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Nigerian mothers opinion of reminder/recall for immunization

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Abstract Introduction:

Reminder/recall interventions have been shown to improve immunization coverage. The perception of mothers/caregivers may influence the outcome of such interventions. The attitude of Nigerian mothers to reminders/recalls using cell phones was evaluated.

Methods: This was a cross-sectional observational study carried out (August to October 2012) on mothers attending the child welfare clinic of the Institute of Child Health, University of Benin, Benin City. The instrument was an interviewer administered questionnaire which sought information on respondents' access to phones, their ability to read, perception and preference with regard to reminders/recalls.

Results: All 203 mothers had access to a phone although 188 (92.6%) currently owned a phone. Majority of the mothers 163 (80.3%) could read. Of the 203 mothers 127(62.6%) agreed that

mothers should be reminded about immunization appointments of their children. Of those who disagreed, most agreed that mothers who forget/did not keep appointments could be reminded. More mothers 126(70.8%) favoured reminders compared to recalls 52 (29.2%) There was no significant difference in the proportion of mothers who preferred telephone calls and those who preferred text messages. Those with post secondary education were more likely to prefer text messages.

Conclusion: The mothers studied are favourably disposed to receipt of reminder/recalls for their children's immunization appointments. There is good access to telephones among the study population enough to support the use of this technology for a reminder/recall intervention but the use of text messages may be limited by literacy.

Key words: Reminder, Recall, Nigerian, Mothers

Introduction

Immunization is among the most cost effective public health interventions¹ The immunization coverage in Nigeria is below the 90% target of the World Health Organization.² This low coverage is contributed to by the weak routine immunization programme amongst other reasons.³ The recent reports of clusters of diphtheria in various parts of Nigeria including an epidemic in Borno state as well as the measles epidemic in the northern states of Nigeria emphasize the need for strengthening of routine immunization.⁴⁻⁸

Various strategies have been employed to improve immunization coverage in developed countries. One of such strategies as stipulated in the standards of immunization practices is the use of reminder/recall interventions.⁹ Reminders are utilized to remind parents of an appointment while recall is used when the immunization is overdue.⁹ Different types of reminders and recalls have been used in various studies.¹⁰ These include

letters, postcards, telephone calls, autodialers, and emails.¹⁰ A systematic review noted that the use of patient reminder/recall interventions resulted in improvement in immunization rates irrespective of baseline immunization rates, patient age, setting or vaccination type in 33(80%) of 41 studies.¹⁰ The same review also noted that telephone reminder/recall interventions were more effective than the other forms of reminder/recall.¹⁰

For a reminder recall intervention to be effective there must be a means of tracking the children so that children due for immunizations, those overdue and those under-immunized can be identified. In Nigeria although immunizations are recorded on cards that are kept by the parents many facilities do not keep immunization registers that can help identify incompletely immunized children. Few studies have evaluated the potential for tracking. In one such study it was concluded that Community Health Extension Workers had the potential for identifying under-immunized children in their communities.¹¹ This approach may however, not be effective due to the

dearth of health care workers in Nigeria.

The introduction of Global System for Mobile Communications (GSM) to Nigeria has greatly improved access to telephones in both urban and rural areas. In a report in 2011, 60% of respondents owned a phone/had access to a phone.¹² The availability of phones could allow for the use of these phones in interventions to raise immunization coverage. In view of this there is a need to examine the factors that could affect the utility of cell phones in a reminder/recall intervention to improve immunization rates in Nigeria.

One of the factors that may determine the effectiveness of a reminder/recall intervention is the perception of the targeted population. In a study on parents' opinion about use of text messaging for immunization reminders, the authors noted that their findings provided a greater understanding of immunization communication from the parents' perspective.¹³ They also opined that their findings provide a basis for further research and text messaging interventions that could address adherence to childhood immunization schedule. In a study, in Lagos the willingness of mothers to receive text message reminders was evaluated.¹⁴ It was found that while 77% were willing to receive text messages, 67% preferred telephone reminders. In that study it was also found that having post secondary education, being currently married and being a Christian were positive predictors of willingness to receive text messages. The findings in that study may not be extrapolated to Nigeria as a whole as the population studied was largely urban and highly educated which is not representative of the country as a whole.

The Institute of Child Health (ICH), University of Benin, Benin City runs a child welfare clinic where a register of the children immunized in the facility is kept. The immunizations received and dates of next appointment are noted. This study evaluated the perception of mothers about reminders/recalls prior to a planned introduction of this service.

Methodology

Ethical approval for the study was obtained from the ethics and research committee of the College of Medical Sciences, University of Benin, Benin City. The study was cross-sectional and was carried out between August and October 2012. A convenience sample of 203 mothers was interviewed using an interviewer administered questionnaire. Mothers who brought at least one child for immunization were included in the study. Those who did not come with any child or did not give consent were excluded. Verbal consent was obtained from the mothers after an explanation of the purpose and procedure of the study. The questionnaire sought information on the age of the respondent, her educational level and number of children. Respondents were asked if they owned a phone and if they did not if they had access to a

phone. A respondent was considered to have access if the respondent had an opportunity to utilize or derive benefits from the phone.¹² Respondents were also asked if they could read. The respondents were asked to agree or disagree with whether parents/ caregivers should be reminded about their child's immunization appointment. For those who neither agreed or disagreed they had the option of "not sure" For those who disagreed they were asked to agree or disagree with whether the parents/ caregivers should be reminded if they failed to keep the child's immunization appointment. Respondents were also asked to state the frequency of reminder/recalls, when the reminder/recall should be sent and the preferred type of reminder.

Responses were recorded as simple percentages while association between variables was tested using Chi square and Fishers Exact tests as appropriate.

Results

Two hundred and three mothers were studied. The socio demographic data of the mothers is shown in table 1. The mean age of the mothers was 30.51 ± 5.07 years with a range of 18 to 45 years. An equal proportion of mothers 38.9% had secondary and post secondary education. Majority of the mothers 63(31.5%) had one child each.

Of the 203 mothers 188(92.6%) currently owned a phone. All 15 who did not own a phone had access to a phone thus total access was 100%. Majority of the mothers 163(80.3%) could read. Most 197(97.0%) of spouses/partners of the respondents could read. Of the 40 mothers who could not read 4(10%) of their spouses/partners could also not read. Thus overall, 4/203(2.0%) of the families represented could not read.

Of the 203 mothers, 127(62.6%) agreed that mothers should be reminded about immunization appointments of their children while 72(35.5%) disagreed and 3(1.5%) were unsure. Those who disagreed opined that a mother should never forget the child's immunization appointment. Of these 72 however 63(87.5%) agreed that a mother could be reminded (that is get a recall) if she forgets the appointment but 7(9.2%) still disagreed while 2(2.8%) were unsure. Thus overall, 190(93.6%) mothers agreed on the need for reminders (either reminder (127) or recall (63)).

Characteristic	n	%
<i>Age</i>		
≤24	26	13.0
25-29	59	29.5
30-34	72	36.0
35-39	35	17.5
≥40	8	4.0
<i>Level of education</i>		
Nil	3	1.5
Primary	42	20.7
Secondary	79	38.9
Post secondary	79	38.9
<i>Number of children</i>		
1	63	31.5
2-4	111	55.5
≥5	20	13.0

Table 2 shows the association between maternal occupation, number of children, level of education and attitude towards reminder/recalls. Mothers with one child were more likely to agree that mothers should be reminded about immunization appointments compared to mothers with two or more children. $P=0.02$. Mothers who were unemployed were also more likely to agree that mothers should be reminded about immunization appointments. $p=0.03$

Table 2: Association between some variables and attitude of mothers to reminder/ recall

Parameter	Agrees on need for RR		Disagrees on need for RR		pvalue
	N	%	N	%	
<i>Maternal occupation</i>					
Unemployed	18	85.7	3	14.3	0.03
Employed	107	61.1	68	38.9	
<i>Level of Education</i>					
Nil	0	0.0	2	100.0	0.99
Primary	27	64.3	15	35.7	
Secondary	50	64.1	28	35.9	
Post secondary	50	64.9	27	35.1	
<i>Number of Children</i>					
1	48	78.7	13	21.3	0.02
2-4	63	57.8	46	42.2	
≥5	14	53.8	12	46.2	

Of those who agreed that mothers could be reminded about immunization appointments (including those who felt such reminders should be if the mother forgets) 126 (70.8%) preferred reminders while 52(29.2%) favoured recalls.

As to the number of reminder/recalls majority 104 (58.1%) felt one reminder/recall was adequate while 56 (31.3%) and 19(10.6%) preferred two and three reminder/recalls respectively. As to when such reminder/recall should be sent 82(45.8%) preferred a week before the due date, 43(24.0%) preferred a day before the due date, 20(9.4%) a day after the due date while 34(14.6%)

preferred a day before the next possible appointment.

Of the 180 who responded to the question on preferred type of reminder/recall 94(52.2%) preferred telephone calls while 86(47.8%) preferred text messages. No mother preferred the use of email. The association

between maternal age and level of education and choice of reminder/recall is shown on table 3. Level of education was significantly associated with the choice of reminder/recall. $P=0.003$. Mothers who had post secondary education were more likely to prefer text messages than those with either primary or secondary education. Age was not significantly associated with preference

Table 3: Association between maternal age, maternal level of education and preferred type of reminder/recall and

Variable	Preferred Reminder/ Recall Telephone Call		Text Message		pvalue
	N	%	N	%	
<i>Maternal Age (years)</i>					
<34	72	55.0	59	45.0	1.0000
>35	21	56.8	16	43.2	
<i>Level of education</i>					
Nil/Primary	30	75.0	10	25.0	0.0003
Secondary	38	55.9	30	44.1	
Tertiary	26	36.1	46	63.9	

Discussion

This study confirms the improved access to phones in Nigeria. Majority of the mothers owned a phone while all mothers had access to the benefits of a phone. This implies that it would be feasible to use a telephone based intervention in the population studied. This is similar to findings from Lagos in Nigeria.¹⁴

Telephone reminders can either be text messages or telephone calls. The use of the former is dependent on the recipient's ability to read and comprehend. In this study almost 20% of the mothers could not read. However when the ability of the couple (mother and spouse/partner) was combined only 2% of the studied group was unable to read. Previous studies have shown that parental education is a significant determinant of immunization uptake with children of less educated parents being more likely to be undervaccinated.^{15,16} The utilization of an intervention that is based on the literacy of parents may thus exclude the most vulnerable groups. This may be a limitation of the use of text messages in this population of mothers.

The attitudinal disposition of the studied mothers suggests that they are highly motivated mothers who believe that a mother should not forget her child's immunization appointment. This attitudinal disposition is different from that of Lagos mothers of whom 25% reported having missed a prior immunization appointment.¹⁴ Thus, the Lagos mothers seemed more favourably disposed to reminders with 77% of those studied reporting their willingness to receive text messages. In this study however the respondents who felt mothers should not forget immunization appointments were favourably disposed to reminders for mothers who forget or miss immunization appointments. Thus overall majority of the studied mothers were favourably disposed to immunization reminders/recalls.

Unemployed mothers and mothers with only one child

were more likely to agree on the need for reminders compared to employed mothers and those with two or more children. It would have been expected that these mothers would be less likely to favour reminders since they have more time. Perhaps mothers with two or more children having had previous experience with immunization appointments feel more confident about the handling of their children's immunization hence their less favourable attitude. It is not clear as to why employed mothers would be unfavourably disposed to reminders.

Even if forgetting appointments may not be a significant contributor to undervaccination among the mothers studied, it is important to note that while improving vaccination coverage is an important goal of an immunization programme, timeliness of receipt of immunizations is also important. Epidemics could result from the temporary build up of susceptible children due to delays in receipt of immunization.¹⁷ Such delays can be prevented by the use of reminder/recall interventions. Previous studies have shown that many Nigerian children do not receive their vaccines on time.¹⁸

More mothers preferred reminders compared to recalls. This may be because reminders are proactive and allows the mother clear her schedule to accommodate the immunization appointment. Recalls on the other hand tends to highlight a failing on the part of the mother. Reminders may be more useful in improving timeliness of receipt of immunizations compared to recalls. Although majority of the mothers felt that one reminder/recall was sufficient a significant proportion suggested multiple reminders/recalls. A systematic review of the literature found that multiple reminders were more effective than single reminders.¹⁰ Most of the reviewed studies were however from developed countries and may not reflect realities in a developing country.

With regards to the preferred time for receipt of reminders more mothers (42.8%) preferred receiving reminders

a week before the appointment day compare to a day before the appointment. This is in contrast to findings in Lagos in which more mothers preferred receipt of reminders on the day before the immunization appointment compared to a week before.¹⁴

The choice of type of reminder showed that although more mothers preferred telephone calls it was not significantly more than those who preferred text messages. The proportion preferring telephone calls in this study was however lower than that in Lagos but higher than that found in a cross-sectional survey of nationally representative sample of parents of children 0-17 years of age in the United States.^{14,19} In this study those with post secondary education were more likely to prefer text messages than those with either primary or secondary education. This may be due to their better literacy. Text messages have the advantage of the recipient being able to see the message repeatedly at a later time unlike the telephone call which may be missed if the mother is busy and a mother may equally forget that she had a telephone call reminding her of her child's immunization appointment.

Conclusion

In conclusion mothers in Benin City have a positive perception of reminders/recalls for immunization. The finding that there was adequate access to cell phones in the study population could allow for the use of reminder/recall interventions. Programme planners would need to be flexible and provide reminder/recalls based on parental preferences for type of reminder and timing of reminders.

Conflict of interest: None

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