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Reasons for Missed Immunisation among Caregivers of Infants in Rural Communities of Abakaliki in Southeast Nigeria

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

Background: Missed immunisation against vaccine preventable diseases is a significant public health problem especially in rural areas of Nigeria. The reasons for missed immunisation are poorly understood. This study, therefore, identified the reasons for missed immunisation in the rural areas of Abakaliki, Nigeria.
Materials and Methods: Descriptive analytical cross- sectional study design was used for the survey. Data were extracted from immunisation registers and also collected using semi-structured interviewer administered questionnaire from 290 mothers/caregivers accessing childhood immunisation services in Mile Four and St.Vincent hospitals which were selected using systematic sampling technique. Analysis was done using IBM-SPSS version 22.0 and level of statistical significance set at $p< 0.05$ and confidence level at 95%. Ethical approval was obtained from the Research and Ethics Committee of the Federal Teaching Hospital Abakaliki, Ebonyi State, Nigeria.
Results: The mean age of respondents was 27.1±4.2 years. No money for transport (4.1%), forgot appointment date (4.8%), caregiver travelled (2.1%), baby was sick (6.2%) and vaccines not available (2.8%) were the main reasons for missed immunisation in both groups. Being a male caregiver was a predictor of missed immunisation in this study.

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Conclusion: The reasons for missed immunisations identified in this study need to be addressed both individually and collectively by the government so as to enhance immunisation timeliness and improve the percentage of fully immunised children especially in rural areas where the immunisation coverage is far below the expected national coverage.

Keywords: Reasons; missed immunisation; caregivers of infants; rural areas; Nigeria.

1. INTRODUCTION

Missed immunisation against childhood diseases is a worldwide problem and remains a significant public health problem in resource-poor areas of Nigeria [1]. The reasons for missed immunisation and non-uptake of immunisation services are poorly understood. Receipt of vaccines at recommended ages and intervals ensures that the child is adequately protected from target diseases at all times [1]. A Nigerian study provided some explanations for missed immunisation which included late reporting for immunisation, non-administration of simultaneous injections, longer interval between Pentavalent vaccines 3 and measles vaccine compared to that between the other vaccines in the schedule [1]. Other reasons given were that as postpartum period lengthened, mothers became engaged in other activities such that they forgot and/or may not have time to make scheduled visits for their infants' immunisations [1]. Childhood vaccines provide lifetime immunity to certain diseases, but for pertussis, additional doses of vaccine are recommended to protect waning immunity [2]. Knowledge of local impediments to effective immunisation programs is very important in the development and implementation of appropriate solutions. The objective of this study was to identify the reasons for missed immunisations in rural areas in Abakaliki, Nigeria.

2. MATERIALS AND METHODS

Descriptive analytical cross- sectional study design was used for the survey. The minimum sample size for this study was determined using the formula for comparing two proportions [3,4]. They were selected using systematic random sampling technique. Data were collected by use of semi-structured interviewer administered questionnaire among 290 mothers/caregivers in Mile Four and St.Vincent hospitals in Ebonyi and Izzi local Government Areas respectively and also extracted from immunisation registers. Reasons for missed immunisation were gotten from caregivers when they brought their children for immunisation in subsequent immunisation days. The analysis was done using IBM-SPSS version 22.0. Chi-squared test was used to determine association or differences between proportions of the variables and level of statistical significance set at $p< 0.05$ and confidence level at 95%. Logistic regression model was used to determine predictors of missed immunisation. Ethical approval was obtained from the Research and Ethics Committee of the Federal Teaching Hospital Abakaliki, Ebonyi State, Nigeria.

3. RESULTS

Table 1 listed the socio-demographic characteristics of responders. The mean age of respondents was 27.1±4.2 years.

Fig. 1 showed that 25.6% and 33.1% of the infants missed immunisations in Mile Four and St. Vincent hospitals respectively. A higher proportion of respondents in Mile Four group missed the 6^{th} and 10^{th} week vaccines when compared with St.Vincent group, while a significantly higher proportion of respondents in St. Vincent group (22.1%) dropped out of the 14^{th} week vaccines than Mile Four (5.5%). No infant missed BCG, OPV0 and HB0 in both groups. Generally there was no significant differences in the proportion of respondents who missed immunisations in both groups (p=0.15).

Table 2 showed that no money for transport (4.1%), forgot appointment date (4.8%), caregiver travelled (2.1%), baby was sick (6.2%) and vaccines not available (2.8%) were the main reasons for missed immunisation in both groups. In Table 3, relative to female caregivers, male caregivers were 6.2 times more likely to miss immunisation in Mile Four hospital. The employed were 2.2 times more likely to miss immunisation. Forgot date, caregiver travelled were 4.8, 7.5 times more likely to miss immunisation than those that did not forget or travelled respectively. In Table 4, none of these factors predicted missed immunisation in the St. Vincent hospital. However, male caregivers were 2.3 times more likely to miss immunisation than the female ones. Those at older age (≥30 years)

were 1.2 times more likely to miss immunisation than those of younger age group.

4. DISCUSSION

A comparable proportion of respondents in Mile Four group (25.6%) and St. Vincent group (33.1) missed immunisation at the end of this study. The more infants miss immunisation among a given population, the more compromised the herd immunity of such population and such infants are prone to vaccine preventable diseases with attendant morbidity and mortality [5]. It is noteworthy that the vaccines not missed by infants in this study were the ones given at birth. Although this study however did not explore the place of birth of these infants, it is therefore likely that most of these infants were delivered in the health facility (study areas) or presented immediately for immunisation probably on the day they were born which made them stand the chance of being immunised with BCG, OPV0 and HB0 vaccines.

Table 1. Socio-demographic characteristics of respondents in the study groups

Variables	Mile Four (n=145) Freq. (%)	St. Vincent (n=145) Freq. (%)	χ^2	p-value
Sex				
Male	5 (3.4)	4 (2.8)	**FT**	0.73
Female	140 (96.6)	141 (97.2)		
Age group (years)				
15-19	11 (7.6)	9 (6.2)	6.38	0.16
20-24	50 (34.5)	37 (25.5)		
25-29	48 (33.1)	68 (46.9)		
30-39	36 (24.8)	31 (21.4)		
Marital status				
Married	137 (94.5)	134 (92.4)	2.44	0.69
Single	8 (5.5)	11 (7.5)		
Education				
Primary	10 (6.8)	17 (11.7)	3.67	0.15
Secondary	88 (60.7)	93 (64.1)		
Tertiary	47 (32.4)	35 (24.1)		
Employment				
Paid employment	25 (17.2)	21 (14.5)	2.75	0.25
Self employment	56 (38.6)	70 (48.3)		
Unemployed	64 (44.1)	54 (37.2)		
Religion				
Christianity	142 (97.9)	143 (98.6)	**FT**	1.00
Others	3 (2.1)	2 (1.4)		

FT= Fisher's exact test

Table 2. Respondents' reasons for missed immunisation in each group (n=290)

Reasons for missed immunisation	Mile Four group	St. Vincent	p-value
	Yes (%)	**Yes (%)**	
Baby was sick	9 (6.2)	2 (1.4)	0.01*
No money for transport	6 (4.1)	1 (0.7)	0.006*
Forgot appointment date	5 (3.4)	7 (4.8)	<0.01*
Rainfall	5 (3.4)	3 (2.1)	0.07
Vaccines not available	4 (2.8)	2 (1.4)	0.15
Caregiver travelled	3 (2.1)	1 (0.7)	0.001*
Mother was sick	2 (1.4)	2 (1.4)	0.08
Forgot immunisation card	2 (1.4)	0 (0.0)	
Busy with work	1 (0.7)	3 (2.1)	0.001*

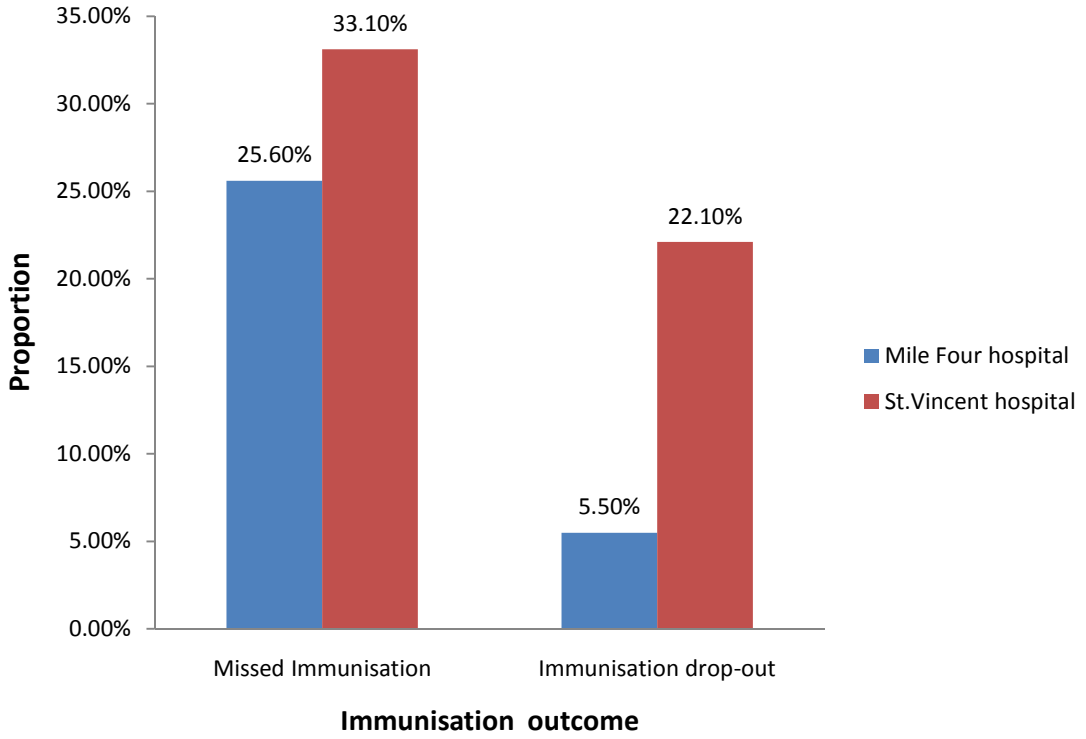

Fig. 1. Showing proportion of missed immunisation and immunisation drop-out in both facilities

Table 3. Predictors of missed immunisation in Mile Four hospital

Variables	Missed immunisation	Mile four group	P-value
	AOR	95% CI of AOR	
Sex			
Female	1		
Male	6.20	1.28-15.89	0.05**
Employment			
Unemployed	1		
Employed	2.15	-0.89-4.54	0.09
Forgot date			
No	1		
Yes	4.83	-0.77-8.78	0.99
Travelled			
No	1		
Yes	7.48	-0.77-14.77	0.99
Busy with work			
No	1		
Yes	1.04	-0.78-2.56	1.00

*** Predictor*

This study was conducted during rainy season with serious economic recession in the country then, as such "bad weather condition and poor economic status stated by the caregivers' may also be viewed as strong factors for missed immunisation. In addition, opened vaccine vials when not completely used should be preserved in the immunisation stations by the use of Cold chain/refrigerator. This will enable the health workers to open a new vial of vaccine when there are few children in the immunisation clinic instead of sending them home unvaccinated.

Table 4. Predictors of missed immunisation in the St. Vincent

Variables	Missed immunisation	St. Vincent group	P-value
	AOR	95% CI of AOR	
Sex			
Female	1		
Male	2.32	-0.99-6.20	0.99
Age group (years)			
<30	1		
≥30	1.21	-0.58-2.55	0.66
Marital status			
Not married	1		
Married	1.23	-0.15-9.56	0.86
Forgot appointment date			
No	1		
Yes	4.22	-0.99-11.12	0.99
Travelled			
No	1		
Yes	3.97	-0.78-9.56	1.00
Difficult getting transport fare			
No	1		
Yes	3.97	-0.78-9.56	1.00
Baby's sickness			
No	1		
Yes	3.47	-0.99-8.3	0.99

.AOR = Adjusted odd ratio
CI = Confidence interval

Refusal to vaccinate the infants on an unscheduled day in this study may have increased the mothers' total cost of transportation as stated by some caregivers, thus dampening their enthusiasm to attend vaccination clinics [6] with loss of confidence in the immunisation system [7].

The reasons for missed immunisation as found in this study were similar to those reported in Ibadan such as - mother too busy (24.2%), place of immunisation too far (21.9%), travelled (8.1%) and family problems including illness of mothers (5.5%). It is expected that "busy with work" would top the reasons for missed immunisation in this study as most working class mothers or caregivers need to get permission from office before bringing their children to the immunisation clinic otherwise miss the schedule. However, Baby's sickness was the commonest reason for missed immunisation due to low level of education/knowledge of contraindications for immunisation which made caregivers not to bring their children on those scheduled immunisation days. The finding of baby's sickness being major reason for missed immunisation in this study is consistent with other findings elsewhere [5,8-10]. Other comparable reasons found in earlier study were that they forgot appointment date (23%), either mother or child was ill (22%), travelled (20%), were too busy (16%) or mixed up dates (5%) [5]. Forgetfulness of immunisation date by caregivers as revealed by the earlier study may be due to the complexity of immunisation schedule with multiple intervals [5].

The findings among respondents in this study may have been confounded by differences in their literacy or awareness level. It would be expected that the housewife and the trader would have more time to take their children to immunisation centers for immunisation compared to their civil servant counterparts. This is because the civil servant would need to obtain permission to be absent from work before he/she is able to go and immunise his/her child. However, awareness of the importance of immunisation may be higher among the civil servants [7]. The reasons given in this study are at variance with those cited by Abdulraheem et al as parental objection, disagreement or concern about immunisation safety (38.8%), long distance walking (17.5%) and long waiting time at the health facility (15.2%) are the most common reasons for partial immunisation [11].

5. CONCLUSION

The reasons for missed immunisation identified in this study need be addressed both individually and collectively by the government so as to enhance immunisation timeliness and improve the percentage of fully immunised infants especially in rural areas where the immunisation coverage is below the expected national coverage. Health care providers should spend more time to communicate to mothers/caregivers on immunisation schedules and have constant training on vaccine management.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Ethical approval was obtained from the Research and Ethics Committee of the Federal Teaching Hospital Abakaliki, Ebonyi State, Nigeria.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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