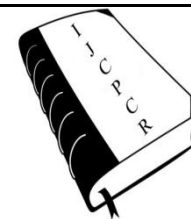




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**ASSESSMENT OF FACTORS AFFECTING UTILIZATION OF EPI
SERVICE AMONG MOTHERS IN ADIREMETS TOWN, WELKAYT
WOREDA, HUMERA ZONE, TIGRAY REGION, NORTH WEST
ETHIOPIA**

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ABSTRACT

The process of protecting the body against disease by means of vaccines or serum (immunization) is the most cost effective of all the health intervention developed so far. However, the poorest countries and those affected by war or civil disturbance continue to have low immunization coverage contributing at least 2 million child hood deaths per year. Objective of the present study was to assess factors affecting utilization of EPI service among mothers in Adiremets town, Welkayt woreda, Humera zone, Tigray region, North West Ethiopia in 2012. Institution based cross- sectional study was conducted in Welkayt woreda, Humera Zone, North West Tigray of Ethiopia and data was collected from 19th to 29th, Feb. 2013 Consecutively; the necessary data was collected from EPI card, maternal history and observation for the presences or absence of BCG scar. From the 294 mothers, 68.4% have knowledge about EPI (know at least of the 8 VPDs), 97.6% positive attitude towards EPI, while 94.4% have positive attitude towards the vaccinators. As to the general benefit of EPI, 82.3% replied that vaccination is given to protect diseases, 11.6% answered to cure a disease, while 6.1% don't know the general use of vaccines. Out of the same total number of children 67% were fully immunized (DPT3, measles) and 78% were vaccinated against measles. The number of children with three doses of DPT, OPV, PCV were 82.6% While the overall dropout rate was 24.6%, the drop-out-rate between DPT3/PCV3/OPV3 and measles was 19%. From the 280 children who visited the nearby health facility, then returned without any vaccination and this makes the missed opportunity rate to be 3.6%. In this study only 67% of the children were fully immunized leaving 24.8% overall dropout rate and 8.2% having no even a single vaccination. Hence, these 33% of the children could be targets for any of the six VPDs. Even if maternal TT2+ coverage is 80.6% ,the fact that the other 19.4% are not vaccinate could put both the mothers and new born at risk of contracting tetanus.

Key words: utilization of EPI, awareness, Immunization, Antenatal care.

INTRODUCTION

Children are the world's most valuable assets and their well -being indicates the standard of living of the country. They constitute one third of the total population. It has been noticed that almost one out of every five live birth infants die before reaching 5 years of age. Health is both a

responsibility and a right of those with power and without it. It has been seen that some 5 million children are dying each year and another 5 million disabled by six childhood diseases in developing countries. Child immunization, as the one component of primary Health Care, is worldwide

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accepted as a cost – effective method in reducing morbidity and mortality rates among children [1-4].

Childhood immunization almost guarantees protection from many major diseases. It prevents 2 million deaths per year worldwide and is widely considered to be tremendously good by the medical science community. However, 2.5 million deaths a year continue to be caused by vaccine – preventable diseases, mainly in Africa and Asia among children less than 5 years old. Expanded program on immunization (EPI) was launched in 1976 by WHO and UNICEF with the aim of controlling six childhood diseases: tuberculosis, diphtheria, pertussis (whooping cough), tetanus, polio and measles. Immunization is the most cost effective health intervention in existence [5, 6].

The community participation is also important especially mothers who take care of the children too, and mothers are so the one dominant group who can make child immunization campaign to be successful as shown in many literatures [1, 4].

In 2001 the global alliance for Vaccines and immunization (GAVI) offered financial support to developing countries to introduce new vaccines and strengthen immunization services. With these funds, Hib – conjugate and Hepatitis B Vaccines were introduced into the EPI schedule combined with diphtheria, pertussis and tetanus (DPT) antigens as a pentavalent vaccine administered at 6,10 and 14 weeks of age. Timely administration of these new antigens was considered essential, as invasive Hib disease incidence peaks at 4 months and vaccination beginning at 6 weeks can prevent early horizontal HBV infection [7].

Now a day's all countries have national immunization programmes, and in most developing countries, children under five years old are immunized with the standard WHO recommended vaccines that protect against eight diseases: tuberculosis, diphtheria, tetanus (including neonatal tetanus through immunization of mothers), pertussis, polio, measles, hepatitis B (Hepatitis b), and homophiles influenza (Hib). Vaccine preventable diseases are among the major causes of childhood morbidity and mortality in Ethiopia [8, 9,].

In Ethiopia, the EPI program was started in 1980 and about 1 million children were estimated to be unvaccinated and about 16% under five mortality has been attributed to vaccine preventable diseases in 2010. Immunization is one of the national child survival strategies in the country to reach diphtheria – pertussis and tetanus (DPT3) /measles vaccination coverage 90% in 2010. It is also presented as the key strategy to achieving the Millennium Development Goals (MDGs) specially to reduce the child mortality and proportion of children immunized against measles is one of the MDG indicators of health [1,3,10].

Evidences show that Ethiopia has made notable progress in routine immunization coverage with an increase

in DPT3, Overall improvement in coverage has been mainly attributed to the Reaching Every District (RED) approach, which was started in 2004 [5,6].

The RED approach was developed in 2002 by W.H.O, UNICEF, USAID and CDC to address common obstacles to increase immunization coverage [7]. And Ethiopia was one of the first African countries selected for implementation. In Ethiopia RED was first introduced in 13 highly populated priority zones and then scaled up phase by phase to all zones. RED has five operational components: re-establishing of outreach, supportive supervision, monitoring for action, linking services with the community, and planning and management of services [5].

Now a day's Ethiopia, the routine immunization services have been provided to children under - one year of age for the eight vaccine preventable childhood diseases (tuberculosis, poliomyelitis, tetanus, diphtheria, pertussis and measles, homophiles influenza (Hib), hepatitis B (Hep B), and tetanus Toxoid is given to women of childbearing age. The schedule for child and TT immunization is in accordance with the WHO recommended schedule for developing canterers [1, 3]. The program had been planned to make immunization services available to 10% of the population in 1980 and to increase immunization access by 10% each year and reach to 100% coverage [10].

A number of evaluations have been carried out to identify knowledge, attitude and practice of population towards EPI [6].

The global universal Childhood Immunization initiative goals for Routine Immunization (RI) are 80% coverage (Immunization) [11]. It has been shown that in 2007 approximately 27 million infants were not vaccinated against common childhood diseases, such as measles or tetanus. In the same year, 24 million children were not being reached with vaccines and over 10% of children under one year old in developing countries were not receiving with vaccines and over 10% of children under one year old in developing countries were not receiving even one dose of DPT vaccine, compared with 2% in industrialized countries [10].

Between 5 years ranged 1998-2002, it was found that the immunization coverage of Lao PDR was very low, as shown on its average values, BCG, OPV3, DPT3 and Measles coverage were 57.8, 58.6, 53.6 and 53.2 respectively. With regard to Pakistan, in 1980 the immunization coverage was 20% which increased to 51% in1990 [6, 12].

Whereas Immunization coverage in the case of South Asia has increased from about five percent in the 1970s to nearly 50% at present but still half of the children remain un-immunized [7].

In the United Arab Emirates (UAE), vaccination coverage is high due to a rigorous follow-up programmed; in 2006, coverage for BCG was 98% while for both the pentavalent (DPT/HBV/Hib) and the measles-mumps-

rubella (MMR) vaccines, coverage was 92%, and in 2008, average immunization coverage was more than 90% [13].

The WHO Africa regional office estimated that about five million children were un-immunized for DPT3 in 2007. Thus, the challenge of meeting the EPI goal is not only limited to a few countries, many countries in Africa are struggling to meet the immunization targets [14].

Among the 29 sub-Saharan countries survived, full childhood immunization coverage varies widely from only 11% of children of age 12-23 Months in Chad to 78% in Zambia [15].

Although estimated global routine measles vaccination coverage reached 82% in 2007, in 2007, nearly 23.2 million children were unvaccinated, of which 15.3 million (65%) resides in eight countries mainly in Africa, from these 1 million of them live in Ethiopia [10]. A national household survey carried out in 1995 in the Democratic Republic of Congo (DRC) , noted that the EPI was far from reaching its target, as the routine coverage was as low as 57% for BCG, 27% for DPT3, 28% for OPV3 and 39% for the measles vaccine [16].

Ethiopia, in 2010 has an aggregated coverage rate of 61-75%, well below the international standard (WHO: Expanded program on immunization). In this country, regional coverage ranges from 4-92% (WHO: expanded program on immunization) (11a). In Ethiopia, the 13 RED zones reported a 47% increase in DPT3 coverage by administrative records in 2004 over 2003, while the increment was 29% for RED zones [16, 17].

In the national EPI coverage survey in 2001 national DPT3 coverage was 56% by card plus history (8). Welfare Monitoring survey in 2004 (WMS - 2004) reported a national DPT3 coverage of 50.3% (card plus history) for 12-23 months of children at the time of the survey [9]. The Ethiopia Demographic and Health survey (EDHS) in 2005 reported that by card plus history 29% of children aged 12-13 months had been vaccinated for DPT3 before the age of one year [10]. The EDHS 2005 reported coverage was much lower than the 2004 administrative coverage of 61% from regular reports [17, 18].

The Ethiopian Demographic and Health Survey (EDHS) 2005 revealed only 20% of children 12 -23 months of age were fully vaccinated and 24 of children did not receive any vaccination. Children were more likely to be vaccinated the first doses of vaccination than the third and the fourth doses in which 60% of children received BCG and from these only 35% of them received measles vaccine and this shows that there is a high rate of drop out from vaccination [10]. According to the 2006 national EPI survey in Ethiopia, only 50% of the children were fully immunizes, with wider variations from one region to another. These shows, half of the children were not fully protected. With regard to each vaccines, the BCG, DPT1, DPT3, measles and FIC coverage before the age of one year by card plus history was 83.4%, 84.3%,54.3% and 49.9% respectively in Ethiopia in 2006[16].

According to a study done in ambo, Ethiopia in 2011, 35.6%, 40.7% and 23.7% were children less than two years who were fully vaccinated, partially vaccinated and unvaccinated respectively. In addition, immunization coverage by routine vaccination was less than 20% with card and less than 50% with card and history [10].

The objective of this study was to assess factors affecting utilization of EPI service among mothers in Adi/remets town, Welkiet woreda, Humera zone, North West Ethiopia

Methods

An institution based cross – sectional study was done on awareness, utilization and factors associated with EPI among mothers was conducted in Adi-remetse town, which is one of sub-urban of Humera Zone, North west Ethiopia. The town is located 114 kms away from Humera, the capital of the zone, on the way to Dansha. The town has total population of 5,817 people while the health center has 5,017, People in its catchment area. The health center also has 9 administrative staff which is 1 accountant, 1 cashier, 1deiver, 3 Guards, 2 Janitors and 1 store man.

Vaccination is given both at 1 static and 17 out – reach sites among which only 10 are accessible to transportation during rainy season. Data was collected from Feb, 19-29/2013 Institution based study cross-sectional was conducted to assess the awareness and factors affecting utilization of EPI. The source population was all reproductive age group women with their children who came to the health facility during the study period. The sample size was determined using single proportion formula, and the final sample size was 294.

All eligible participants came to the health center with their children were consecutively interviewed until the sample size was saturated. All necessary data was collected by face to face interview of the respondents using structured and pre-tested questionnaire. Vaccination card and BCG-scar will be reviewed for history of vaccination. After the data collection, Data analysis was coded and entered to SPSS version 16. For the presence or absence of an association between the study variables, the chi-square test was employed

Letter of permission was taken from JU, ethical clearance committed and submitted to the Adi-remets woreda Health office. And then the woreda health office will write a letter of cooperation to the health center, then Oral consent was obtained from the each study participants. Study subjects were well informed about the purpose of the study by the interviewers as relates to the six vaccine preventable diseases [17-19].

RESULTS

Out of the two hundred and ninny four study population, the questionnaires responded by fifteen (4.9%) mothers were rejected out from analysis due to inconsistency in response, which makes the total response

rate to be 95.1%. From the 294 mothers interviewed 74% were Orthodox, while 25.8 Muslims by religion. The age range of the mothers varies from 15 to 49 year. Accordingly, 22.1% were 15-49 years old, 52.7% 20-34 years, while 25.1% were 35-49 years old.

Out of the same number of mother interviewed 97.6 were tigriss followed by 7% Amharas by Ethnicity. As to the marital status of the mother , 88.1% were married 7.1% divorced , while only 0.3% mothers live separated from her husband .Educationally 41.5% of the mothers were illiterate , 3.8% were able to read and write , while only 2.4% of the mothers had above 10th grade Educational level. Like most others Ethiopians, majority of the women were confined to home and house hold activities occupationally .Accordingly, 92.2% were house wives, while 2.7% were government employees and students each. Merchant mothers coverage the remaining 2.4% of the mothers by occupation. So long as income level is concerned, 82.7% had income, <200birr per month, 11.2% had income between 200-400 birr per month, while only 6.1% had income >400 birr per month. The average number of children alive now per house hold was found to be four. As there is no electrical power supply in the town, the main stay of mass media was radio. Accordingly while 78.9% of the respondents had radio, 21.1% had not any means of media (Table 1).

Out of the respondents ,78.2% had had antenatal visit during the last pregnancy ,while 12.6% were pregnant at the time of the interview .From the same number of pregnancy,280(95.2%) have at least once taken their index child to nearby health facility where vaccination is available out of which 270 have vaccinated their index at least once. From the mothers whose index child was vaccinated at least once, 85.2% had vaccinated card, while14.8% didn't .From the mothers who did not have vaccination card, and maternal history was the mainstay of information for their vaccination status. As to the 294 index children aged 12 – 23months, 51.4 were males, while 48.6% were females. Accordingly, the male to female ratio was 1:1:1.

Out of the same total number of children 67% were fully immunized (DPT3,measles) and 78% were vaccinated against measles .the number of children with three doses of DPT,OPV,PCV were 82.6% While the overall dropout rate was 24.6% ,the drop-out-rate between DPT3/PCV3/OPV3 and measles was 19% .From the 280 children who visited the nearby health facility , then

returned without any vaccination and this makes the missed opportunity rate to be 3.6% (Table 4).

The four main reasons indicated by the mothers for not vaccinating and /or defaulting their children from vaccination ere un awareness of EPI (35.1%) ,unawareness of the need to return (31.9%), child too sick (19.6%) and family problem (13.4%). Knowledge about EPI, attitude towards EPI and attitude towards vaccination were the other maternal variables assessed. Accordingly form the 294 mothers, 68.4% have knowledge about EPI (know at least of the 8 VPDs), 97.6% positive attitude towards EPI, while 94.4% have positive attitude towards the vaccinators .As to the general benefit of EPI, 82.3% replied that vaccination is given to protect diseases, 11.6% answered to cure a disease, while 6.1% don't know the general use of vaccines. Concerning to the benefit of maternal vaccination, 49.6% of the mothers replied that TT is used to protect both the mothers and new born from tetanus while 33.3% said to cure a disease .As to the frequency of maternal vaccination, 8.5% replied that TT is given only once , while 65,9% replied that the vaccine is given for a total of five times .

Two hundred one (68.4 %) of the mothers who have knowledge about EPI were also asked about the source of their information. Accordingly, while 96.5% replied that their sources were health workers, neighbors and friends contributed for 0.5 each. Out of the 270 mothers who vaccinated their index child at least once, 76.3% have got health information on adverse effects of vaccines by vaccinators, while 23.7% didn't have any information.

From the 294 mothers interviewed 91.8% (270) were vaccinated against tetanus at least once. Accordingly, while 12.2 % of the vaccinated mothers are on TT1, 87.8% have got two and more does of TT vaccine. On part of the pregnant and non pregnant TT immunization status, while 81.1 % of the pregnant mothers have taken two and more dose of TT, 80.5 % of the non pregnant had TT2+ .Lack of information, fear of adverse reaction and lack of interest were the reason cited by the mothers for their own immunization failure.

In this study, selected parental socio-demographic characteristics and children's sex were computed for their association with immunization status of the study population. Accordingly, while ANC follow up knowledge about EPI and availability of radio were the variable statically associated with children's immunization status, ANC follow up availability of radio were also associated with maternal immunization (P. value < 0.05). (Table 5,6,7,8)

Table 1. Frequency of maternal socio-demographic variables, Adie-remetse town, Humera zone, Tigray region, North-west Ethiopia, 2012/2013.

S.No	Maternal Variable	No	%
1	Religion		
	➤ Orthodox	218	74.1
	➤ Muslim	78	25.8
	Total	294	100

2	Age distribution		
	➤ 15 – 19	65	22.1
	➤ 20 – 34	155	52.7
	➤ 35 – 49	74	25.1
	Total	294	1
3	Ethnicity	287	97.6
	➤ Tigrers	7	2.3
	➤ Amhara	294	99.9
	Total		
4	Marital status	4	1.4
	➤ Single	258	87.8
	➤ Married	21	7.1
	➤ Divorced	10	3.4
	➤ Widowed	1	0.3
	➤ Separated	294	100
5	Educational status	122	41.5
	➤ Illiterate	26	8.8
	➤ Read and write	77	26.2
	➤ 1 – 6	34	11.6
	➤ 7 – 8	28	9.5
	➤ 9 – 12	7	2.4
	12+	294	100
6	Occupational	271	92.2
	➤ House wife	8	2.7
	➤ Students	8	2.7
	➤ Gov't employee	7	2.4
	➤ Merchant	294	100
7	Income level	155	52.7
	➤ < 100	88	30
	➤ 100 – 200	33	11.2
	➤ 201 – 400	18	6.1
	➤ >401	294	100
8	Availability of Radio	232	78.1
	➤ Yes	62	21.1
	➤ No	294	100
	Total		

Table 2. Frequency of maternal ANC follow up during the last pregnancy, Adi-Remtse town, Humera zone, Tigray region North-West Ethiopia, 2012/2013.

ANC follow up	No	%
Yes	230	78.2
No	64	21.8
Total	294	100

Table 3. Frequency of maternal ANC follow up during the last pregnancy, Adi-Remtse town, Humera zone, Tigray region, North-west Ethiopia, 2012/2013.

S.N	Immunization card	No	%
1	Available	230	85.2
2	Not available	40	14.8
3	Total	270	100

Table 4. Frequency distribution of children 12 -23 months of age by immunization status Adi-Temtse town, Humera zone, Tigray region, North-west Ethiopia, 2012/2013.

S.N	Immunization Card	No	%
1	BCG	270	91.8
2	DPT1,OPV1,PCV1	270	91.8
3	DPT2,OPV2,PCV2	250	85.03
4	DPT3,OPV3,PCV3	243	82.6
5	Measles	230	78
6	Fully Vaccinated	197	67
7	Overall drop out	73	24.8

Table 5. distribution of certain maternal socio- demographic characteristics and their association with immunization status of children 12-23 months, Adi-Remtse town, Humera zone, Tigray region, North –west Ethiopia, 2012/2013.

S.No	Variable	Fully immunized				X2	df	P.value
		Total		yes	No			
		yes	No					
1	Religion					0.176	2	>0.10
	✓ Ortodox	147	71	218	69			
	✓ Muslim	50	26	76	21.8			
	Total	197	97	294	100			
2	Age					2.33	2	>0.10
	✓ 15-19	53	12	65	22.1			
	✓ 20-34	110	45	155	52.1			
	✓ 35-49	34	40	74	25.1			
	Total	197	97	294	100			
3	Marital status					0.078	3	>0.10
	Single	1	3	4	1.4			
	Married	176	83	259	88.1			
	Divorced	12	9	21	7.1			
	Widowed	8	2	10	3.4			
	Total	197	97	294	100			
8	Knowledge about EPI					27.6	1	<0.005
	Yes	180	21	20	68.4			
	No	17	76	93	31.6			
	Total	197	97	294	100			

Table 6. Association between maternal age and their attitude towards EPI, Adi-Remtse town, Hum era zone, Tigray region, North -west Ethiopia, 2012/2013.

Maternal age	Attitude towards EPI		Total		X2	df	P.value
	Positive	Negative	No	%			
15_19	64	1	65	22.1	0.1	2	>0.10
20_34	153	2	155	52.7			
35_49	70	4	74	25.2			
Total	287	7	294	100			

Table 7. Association between sex of children 12_23 months of age and fully immunization, Adi-Remtse town, Humera zone, Tigray region, North-west Ethiopia, 2012/2013.

Sex	Fully immunized		Total		X2	df	p-value
	Yes	No	No	%			
Male	110	42	152	51.7	0.87	1	>0.10
Female	87	55	142	48.3			
Total	197	97	294	100			

Table 8. Association between certain maternal variable and TT2+ immunization status, Adi-Remtse town, Hum era zone, Tigray region, North-west Ethiopia, 2012/2013.

Variable	TT2		Total		X2	df	p.value
	Yes	No	No	%			
EPI attitude							
• Yes	237	50	287	97.6	0.34	1	>0.10
• No	0	7	7	2.4			
Total	237	57	294	100			
Availability of radio							
• Yes	208	24	232	78.9	6.17	1	<0.025
• No	29	33	62	21.1			
Total	237	57	294	100			
ANC follow up							
• Yes	210	20	230	78.2	8.17	1	<0.005
• No	27	37	64	21.8			
Total	237	57	294	100			

DISCUSSION

When the result of this study is compared to the studies done in three selected administrative region of Ethiopia and to a similar study in Tsegedae woreda, which showed 63.2 % and 37 % fully immunized respectively, the result obtained in this study is a dig higher 28.4 .the behavioral changes of the community obtained through in this study area could be possible explanation for this difference in addition to the above mentioned reasons. The number of fully immunized children in this study is also much higher compared to the result obtained Hum era zone hum era pediatric department hospitals which showed 36.4 % fully immunized [19]. This variation is result could be attitude to the age variation of the children incorporated in the two study areas. The overall dropout rate in this study was found to be 24.8%. This rate is fairly less than the 1990’s national dropout rate which was 36% [20].

Similarly the dropout rate is less than that which was observed in Tsegedae woreda, which showed 39% drop out rate [20]. As earlier above, and the possible explanation for the difference. In the study TT vaccination coverage was determined for pregnant and non pregnant mothers .Accordingly 81.1% of the pregnant and 80.5% of the non pregnant mothers were on TT2+ .The total number of TT2+ coverage to both pregnant and non pregnant mothers was 237(80.6%).This figure is much higher compared to the 2000/2001 national converge of TT2+ for

pregnant and non pregnant mothers, which was 29.3%and 14.85% respectively. The result is also much higher when compared to the 2000/2001 TT2+ coverage for pregnant and non pregnant mothers of Tigray region which was 29.5% and 10.8% respectively [21].

CONCLUSION

In this study only 67% of the children were fully immunized leaving 24.8% overall dropout rate and 8.2% having no even a single vaccination. Hence, these 33% of the children could be targets for any of the six VPDs. Even if maternal TT2+ coverage is 80.6% ,the fact that the other 19.4% are not vaccinate could put both the mothers and new born at risk of contracting tetanus. Similarly, unawareness of some of index children mothers on immunization schedule for their children and them solves, unawareness of EPI on the eight VPDs could lead to low utilization or an increased dropout rate. The fact that some of the mothers did not keep their immunization card could lead to difficulties in evaluation of immunization status. On the health personal technical point of view 23.7% (64/270) of the children who got BCG did not have BCG scar. On the other hand un awareness of some of the mother on vaccine side effect would lead the mothers to think that vaccination could cause suffering of their children and hence increasing the dropout rates.

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