



Missed Vaccination Opportunities at a Secondary Health Facility in Ilorin, Nigeria.

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Keywords

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ABSTRACT

Background: Immunization remains a key strategy in the control of childhood diseases, with a child expected to have five visits according to the current National Programme on Immunization. The study aimed to identify missed vaccination visits and the associated factors in children presenting at the general out-patient clinic of a secondary health facility in Ilorin, Nigeria.

Method: Through a descriptive cross-sectional study, the vaccination data of all children seen at the out-patient clinic were critically reviewed over a period of one month. Socio-demographic and immunization details were obtained and reasons for missed vaccination documented. Those that had missed vaccination were commenced on the needed vaccine(s) after counselling of their parent(s), and adequate follow-up was instituted.

Results: Eighty-two (5.1%) children out of 1603 seen had missed at least one vaccine visit. The mean (SD) age of the children was 20.1(14.9) months. The male to female ratio was 1.1:1. Thirty-nine (47.2%) children had missed one visit while 43(52.7%) had missed two or more visits; 16(19.5%) had missed all five visits.

Major reasons for missed visits were ill child(26.8%), ignorance about routine vaccine but received vaccine during the National Immunization Days(NID) (19.5%), mother travelled (14.6%), forgot(9.8%), and reaction to previous vaccine(6.1%).

Conclusion: The missed opportunity for immunization is high therefore health care providers should enquire about the vaccination status of children at all contact. There is a need to increase awareness on illnesses that are not contra-indications to vaccination, and routine vaccine status should be checked during NID.

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INTRODUCTION

Vaccine preventable diseases constitute a major burden causing morbidity and mortality in infants and under five children in Nigeria and indeed, most developing nations.¹ However, immunization has been shown to remain a key, cost effective strategy in the control and eradication of childhood diseases.¹ The National Programme on Immunization (NPI) schedule in Nigeria provides protection against diseases such as tuberculosis, diphtheria, pertussis, hepatitis B, tetanus, measles, yellow fever and recently, invasive *Haemophilus influenzae* type b., In Nigeria, a child is expected to have five visits to receive vaccines before been considered to have completed the routine immunization schedule.³

Despite its proven effectiveness in reducing the burden of childhood infectious diseases, immunization coverage remains low and missed

opportunities for immunization (MOI) has been identified as a contributor to this low coverage.⁴ Missed opportunities for immunization (MOI) occur when a child who is eligible for immunization visits a health service facility and does not receive all the recommended vaccines despite the absence of any contraindication to the vaccine.⁵ The health service facility visit could be to the general or speciality clinics and either the outpatient or emergency department, with failure of the health care provider to assess the immunization status of the child resulting in the MOI.⁶ Indeed, a high rate of MOI has been reported, particularly in developing countries., Some studies on MOI emanating from Nigeria have reported a prevalence ranging from 15.1%-39.1% 7-10 however, these studies were conducted in tertiary institutions. Therefore, the aim of this study was to identify the proportion of children with missed

vaccination visits and the associated risk factors in children presenting at the general out-patient clinic of a secondary health facility in Ilorin, Nigeria.

METHODOLOGY

The study was conducted at the Children's Specialist Hospital, Centre-Igboro, Ilorin. This is a public-based secondary health facility, owned and run by the state government, located in Ilorin South Local Government Area (LGA) of Kwara State. Ilorin is the capital city of Kwara State, situated in the North Central geopolitical zone of Nigeria. The state population stands at 2.4million, with about one million of these aged 14years and below, while Ilorin South LGA is populated by 36,466 people.¹¹ The centre has an immunization unit that gives vaccinations to an average of 160 newborns every month. All the vaccines, except for BCG vaccine which is given on Mondays and Friday, are given daily. An average of 1350 children present at the general outpatient per month, with peaks seen in the rainy season between May and October.

Ethical approval was obtained from the Ethical Committee of the Ministry of Health, Kwara State and informed consent was obtained from the parent/caregiver.

The study was a descriptive cross sectional survey that involved caregiver/mother-child pair presenting at the outpatient clinic between the 1st and 31st of August 2013. During the stated period, every caregiver-child pair who presented was interviewed about their child's immunization status. Mothers who did not immunize or failed to completely immunize their children were subsequently recruited for the study. Vaccination coverage was assessed by vaccination card and maternal history. At the first visit after birth, a baby is given BCG, OPV0 and HBV1, second visit is at six weeks and the child receives OPV1, Pentavalent 1, third visit at 10 weeks, child receives OPV2, Pentavalent 2 while at 14 weeks, OPV3 and Pentavalent 3. At the fifth visit at the age of nine months, the child receives the yellow fever and measles vaccine. A child was considered to be fully

immunized if he or she had a certificate of full immunization and had completed the five visits.

Data was collected by means of a semi-structured questionnaire. Socio-demographic details were obtained from the mother and socio-economic index scores were awarded to the occupations and educational attainments of their parents or caregivers using the Oyedeji socio-economic classification scheme.¹² The mean of four scores (two for the father and two for the mother) approximated to the nearest whole number was the social class assigned to the child as proposed by Oyedeji.¹² For example, if the mother was a junior school teacher (score = 3) and father a senior teacher (score=2) and the educational attainment of the mother was primary six (score=4), and the father was a school certificate holder (score=2). The socio-economic class (SC) score for this child was: $(3+2+4+2)/4 = 2.75$, which approximated to the nearest whole number and reported as SC III.

A child was assessed to check whether he or she had received the vaccination that he/she was due for. Data was collected on the number of times the child was taken to a vaccination centre, route by which the vaccines were given, and the reasons for not taking the child to the vaccination centre as and when due if the child had missed any. Also, data were collected on whether the subject had sibling(s) and if the siblings had fully received their vaccinations.

Each caregiver was educated about the importance of vaccination and commenced on the missed vaccination doses as appropriate on the same clinic day. Also, mothers who had other children with incomplete vaccination status were encouraged to bring their children to the vaccination centre and follow-up on them were done.

Data was analyzed using the IBM® SPSS version 20.0 (IBM corporation, Virginia, U.S.A.) 2011 for windows software package. The data collected on the proforma were transferred into a master sheet using numerical codes. After the generation of frequency tables and simple proportions, the chi-

square (χ^2) was used to identify significant differences for categorical variables. A p-value of <0.05 was considered significant.

RESULTS

Eighty-two (5.1%) children out of a total of 1603 children who presented in clinic during the study period had missed at least one vaccine visit. Forty-three (52.4%) subjects were male and 39(47.6%) female. The mean (SD) age of the children was 20.1(14.9) months, range of 1-72 months.

Nine (9.8%) children had Christian parents while 74 (90.2%) children had Muslim parents. Three (3.7%) children had a single mother, one (1.2%) a divorced mother while 78(95.1%) children had married parents of which; 59 children were from monogamous background and 19 children from a polygamous home. Fifty-five (67.1%) of the children had a birth order of between 2nd and 4th, 14(17.1%) children were of a 5th or higher birth order and the remaining 13 were a 1st child. Table I shows some socio-demographic characteristics of the children recruited.

Thirty-nine (47.2%) children had missed one visit while 43(52.7%) had missed two or more visits; 16(19.5%) had missed all five visits. The 5th visit was the most commonly missed; 73(89.0%), 42(51.2%), 36(43.9%), 28(34.1%) and 18(22.0%) children had missed the 5th, 4th, 3rd, 2nd and 1st visit respectively (Table II).

Table III shows the common reason for missed vaccine centre visits were ill child(26.8%), ignorance about routine vaccine but received vaccine during polio vaccine booster campaign(19.5%), and mother travelled (14.6%), while the least common cause of missed visits were ill mother(2.4%) and religious belief(1.2%).

The cause of illness resulting in missed vaccination reported among the 22 children included fever in 10 (45.5%) children, cough and nasal discharge in four (18.2%) children, poor weight gain in three (13.6%) children, fever with vomiting in two (9.1%) children and one (4.5%) child with each of convulsion, diarrhoea and scald injury

Thirty-five (42.7%) children had siblings who had also missed immunization clinic visits while 34 (41.4%) children had siblings who had completed

Table I: Some socio - demographic features of subjects recruited

Parameter	Frequency N=82	Percent	Cumulative percent
Age group (months)			
≤12	35	42.7	42.7
>12 -24	25	30.5	73.2
>24 -36	10	12.2	85.4
>36	12	14.6	100.0
Place of birth			
Hospital	52	63.4	63.4
Home	19	23.2	86.6
Traditional birth attendant (TBA)	8	9.8	96.3
Religious home (RH)	3	3.7	100.0
Maternal occupation			
Trading	39	47.6	47.6
Artisan	21	25.6	73.2
Housewife/ student/farmer/cleaner	12	14.7	87.9
Professional	5	6.1	94.0
Food vendor assistant	2	2.4	96.4
Clergy	2	2.4	98.8
Computer operator	1	1.2	100.0
Paternal occupation			
Trading	14	17.1	17.1
Artisan	30	36.6	53.7
Driver/farmer	14	17.1	70.8
Professional	13	15.9	86.7
Islamic cleric	7	8.5	95.2
Clergy	2	2.4	97.6
Pensioner /herbalist	2	2.4	100.0
Maternal educational level			
Primary/Arabic	31	37.8	37.8
Secondary	27	32.9	70.7
Postsecondary	9	11.0	81.7
None	15	18.3	100.0
Paternal educational level			
Primary/Arabic	24	29.3	29.3
Secondary	28	34.1	63.4
Postsecondary	19	23.2	86.6
None	11	13.4	100.0
Maternal age group			
≤20yrs	11	13.4	13.4
>20-35yrs	56	68.3	81.7
>35yrs	15	18.3	100.0
Number of siblings			
None	13	15.9	15.9
≤3	52	63.4	79.3
>3	17	20.7	100.0

Table II: Attendance at immunization centre and number of visits missed by subjects

Attendance at Immunization centre	Frequency N=82	Percent	Cumulative percent
At birth (1st visit)			
Did not miss	64	78.0	78.0
Missed	18	22.0	100.0
6weeks (2nd visit)			
Did not miss	53	64.6	64.6
Missed	28	34.1	98.8
N ot due	1	1.2	100.0
10 weeks(3rd visit)			
Did n ot miss	44	53.7	53.7
Missed	36	43.9	97.6
Not due	2	2.4	100.0
14weeks(4th visit)			
Did not miss	36	43.9	43.9
Missed	42	51.2	95.1
Not due	4	4.9	100.0
9 months(5th visit)			
Did not miss	0	0.0	0.0
Missed	73	89.0	89.0
Not due	9	11.0	100.0
Number of immunization centre visits missed			
One	39	47.6	47.6
Two	11	13.4	61.0
Three	8	9.8	70.7
Four	8	9.8	80.5
Five	16	19.5	100.0

Table III: Reasons for missing vaccination at immunization clinics

Reason for missed vaccination	Frequency N=82	Percent	Cumulative percent
ill child	22	26.8	26.8
Ignorance about routine vaccines	16	19.5	46.3
mother travelled when vaccine was due	12	14.6	60.9
mother forgot	8	9.8	70.7
mother busy	7	8.5	79.2
reaction to previous vaccine	5	6.1	85.3
immunization card misplaced or destroyed	3	3.7	89.0
lack of money for transportation	3	3.7	92.7
non-availability of vaccine	3	3.7	96.4
maternal ill health	2	2.4	98.8
religious belief	1	1.2	100.0

the immunization and 13(15.9%) of the subjects had no sibling. A significantly higher number of vaccine visits were missed by children from monogamous home compared to those from a polygamous home, p=0.038 as shown in Table IV.

Table IV: Relationship between some socio-demographic factors and number of missed vaccine visit days

Parameter	number of vaccine visit days missed		Chi-square	p
	one visit n=39	≥2 visits n=43		
Age group(months)				
≤12	15	20	0.743	0.690
>12 - 24	12	13		
>24	12	10		
Gender				
Male	19	24	0.413	0.521
Female	20	19		
Place of birth				
Hospital +TBA	29	31	0.053	0.817
Home + RH	10	12		
Mother's educational level				
Primary	11	16	0.899	0.638
≥secondary	21	19		
None	7	8		
Maternal age(years)				
≤20	8	3	5.429	0.066
>20 - 35	27	29		
>35	4	11		
Father's educational level				
Primary/none	11	15	0.421	0.516
≥secondary	28	28		
Type of marriage				
Monogamy/none	26	37	4.315	0.038
Polygamy	13	6		
No of siblings				
none - ≤3	32	33	0.351	0.554
>3 sibs	7	10		
Incomplete Sibling vaccination status				
Yes	15	20	0.542	0.462
No +no sibling	24	23		
Socioeconomic status of child				
SC II + III	10	7	1.091	0.298
SC IV +V	29	36		

DISCUSSION

Despite the advantage conferred by vaccines against some diseases, it is still being under-utilised in Nigeria as evident by findings of the current study which demonstrated that about five percent of the children had missed at least one vaccine visit. If these children had not been identified in the outpatient clinic, it would have been a 'missed opportunity' as they had come in contact with the health care system without benefitting from the system as regards vaccination despite the absence of any contraindication. The prevalence of the

current study is similar to the prevalence of 6% and 3% reported from Australia¹³ and Nairobi 14 respectively, but lower than 38% and 28.2% reported in India¹⁵ and Mozambique¹⁶ respectively. The varying prevalence reported in these studies could be due to the fact that most of the latter studies were done over a one year period or limited to those aged less than two years.¹³⁻¹⁶

Forty six (56.1%) of the mothers of the children recruited in the study had no secondary education which probably accounted for the attitude of some of the mothers in relation to their child's immunization schedule. Some caregivers complained of the distance from their place of residence and illness as reasons for missing the necessary visit for immunization. These reasons had been earlier reported as reasons for under-vaccination by some earlier studies. An interesting observation is the significantly higher proportion of children with missed visits from monogamous homes compared to polygamous homes in the current study. Perhaps, the higher missed visits among the mother-child pair from a monogamous family could be attributed to lack of support from the other mothers that might occur in a polygamous home. All the aforementioned implies that there is a need to involve mothers in strategies related to curbing missed opportunity as well as emphasizing the importance of completing the immunization visits. Therefore, strategies focused on the mother are cardinal in increasing immunization uptake rates. Improving the vaccination coverage via a reduction in the missed opportunities in the general clinic will re-invigorate the effort at achieving the Millennium Development Goals (MDG), especially MDG II and III.²² Also there is a need to create a setting where there is a connection between the health centre and the home. Such an intervention programme via reminders to parents of their next course of vaccine has shown improved immunization rates. Town criers and village health educators may also be harnessed as a local approach to improve the immunization rates in rural settings in Nigeria.

Delivery of a child in the health facility has been reported to promote immunization in such

children.²⁵ The rationale for this is that their parents benefit from health education on immunization and the child will likely benefit from the first course of vaccine. Our findings were contrary to this assumption, though 52 (63.4%) of the children in our study were delivered in a health facility there was still a high proportion of missed opportunity amongst these children. The high proportion recorded in the current study may be due to the fact that there are fixed days for immunization rather than everyday resulting in eligible children missing their course of vaccine. A health care provider focused strategy will contribute to an optimal provision of immunization service by ensuring that ill children seen, especially during infancy, who have missed vaccination visits receive the appropriate vaccines.

Inaccurate information about some symptoms in the child was identified in the current study as another source of missed opportunities. Parental complaints of symptoms such as fever, nasal discharges, cough and vomiting which are not contraindications for immunization were identified reasons for missing an immunization appointment.³ While these parents had inaccurate reasons for missing immunization visit, an earlier study reported that some health care providers are a party to disseminating such wrong information.⁹ Also, incomplete maternal information about the immunization schedule was a finding in this study which had been earlier reported.²⁶ It is therefore apparent that there needs to be a concerted effort involving both the health care provider and the caregiver to tackle missed opportunities as a means to increase immunization rates.

The high proportion of caregivers who were ignorant about routine vaccine despite their child having received vaccines during the National Immunization Days (NID) shows that there is a need to ensure that the latter doesn't erode the benefits of the former. Indeed, lack of parental awareness about vaccination has been reported as a barrier to immunization.²⁷ Thus, the vaccination records of children should be checked during NID, with caregivers of children with missed vaccines

educated about the importance of routine vaccine and encouraged to commence the missed vaccines.

In addition to reducing missed opportunity for vaccination in the clinic by identifying children who had missed vaccinations, these children were immunized and a platform for educating caregivers provided. Updated information on immunization practice as well as true contraindications was disseminated to the parents who attended the general and immunization clinic. Ensuring continuing education for health providers and equipping them with updated guidelines on vaccine schedules has been shown to improve immunization rates.²³ We therefore enjoin health authorities to include updated immunization practices in the curriculum of health workers and continuous medical education programmes.

CONCLUSION

The missed opportunity for vaccination was high in the current study, and indeed, maybe a contributing factor to the low immunization rate. Therefore, there is a need for health authorities to include strategies to mitigate missed immunization opportunities as a means to increase immunization rates in the country. This strategy should focus on health providers and caregivers to achieve optimum impact at increasing immunization rates. Health care providers should enquire about the vaccination status of children at all contact. There is a need to increase awareness on illnesses that are not contraindications to vaccination, and routine vaccine status should be checked during NID.

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