

## Factors Responsible for Missed Opportunities of Immunization among Children 0-5 Years in Mgbundukwu Health Centre in Port Harcourt, Rivers State

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DOI: [10.36347/sasjm.2023.v09i08.002](https://doi.org/10.36347/sasjm.2023.v09i08.002)

| Received: 28.06.2023 | Accepted: 01.08.2023 | Published: 06.08.2023

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### Abstract

### Original Research Article

Immunization over the years has been so effective that its ability to save lives of under-five children globally and more has promoted its usage all over the world especially in the developing countries. The aim of the study was to determine the factors responsible for missed opportunities of immunization among children of 0-5 years in Mgbundukwu Model Primary Health Center, Port Harcourt, Rivers State. The study was guided by four objectives and research questions. The study employed a descriptive survey design. A sample size of 120 was drawn using simple random sampling technique and data was collected using a self-developed structured questionnaire. The Standard World Health Organization, Expanded Programme on Immunization (WHO EPI) protocol was used for assessing missed opportunities for immunization. Data obtained were analyzed using frequencies and percentages. The result showed that majority of mothers (94.0%) have heard of National Programme on Immunization (NPI), mothers who had heard of immunization from the health facilities had the highest percentage of 55.0%. The result also shows an increased prevalence of missed opportunity for immunization 61(61.0%), missed opportunity for immunization was more common for OPV3 (13.33%) compared to other vaccines, the factors responsible for the missed opportunity for immunization were failure to attend antenatal care and home delivery, concern about vaccine safety, long distance trekking/walking to health center, long waiting time, lack of money, lack of vaccine at the health center when visited and lack of information about day of immunization. It was recommended that health awareness campaign targeted at caretakers on the importance of immunization should be carried out regularly and government should encourage community participation in immunization programmes.

**Keywords:** Immunization programmes, National Programme on Immunization (NPI), (WHO EPI).

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**Citation:** Alozie Stella Uloaku *et al.* Factors Responsible for Missed Opportunities of Immunization among Children 0-5 Years in Mgbundukwu Health Centre in Port Harcourt, Rivers State. SAS J Med, 2023 Aug 9(8): 807-816.

## INTRODUCTION

Immunization over the years has been so effective that its ability to save lives of under-five children globally and more has promoted its usage all over the world especially in the developing countries. The World Health Organization (WHO) defines immunization as the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine” (WHO, 2014).

Every year, 10.6 million children die before the age of five years; 1.4 million of these are due to diseases that could have been prevented by vaccines. Taking into account both children and adults, vaccine-preventable diseases kill 3 million people around the world every year (WHO, 2014). Globally, each year 130 million children are born, 91 million of which are in the developing countries. However, around 10 million children under the age of five years die every year and over 27 million infants in the world do not get full routine immunization.

The estimate for global child deaths under five years was 10.8 million in 2000. About 41% of these were in Sub-Saharan Africa and 34% in South Asia. Immunization being one of the most Cost- effective public health interventions which is directly or indirectly responsible to prevent the bulk of mortalities in under-fives (Wadgave and Pore, 2012), it is wise to look at its uptake carefully, to draw lessons and address them accordingly. Immunization saves lives of under-five children globally and more in developing countries. The ultimate outcomes after immunization can either be death or survival for children receiving it. However, even those who survive. serious complications, and even death can occur thereafter.

During the Millennium Development Goals meeting, the signatories agreed to curb the mortality rates of under-five due to preventable diseases by two-thirds by scaling up the immunization coverage in less industrialised countries.

Missed opportunities for immunization (MOI) constitute an obstacle to raising immunization coverage among children. An opportunity for immunization is missed when a child who is eligible for immunization and who has no contraindication to immunization visits a health service and does not receive all the needed vaccines (Hutchins, et al., 2012). Many countries in Africa particularly Nigeria have been making efforts to strengthen its health system especially routine immunization so as to reduce disease burden from vaccine preventable diseases (VPDs).

In 1979, Nigeria’s Expanded Programme on Immunization (EPI) was initiated (NPI, 2004). though created in 1974 by WHO, UNICEF and Rotary International as partners. It was relaunched in 1984 due

to poor coverage (Awosika, 2012). In 1996 it became the National Programme on Immunization (NPI). Various types of missed immunization opportunities contribute to failure of children to assess immunization during visits to health facilities; failure to administer needed vaccines because of the presence of a medical condition inaccurately perceived as a contraindication to vaccination and failure to administer all the needed vaccines simultaneously. A direct approach to increasing immunization coverage is to provide immunization to all eligible persons at every opportunity (Tagbo and Onwuasigwe, 2010). The World Health Organization has developed a module for assessing the causes of missed opportunities and determining effective strategies for its elimination (WHO, 2012). The aim of the present study is to determine the factors responsible for missed immunization opportunities (MIO) at the Mgbundukwu Health Centre in Port Harcourt Local Government Area of Rivers State.

### Statement of the Problem

Globally, 2.5 million children die every year from easily preventable infectious diseases. In 2000, measles resulted in 777,000 deaths and 2 million disabilities. The expanded programme on immunization (EPI), when introduced, experienced some initial success. However, a few years after its inception, it became obvious that it was no longer achieving its stated objectives and had to be relaunched in 1984. Nigeria attained Universal Childhood Immunization (UCI) with 81.5 percent coverage for all antigens in 1990, but the success was not to last long and by 1996, immunization coverage had declined substantially to less than 30 percent for DPT-3 and 21 percent for the doses of oral polio virus (OPV).

The situation had continued to worsen that presently the coverage of the various childhood vaccines in Nigeria are among the lowest in the world. The above scenario has been playing out in Nigeria which has continued to witness fluctuation in immunization coverage for all vaccine preventable diseases with its attendant increase in the incidence of the diseases. The question therefore is what are the factors responsible for missed opportunities for immunization in Mgbundukwu Health Centre Port Harcourt.

### Purpose of the study

To determine the factors responsible for missed opportunity for immunization in children attending Mgbundukwu Health Centre in Port Harcourt LGA of Rivers State.

### Objective of Study

- To assess the knowledge of mothers of under-five years on immunization

- To ascertain missed opportunities for immunization among children aged 0-5 years.
- To ascertain the categories of children that actually missed immunization
- To identify factors responsible for the missed opportunities of immunization.

### Research Questions

- What is the level of knowledge of mothers of under-five children on immunization?
- What are the missed opportunities of immunization among children 0-5 years?
- What categories of children actually missed opportunities of immunization?
- What factors are responsible for missed opportunities of immunization?

### Significance of the Study

The study will help to determine the factors responsible for missed opportunities of immunization among children 0-5 years in Mgbundukwu Health Centre. It will sensitize child bearing mothers on the need to appreciate immunization programmes. It will serve as reference materials to lecturers, midwives' and other interested groups on the topic.

### Scope of the Study

The study was carried out in Mgbundukwu Health Centre in Port Harcourt, Rivers State and conducted among parent/guardian attending the health centre for vaccination of their children between the ages 0-5 years.

### Operational Definition of Terms

**Missed immunization** - Failure to vaccinate a child who attends immunization or curative clinics with vaccine(s), for which he/she is eligible in the absence of any unknown contra-indication.

**Fully immunized**- A child who had completed the recommended EPI immunization schedule of BCG, DPT, OPV (3doses) yellow fever and measles vaccines before one year of life.

**Adverse effect following immunization** - Any event or reaction that occurs after receiving a vaccine, it does not necessarily have a causal relationship with the administration of the vaccine.

## MATERIALS AND METHODS

### Research Design

A descriptive survey design was used in conducting the study. Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data collection (Glass & Hopkins, 2012). It is deemed fit for this study because it is a type of study design used to describe characteristics of a population or phenomenon being studied. It does not answer questions about how/when/why the characteristics occurred. Rather it

addresses the "what" question (what are the characteristics of the population or situation being studied). The study was designed to describe the factors responsible for missed opportunities of immunization among children 0-5 years in Mgbudukwu Health Care Centre, Port Harcourt, Rivers State.

### Area of Study

The setting of study was Mgbudukwu Primary Health Care Centre. The Health Centre is located in Port Harcourt City, precisely in Umuoji-Mgbudukwu Community in Port Harcourt Local Government Area of Rivers State. It is an eight bed health facility with various units which includes: the outpatient unit, child health unit, maternity unit, family planning unit, record unit, pharmacy unit, medical laboratory unit. Also the staff strength of 20 which includes Doctors, Registered Nurses/Midwives, Community Health Extension Worker (CHEW), Laboratory Scientists, Record Clerks, the Cleaners and Security Men.

### Target Population

This consists of 200 mothers of child bearing age attending Mgbundukwu Health Care Centre with babies 5 years and below.

**Sample Size:** The sample size of 122 was gotten using an online sample size calculator.

### Sampling Technique

A simple random sampling technique by balloting was used for selection as all respondents were given equal chances of being selected.

### Instruments for Data Collection

The instrument used was a questionnaire developed by researcher. The questionnaire had five sections: A, B, C, D and E. Section A was designed to collect information on the child's bio data; section B on the parent/guardian socio-demographic information; section C on knowledge of immunization; section D on immunization status of child and section E on factors responsible for missed opportunity for immunization.

### Validity of the Instrument

The instrument (questionnaire) was submitted to the research supervisor, the principal of the school and other professionals in the field to access the face validity and suitability of items. Corrections and suggestions were integrated into the instrument to make it valid for the study.

### Reliability of the instrument

The reliability of the instrument was determined by carrying out a pilot study in the health facility. Ten questionnaires were given to 10 women of child bearing age at the immunization clinic of Mgbundukwu health centre and reliability calculated using cronbach alpha. An average reliability coefficient of 0.82 was obtained.

### Method of Data Collection

Copies of the questionnaire were administered by the researcher to the respondents on clinic day. Instruction guiding the filling of the instrument was given to the respondents. Two research assistants were used for data collection and collation. Appropriate clearance and permission were obtained from the heads of the units/clinics and wards after due introduction of the research intention were declared, 122 questionnaires were distributed to those eligible and willing to participate in the study. All completed questionnaires were collected and data (responses) collated appropriately. A total of 100 questionnaires were used after accounting for non-response giving us a return rate of 82%.

### Method of Data Analysis

Data retrieved from the questionnaires were coded and entered using Microsoft Excel<sup>®</sup> version 2010 and imputed into the statistical package for social sciences (SPSS) version 20 for analysis. Categorical data was presented in the form of frequencies and percentages (%). The descriptive statistics generated simple proportions; the results were presented in tables.

### Ethical Consideration

The researcher abided by the code of conducts which includes: Obtaining letter from the school authority which was presented to the Chief Nursing Officer in-charge of Mgbundukwu Health Centre where study was carried out. For the purpose of maintaining confidentiality, anonymisation of participants was done. Consent was also obtained from respondents before recruiting them into the study.

## RESULT

**Table 1: Characteristics of study children**

Variable	Frequency (n)	Percentage (%)
Age group (months)		
< 12 months	70	70.0
≥ 12 months	30	30.0
Sex		
Male	49	50.0
Female	49	50.0
Antenatal care		
Yes	78	78.0
No	22	22.0
Place of antenatal care		
Health centre	33	45.83
Home	1	1.39
Hospital	16	22.23
Maternity home	5	6.94
Primary health centre	6	8.33
Private clinic	6	8.33
School of health	2	2.78
No response	3	4.17
Place of birth		
Hospital	30	30.0
Home	25	25.0
Primary health centre	38	38.0
Maternity home	7	7.0

Table 1 above shows that a total of 100 children aged 0-5 years were included in the study. Majority of the children 70 (70.0%) were less than 12 months and 30 (30.0%) were more than one year. Equal

number of children 49 (50.0%) were males and females. Most of these children's parents/guardians 78 (78.0%) attended antenatal care clinic and 68 (68.0%) delivered in a health facility.

**Table 2: Socio-demographic characterization of the parents and guardians**

Variable	Frequency (n)	Percentage (%)
Age group (yrs)		
18-25	25	25.0
26-35	66	66.0
36-45	9	9.0
Educational level		
No formal education	53	53.0

Variable	Frequency (n)	Percentage (%)
Primary	4	4.0
Secondary	6	6.0
Tertiary	37	37.0
Occupation		
Artisan	8	8.0
Trader	17	17.0
Farmer	5	5.0
Fishing	0	0.0
Civil servant	22	22.0
Housewife	27	27.0
Allied health professionals	21	21.0
Marital status		
Single	8	8.0
Married	92	92.0
Divorced/separated/widowed	0	0.0
Religion		
Christianity	94	94.0
Islam	4	4.0
Traditional worshipper	2	2.0
Relationship with child		
Father	5	5.0
Mother	86	86.0
Aunt	2	2.0
Uncle	4	4.0
Guardian	2	2.0
Brother	1	1.0
Parity		
1-2	71	71.0
3 & above	29	29.0

Table 2 above shows that. 100 caretakers, majority had both secondary 37 (37.0%) and tertiary 53 (53.0%) education. Majority were civil servants 22 (22.0%), Traders 17 (17.0%) and those that work in the allied health field 21 (21.05%). Most of them were

married 92 (92.5%) and were also Christians 94 (94.0%). Majority 86 (86.0%) were mothers. Of these 100 respondents, 71(71.0%) have had one or two child, and the remaining 29 (29.0%) have had three or more children.

**Table 3: Knowledge of immunization**

Variable	Frequency (n)	Percentage (%)
Have heard of NPI		
Yes	94	94.0
No	0	0.0
Not sure	6	6.0
Where heard(Multiple response)		
Health centre, clinic or hospital	55	56.12
Church	14	14.29
Friend/Someone	14	14.29
Newspaper	2	2.04
Radio/TV	13	13.27
Some of the known benefits of immunization		
Prevent polio	67	57.26
Prevent TB	6	5.13
Prevent Measles	32	27.35
Prevent whooping cough	2	1.71
Prevent tetanus	1	0.85
Prevent cerebral Meningitis	2	1.71
Prevent Hepatitis	3	2.56
Prevent yellow fever	4	3.42

Table 3 shows that most of the caregivers have heard of NPI (94.0%). Most of them (56.12%) had obtained information about immunization from a health centre (health worker). The table also shows that most

of the parents/guardians (57.26%) had appropriate knowledge on the importance of polio vaccine and (27.35%) for measles vaccine.

**Table 4: Missed opportunities for immunization**

Variable	Frequency (n)	Percentage (%)
Missed opportunities for immunization		
Yes	61	61.0
No	39	39.0
Missed opportunities for immunization per vaccine (Multiple response)		
BCG	17	5.15
OPV0	29	8.79
DTP1	38	11.52
OPV1	35	10.60
DTP2	43	13.03
OPV2	43	13.03
DTP3	42	12.75
OPV3	44	13.33
Measles	39	11.80
Total		100.0

Table 4 shows a high missed opportunity for immunization (61.0%) over those that did not miss (39.0%). Missed opportunities for immunization was higher for first doses of Diphtena Pertussis and Tetanus

(DPT1) (11.52%), second dose of Diphteria Pertussis and Tetanus (DPT2) (13.03%), second and third doses of Oral Polio Vaccine (OPV2&3) (13.03% and 13.33%), and measles vaccine (11.81%).

**Table 5: Categories of children that actually missed immunization**

Age category	Missed opportunities n(%)		Total
	Yes	No	
<12 months	48(68.57)	22(56.41)	70
≥ 12 months	13(21.31)	17(43.59)	30
Total	61	39	

Table 5 shows a higher proportion of children that miss immunization in the category of less than 12

months, (68.57%), which is statistically higher than children 12 months and greater.

**Table 6: Factors responsible for missed opportunity for immunization**

Reasons for missed opportunity/immunization failure (Multiple Response)	Frequency (n)	Percentage (%)
Unaware of need for immunization	12	4.69
Unaware of need to return for 2 <sup>nd</sup> and 3 <sup>rd</sup> dose	6	2.34
Wrong ideas about contra-indication	8	3.13
Concern about vaccine safety	14	5.47
Long distance trekking/walking to health centre	18	7.03
Long waiting time	40	15.63
Lack of money	38	14.84
Absence of personnel when visited	13	5.07
Child was sick during period	9	3.51
Lack of vaccine at the health centre when visited	31	12.1
Lack of information about day of immunization	21	8.2
Forgot the day of immunization	36	14.06
Had other social engagements	9	3.5
Simply my religious beliefs	1	0.39
Total	256	100

Table 6 shows the factors responsible for incomplete immunization of children are: long waiting time (15.63%), lack of money (14.84%), Lack of

vaccine at the health centre when visited (12.11%), lack of information about day of immunization (8.2%) among others.

## DISCUSSION

### Limitations of the Study

Few mothers did not have their child's immunization cards during the study. In this circumstance, information on vaccination status was provided via recall, therefore, posing a possibility of recall bias.

## DISCUSSION OF FINDINGS

The discussion of findings is based on the research questions and the data derived from the questionnaire.

From the data analysis made in Table 1 (Characteristics of study children) majority of the children, 70 (70.0%), are less than 12 months, and 30 (30.0%) are more than 1 year, an equal number of children, 50 (50.0%) were males and females. The "Yes" attendance for antenatal care has the highest percentage of 78.0% and delivery in the health facility (Hospital, primary health care centre) has the highest percentage of 68.0%.

From the data analysis made in Table 2 (Socio-demographic characteristics of parents/guardians) mothers between the age bracket of 26—35 years has the highest percentage of 66.0%, no formal education has the highest percentage of 53.0%, the housewife has the highest percentage of 27.0%, married has the highest percentage of 92M%, Christians have the highest percentage of 94.0% and mothers who have 1-2 children have the highest percentage of 71.0%.

### Research Question 1

What is the knowledge of mothers of under-five years of immunization?

The findings in Table 3 revealed that most mothers, 94 (94.0%), have heard of NPI, and mothers who have heard of immunization from health facilities have the highest percentage of 55.0%. The study showed a good proportion of the mothers had an appropriate knowledge of the importance of immunization, especially the polio vaccine and measles vaccine. Studies have shown a strong positive association between maternal knowledge and full immunization, as education helps to improve health seeking behaviour of an individual. This finding is consistent with other literature like Tadesse *et al.*, (2012) and Zaman *et al.*, (2011) that found that maternal knowledge was a significant predictor of completeness of immunization because highly educated mothers will be more aware of the importance of immunization.

### Research Question 2

What are the missed opportunities for immunization among children 0-5 years?

The Findings revealed that missed opportunities for immunization has the highest percentage of 61 (61.0%), and missed opportunities were highest on OPV3 with a percentage of 13.33%. The highest number of missed opportunities for immunization among children aged 0-5 years attending Mgbundukwu Health Centre was 61.0%. The high prevalence of missed opportunities for immunization in this study is similar to a study which had been done in Kenya, 57.5% prevalence and the high prevalence of missed opportunities for immunization was attributed to inadequate knowledge of health workers on immunization practices (Wainaina, 2012).

Missed opportunities in this study were also higher compared to those reported in Benin City (27.6%) (Onyiriuka, 2011) and Calabar (39.1%) (Anah *et al.*, 2012) where immunization services offered at the health facility were perceived as very good. Our study shows a higher prevalence of missed opportunities for immunization for OPV 3, DPT3 and measles vaccine (Table 4). This shows that children in Nigeria are still at high risk of vaccine-preventable diseases especially poliomyelitis, diphtheria, tetanus, pertussis and from the complications of measles, particularly malnutrition and pneumonia. So Nigeria policymakers need to address the issues of missed opportunities for immunization very seriously in order to reduce its occurrence and to improve the immunity profile of children in Nigeria.

### Researched Question 3

What categories of children actually missed the opportunity of immunization?

The findings revealed that the majority of the children (70.0%) that missed immunization are less than 12 months. Other studies have shown reluctance of parents to immunization when a child is much younger due to fear of the effectiveness of the vaccine and its side effects (Bennett and Smith, 2011; Irene *et al.*, 2012). Over half of the caregivers knew the value of immunization. Polio and measles were the most frequently identified vaccine-preventable illnesses. This finding is similar to a study which had been done in Nigeria in 2011 (Abdulraheem *et al.*, 2011).

### Researched Question 4

What factors are responsible for missed opportunities for immunization?

The findings revealed that long waiting time is the main factor responsible for the missed opportunity of immunization with the highest percentage of 15.63%. Missed opportunity for immunization is the most important factor that is influencing immunization coverage in Nigeria. Many children miss immunization in Nigeria because of the wrong beliefs and false cultural opinions on immunization. The major reasons given for missed immunization were concerns about vaccine safety, Long distance trekking/walking to the

health centre, Long waiting time, lack of money, Lack of vaccine at the health centre when visited, and lack of information about the day of immunization. This finding is in accordance with several studies (Becher *et al.*, 2011; Culls, *et al.*, 2012; Anand and Barnighausen, 2012).

## SUMMARY

This study was done to determine the factors responsible for the missed opportunity of immunization among children of 0-5 years in Mgbundukwu health centre in Port Harcourt. The problem in the study was identified, and research questions were developed to solve the problem. Relevant literature was reviewed in the study, Hildegard.E. Peplau's Theory was used because it is in line with the study. Questionnaire was used for data collection from hundred (120) respondents and a simple random sampling technique was used in selecting the respondents. The data was analysed and represented using frequency and percentage tables. Findings revealed that a good proportion of mothers have appropriate knowledge of the importance of immunization, especially polio and measles vaccine, and a high percentage of missed opportunities for immunization especially for OPV3, DPT3 and measles compared to other vaccines. The reasons for this rate were failure to attend antenatal care and home delivery.

### The implication for midwifery practice

The study was carried out on factors responsible for missed opportunities of immunization among children 0-5 years in Mgbundukwu health centre in Port Harcourt. The implication of the study to midwifery practice is; there is need for regular sensitization of the community and public on the importance and benefits of Immunization, advocating for regular availability of vaccines to the communities and advocating for community participation in their own immunization programmes to avoid missed opportunities.

## CONCLUSIONS

In conclusion, the rate of missed opportunities for immunization at Mgbudukwu Health Centre was 61.0%. Home delivery and failure to attend antenatal clinics were the independent variables associated with missed opportunities for immunization. Concern about vaccine safety, long-distance trekking/walking to the health centre, long waiting time, lack of money, lack of vaccine at the health centre when visited and lack of information about the day of immunization were the most common reasons given by the caregivers for incomplete immunization.

## RECOMMENDATIONS

- The Nigerian government should emphasize more on the policy that every child who comes in contact with a health facility should have her/his immunization status updated.

- Regular supply of vaccines should be ensured at the local government level.
- Members of the community should be mobilized and made to participate in immunization programmes as their own to discourage missed opportunities due to lack of information.
- More frequent assessment of vaccination coverage should be encouraged.

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