PREVALENCE OF DIARRHEA AND ASSOCIATED FACTORS AMONG CHILDREN UNDER-FIVE YEARS OF AGE IN ENDERTA WOREDA, TIGRAY, NORTHERN ETHIOPIA, 2014

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ABSTRACT

Background: Acute diarrhea is defined as experience of three or more watery stools, with or without blood, in 24 hours period. It is a leading cause of mortality and morbidity in children under the age of five in developing countries. On the African continent, diarrhea cause more child deaths than Malaria, HIV/AIDS, and measles.

Objective: the aim of this study was to assess the prevalence of diarrhea and its associated factors among children under-five years of age in Enderta woreda, Tigray, Ethiopia.

Methods: Community based cross-sectional study was used among 295 mothers or care givers of children in Enderta woreda, seven tabia/sub-districts and study participants were selected using systematic random sampling technique by considering proportional to size allocation. Data was entered and cleaned using SPSS version 20. A binary logistic regression with 95% CI was used to see the association between the dependent and independent variables. Finally the results were presented by figure, table and text.

Result: A total of 295 mothers were participated in the study with a response rate of 278(94.23%). From 278 participants, 150(54%) child's had acute diarrhea. only family income and current breast feeding status of the child were significantly associated with diarrhea (AOR at 95% CI, 0.59(0.21-1.65) and (AOR at 95% CI, 0.36(0.16- 0.80) respectively.

Conclusion: in this study, prevalence of diarrhea among under- five children was 35.6%. Income and current breast feeding status of the child were strongly associated with diarrhea among under -five children. These problems could be alleviated in the long run by integrated efforts of governmental and non-governmental organizations.

Key words: Acute diarrhea disease, under 5 years of children, associated factor

INTRODUCTION

Acute diarrhea means the experience of loss stool three times in day which occurs for less than 2-weeks duration. Diarrhea is the leading causes of mortality and morbidity in children under the age of five years in developing countries. it is caused by ingesting certain bacteria, viruses or parasites found in fecal matter which may be spread through water, food, hands, eating and drinking utensils, flies, and dirt under fingernails(1). Child health is one of the important indicators that show the socio-economic status of the population and the country. The government of Ethiopia has formulated a number of strategies that provide a frame work for improving child health. It is one of the agendas in Health sector development plan (HSDP) IV which stipulates improving child health, with a goal to reduce the under-five mortality rate to 68 per 1000 live births and the infant mortality rate to 31 per 1,000 live births by 2015 (2).

International efforts to combat this world wide problem include the recent diarrheal disease control programme, whose objectives are to reduce diarrheal morbidity and mortality (3). In order to have a continuous monitoring activity over this programme, quantification of the current incidence of diarrheal illnesses and the associated mortality is needed. Previous estimates of morbidity and mortality have been extrapolated from the results of a limited number of studies without attempting to evaluate such factors as frequency of surveillance, size and location of study population, and definition of diarrhea used (4).

Diarrhea remains a major cause of mortality in children under 5 years of age in Sub-Saharan countries in Africa. Risk factors for acute diarrhea vary by context and have important implications for developing appropriate strategies to reduce the burden of the disease. Diarrhea occurs worldwide

and causes 4% of all deaths and 5% of health loss to disability. In Africa, it is responsible for 7.7% of all deaths. It is associated with 2.2 million deaths globally each year, most of whom are children under five years of age in developing countries. Each year there are approximately 4 billion cases of diarrhea worldwide (5). Comparing the percentages of death due to the major killer diseases globally, diarrhea (14%) cause more child deaths compared to malaria (8%), HIV/AIDS (2%) and measles (1%) combined. On the African continent, pneumonia (14%) and diarrhea (17%) cause more child deaths than Malaria (16%), HIV/AIDS (4%), and measles (1%) combined (6).

In the 2011 EDHS mothers were asked whether any of their children under age five had diarrhea at any time during the two-week period preceding the survey. If the child had had diarrhea, the mother was asked about feeding practices during the diarrheal episode.

Diarrhea prevalence was highest among children residing in households that drink from unprotected wells (18%), those residing in rural areas (14%), and children residing in Benishangul-Gumuz and Gambela (both 23 %) (7).

The importance of this research is to highlight the prevalence and its associated factors of acute diarrheal disease among under-five year old children in Enderta woreda. Its findings will contribute to those concerned about caring and improving the lives of under-five children and helping them to their full potential.

In addition, the information which will be obtained from this research about acute diarrheal disease among under-five children can be useful in devising effective educational programs for reducing the problem in high-risk segment of the population.

Similarly this research will contribute to policy makers, stake-holders and program initiators on possible and actionable services required to improve the situation of these children which can help for decision making.

METHODOLOGY

SETTING

This study was carried out in Enderta woreda which is in south-east Tigray zone, northern Ethiopia and it is located at 783 km from Addis Ababa, capital city of Ethiopia. There are seventeen tabia/sub-districs in the woreda with total population of 109,419 which is projected according to bureau of economic and finance development 2010. Among this population 16,270

are <5 years age children. The population in Enderta woreda has low consumption of water. Majority of them were peasants living by farming and fewer were merchants. Community based cross-sectional study was used and it was conducted from January to May 2014.

The source population was all caregivers with children aged less than 5 years old in all Tabias of Enderta woreda; study population was sampled mothers or caregivers of children aged less than 5 years in the selected Tabias of Enderta woreda

To determine the sample size for this particular quantitative study, a single population proportion formula was used considering the following assumptions.

Assumptions: A 95% confidence level, margin of error (0.05). Since the prevalence of diarrheal disease at age 0 -5 years among children in southern Ethiopia, in Arba-Minch district was 22.5% (8).

So this prevalence was used to obtain the possible sample size of the study area. The above assumptions are substituted in the following single population proportion formula.

$$n = \frac{z^2 p(1-p)}{d^2}$$

Where   n = required sample size for this cross sectional survey

z = Percentiles of the standard normal distribution corresponding to 95% confidence level which is equals to 1.96.

P = Prevalence of acute diarrhea disease in southern Ethiopia, in Arba-Minch district (22.5 %) (26).

d = 0.05 (5% margin of error)

$$n = \frac{1.96 * 1.96 * 0.225(1-0.225)}{0.05 * 0.05}$$

n =268

So the sample sizes was 268 and by considering 10% of non-response rate a total of 295 mothers or caregivers of children were selected for the study. From all tabias, seven tabia were selected by simple random sampling .Based on the average household of each tabia, study participants were selected using simple random sampling technique by considering proportional to size allocation. The data was collected using structured self administered questionnaires. Data collectors were 3 nurses and 4 Health Extension workers that work inside the study area they were recruited and trained for one day by the principal investigator.

The training consists of how to take informed consent, how to approach participants, ethical procedure and general information on acute diarrheal disease and the objective of the study. Another 1BSc nurse and 1 health officer were assigned as supervisor to check for the daily activity, consistency and completeness of the questionnaire and to give appropriate support during the data collection process. Each questionnaire filled was checked for completeness of the information jointly by the facilitators.

Data collected through quantitative method was processed and analyzed. To analyze the quantitative data, different statistical techniques were used by computing using SPSS version 20. Percentage, cross tabulation, binary logistic regression techniques were used to analyze those computed data. The cross tabulation and percentage was used to describe the prevalence and level of diarrheal disease in Enderta woreda. Binary logistic regression was also be used to identify and examine the association between the dependent variable and independent variables.

The questionnaire was originally prepared in English language and then translated to Tigrigna and again retranslated to English by language experts for consistency. The questionnaire was pre-tested on 5% of the study population in non-selected tabia two weeks before the actual data collection to ensure appropriateness of the questionnaire about content, consistency, language was checked and modified after the pretest. Every day the filled questionnaires were checked before a respondent went from the setting by data collectors and supervisors. Training was provided for data collectors and supervisors for data accuracy and completeness. The principal investigator was also officially communicated and controls the data collection procedure by supporting the supervisors and data collectors.

After data collection, data was stored in a secured place to maintain confidentiality and backup of the data was stored in different areas not to lose the data. Each questionnaire was coded separately before analysis.

Dependent variables: Acute diarrheal disease

Independent variable-Socio-economic factors: Income, parental education, parental occupation, religion, number of children, marital status, age, sex.

Environmental Factors: Types of water source, distance to water source, daily water consumption, availability of latrine, refuse disposal, number of rooms, livestock in house.

Behavioral Factors: Methods of water storage, methods of water drawing, feeding practices, duration of breast-feeding, time of introducing supplementary feeding.

Data were analyzed using SPSS version 20 software statistical package. Statistical significance was was defined as $p<0.05$.Odds ratio were also calculated, bivariate and multivariate analysis were executed using logistic regression. Ethical clearance was obtained from the Mekelle University, College of Health Sciences, and Institutional Ethical Review Committee. Formal letter of permission was obtained from Mekelle University and Tigray Health Bureau to the respective Enderta woreda health office, tabia/kebelle administration. The importance of the study was explained to the participants of the study. For this consent was attached on the cover page of each questionnaire and it was explained to study participants that participation is voluntary and confidentiality and private information was protected. The right of the respondent to withdraw from the interview or not to participate was respected. The information collected from the study subjects were kept confidential and it was used only for study purpose.

RESULT

SOCIO-ECONOMIC DETERMINANTS OF DIARRHEA AMONG CHILDREN UNDER FIVE YEARS AGE IN ENDERTA WOREDA, 2014.

The data collection was accomplished with 278(94.2%) from 295 respondents. Out of the total 278,149(53.6%) female and 129(46.4%) male children, 0-5(13.7%), 6-11(18.3%), 12-23 and >35 (23.4%),24-35 (21.2%) months . Concerning to residence 197(70.9%) and 81(29.1%) are from semi-urban and rural areas respectively. In terms of religion 275(98.9%) are Orthodox Christian. From the total respondents, 32(10.2%) of them are married and 273(86.9%) are single. fellow currently schooling of the child 28(10.1%).

FACTORS ASSOCIATED WITH ACUTE DIARRHEA AMONG CHILDREN UNDER-FIVE YEARS OF AGE

In multi-variable analysis, only family income and current breast feeding status of the child were significantly associated with diarrhea among under-five children. The Odds of having diarrhea in children was 0.38 among family with income < 500 ETB compared to those families with income of greater than 1000 ETB.

Table 1. Socio-economic determinants of diarrhea among children under five years.

Variables	Diarrhea (N = 278)	
	Frequency	Percent
Residence		
Semi-Urban	197	70.9
Rural	81	29.1
Age of child (in month)		
0-5	38	13.7
6-11	51	18.3
12-23	65	23.4
24-35	59	21.2
>35	65	23.4
Education of mother/caregiver		
Primary	126	45.3
Secondary	18	6.5
Technical/Vocational School	30	10.8
University/College	45	16.2
Occupation of mother/caregiver		
Student	6	2.2
Government	19	6.8
Private	50	18.0
Unemployed (Farmer)	203	73.0
Sex of the child		
Male	149	53.6
Female	129	46.4
Monthly Income of the Family in Eth.Birr		
< = 500 ETB	165	59.4
500- 1000 ETB	83	29.9
>1000 ETB	30	10.8
Currently Schooling of the Child		
Yes	28	10.1
No	250	89.9

mothers/caregivers knowledge related factors, information of the index child associated with acute diarrhea in children under-five years old in Enderta woreda, Northern Ethiopia. In this study prevalence of diarrhea in under-five children was 35.6%. This was higher than the study conducted in Arba-minch district, Kefa sheka, Dabat district, Wolayta which was 22.5%, 15%, 11.4% and 14.4% respectively (5, 7, 8, and 9). This difference might be due to cultural and socio-economic difference between these two study areas. Such high rate of childhood diarrhea indicates the need for more attention despite considerable improvements in water sources and sanitation facilities. The importance of refuse in transmitting diarrhea pathogens has been documented in this study. Open disposal of refuse around the house was an independent risk factor for diarrhea. This was in line with other studies conducted elsewhere [10].
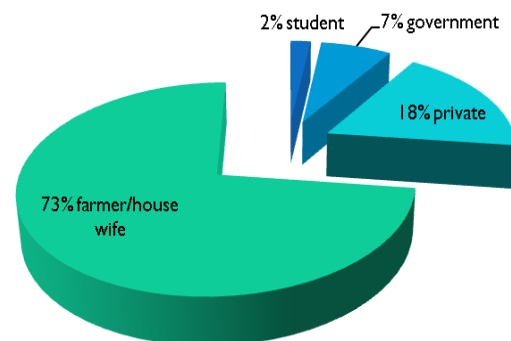

Figure 1- Occupation of Mothers/care givers in under-five children.

The study showed that diarrhea was significantly associated with children in the age groups 6 - 11 months and 12 - 23 months compared to children aged above 35 months. This finding was in line with other studies (8). The peak prevalence of diarrhea at the age of 6 - 11 months can be explained by the introduction of contaminated weaning foods [11]. In addition, crawling starts at this age and the risk of ingesting contaminated materials may cause diarrhea. The risk of diarrhea decreases subsequently after 6 - 11 months; this was probably because the children begin to develop immunity to pathogens after repeated exposure [13].

Education, age of child, and ethnicity not statically significant (12) .This could be attributed to the fact that the lack of access to water and sanitation facilities in the rural areas was more than in the urban areas [9].

In this study, diarrhea was significantly associated with the presence of two or more under

With 0.38(0.15-0.99) 95%CI, But there was no significant association between 500-1000 ETB and diarrhea among under five children with 0.59(0.215-1.65) 95%CI.

In addition the odds of having diarrhea was 0.351 among mothers with exclusive current breast feeding compared to mother with no current breast feeding with 0.35(0.15-0.81).

In this study there were no significant association in cover of container of water 0.49(0.16-1.52)95%CI measles vaccination status, (Mothers/Care givers response by verbally 1.28(0.40-4.07) 95%CI), and (by checking the card 0.85(0.32-2.30) 95%CI).

DISCUSSION

This study investigated the prevalence and socio- economic, behavioral factors,

Table 2. Factors associated with acute diarrhea among children under-five years.

Variables	Frequency	COR (95%) CI	AOR(95%)CI
The drinking water storage container have a cover			
Yes	262	0.51(0.17-1.52)	0.49(0.16-1.52)
No	16	1	1
Family income in ETB.			
<=500ETB	165	0.28(0.11-0.68)	0.59(0.21-1.65)
501-1000ETB	83	0.41(0.16-1.08)	0.38(0.15-0.99)*
>1000ETB	30	1	1
Current breast feeding status of the child			
Exclusive breast feeding	38	0.36(0.17-0.76)	0.36(0.16-0.80)*
Partial breast feeding	112	0.64(0.38-1.07)	0.70(0.40-1.19)
Not breast feeding	128	1	1
Childs Measles vaccination			
Yes by the respondent	47	1.69(0.56-5.11)	1.28(0.40-4.07)
Yes by checking the card	211	1.20(0.47-3.04)	0.85(0.32-2.30)
No	20	1	1

five children in the family. This is in agreement with a study done in Arba-minch district [8].

This might be due to the incapability of the mothers/caregiver to care for a large number of children.

In sum, childhood diarrhea remains an important health concern in the study community. Occurrence of diarrhea could be decreased by interventions aimed to improve sanitation, hygiene.

In this study, an overall child have diarrhea within the last 14 days prevalence rates of diarrheal diseases among children under age of 5 years were found to be 35.6%. This might be the result of the decline in maternally acquired antibodies and the introduction of weaning foods that are given in unhygienic way in semi-urban and rural areas. In addition, crawling usually begun at this age and the risk of putting contaminated materials and fingers in the mouth during teething was high especially in semi-urban and rural environments where these fingers are usually contaminated due to improper personal hygiene. In higher age groups, lower rate may be because the children have started adapting the environment and food habits and the immunological system development to a large extent.

STRENGTH AND LIMITATION OF THE STUDY

Strength of the study

✓ The high response rate to the survey interviews (94.2%)
✓ Hopefully, it will be a base line data for other researchers who are interested for further

research in the area as it is not done before in the study area.

Limitation of the study

➢ It is difficult to entertain the seasonal differences in the occurrence of diarrheal diseases.
➢ The information on the prevalence of diarrhea may not reflect the actual situation that may be observed in the various seasons of the year, as the information on diarrhea was collected in January, which is a dry season.
➢ There may be difference among mothers/Care givers in perceiving their child's health.

And, the definition of diarrhea given by mothers shares this difference in perception.

This was considered during the design, and it was tried to give the definition of diarrhea to the mothers or caregivers.

CONCLUSION

In this study, prevalence of diarrhea among under- five children was 35.6%. Income and current breast feeding status of the child were strongly associated with diarrhea among under - five children.

Even though poor environmental conditions are generally believed to increase the risk of diarrheal disease, the majority of the environmental variables included in this study showed no significant association with diarrhea disease. In addition, there was no association with cover of the container and immunization status for measles.

RECOMMENDATION

As seen in this study, mothers/caregivers knowledge, behavioral factor and poor environmental conditions are associated with the occurrence of acute diarrhea in children. These problems may be alleviated in the long run, by integrated efforts of different sectors. However, there are activities that can be performed before long-term solutions are obtained. Taking this into consideration, the following recommendations are forwarded based on the findings of the study.

- ✓ Providing simple and "easy to understand" information to the mothers/caretakers on how to care for a child especially during they (mothers) are ill.
- ✓ Strength and incorporate family planning service activities in the prevention of childhood diarrhea.
- ✓ Improve the environmental condition at the household level by providing continuous information and minimal material support.
- ✓ Further study to identify the possible factors that are responsible for the high prevalence of diarrhea in semi-urban and rural areas for proper interventions.

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