ORIGINAL ARTICLE

Reasons for defaulting from expanded program of immunization (EPI) in Jimma town, South Western Ethiopia

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Abstract: *A cross sectional community based study was carried out in Jimma Town, South Western Ethiopia to determine reasons for defaulting from expanded program of immunization (EPI) using structured questionnaire in March 1997. A total of 376 children aged 12 to 23 months and their mothers were covered in the study. The data entry and analysis was done using SPSS computer software. Appropriate tests of statistical significance were employed where necessary. Out of the total 376 children 175 (46.5%) were fully immunized, 201 (53.5%) were defaulters. The reasons given by mothers for not completing vaccination were missed appointment time 48.8% , mothers had no enough time 25.9% and child was sick 23.4%. In the bivariate analysis maternal age, antenatal care attendance, parity, education, knowledge about vaccine preventable diseases and benefit of immunization were all found to have statistically significant association with status of immunization (P.value <0.05). The availability and accessibility of EPI services alone does not make mothers to complete the immunization unless they are made to understand the need for repeated doses of vaccine through other means. Therefore, concerted efforts should be made by all concerned to further promote information, education and communication on utilization of available services.*

Introduction

Expanded program in Immunization (EPI) was launched in Ethiopia in 1980 (1) as one of the program components of primary Health Care (PHC) (2). When the program was launched the immunization coverage was less than 1%(6), and the presumed goal was to provide immunization services to all children under the age of 2 years. It was thus believed that increasing EPI coverage by 10% every year for the up coming 10 years shall fulfill the goal of universal immunization coverage by 1990 (1,3). That target was later revised to 75% and the target age group was changed to less than one year in 1986. Inspite of the efforts made by the government to make immunization service available to mothers and children, in 1990 immunization coverage for under one children was reported to be 59.0% for DPT_3 and the dropout rate from the schedule was 36.0%. In 1992 the DPT_3 coverage declined to 13.0% and then rose to 37.0% in 1994 (4,5).

According to the 1995/96 annual EPI report of Jimma Zonal Health Department, only 43% children under two

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years of age were fully vaccinated as compared to 85% who received the first dose of polio and DPT_1 indicating that the problem is not that of coverage alone, but of high rate of drop-out (6).

In limited studies conducted some factors responsible for compliance or defaulting were identified (7-12), however, these surveys did not exhaust the list of factors which may influence compliance or defaulting. An attempt was made in this study to assess reasons for defaulting from the EPI in Jimma town, South Western Ethiopia. The findings of the study could be utilized in planning and managing EPI in the area.

Methods

A community based cross-sectional survey was conducted to assess reasons for defaulting from EPI among children aged 12 –23 months in Jimma town, South Western Ethiopia in March 1997. Jimma town had a population of 88,867 according to the 1994 census (13). The town is divided administratively into three 'kefetegnas' and twenty 'kebeles'. All houses have been numbered by the 'kebeles' for administrative activities. The town has one hospital, one health center and one MCH clinic. These health institutions are distributed in each 'kefetegna'. A retrospective cohort of children aged 12-23 months for vaccination between February 1996 to January 1997 was obtained from health records of respective institution. This group was selected as they would be completing their immunization schedule at the time of the beginning of the study. The addresses of the houses in which these children live were also abstracted from the health records. The total sample size of 376 was determined from the source population (children 12-23 months of age) assuming EPI coverage of 43%.

In order to select the study subjects stratified random sampling scheme was used. The strata were 'kefetegnas' composed of 'kebeles'.

With probability proportion to size (PPS), a sample was drawn from each of the strata. To ensure proportional allocation, first the total number of eligible children in the entire study areas was listed (N=990). Accordingly a sample of 124, 131 and 121 children from 'kefetegna' I, II and III respectively, were taken. Proportional allocation was also maintained for kebeles in each kefetegnas. Using list of eligible children in the respective kebeles, simple random sampling technique was employed to attain the required sample size. To collect data, pre-tested and standardized questionnaire was used which addresses the socio-demographic, cultural and economic characteristics of the study group. Mothers' or guardians' knowledge, attitude and practice of vaccination and major causes of defaulting from EPI service were also investigated. Furthermore the attitudes of the male partners on vaccination of children, place and time convenience of immunization and status of antenatal care (ANC) and delivery services was examined. The questionnaire was prepared in English and then translated into Amharic. It was administered to mothers or nearest guardians of the child by trained interviewers. The raw data collected was coded directly on the questionnaire and then entered into computer. The investigator made close supervision of data quality. Descriptive data analysis and interpretation as well as bivariate chi-square tests of significance were done using SPSS computer software.

In this study "Fully vaccinated" means a child who received BCG, DPT_3, OPV_3 and measles vaccination.

Defaulter/Dropout was defined as children and women who did not return for subsequent immunization.

Result

A total of 376 children between 12-23 months of age and their index mother were covered in the study. About half (50.8%) of the children were males and 49.2% were females. Their mean age was 16.6 months, and 65.1% of the children were below the age of 18 months.

Most of the mothers of the study children were in the age group 20-34(70.5%); 88.8% were married while 8.2% were single; 32.2% were primipara, 43.9% gave birth to 5 or more children. The majority (63.3%) was Orthodox Christians followed by Muslims (33.5%) and protestant (3.2%). Most of the mothers are from Oromo and Amhara ethnic group, which accounted for 39.9% and 22.1% respectively. Occupationally, 71.5% were housewives, 14.9% government employees, 10.6% daily laborers and 2.9% unemployed /student. The educational status of the mothers indicates that 10.9 % could not read and write (illiterate) and 40.4% attended grade 9 or above. Families whose monthly income was less than 100 Birr per month were 39.6% and only for 12% of them income was reported to be greater than 500 Birr.

Majority of the mothers (80.3%) had attended antenatal care (ANC) during the pregnancy of the index child. About 68% of the index children were born at health institutions while 32% were born at home.

On the other hand, 93.4% of the mothers have knowledge about immunization, 46.5% responded that immunization prevents disease, and 27.1% received TT_2 vaccination during the pregnancy of the index child.

Out of the total 376 children 175 (46.5%) were fully immunized, 201(53.5%) were defaulters. The rate of defaulting varied from 44.5% in children between 12-14 months of age to 74.4% in those between 15-17 months ($P < 0.0001$). The defaulter rate between DPT_1 / OPV_1 and DPT_3 / OPV_3 was 22.6%, while that between DPT_3 and measles was 49.8% (Table 1).

Table 1. Distribution of children between 12-23 months of age by vaccine type received, Jimma town, SouthWestern, 1998.

Vaccine type	No. (%)
BCG	263(69.9)
DPT_1, OPV_1	226(60.1)
DPT_2, OPV_2	210(55.9)
DPT_3, OPV_3	175(46.5)
Measles	132(35.1)

Furthermore there was no statistically significant difference between the various categories of marital status, occupation, monthly income, place of delivery, ethnicity and religion on the one hand and the status of immunization on the other.

As depicted in Table 2, maternal age was found to have statistical association with immunization status of children (p-value <0.05). The younger the age of the mother the higher the defaulting. Parity has also shown significant association with immunization. The educational status of the mother also has statistically significant effect on the rate of defaulting. The lower the educational status of mothers the higher the rate of defaulting. There was however, defaulting in all the educational categories. The immunization status also differed among the three 'keftegnas'. Kefetegna II has the highest proportion of defaulters (68.5%) followed by kefetegna I and III with a defaulter rates of 47.6% and 43.4%, respectively ($P < 0.05$).

Table 2. Association between immunization status of children and sociodemographic and other variables of the mother, Jimma town, SouthWestern, 1998.

Maternal variables	Fully immunized No. (%)	Defaulter No. (%)
Age in years *		
15-19	5(26.3)	14 (73.7)
20-34	119(44.9)	146(55.1)
35-49	51(55.4)	41(44.6)
Educational status *		
Illiterate	10(24.4)	31(75.6)
Grade 1-6	39(40.6)	57(59.4)
Grade 7-8	44(50.6)	43(49.4)
Grade 9-12	68(52.7)	61(47.3)
> Grade 12	14(60.9)	9(39.1)
ANC Attendance **		
Yes	172(57.0)	130(43.0)
No	3(4.1)	71(95.9)
TT During pregnancy *		
TT_1	79(39.9)	119(60.1)
TT_2 and above	77(58.3)	55(41.7)
No vaccination	19(41.3)	27(58.7)
Knowledge about immunization *		
Yes	171(48.7)	180(51.3)
No	4(16.0)	21(84.0)
Benefit of immunization **		
To cure	67(52.8)	60(47.2)
To prevent	102(58.3)	73(41.7)
Don't know	6(8.1)	68(91.9)
Parity *		
1	56(46.3)	65(53.7)
2-4	91(55.2)	74(44.8)
5^+	28(31.1)	62(68.9)

* $P< 0.05$
** $P<0.0001$

The relationship of maternal ANC attendance and immunization status of children was statistically significant. The proportion of defaulters was more for those who did not attend ANC. The study also revealed strong relationship between maternal tetanus toxoid (TT_2) immunization and child immunization status. Similarly, knowledge about vaccine preventable disease and benefit of immunization were all found to have highly significant association with status of child immunization (P-value <0.01).

Reasons given by mothers for starting vaccination were illustrated when asked why they registered their child for vaccination. About half (46.5%) said that it was because they knew that it prevents disease, 34.1 said that they registered their child when they went to health institutions for other reasons, 19.4% said that they registered their child because they were

told by other people. In general most of them said that they wanted to keep their child healthy.

Mothers were also asked to name 6 vaccine preventable diseases they know. About one-fourth (25.3%) could not name any disease correctly whereas 43.9 % named 4 or more diseases correctly (Table 3). Attitude of the partner was also asked for married parents and the result shows that almost all (99.4%) of the partners do support immunization for the child.

Table 3. Distribution of mothers by number of vaccine preventable diseases recalled, Jimma town, SouthWestern, 1998.

Number of disease correctly given	Frequency	Percent
0	95	25.3
1	17	4.5
2	31	8.2
3	68	18.1
4	75	19.9
5	60	16.0
6	30	8.0
Total	376	100.0

The study in relation to accessibility of service revealed that about 35.4% of mothers could reach the vaccination site within less than 15 minutes and 49.2% of them can reach within 15 to 30 minutes . While 86.4% walk on foot, 12.5% and 1.1% were reported using vehicle (taxi bus/private cars and horse back respectively. Both time required for transportation and type of transportation used have no significant relationship with the status of immunization. The cost of transportation to health institutions was Birr 1.20 in almost all of the cases (97.3%). Both place and time of immunization were found to be convenient for mothers: 98.1% said that the place was convenient and 98.9% indicated that time of appointment was also convenient. Concerning time spent by mothers at health institution for one session of vaccination, 6.6% said that there was no queue, 25.0 % stayed for less than 30 minutes , while 11.1% said they stayed for more than 1 hour. In addition 96.8% of mothers said that they like the attitude of health workers.

Reasons for defaulting from immunization among the 201 (53.5%) children were explored . The major reason given by the mothers were missed appointment time (48.8%), mother had no enough time (25.9%), and child was sick (23.4%). Other reasons were loses of cards and health institution being far away. (Table 4)

Mothers were also asked if they were told not to bring their child for immunization when the child gets sick: in which 71% answered that they were told.

Table 4. Reasons given by mothers for not completing vaccination, Jimma town, SouthWestern, 1998.

Reasons	No. (%)
Missed appointment time	98(48.8)
Mother had no enough time	52(25.9)
Child was sick	47(23.4)
Card lost	2(1.0)
Health institution far away	2(1.0)
Total	201

Discussion

The rate of defaulting was 53.5%, in those children registered for immunization. Like many other studies (5,9-12) the dropout rate was considerably high. Over all

defaulting decreases as maternal age increases. On the contrary high parity (5 or more children ever born) and primipara mothers were significant defaulters. This might be due to confounding factors operating with age and parity. The older the mother the more she develops experience and awareness to the importance of immunization and so the lower the chances for defaulting. Regardless of their age some mothers of high parity may lack time to complete immunization as they have to care for many children.

Child immunization status did not show statistically significant relationship with marital status, ethnic group, religion, occupation, place of delivery, and economic status in the current study. These findings in part contradict with other studies done by Yemaneberhan in East Showa and Wondimagegehu in Addis Ababa (10,11) who found significant association between occupation and monthly income of mothers and immunization status of children.

Our study revealed that maternal educational status had an association with the status of child immunization. The higher the educational status, the higher was the rate of completing the vaccination schedule. This indicates that educational status of the mothers was very important in understanding the need for repeated vaccination. This was in conformation with other studies (10,11). It is note worthy, however, that even at the higher levels of educational status there were still defaulters showing that maternal education status is not the only factor which determines the status of child immunization.

The relationship between maternal ANC attendance and the status of immunization suggests that education and encouragement of mothers at ANC is an important factor in completing immunization for their children. Furthermore, as shown in the current study, mothers who knew the benefits of vaccination are more likely to complete the immunization schedule.

'Kefetegna' II had the highest proportion of defaulters followed by 'kefetegna' I and III. This indicates that the availability of the services nearby is not the only factor which influence the rate of defaulters among those registered. In addition to possible socioeconomic differentials , this could be explained by the fact that the level of illiteracy was relatively higher in ;'kefetegna' II than in others.

The study also considered the factors of availability and accessibility of the service by considering the time taken to reach vaccination site, and the type of transport used. The results showed that the health institutions are near enough. The place and appointment times were also found to be convenient for mothers and therefore do not appear to have any significant effect on the rate of defaulting.

One of the factors that influence defaulting was competing priorities. Families that have a marginal existence have little time to devote to childcare. In Conakry, Guinea, a knowledge, attitude and practice survey found that among lower socioeconomic groups children of mothers who worked outside the home (mainly in markets or as street vendors) had lower immunization uptake than those where mothers were not employed (14). Missing appointment for repeated vaccination in this study reflects similar conditions.

Once vaccination services became accessible, efforts should be made to increase community motivation and to ensure that children complete the immunization series. Although the urban

poor have been labeled as apathetic and lacking in social organization, urban program are increasingly adopting the house-to-house approach to community motivation. Organizers need to carry out house to house registration of eligible individuals and tracing of defaulters.

A system of birth registration and follow up of defaulters need to be developed to improve immunization services similar to the study done in Khartoum. Registration cards are completed for each birth notified to the clinic by nurses and are to be classified according to the month of child's next visit. If the child does not appear, nurses visit the family to remind the parents of the immunization required.

Intersectoral collaboration need to be given due attention, as immunization personnel acting alone are unlikely to be able to resolve the multifaceted problems encountered. Other health education methods complement community based mobilization to create full awareness of the public to effectively use EPI services and to make sure that mothers know and understand about the schedule of vaccination.

The role of research in problem solving should be appreciated and supported in EPI activities.

The need to improve disease surveillance to identify high risk populations and provide information about the effectiveness of EPI to be maintained The programmes impact can be measured by routine disease notification or by using sentinel sites.

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