------------|
| child receive                                                                                                                                | (20.8)      | (9.2)  | (5.0)  | (65.0)        | (1.25) |              |
| I do not know the particular disease that each of the vaccines are used for                                                                  | 27          | 34     | 75     | 167           | 1.74   | 0.000        |
|                                                                                                                                              | (8.90)      | (11.2) | (24.8) | (55.1)        | (0.98) |              |
| My religion does not allow immunization                                                                                                      | 26          | 30     | 82     | 165           | 1.73   | 0.000        |
|                                                                                                                                              | (8.6)       | (9.9)  | (27.1) | (54.5)        | (0.96) |              |
| I am forced to allow my child to be immunized because he / she does not need it                                                              | 37          | 23     | 33     | 210           | 1.63   | 0.000        |
|                                                                                                                                              | (12.2)      | (7.6)  | (10.9) | (69.3)        | (1.06) |              |
| Giving immunization to my healthy child will make him fall sick                                                                              | 25          | 23     | 48     | 207           | 1.56   | 0.000        |
|                                                                                                                                              | (8.3)       | (7.6)  | (15.8) | (68.3)        | (0.95) |              |
| I do not take my child to health facility at the right time for immunization so the vaccine may not work well in my child's body             | 182         | 60     | 32     | 29            | 3.30   | 0.000        |
|                                                                                                                                              | (60.1)      | (19.8) | (10.6) | (9.6)         | (1.00) |              |
| My child is often prevented from receiving vaccine at the right time because of distance from my home and health facility                    | 199         | 39     | 39     | 26            | 3.36   | 0.000        |
|                                                                                                                                              | (65.7)      | (12.9) | (12.9) | (8.6)         | (1.00) |              |
| My child is often prevented from receiving vaccine at the right time because I do not have money for transport and to pay the necessary bill | 217         | 37     | 27     | 22            | 3.48   | 0.000        |
|                                                                                                                                              | (71.6)      | (12.2) | (8.9)  | (7.3)         | (0.93) |              |
| I do not know if a sick child can receive vaccine                                                                                            | 43          | 193    | 46     | 21            | 2.85   | 0.000        |
|                                                                                                                                              | (14.2)      | (63.7) | (15.2) | (6.9)         | (0.74) |              |
|                                                                                                                                              | 215         | 30     | 24     | 34            | 3.41   | 0.000        |
| I tend to forget the immunization appointment date                                                                                           | (71.0)      | (9.9)  | (7.9)  | (12.2)        | (1.04) |              |
| <b>Overall</b>                                                                                                                               | <b>MEAN</b> |        |        | <b>2.49</b>   |        |              |
|                                                                                                                                              | <b>(SD)</b> |        |        | <b>(1.28)</b> |        | <b>0.007</b> |

From Table 4a above, the responses on mothers' concerns for childhood immunization effectiveness were significant (as all p values were 0.000) and majorly expressed as 'I do not take my child to health facility at the right time for immunization so the vaccine may not work well in my child's body (mean score = 3.30(1.00))', 'My child is often prevented from receiving vaccine at the right time because of distance from my home and health facility (mean score = 3.36(1.00))', 'My child is often prevented from receiving vaccine at the right time because I do not have money for transport and to pay the necessary bill (mean score = 3.48(0.93))', 'I do not know if a sick child can receive vaccine (mean score = 2.85 (0.74))' and I tend to forget the immunization appointment date (mean score = 3.41(1.04)).

The overall mean score for the mothers' response on concerns for childhood immunization effectiveness was 2.49(1.28). This means that the mothers did not agree on some of the concerns for childhood immunization effectiveness. Base on the set criteria, the mothers' concerns were rated as 'low concern' or 'high concern' and presented in table 4.3b below.

**Table 4b: Response on mothers' concerns for childhood immunization effectiveness**

| Rating       | Frequency | Percent |
|--------------|-----------|---------|
| High concern | 175       | 57.8    |
| Low concern  | 128       | 42.2    |
| Total        | 303       | 100.0   |

The table 4b revealed that 175 ( 57.8%) of the mothers had high concern for childhood immunization effectiveness while the remaining 128 ( 42.2% ) of the mothers had low concern for Childhood immunization effectiveness.

### Objective three:

**To determine the influence of received antenatal and labour care on the mothers' concern for childhood immunization effectiveness**

**Table 5a: Influence of received antenatal and labour care on the mothers' concern for childhood immunization effectiveness**

| Place where antenatal and labour care was received |   | Mothers' concern for childhood immunization effectiveness |             | Total  |
|----------------------------------------------------|---|-----------------------------------------------------------|-------------|--------|
|                                                    |   | high concern                                              | low concern |        |
| Hospital                                           | f | 66                                                        | 67          | 133    |
|                                                    | % | 49.6%                                                     | 50.4%       | 100.0% |
| health centre                                      | f | 39                                                        | 43          | 82     |
|                                                    | % | 47.6%                                                     | 52.4%       | 100.0% |
| maternity home                                     | f | 35                                                        | 10          | 45     |
|                                                    | % | 77.8%                                                     | 22.2%       | 100.0% |
| traditional (TBA)                                  | f | 21                                                        | 8           | 29     |
|                                                    | % | 72.4%                                                     | 27.6%       | 100.0% |
| church                                             | f | 14                                                        | 0           | 14     |
|                                                    | % | 100.0%                                                    | 0.0%        | 100.0% |
| Total                                              |   | 175                                                       | 128         | 303    |
|                                                    | % | 57.8%                                                     | 42.2%       | 100.0% |

Chi-square = 27.285, df = 4, p value = 0.000

The places where mothers received antenatal and labour care were hospital, health centre, maternity home, traditional (TBA) and church. Hospital and health centre were major places where mother received antenatal and labour care. Among the mothers that received antenatal and labour care from hospital, 49.6% of them had high concern on the mothers' concern for childhood immunization effectiveness, while 50.4% had low concern on the mothers' concern for childhood immunization effectiveness. On the mothers that received antenatal and labour care from health centre, 47.6% of them had high concern on the mothers' concern for childhood immunization effectiveness, while 52.4% had low concern on the mothers' concern for childhood immunization effectiveness. There is significant influence of received antenatal and labour care on mother's concern for childhood immunization effectiveness, due to the chi-square value and its p value (chi-square = 27.285, p = 0.000).

**Objective 4:**

**To assess the association between the mothers' place of birth and their concern for childhood vaccine safety**

**Table 6: Relationship between the mothers' place of birth and their concern for childhood vaccine safety**

| Mothers' place of birth |   | Mothers' concern for childhood vaccine safety |             | Total  |
|-------------------------|---|-----------------------------------------------|-------------|--------|
|                         |   | high concern                                  | low concern |        |
| Hospital                | F | 70                                            | 78          | 148    |
|                         | % | 47.3%                                         | 52.7%       | 100.0% |
| Home                    | f | 3                                             | 17          | 20     |
|                         | % | 15.0%                                         | 85.0%       | 100.0% |
| health centre           | f | 34                                            | 73          | 107    |
|                         | % | 31.8%                                         | 68.2%       | 100.0% |
| prayer house            | f | 4                                             | 14          | 18     |
|                         | % | 22.2%                                         | 77.8%       | 100.0% |
| tradition (TBA)         | f | 3                                             | 7           | 10     |
|                         | % | 30.0%                                         | 70.0%       | 100.0% |
| Total                   | F | 114                                           | 189         | 303    |
|                         | % | 37.6%                                         | 62.4%       | 100.0% |

Chi-square = 13.890, df = 4, p value = 0.008

Mothers' places of birth were hospital, home, health center, prayer house and traditional house. Hospital and health centre were major places of mothers' birth place. Among the mothers that had birth delivery in hospital, 47.3% of them had high concern on the mothers' concern for childhood vaccine safety, while 52.7% had low concern on the mothers' concern for childhood vaccine safety. On the mothers that had birth delivery in health centre, 31.8% of them had high concern on the mothers' concern for childhood vaccine safety, while 52.4% had low concern on the mothers' concern for childhood vaccine safety. There is significant relationship between the mothers' place of birth and their concern for childhood vaccine safety, due to the chi-square value and its p value (chi-square = 13.890, p = 0.008).

**Summary of Result**

Majority of mothers with under five children (62.4%) in Awka South LGA had high concern for childhood vaccine safety. The most frequent concerns identified by the study participants for childhood vaccine safety were that "some of the vaccines have substances that can affect the health of my child in later life, the vaccine does not protect the child against the target disease.

A good number of the mothers (57.8%) had high concern for childhood immunization effectiveness whereas (42.2%) of the mothers had low concern for childhood immunization effectiveness.

The most prominent places where mothers received antenatal and labour care were hospital and health center. Among the mothers that received antenatal and labour care from hospital, (50.4%) had low concern on mothers' concern for childhood immunization effectiveness, whereas 49.6% had high concern for childhood immunization effectiveness.

Among mothers that had birth delivery in the hospital 52.7% had low concern for childhood vaccine safety, 47.3% had high concern for childhood vaccine safety. At 0.05 level of significance, education qualification ( $p= 0.040$ ), places source of antenatal ( $p= 0.000$ ) had association with child vaccine safety, parity ( $p= 0.003$ ) had association childhood immunization effectiveness concerns of mothers in Awka South LGA. Source of pregnancy and labour care ( $p= 0.175$ ) had no significant association with mothers' concerns for childhood vaccine safety.

### **Discussion of major findings**

Major findings from the study were discussed based on the specific objectives;

#### **Objective 1:**

##### **To determine the mothers' concerns for childhood vaccine safety.**

The findings of this study revealed that majority of the mothers in Awka South LGA had low concerns for childhood vaccine safety. It is inferred from the findings that the number of mothers in Awka South who had low concerns for childhood vaccine safety is estimated to be 189, while 114 had high concerns for childhood vaccine safety. Greater percentage of participants with low level concern about vaccine safety responded higher but did not agree that some of the vaccines have substances that can affect the health of their child in later life. This implies that mothers responded higher on some of the concerns for childhood vaccine safety but did not agree that vaccines contain substances that may affect their child health in later life, in other words they agree that vaccines are safe.

This is not in line with the study conducted by Anthio, (2010) report that 50% of mothers in United State question the validity of vaccine safety, over 40% believe the government is covering up information about vaccine safety, no vaccine is 100% safe. (Raji and Ndikom, 2013) contended the worry about the side effects of immunization, and 60% of the respondents disagree with immunization.

This finding is in agreement with Freed et al (2010) who reported that mothers agreed that vaccines are safe and protect their children from diseases. The finding also conforms to Tadesse et al (2008) who carried out a study on parental attitude toward childhood immunization and discovered that majority of the mothers' strongly agreed that vaccines are safe. These could be that mothers were well informed about immunization safety of their children.

#### **Objective 2:**

##### **To determine the mothers' concerns for childhood immunization effectiveness**

The major concerns identified by the study participants as concerns of the mothers for childhood immunization effectiveness were "I do not take my child to health facility at the right time for

immunization so vaccine may not work well in my child's body, my child is often prevented from receiving vaccine at the right time because of distance from my home and health facility, child is often prevented from receiving vaccine at the right time because I do not have money for transport and pay the necessary bill, I do not know if my sick child can receive vaccine and I tend to forget the immunization appointment date. Mothers' response on concern for immunization effectiveness showed that mothers agree on some of the concerns for immunization effectiveness. These imply that greater percentage of the participants had high concern about immunization effectiveness, which shows that mothers have low response and agree that childhood immunization are effective. These findings conform to Martin et al (2008) who concluded in their studies that there was limited evidence on vaccine effectiveness and efficacy. These could be that mothers' high concern for childhood vaccine effectiveness means that their responses were lower but agree that childhood vaccines are effective because the places these vaccines are dispensed are where they go for their antenatal and labour care this made them to have confidence in immunization given to their children.

### **Objective 3:**

#### **To determine the influence of received antenatal and labor care on the mothers' concern for childhood immunization effectiveness**

The result shows that there is significant influence of received antenatal and labor care on mother's concern for childhood immunization effectiveness. The major places where mothers received antenatal and labor care were hospital and health center. These findings is in line with study done by Biswas et al, (2012) which showed that, children of mothers who received sufficient antenatal care were more likely to be fully immunized than children of those mothers who received insufficient antenatal care and those who had received no antenatal care. This also conforms to Adedayo, Olanrewaju, Adeyinka, and Aimahku, (2009) who added that children whose mothers attended antenatal four or more times received full immunization, than those mothers who attended less than four times. Antenatal care is a significant predictor of full child immunization, this could be that antenatal clinic creates room for women to be aware of immunization programme, and also antenatal and post natal care services gives room for mothers to communicate with health workers, obtain health talks about the benefit of completion of their child immunization.

### **Objective 4:**

#### **To assess the relationship between the mothers' place of birth and their concern for childhood vaccine safety**

The analysis of the study revealed that there is significant relationship between the mothers' place of birth and their concern for childhood vaccine safety. Hospital and health center were major mothers' birth place. The finding is similar to Tadesse et al, (2008) who discovered that majority of mothers who deliver in the hospital strongly agreed that child immunization is more beneficial and strongly agreed that vaccines are safe, than those who deliver outside the hospital. The study is also in line with the Nigeria journal of pediatrics,(2012) in a cross- sectional survey used questionnaire to elicit information from 207 postnatal mothers attending immunization clinics at University Teaching Hospital, Enugu, majority of the mothers who took their children to health facilities for routine immunization agree that vaccines are safe. This could be that mothers who deliver in the hospital and health center receive health talk about child immunization and vaccine safety directly from the health care providers.

### Major of Findings

The findings from the results of analysis of this study revealed that;

- 62.4% of the mothers had low concern for childhood vaccine safety while the remaining 37.6% of the mothers had high concern for childhood vaccine safety.
- 57.8% of the mothers had high concern for childhood immunization effectiveness while the remaining 42.2% of the mothers had low concern for childhood immunization effectiveness.
- There was significant association between received antenatal and labour care and mother's concern for childhood immunization effectiveness.
- There was significant association between the mothers' place of birth and their concern for childhood vaccine safety.
- There was significant association between the mothers' parity and their concerns for childhood immunization effectiveness.
- There was significant association between the mothers' education qualification and their concerns for childhood vaccine safety.
- There was no significant association between the source of pregnancy and labour care and mothers' concerns for childhood vaccine safety.
- There was significant association between the source of pregnancy and labour care and the mothers' concerns for childhood immunization effectiveness.

### Implication of the findings

The result of the study revealed that majority of the respondents are aware and agreed that vaccines are safe and effective though data indicated that most of the mothers despite their educational level were able to deliver and received their antenatal services in the hospitals and health centers where information about child immunization are passed. Childhood vaccine safety and immunization effectiveness were judged adequately by their responses as majority of the respondents agreed that vaccines are safe and effective, the result of the study also revealed that a few of them did not agree that vaccines are safe and effective through their responses. Again, the study revealed that the educational attainment of the respondents was significant to their concerns for childhood vaccine safety. The results therefore have implication on the nurses/ other health practitioners, the government and other stake holders of health, women and child welfare. To the health workers especially the nurse (public/community health nurses) there is need to emphasize and re-enforce health education for the mothers especially in the rural communities on the childhood immunization schedule and importance of antenatal and labour care to the health facilities. Also the women, especially older/ experienced mothers (due to their parity) could be used on volunteer bases to reverse some of the misconception about child vaccine safety.

### Recommendations

Based on the findings from this study, it is recommended that;

- Greater awareness of the value of vaccines among parents, health practitioners, community leaders, policy makers and the media is necessary to build trust in vaccines and in the health system.

- Health practitioners should be empowered about the susceptibility and severity of preventable diseases, and about vaccine safety and efficacy,
- Grass roots mobilization campaign that will actively engaged political, traditional and religious leaders to participate in the vaccination campaign.
- Government should build more health centers.
- Special announcement should be made on the vaccine days so as to enable mothers not to miss immunization of their children. Government should engage local jingles when immunization days are approaching.

### **Suggestions for further studies**

This study is a preliminary for further studies as there are lots of variables to be researched under childhood vaccine safety and immunization effectiveness concerns of mothers with under five children. The researcher therefore suggests the following;

- Determine the uptake of childhood immunization among mothers of under five children.
- Influence of media on child immunization status of children under fiveold.
- Mothers' education as a determinant of child vaccine uptake.

### **Summary of the study**

This study was designed to determine the childhood vaccine safety and immunization effectiveness concerns of mothers with under five children in Awka South. The specific objectives were to: determine the mothers concerns for childhood vaccine safety, determine the mothers' concerns for the childhood immunization effectiveness, determine the influence of received antenatal and labor care on the mothers' concern for childhood immunization effectiveness, and assess the relationship between the mothers' place of childbirth and their concern for childhood vaccine safety.

Literature was extensively reviewed on the concepts, theory and empirical studies. Cross sectional descriptive survey design was successfully adopted for the study. A multi stage sampling technique was employed, simple random sampling technique was also used to select six health centers out of the twenty four health centers in Awka South. Using the systematic sampling technique 312 mothers was selected from the six health centers. Mothers were numbered from 1 to 1300, sampling frame determined and starting point was established from the table of random number and mothers were selected from every fourth, starting with the second number on the list. Mothers were selected at interval until 312 mothers were obtained. Questionnaire was the only tool used for data collection. The data generated was analyzed based on the research questions using tables.

### **Conclusion**

Majority of the mothers in Awka South agreed that childhood vaccines are safe and effective despite their educational level, mothers in Awka South received antenatal and labour care in the hospitals and health centers which made them agree that childhood immunization is safe and effective.

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