Assessment of the Management of Diarrhea in Children Under Five in Health Centers of Addis Ababa City Administration, Ethiopia

By Arega Gashaw

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This is to certify that the thesis prepared by Arega Gashaw, entitled: "*Assessment of management of diarrhea in children under five in health centers of Addis Ababa city administration, Ethiopia*" and submitted in partial fulfillment of the requirements for the Degree of Master of Pharmacy in Pharmacy Practice complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

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Examiner: Dr. Workineh Shibeshi (PhD, Associate professor)

Signature _____Date _____

Examiner: Dr. Muluwork Tefera (MD, Assistance Professor of Pediatrics)

Signature _____Date _____

Advisor: Dr. Teshome Nedi (PhD)

Signature _____Date _____

Advisor: Dr. Tigist Bacha (MD, MPH, Assistant Professor of Pediatrics)

Signature _____Date _____

_____

Head of Department

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ABSTRACT

Assessment of the management of diarrhea in children under five in health centers of Addis Ababa city administration, Ethiopia

Arega Gashaw

Addis Ababa University, 2015

Despite the progress made in reducing mortality in children, diarrhea continues to be a major cause of hospitalization and death of young children and has major economic consequences. Diarrhea is a condition for which high rate and misuse of drugs is common. The purpose of this study was to assess the management of diarrhea in children under five in health centers of Addis Ababa city administration, Ethiopia**.** Cross sectional study was conducted between September 1, 2014 and February 30/2015. An appropriate data extraction format was used to extract relevant information. Epi data was used for data entry and SPSS 20 was used for data analysis. A logistic regression was employed to examine the association between variables. A total of 803 children with diarrhea were enrolled. Of these 54.4 % had got inappropriate managements. At least one antimicrobial was prescribed to 588 (73.2%) of all children who attend the health centers. ORS and zinc were prescribed to 66.7% and 47.5 % respectively. Regarding appropriate management based on stool characteristics, children with bloody diarrhea 6.38 times more likely (AOR= 6.38(3.11, 13.63) to receive appropriate diarrhea management compared to children mucous diarrhea ($p<0.05$; OR=6.38(3.11,13.63) and the odds of appropriate management of diarrhea for children with watery diarrhea were 77 % less compared to children with mucous diarrhea (OR=0.23(0.13, 0.88)). The odds of appropriate management of diarrhea for children with 2-11 months were 54 % less compared to children 12-59 months ($p<0.05$; OR=0.46(0.24, 0.90). Based on the findings of the study, it can be concluded that health professionals are not strictly follow the guidelines with respect to the use of ORS, zinc and antimicrobials in management of diarrhea. Antimicrobial prescription rate were high whereas low rate of prescription rate in ORS and zinc regardless the type of diarrhea, stool characteristics and dehydration status of the children. It is important that interventions to educate clinicians about the dangers of irrational use of drugs and strictly follow the recommended guide lines in the management of diarrhea.

Key words: Diarrhea; under-five children, rational use; assessment; management

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LIST OF ACRONYMS

AURTI	Acute Upper Respiratory Tract Infection
AMR	Antimicrobial Resistance
DHN	Dehydration
E.H	Entamoeba Histolytica
FMOH	Federal Ministry of Health
IMNCI	Integrated Management of Newborn and Childhood Illness
ICCM	Integrated Community Case Management of Common Childhood Illnesses
G.L	Giardia Lamblia
NBD	Non Bloody Diarrhea
NGO	Non-Governmental Organization
O/P	Ova or Parasites
ORS	Oral Rehydration Salts
ORT	Oral Rehydration Treatment
PCV	Pneumococcal Conjugate Vaccine
STG	Standard Treatment Guideline
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USD	United States Dollar
WHO	World Health Organization

1. INTRODUCTION

1.1 Background

Diarrheal disease and its complications remain a major cause of morbidity and mortality in children, especially in developing countries (1). According to the World Health Organization (WHO) and UNICEF report, there are about two billion cases of diarrheal disease worldwide and 1.9 million children younger than 5 years of age perish from diarrhea each year (2).

Management of a child presenting with diarrhea must include a thorough history and examination with evaluation of hydration status, nutritional status and comprehensive clinical evaluation for any complications or associated illnesses so knowledge of etiology and appropriate management is essential (1). Decision then needs to be made on method of rehydration, feeding, and if there are indications for any specialized investigations. Adequate fluid and electrolyte replacement and maintenance are key to managing diarrheal illnesses (3).

As most of the diarrheal cases are viral and self-limiting, it is well established for decades that mainstay of management is based on oral rehydration solutions (ORS) and rational use of antibiotics is justified only in a small proportion (4). Many studies reveals antibiotics are commonly prescribed drugs to treat diarrhea in children under five (5,6). Unrestricted use of antibiotics in diarrhea by healthcare providers is still rampant worldwide, more so in the poor-resource settings (4). Routine prescribing of antimicrobials to patients with acute diarrhea should be discouraged (1). Antibiotic use is recommended only for acute bloody diarrhea/dysentery (6).

Incorrect drug use occurs in the sense of incorrect prescribing as well as inappropriate use by consumers. The irrational use of antimicrobials results in wasting of resources and risks adverse reactions (7). Irrational use includes use of antibiotics for non-bacterial illnesses and non-adherence to recommended dosing regimens, hence preventing desired therapeutic outcomes from being achieved and potentially increasing antimicrobial resistance (8). The inappropriate use of antimicrobials is an extremely serious global problem that is wasteful and harmful (9).

Misuses of antibiotics become a worldwide phenomenon, with emergence of serious infections caused by multi-level antibiotic-resistant bacteria. Infections caused by multi-drug resistant bacteria are associated with higher incidences of mortality and prolonged hospital stay and increase health care costs (10,11).

Antibiotic resistance has increased dramatically in the last 20 years, and very few new products have been discovered, with almost no drug with any new mechanisms of action. Therefore, we are in a very dangerous and fragile situation (11). Improving drug use would have important financial and public health benefits (12).

Irrational use of drugs has been perceived to be a major problem in the Ethiopian health care system for a long time. Among the strategies devised to improve the situation and promote more rational drug use by the Food, Medicine and Health Care Administration and Control Authority (FMHACA) was the preparation and distribution of Standard Treatment Guidelines (STGs) for the different levels of health institutions in the country (13).

The use of treatment guidelines based on clinical presentation is common in developing countries due to unavailability of laboratory services and patient overload (8). In Ethiopia guidelines used are Ethiopian Medicines Formulary, National Standard Treatment Guidelines and the National Essential Medicines List, prepared by Food, Medicine and Health Care Administration and Control Authority of Ethiopia, World Health Organization pocket book of hospital care for children guidelines for the management of common illnesses with limited resources (WHO), and the Integrated Management of Childhood Illnesses (IMCI) (14,15).

In 2013, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) published the integrated Global Action Plan for Pneumonia and Diarrhea (GAPPD), which outlined a framework for ending preventable child deaths due to diarrhea and pneumonia by 2025.

In order to attain these targets, coverage of appropriate diarrhea management must increase to 90% by 2025, and access to sanitation and drinking water should be universal in healthcare facilities and households by 2030 (16).

1.2 Statement of the problem

Despite the progress made in reducing mortality in children less than five years of age, diarrhea continues to be a major cause of hospitalization and death of young children and has major economic consequences (17,18).

According to the World Health Organization (WHO) and UNICEF, there are about two billion cases of diarrheal disease worldwide every year, and 1.9 million children younger than 5 years of age perish from diarrhea each year, mostly in developing countries. This amounts to 18 % of all the deaths of children under the age of five and means that more than 5000 children are dying every day as a result of diarrheal diseases. Of all children deaths from diarrhea, 78 % occur in the African and South-East Asian regions (2).

Ethiopia has one of the highest under-five mortality rates with more than 321,000 children under the age of five dying every year. Of these 20 % of the children die due to diarrheal diseases (14). It is more than the death due to AIDS, malaria, and measles combined (19).

In Europe, it has been reported that about every second a child receives an antimicrobial agent in the community setting throughout a calendar year. Moreover, it has been estimated that about 1/3 of children admitted to the hospital receive at least one antimicrobial agent throughout their hospital stay. A substantial proportion of these antimicrobial prescriptions have to be considered questionable or inappropriate (20).

Diarrhea is a condition for which the misuse of antibiotics is common and is reported from different parts of the world (6). Antibiotics are prescribed at a high rate among provisionally diagnosed diarrhea cases. Indiscriminate use of antibiotics has resulted in increasing resistance to commonly used antibiotics (21).

Antimicrobial resistance is dramatically increasing worldwide in response to antibiotic use; much of it inappropriate over uses and causing significant morbidity and mortality (9). The economic effects of AMR have been estimated, and the findings are disturbing. Rand Corporation estimated that 10 million people worldwide could die from resistant micro-organisms in 2050, which is more than from cancer, and that the cumulative costs from now to 2050 could climb up to USD 1 billion (11). It has been estimated that antimicrobial resistance costs annually USD 4-5 billion in the USA and €9 billion in Europe (9).

The issues of antimicrobial misuse are of global concern, not only because of the spreading and developing resistance of most common bacteria to most antibiotics, but also due to escalating healthcare costs that cause severe financial hardship for the poor in developing countries. Irrational use is wasteful and can be harmful for both the individual and the population (9). It also considered being risks factors for persistent diarrhea (22).

Adverse medicines events are major consequences of irrational use which cause significant morbidity and mortality and rank among the top 10 causes of death in the United States of America (23). They have been estimated to cost € 466 million annually in the United Kingdom of Great Britain and Northern Ireland and up to USD 5.6 million per hospital per year in the USA (9).

A very limited study has been carried out to the management of diarrhea in children under five of age at health center level. So this study can attempt to obtain baseline information of the management of diarrhea in the health centers of Addis Ababa city administration.

This study was done to assess the management of diarrhea in the children under five and to analyze the factors, which encourage people to resort to rational use. The overall aims were to detect baselines information regarding drug utilization pattern, appropriate use of antibiotics, degree of poly pharmacy and comparative study in WHO standard guideline, whether any significant difference were present in usual prescribing trends. This will help the government to influence the appropriate management and rational use of drug. This study aimed to assess the management of diarrhea in children under five of age attending pediatrics clinic of Addis Ababa city administration health centers, Addis Ababa, and Ethiopia.

1.3 Literature review

The main goal in the management of diarrhea is to prevent and treat dehydration (7) and clinical improvement as well as shortening the fecal shedding of the causative pathogen to limit transmission are goal of dysentery management (24).

The Who / Unicef Joint Statement on clinical management of acute diarrhea state that prevention and treatment of dehydration with appropriate fluids, breastfeeding, continued feeding and selective use of antibiotics, will reduce the duration and severity of diarrheal

episodes and lower their incidence (25). The Integrated Management of Newborn and Childhood Illness (IMNCI) guidelines comparing different treatment option based on dehydration status and type of diarrhea (annex 4). According to Federal Democratic Republic of Ethiopia Ministry of Health (FMOH) guideline, the presence of dehydration, blood in the stool and duration of diarrhea should be properly assessed before initiating treatment, since proper assessment guides clinical decisions on the appropriate medications and other therapeutic interventions which best fits with the severity of the dehydration and stool characteristic (14).

The clinical reviews on the acute gastroenteritis take delight in that the most accurate way to assess the degree of dehydration is by calculating the percentage of weight loss. However, a child's weight prior to the episode is rarely known, and it is usually necessary to rely on clinical signs. The level of dehydration will guide decisions either to maintain or adjust therapy (24). Different guidelines on integrated management of childhood illness (IMCI) classifies dehydration as no, some and severe dehydration and determines its treatment according to clinical findings (14,26,27).

Management of a child presenting with diarrhea must include a thorough history and examination with evaluation of dehydration status, nutritional status and comprehensive clinical evaluation for any complications or associated illnesses (1). Early diagnosis and treatment are thus essential to reduce the impact of diarrheal diseases on people affected by disasters. So the use of primary care management tools, such as the integrated management of childhood illness (IMCI) strategy is highly important (24).

Assessing prevalence of antibiotics use in pediatric population is one of the tools to measure the burden of inappropriate drug use in children (28). Many studies have been done to document drug use patterns, and indicate that overprescribing, multi-drug prescribing, misuse of drugs, use of unnecessary expensive drugs and overuse of antibiotics and injections are the most common problems of irrational drug use by prescribers as well as consumers (12).

According to the WHO factsheet 2010 and other contemporary literatures on rational use of medicines, it has been estimated that half of all patients fail to take their medication as prescribed or dispensed (9). The study conducted in Mekelle general hospital which

mentioned irrational use of antibiotics to children indicates 99.3% antibiotics was prescribed both for outpatients and inpatients (29).

The study that assesses antibiotic-prescribing practices of primary care prescribers for acute diarrhea in New Delhi, India estimated that 20% to 50% of all antibiotic use is inappropriate. Unfortunately diarrhea is a condition for which the misuse of antibiotics is common and is reported from different parts of the world (6).

WHO estimated that more than 40 % children with acute diarrhea in developing countries received antibiotic (4). The study conducted in Moshi Municipality, Northern Tanzania also reported the inappropriate prescription was more frequent in management of diarrhea among health professional at the range of 13-48.9 % (8).

A cross sectional study carried out in Kashmir, India reported the rate of antibiotic use is higher with 77.9% in under five children with diarrhea (30). These findings corroborated with previous studies where antibiotics were prescribed to 80.6% children with acute watery diarrhea (AWD), antibiotics have no role in the management of AWD as most of the time its cause is viral (8).

Cross-sectional descriptive hospital based study done in Tanzania have shown that 68.9% with common cold and watery diarrhea were given antibiotics inappropriately (8). Several studies have shown that despite the promotion of oral rehydration salt extensively by the WHO for the management of diarrhea, inappropriate drug prescribing is common (31).

The use of antibiotics was high in all illness categories including conditions for which antibiotics were not recommended by WHO, like common cold and diarrhea (8). Study on the prescribing patterns in childhood diarrhea revealed that antimicrobial (40.3%) were prescribed by the medical practitioner (31). Of the total prescriptions with antibiotics, 89% and 94% of prescriptions, respectively, had a Ciprofloxacin at dispensaries and at secondary care level hospital. At private facilities, of the total antibiotics prescribed, 96% of prescriptions had a Ciprofloxacin and for pediatricians it was 100% (32). A single report from Bahrain found that only 2 % antimicrobials were prescribed to children with acute childhood diarrhea (7).

In the management of diarrhea, all the guidelines recommend use of Oral Rehydration Solution. ORS solution therapy which is accepted as the gold standard to achieve clinically efficacious and cost-effective management of dehydration and its complication (7).

All children with diarrhea should be given ORS (33). ORS is currently recommended for the treatment of all episodes of diarrhea (34). Unless the patient is comatose or severely dehydrated, ORS solution is recommended regardless of the causative agent and age of the patient because ORS solution therapy is less expensive, often just as effective, and more practical than intravenous fluid (7).

A clinical study done in India demonstrated that ORS was effective in treating and preventing fluid loss compared to IV therapy (35). Because of the improved effectiveness of reduced osmolarity ORS solution WHO and UNICEF now recommend that countries use and manufacture, for diarrhea of all etiologies and in all age groups and has been included in the WHO model list of Essential Medicines (36).

Other study that comparing ORT and IV therapy in the management of diarrhea indicated Oral rehydration therapy has multiple advantages over parenteral rehydration. Since ORT uses the normal physiologic mechanisms of intestinal absorption there is no risk of complications, such as water overload or overcorrection of electrolyte and acid-base disturbances associated with dehydration. Thus, ORT can be used in any dehydrated child, regardless of the type of dehydration. Moreover, laboratory tests are not usually necessary for the patient's evaluation (24).

In 2010, WHO estimated that less than 60% children with acute diarrhea in developing countries received ORS (4). World Gastroenterology Organization indicated the global ORS coverage rates are still less than 50%. But the fifth annual progress report published by the International Vaccine Access Center (IVAC) shows coverage of ORS from 2005-2014 in Ethiopia was 26 % (37).

Study done on Bahrain have also shown ORS solution was prescribed to 89.3% patients; 12.3% received ORS alone, whereas 77% received ORS in combination with symptomatic drugs (7). These findings corroborated with previous studies done in Kenya where 90% prescription rate ORS in Management of ill children with diarrhea by healthcare workers (38).

In 2004, WHO revised its recommendations for the management of acute diarrhea to include zinc treatment in conjunction with the administration of oral rehydration solution (39). Zinc plays an important role in modulating host resistance to infectious agents and reducing the risk, severity, and duration of diarrheal diseases (40). WHO and UNICEF recommend routine zinc therapy for children with diarrhea, irrespective of the types of diarrhea (2). Evidence over the years has shown that zinc supplementation reduces the duration and severity of diarrhea (41). A double blind study on effectiveness and efficacy of zinc for the treatment of acute diarrhea in young children demonstrate zinc supplementation substantially reduced the duration of diarrhea (42).

A literature reviews sought to evaluate the benefit of oral zinc supplementation for the treatment of diarrhea in children less than 5 years of age indicate oral zinc supplementation for the management of diarrhea has been shown to curtail the duration, severity and mortality of children younger than 5 years old. Since 2004, WHO/UNICEF have been recommending routine use of oral zinc supplementation for the treatment of diarrhea (43).

A cross sectional descriptive study on antibiotic prescribing practice in management of cough and/or diarrhea in Moshi Municipality, Northern Tanzania shows zinc supplementation rate were (28.0%) (44). Another cross sectional study conducted in three major health facilities in Baghdad city states only 1.25% use zinc tablet were prescribed (45). Research conducted in Kenya also shows that 62% reported giving zinc for fewer than the recommended 10 days among those who used zinc tablets (38).

The fifth annual progress report published by the International Vaccine Access Center (IVAC) argues treatment with zinc can lower childhood diarrhea mortality by over 20% and thus is a critical component of diarrhea treatment but according to the report the coverage of zinc from 2005-2014 in Ethiopia was 0 % (37).

According to World health organization, Vitamin A also recommended for young children with acute and persistent diarrhea since diarrhea reduces the absorption of, and increases the need for, vitamin A. This is especially important when diarrhea occurs during or shortly after measles, or in children who are already malnourished (46). The seven points in the WHO and UNICEF 2004 joint statement for comprehensive prevention and treatment of diarrhea indicate that vitamin A supplementation as prevention package (47).

Study done in Baghdad that state drug misuse in the treatment of diarrhea among children indicates that anti-diarrheal and anti-emetics drugs were used in 12.8% and 33.2% of the cases respectively (45). Other study done in Bahrain report anti-diarrheal and anti-emetics drugs were used in 7% and 12% of the cases respectively (7). The anti-diarrheal and anti-emetics drugs are not recommended to treat acute diarrhea, since they reduce intestinal motility, lengthen the course of the disease, prolong the contact of the causal pathogen with the intestinal mucosa, and can worsen systemic symptoms (24,48,49). These drugs not only have no benefit in diarrhea treatment, but may also cause serious, even life- threatening side effects in children. It may be considered as harmful practices in the management of childhood diarrhea (50).

2. OBJECTIVE

2.1 General objective

- To assess the management of diarrhea in children in under five of age in health centers of Addis Ababa city administration, Ethiopia

2.2 Specific objectives

- To investigate the pattern of drug use in the management of diarrhea
- To assess the extent of adherence of health professionals to the FMOH/WHO guide lines
- To determine factors associated with management of diarrhea

3. METHODOLOGY

3.1 Study area and period

The study was carried out among 14 out of 85 health centers under Addis Ababa city administration. The city administration has a total of 10 sub-cities and the sampled health centers were selected from 4 sub-cities. The study conducted in Bole, Yeka, kolfe and Lideta sub cities. The numbers of fully functional health centers during the study period in these sub cities are 9, 11, 7 and 5 respectively. All health centers receive financial support from the government in order to provide free of charge services for under-five children. The study was conducted from January, 2015- April, 2015.

3.2 Study design

Retrospective cross sectional study was conducted.

3.3 Population

3.2.1 Source population

Children under five of age who visited health centers and presenting with diarrhea illness under Addis Ababa city administration found between September 1, 2014 and February 30/2015.

3.2.2 Study population

Children with diarrhea from randomly selected health centers under Addis Ababa city administration found between September 1, 2014 and February 30/2015.

3.3 Inclusion and exclusion criteria

3.3.1 Inclusion criteria

Children under 5 years of age with diarrhea in pediatric clinic of Addis Ababa city administration health centers were included.

3.3.2 Exclusion criteria

Children younger than 2 months and older than 5 years of age and incomplete patient cards were excluded in the study.

Age less than two months were excluded because diarrhea in a young infant (below two months) is not classified in the same way as in an older infants or young children (two months to five years). The main difference is that for a young infant with diarrhea lasting for 14 days or more the only classification is severe persistent diarrhea. This is because 14 days represents a significant amount of time in a young infant's life and they should be referred to hospital for treatment. Children above 5 years were excluded because their medical records are not found in IMNCI assess and classify chart booklet and treatment is not free for children above 5 years in all public health centers.

3.4 Sample size determination and sampling procedure

A multistage sampling method was used to determine the size of the sample. A systematic random sampling was followed for selecting the appropriate sample patient cards based on the total number of children with diarrhea in each health centers. The total number of sample fulfilling the inclusion criteria was arranged chronologically in each month and quota was given based on the calculated sample size so that sample can be representative to show children with diarrhea in the health centers of Addis Ababa city administration.

The sample size was drown by using formula

$$n = \frac{[Z_{1-\alpha/2}]^2 \, p \, (1-p)}{D^2}$$

Where: n = the minimum sample size required

P= estimated prevalence rate of the population

D= the margin of tolerance

Z= the standard normal variation at confidence level and α is mostly 5 % with 95 % confidence level

The minimum sample size required was obtained by taking a prevalence rate of 50 %(0.5) and confidence interval of 95 % and the margins of error is 5 %(0.5).

The sample was calculated as

$$n = \frac{[1.96]^2 \, 0.5(1-0.5)}{(0.5)^2} = 384$$

Ten present the sample size was added for contingency. And it gives 422-sample size. Since i used multistage sampling a design effect of 2 was used and a total sample size was found to be 845. A total of 845 medical records of children were reviewed for the purpose of assessment of the management of diarrhea in under five children in health centers of Addis Ababa city administration.

3.4.1 Sampling procedure

Addis Ababa city administration has 10 sub cities. There are 85 health centers in all 10 sub cities. Four out of the 10 sub cities of Addis Ababa city administration were selected using by simple lottery methods as cluster sample. Fourteen health centers that found in the 4 sub cities from the selected sub cities were selected using simple lottery method but the number of health centers in each health centers determined proportionally by the total number of health centers in each sub cities as shown in figure 1. A systematic random sampling was followed for selecting the appropriate sample patient cards based on the total number of children with diarrhea in each health centers.

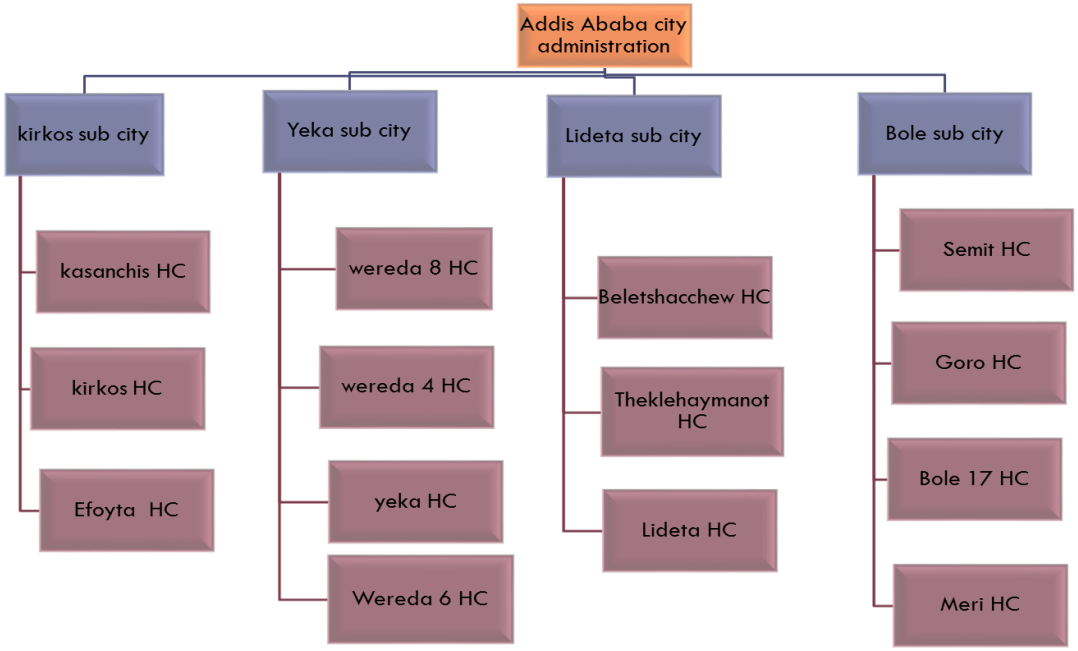


Figure 1: Multistage sampling of the health centers from the 10 sub cities of Addis Ababa city administration.

The numbers of fully functional health centers during the study period in kirkose. Yeka, Lideta and Bole sub cities sub cities are 7, 11, 5 and 9 respectively.

3.5 Study variables

3.5.1 Dependent variable:

- Appropriate diarrhea management

3.5.2 Independent variable:

Demographic variable: age and sex

Disease related variable: duration of the current episode of diarrhea, fever, vomiting, time from onset of diarrhea to visiting diarrhea clinic, stool characteristics, frequency of stools/24 hrs, dehydration status, co-comorbid condition like pneumonia, malnutrition

Drug related variables: administered drugs, fluid and electrolyte therapy and vaccination status

3.6 Data collection and management

3.6.1 Data collection instruments

An appropriate data extraction format (annex I) was used to extract relevant information for the study of the management of diarrhea in under five children after reviewing literature, IMNCI guidelines and based on the objectives the study. Data extracted from IMNCI assess and classify chart booklet and children medical records include demographic characteristics (age, gender), medical characteristics (chief child complain, presence of danger sign and sign of dehydration, stool characteristics, type of diarrhea, the type of drug used.

3.6.2 Data processing and analysis

Data was collected by two nurses after proper training for two days by the investigator. Data was collected from IMNCI assess and classify chart booklet and children medical records. The investigator was checked the data, sort, and review it manually for errors and data incompleteness. Epi data was used for data entry and SPSS 20 used for analysis as recommended for cluster level analysis. Frequencies and percentages were calculated to describe findings while binary logistic regression for looking association in variables and those variables showed p value ≤ 0.25 with outcome variables in the bivariate analysis and deemed to be important from previous study were selected as candidate variables for

multivariable logistic regression analysis. P value less than 0.05 was considered to be statistically significant.

3.6.3 Data quality control

To ensure data quality, pretest of data collection checklist was done in 40 patient's card (5%) that was not be included in the data for the final study. Trained nurses under the supervision of the investigator were done the data collection.

3.7 Ethical consideration

Ethical clearance was obtained from School of Pharmacy, Addis Ababa University Research and Ethics Review Committee and Addis Ababa City Administration Health Bureau. Permission to conduct the study was obtained from the sub cities administration in which the health centers were selected.

The information from the patient cards was kept confidential, only the data collector had the access to information, which talks about the patient information other than the topic of interest.

3.8 Operational definition

Diarrhea is the passage of three or more loose or watery stools per day.

Persistent diarrhea: diarrhea which lasts 14 days or more.

Severe persistent diarrhea: If a child has had diarrhea for 14 days or more and also has some or severe dehydration.

Dysentery: diarrhea with blood in the stool, with or without mucus.

Severe dehydration: it is a clinical condition at which a patient presenting with two or more of the following signs: lethargic or unconscious, sunken eyes, not able to drink or drinking poorly and skin pinch goes back very slowly or greater than 10 percent of their body weight.

Some dehydration: Children with some dehydration will be presenting with two of the following signs: restless/irritable, sunken eyes, drinks eagerly/thirsty, skin pinch goes back slowly. Or if the child decrease 5 to 10 percent of their body weight

Appropriately managed child: The child was correctly assessed and correctly classified his diarrhea illness and has gotten appropriate treatment according to the FMOH and WHO guide lines as shown in annex 2.

Up-to-date in vaccination status and vitamin A and albendazole administration: The child was taking them in accord with his age.

4. RESULTS

A total of 845 children presenting with of diarrhea between the age of 2 month and 59 months were enrolled in the study from health centers under Addis Ababa city administration. The data of 42 children were excluded from the study because of incompleteness of the data, bringing the number of patients to 803 which give us a response rate 95.1 %.

The median age of the patients was found to be 23.1 months with interquartile range (IQR) 11-21 months. Among the children, 365 (45.5%) were female as shown in Table 1.

Table 1: Demographic, vaccination, vitamin A and albendazole administration status of children

	Number	Percentage
Demographic variables		
Sex Male	438	54.5
Female	365	45.5
Age 2-11 months	271	33.7
12- 59 months	532	66.3
Vaccination status		
▪ Complete	586	73.0
▪ Up-to-date	112	13.9
▪ Default	6	.7
Vitamin A administration		
▪ Up to-date	429	53.4
▪ Not up-to-date	26	3.2
▪ Not candidate	73	9.1
Albendazole administration in the past 6 months		
▪ Up to-date	247	30.8
▪ Not up-to-date	24	3.0
▪ Not taken at all	3	0. 4
▪ Not candidate	270	33.6

Majority of the children were assessed for vaccination status and it was found that 86.9 % of the children were vaccinated and 0.7 % of the children default their vaccination with unknown reason. From those children that assessed their vitamin A and albendazole administration history, 53. 4 % and 30 % were received respectively as shown in Table 1.

The characteristic of diarrhea, finding of physical examination and laboratory investigation are shown in Table 2.

Table 2 : Characteristics of diarrhea, clinical and laboratory finding of the children

Characteristics of stool	Numbers	Percent
▪ Watery	326	40.6
▪ Bloody	102	12.7
▪ Mucus	53	6.6
▪ Not specified	322	40.1
Physical examination		
▪ Diarrhea with no dehydration	634	79.0
▪ Diarrhea with some dehydration	18	2.2
▪ Diarrhea with severe dehydration	0	
▪ Dysentery	102	12.7
▪ Persistence diarrhea	100	12.5
▪ Sever persistence diarrhea	5	0.6
Other complaints of children		
▪ Vomiting	475	59.2
▪ Fever	175	21.8
▪ Abdominal pain	84	10.5
▪ Vomiting + fever	109	13.6
▪ Vomiting + abdominal pain	61	7.6
▪ Fever + abdominal pain	16	2.0
▪ Vomiting +fever+ abdominal pain	11	1.4
Comorbid		
▪ Pneumonia	21	2.6
▪ Acute upper respiratory tract infection	185	23
▪ Malnutrition	11	1.4
Laboratory investigation		
▪ Microscopy(Stool examination)	300	37.4
▪ Blood culture	2	0.25
▪ Complete blood count	2	0.25

The mean time elapsed between onsets of diarrhea and visiting the health centers was 2.58 ±1.24 days, and the mean frequency of passing stool per day was 3.9.0 ± 0.83.

The number of the children that were assessed for presence of dehydration and type of diarrhea the children has 81.1 % (n=634) and 88 % (n=706) respectively but half of the children were assessed for the presence of blood in the stool.

Based on the signs and symptoms of dehydration, the physical examinations revealed that only 18 (2.2%) patients had some dehydration, whereas 634 (79%) had no signs of dehydration. Vomiting (59%), fevers 21.8% were the most common complaints.

Acute upper respiratory tract infection (AURTI) and pneumonia are common comorbid illness (23 and 2.6 % respectively) in the children presented with diarrhea. Routine microscopic examination were done for 37.4 % of the children (n=300). Majority of the children were also assessed for presence of blood in the stool. Three hundred twenty six (40.6%) of the 803 patients with diarrhea complained of watery stools, 102 (12.7%) complained of bloody diarrhea, and 53(6.6) mucous diarrhea whereas stool characteristics were not specified in 322 (40.1%) patients as shown in Table 2

4.1 Management of diarrhea

Of the 803 episodes diarrhea, 726 (90.4%) children were on pharmacological intervention. At least one antimicrobial were prescribed to 588 (73.2) of all children who attend the health centers. The prescribing patterns for the treatment of 803 episodes of diarrhea are shown in Table 3.

Table 3: Prescribing patterns of drugs for treatment of diarrheal episodes among children in health centers

	Number	Percent
Antimicrobial only	184	22.9
Antimicrobial + ORS	125	15.6
Antimicrobial + ORS+ zinc	162	20.2
Antimicrobial + ORS+ zinc + Other drugs	82	10.2
Antimicrobial and other drugs	52	6.4
ORS only	27	3.4
ORS and zinc only	0	0

Antimicrobial were prescribed to 86.6 % of the children presented with diarrhea attending the 14 health centers during the period of the study. From the total prescription that contain antimicrobial, ORS and zinc were co administered in 20.2 % of them whereas 22. 9 % (n=184) antimicrobial were given alone as shown in Table 3. Zinc and/ or ORS not usually prescribed alone.

Of 803 children, 743 (92.8 %) were on pharmacological interventions. The number of drugs for the treatment of diarrheal episodes per prescription is presented in Table 4. The mean number of drugs per prescription was 2.3±1.36 whereas the mean number of drugs per prescription containing three or more drugs was 3.9 ± 0.8 as shown in Table 4.

Table 4: Number of drugs prescribed for children with diarrhea in health centers

Prescription characteristics (Number of drugs)	Number of children	Percentage
No drugs	60	7.5
1	194	24.1
2	156	19.4
3	260	32.3
4	84	10.4
5	36	4.5
6	14	1.7

The drugs prescribed for the treatment of diarrheal episodes are presented in Figure 2. Cotrimoxazole was prescribed for the majority of the children (70.7%) of children presented with diarrhea whereas metronidazole and amoxicillin were less common prescribed drugs 7% and 4.6 % respectively. ORS was prescribed to 66.7% of the children whereas zinc was prescribed to 43.8% of the children who attended the study health centers as shown in figure 2. Antidiarrheal and anti-emetics were prescribed for treatments of diarrhea were 0 % and 7% respectively.

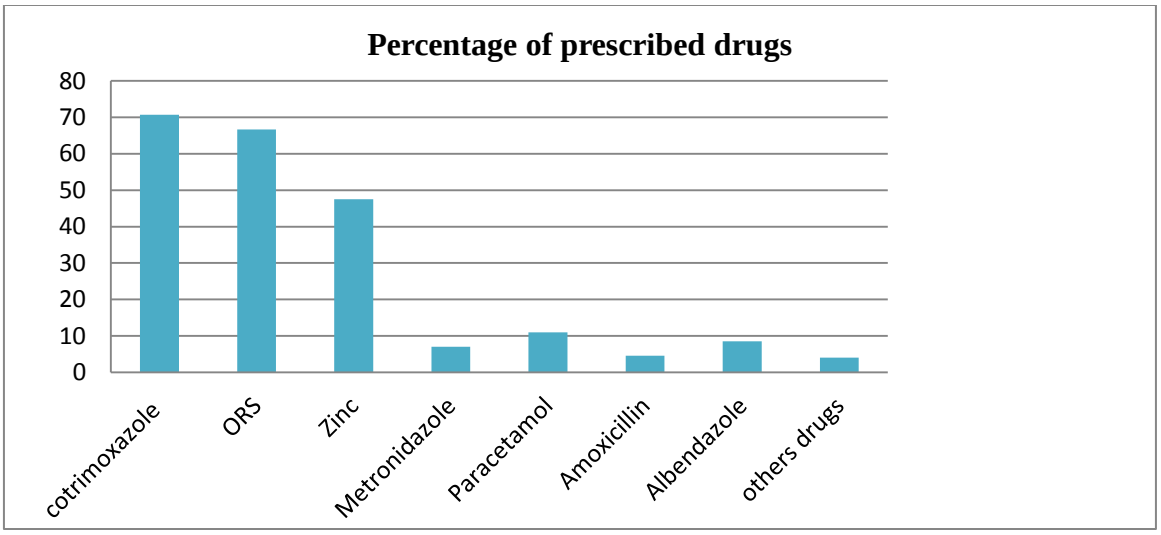


Figure 2: Drugs prescribed for the treatment of diarrheal episodes in health centers

High percentage of antimicrobials were prescribed irrespective dehydration status of the children and the presence of blood or mucous in the stool and the type of diarrhea. The prescription rates of antibiotics were changed in magnitude as dehydration status and persistency of the diarrhea increase. All children presented with persistence diarrhea were received antibiotics.

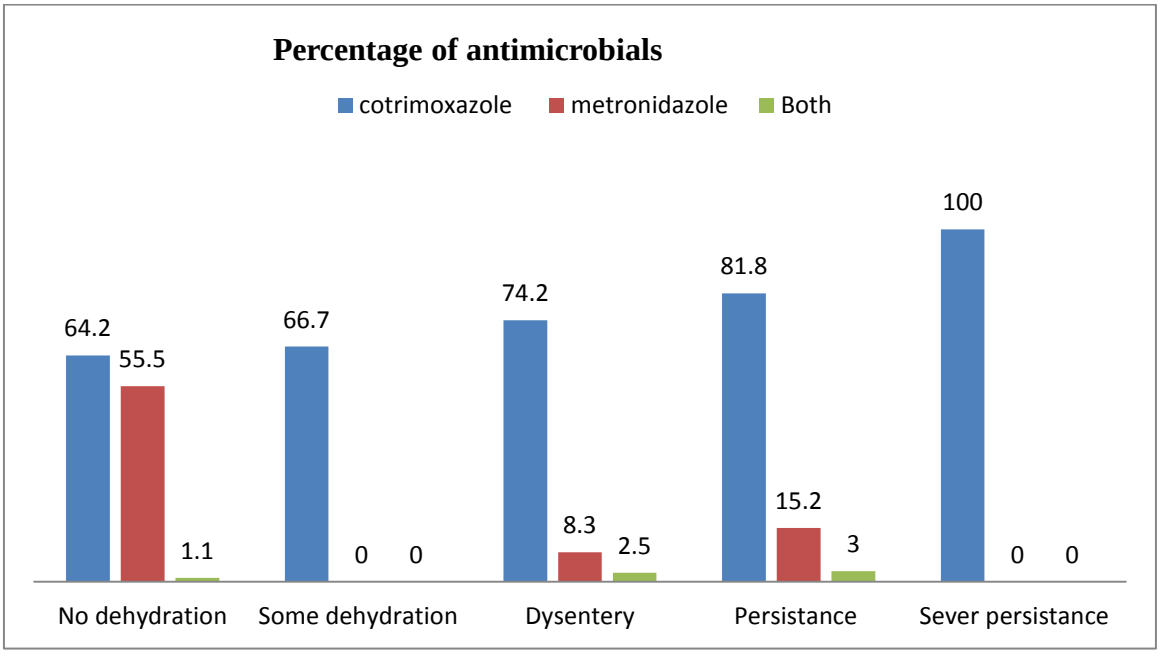
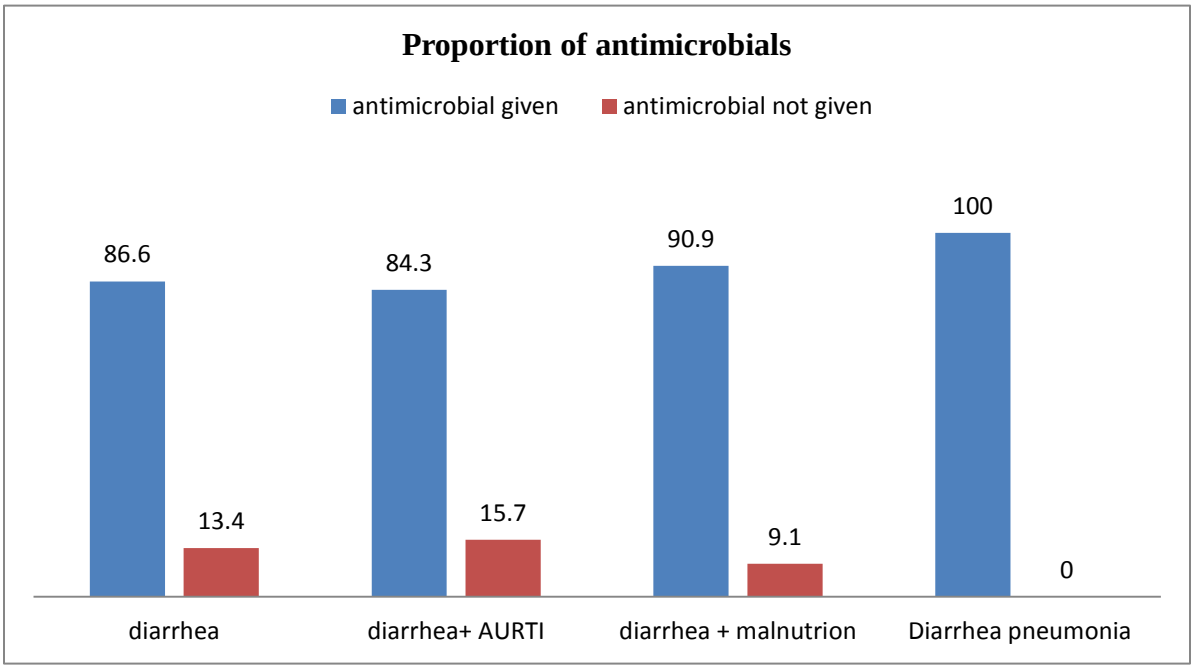


Figure 3: The drug prescription patterns based on clinical classification of the disease in health centers

Relatively high percentage of metronidazole was prescribed in case of diarrhea with no dehydration than dysentery diarrhea. Co-administration of metronidazole and cotrimoxazole is rare.

The prescription rates of antibiotics were changed in magnitude when the children present with diarrhea and other comorbid illness as shown in figure 4. High percentage antimicrobial was prescribed for all children (100%) when the children presented with pneumonia and 90 % of children with malnutrition as comorbid illness.



AURTI= Acute upper respiratory tract infection

Figure 4: Proportion of antimicrobials prescribed for treatment of diarrhea and other to comorbid illness

Half of caretakers (52.6%) were advised to give extra fluids and continue feeding a child with diarrhea, and 51% were advised to return immediately if the child was unable to drink/breastfeed or if the child became sicker. and only (32.9%) of caretakers was advised when to return to the health centers for follow- up.

4.2 Appropriate management of diarrhea

Based on diarrhea treatment guideline 366(45.6 %) of children have received appropriate management of diarrhea.

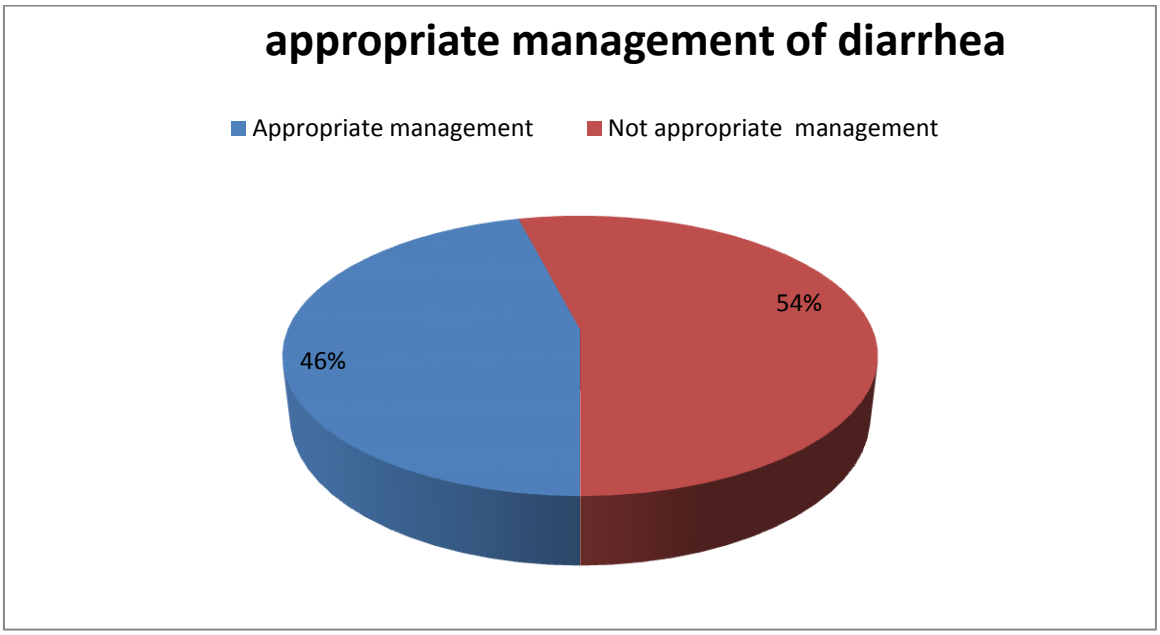


Figure 5: The prevalence of appropriate management in health centers

Table 5: Indicators of inappropriateness of the management of children with diarrhea

	Number	Percentage
Child received an antibiotic that wasn't needed	**216**	**27.9**
Children received antidiarrheal agent that was not needed	42	5.6
Children needing ORS that was not received	270	33.7
Children needing zinc supplement that was not received	421	52.5
Children needing antibiotics that was not received	78	9.7
Children with persistent diarrhea that was not received at least one dose of Vitamin A at its therapeutic dose	2	2
Child with diarrhea incorrectly managed for diarrhea	437	54.4

4.3 Factors associated with appropriate management of diarrhea

In order to identify the association of independent variables with appropriate management of diarrhea both bivariate and multivariate analysis were used. Those variables showed p value $\leq$ 0.25 with outcome variables in the bivariate analysis and deemed to be important from previous study were selected as candidate variables for multivariable logistic regression analysis.

Regarding appropriate management based on stool characteristics, children with bloody diarrhea 6.38 times more likely (AOR= 6.38(3.11, 13.63) to receive appropriate diarrhea management compared to children mucous diarrhea ($p<0.05$; OR=6.38(3.11,13.63) and the odds of appropriate management of diarrhea for children with watery diarrhea were 77 % less compared to children with mucous diarrhea OR=0.23(0.13, 0.88). The odds of appropriate management of diarrhea for children with 2-11 months were 54 % less compared to children 12-59 months ($p<0.05$; OR=0.46(0.24, 0.90).

Table 6: Association of appropriate management of diarrhea and demographic characteristics of the child and stool characteristics in health centers

Variable	Appropriate management		COR	AOR
	NO (%)	Yes (%)		
Age of child				
2 - 11 months	173(63.8)	98(36.2)	0.056(0.041,0.75)	0.46(0.24,0.90)*
12-59 months	264(49.6)	268(50.4)	1.00	1,00
Sex of child				
Male	256(70.1)	109(29.9)	1.07(0.81,1.42)	1.09(0.74,1.6)
Female	312(71.2)	126(28.)	1.00	1.00
Stool characteristics				
Watery diarrhea	164(70.4)	69(29.6)	0.51(0.028,0.94)	0.23(0.13, 0.88)*
Bloody diarrhea	18(15.7)	97(84.3)	7.01(3.24,15.13)	6.38(3.11,13.63)*
Mucous diarrhea	29(54.7)	24(45.3)	1.00	1.00

5. DISCUSSION

The main goal in the management of diarrhea is to prevent and treat dehydration (7). A thorough assessment and classification will establish the most appropriate management for each patient. It will also aid for appropriate decisions (51). Large proportions of children were assessed for presence sign of dehydration (81.1 %) and duration of diarrhea (88 %). But half of the children were assessed for the presence of blood in the stool. A cross-sectional survey conducted in 938 health posts of that assess of ICCM implementation strength and quality of care in Oromia, Ethiopia also shows that the proportion of children with diarrhea correctly assessed and classified with diarrhea was 75% (52). From a clinical point of view, diarrhea needs to be classified taking into account certain characteristics such as trends over time (acute or persistence), the characteristics of the stool. It is fundamental for a diagnostic and therapeutic approach (53).

Relatively short-time elapsed between onsets of diarrhea and attending health centers (2.58$\pm$1.24 days) and majority of the children (78.6%) who visit the health centers presented with no sign of dehydration are important considerations. Plausible explanations for these findings may be related to the community awareness about diarrhea and its hazards and health-seeking behavior of the population.

Characteristics of diarrhea, especially low frequency of passing stools per day and low proportion of patients with some dehydration or bloody diarrhea as shown in Table 2 suggest that the majority of cases of acute diarrhea were mild and self-limited.

This explains why requests for microbiological investigations and other laboratory tests were judicious, and the health professionals complied in general with the published guidelines.

Antibiotics were prescribed to 86.6 % of the children presented with diarrhea attending the 14 health centers during the period of the study. This proportion is similar to that reported in other a cross-sectional descriptive hospital based studies, where the proportion use of antibiotics ranged from 69.0 % to 89% in Tanzania and India (6,8,32). While the routine use of antibiotics for infectious diarrhea in children is discouraged, because it brings little benefit in most cases and is associated with the risk of increasing antimicrobial resistance (54), but selected cases may require antimicrobial therapy (2,55).

This study shows that 73.2 % of 803 children presenting with diarrhea were given at least one type of antibiotics with no significance variation with antibiotics pattern when diarrhea associated with other clinical complaint such as vomiting, fever and abdominal pain. This is consistent with a cross-sectional descriptive hospital based study done in Tanzania revealed that 71.5% of all prescriptions contained at least one antibiotic (8). But this was different with the findings from India were 43-69 % of prescription contained at least one antibiotics (6). This unreserved use of antibiotics may result antibiotics resistance. In addition, antibiotics are costly, so money is wasted where the use of antibiotics is unrestricted.

In this study, cotrimoxazole was prescribed for the majority of the children (70.7 %) of children presented with diarrhea whereas metronidazole and amoxicillin were less common prescribed drugs 7% and 4.6 % respectively. This result is not agreed with the study done in university of Nigeria teaching hospital between October 2006 and February 2007 that on medication use and abuse in childhood diarrhoeal diseases state the percentage of cotrimoxazole were 7.5 and % (56). Other similar studies done in New Delhi and Ujjain, India shows Ciprofloxacin and Ampicillin were commonly used antibiotics (6,32).

ORS were prescribed to 66.7% of under-five children who had diarrhea attending the 14 health centers during the period of the study and 41% of the children received ORS with zinc , whereas 16.9% of the children received ORS in combination with antibiotics drugs. The prescription rate of ORS in this study was comparable with other cross-sectional hoapital based descriptive study in Moshi Municipality, Northern Tanzania on antibiotic prescribing practice in management of cough and/or diarrhoe (8), and considerably lower when this result compare with other similar studies done in Bahrain, Kashmir, Kenya (7,30,57). Other cross-sectional study conducted in Hawassa University teaching and referral hospital , south Ethiopia that acesses drug use pattern using WHO prescribing indicators shows that 90% coverage of treatment with oral rehydration salts (ORS) and zinc supplements for children with diarrhea (58). But the fifth annual progress report published by the International Vaccine Access Center (IVAC) shows coverage of ORS from 2005-2014 in Ethiopia was 26 % (37).

ORS solution therapy is accepted as the gold standard to achieve clinically-efficacious and cost-effective management of diarrhea. Unless the patient is comatose or severely dehydrated, ORS solution is recommended regardless of the causative agent and age of the patient because ORS solution therapy is less expensive, often just as effective, and more practical than intravenous fluid (7,47).

In this study the prescription rate of zinc supplementation was 43.7 %. This finding is very low when it compares study done in Kenya (90%). In addition; since 2004, WHO/UNICEF have been recommending routine use of oral zinc supplementation for the treatment of diarrhea (43).

A number of studies have shown that zinc supplementation, either continuous or short course, had a positive impact of the prevalence of dysentery in the month following the supplementation (59).

For all these reasons, it is clear that zinc supplementation should be given as an adjunct to antibiotic treatment of bloody diarrhea (60). Policy guidelines on control and management of diarrhea diseases in children below five years in Kenya state that zinc reduces the duration and severity of episodes, and lowers incidence of diarrhea in the following 2-3 months. All patients with diarrhea should therefore be given zinc supplements as soon as possible after diarrhea has started as part of first line treatment (33).

Antidiarrheal and anti-emetics were prescribed for treatments of diarrhea were 0 % and 7 % respectively. This result is not aligned with the study done in Baghdad that indicates anti-diarrheal and anti-emetics drugs were used in 12.8% and 33.2% of the cases respectively (45). Studies done in Bahraini reports 7% and 12% of anti-diarrheal and anti-emetics drugs were used respectively (7). The anti-diarrheal and anti-emetics drugs are not recommended to treat acute diarrhea, since they reduce intestinal motility, lengthen the course of the disease, prolong the contact of the causal pathogen with the intestinal mucosa, and can worsen systemic symptoms (24,48,49). These drugs not only have no benefit in diarrhea treatment, but may also cause serious, even life- threatening side effects in children. It may be considered as harmful practices in the management of childhood diarrhea (50).

In this study, antibiotics were prescribed to 65.5 % children with AWD. This findings are consistent with reports from other countries where 68-95% patients with diarrhea received antibiotics (61,62). A study from Bangladesh showed that only 27% of children received treatment for acute watery diarrhea according to WHO guidelines and the rest either got antibiotics or other treatments not recommended by WHO guidelines (6). Antibiotics have no role in the management of AWD as most of the time its cause is viral (8). Recommendations on use of antibiotics in the management of acute watery diarrhea should be followed strictly, since indiscriminate use of antibiotics results in development of resistance.

Majority of children presented with bloody diarrhea were treated with cotrimoxazole (74.2%) and 10.8 % of the children treated with metronidazole.

The Integrated Management of Childhood Illness (IMCI) recommends use of oral antimicrobials for all children with bloody diarrhea (amoebic or bacterial dysentery), cholera, and giardiasis (24). Therefore, 30.8 % of the children with bloody diarrhea were not appropriately managed.

According to WHO/FMOH guide line, antibiotic use is recommended only for acute bloody diarrhea/dysentery (6). Appropriate antimicrobial therapy can shorten illness and reduce morbidity in some bacterial and parasitic infections and can be life-saving in invasive infections(63). For examples; Antibiotic therapy reduces the duration Shigella induced diarrhea which cause about 60 % life threatening dysenteries infection and, therefore, is recommended, for the treatment of moderate to severe dysentery (64). Although antibacterial agents have no proven usefulness in the management of acute watery diarrhea (56). Many health professional continue to use them extensively, as was seen in this study.

Antimicrobial was prescribed for all children (100%) when the children presented with pneumonia and 90 % of children with malnutrition as comorbid illness. This results aligned with the cross-sectional descriptive hospital based study conducted in Moshi municipal, Tanzania describe 84.5 % of antibiotics were prescribed (44).

Almost half of the caretakers (52.6%) were received advice to give extra fluids and continue feeding a child with diarrhea, and 51% were advised to return immediately if the

was unable to drink/breastfeed or if the child became sicker. But only (32.9%) was advised when to return to the health centers for follow- up. FMOH/WHO recommends extra fluids and continues feeding as part of the management to treat diarrheal illness (14).

According to WHO guideline the 4 rule that should be follow in treatment of diarrhea give extra fluids, continue feeding, and when to return and give zinc supplements. Children who have been classified with diarrhea will need follow-up care to ensure that rehydration/hydration is maintained and to assess that the diarrhea has stopped (14).

Nearly half of the children (45.6%) who were visited the health centers were correctly managed for diarrhea. This result is different with study conducted a cross-sectional survey in a random sample of 938 health posts in Jimma and West Harage Zones, Oromia region, Ethiopia that assess of ICCM implementation strength and quality of care given by health extension state that 79% of children with diarrhea were correctly managed (65).

Studies show that about half of all viral diarrhea cases receive antibiotics inappropriately (9). Because the majority of cases of acute diarrhea are due to viral and non-invasive bacterial infections, routine use of antibiotics should be avoided since it results in wasting of resources and risks adverse reactions and it can also lead to increased antimicrobial resistance (6,64)

Inappropriate management of diarrhea was significantly associated with age of children and stool characteristics. The result of this study shows that Regarding appropriate management based on stool characteristics, children with bloody diarrhea 6.38 times more likely (AOR= 6.38(3.11, 13.63) to receive appropriate diarrhea management compared to children mucous diarrhea ($p<0.05$; OR=6.38(3.11, 13.63) and the odds of appropriate management of diarrhea for children with watery diarrhea were 77 % less compared to children with mucous diarrhea OR=0.23(0.13, 0.88). The odds of appropriate management of diarrhea for children with 2-11 months were 54 % less compared to children 12-59 months ($p<0.05$; OR=0.46(0.24, 0.90).

This association does not align with the study done in Tanzania where inappropriate antibiotic prescription was significantly associated with prescriber being a clinical officer and assistant medical officer rather than age and stool characteristics (8).

5.1 Limitation of the study

The study has two inherent weaknesses. First, it was conducted in 14 public health centers in Addis Ababa so any effort to extrapolate the results beyond the study population should be made with caution. Second, since it is the retrospective chart review research; incomplete or missing documentation, poorly recorded and absent information are other limitations of this study.

6. CONCLUSION

Results of this study have revealed that half of the children were appropriately managed. The health professionals were not strictly followed to the guidelines with respect to the use of antimicrobials ORS and zinc supplementation in management of diarrhea. A very high use of antibiotics and underutilization of ORS and zinc supplementation for the treatment of diarrhea by health professionals are observed. Cotrimoxazole was the main antibiotics that were prescribed. This high rate of antibiotic prescription is likely to favor development and spread of resistance of bacterial pathogens to common antibiotics. Addition of unnecessary drugs also bring unnecessary financial burden on the community.

7. RECOMMENDATION

The findings suggest that

- The health professional should find a means to update themselves
- The health professional should strictly follow the recommended guide lines in the management of diarrhea.
- FMOH/WHO should facilitate training on the management of diarrhea and monitor whether health professional are strictly follow the recommended guide lines in the management of diarrhea.
- FMOH should increase efforts on consistence availability of necessary drugs.
- WHO/UNICEF or other NGOs should avail to educate health professionals about the dangers of irrational use of antimicrobials to reduce unnecessary financial burden including drug resistance are emphasized.

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9. ANNEXES

9.1 Annex 1

Check List

1. Card number……
2. Name of health institution (code NO.): ……
3. Age of child in months……..
4. Sex of child

a. Male b. Female

5. Temperature in ^{o}C……
6. Weight of child…..…kg.
7. Height:……..cm
8. Type of visit

a. Initials b. Follow up

9. Child chief compliant

a. ……
b. ……
c. ……
d. ……
e. ……

10. General danger sign present?

a. Yes b. No

11. General danger sign

a. Unable to drink or breast feeding
b. Vomiting every thing
c. Convolution history
d. Convulsion now
e. Fever
f. Fast breathing
g. Severe chest in drawing
h. Grunting (difficulty of breathing)
i. Lethargic/unconscious

12. Time from onset of diarrhea to visiting the clinic in hours/ days

a. Less than 24 hours
b. 24-72 hours
c. More than 72 hours
d. >14 days

e. Unstated

13. Stool characteristics

a. Watery diarrhea
b. Bloody diarrhea
c. Mucous diarrhea
d. Unstated

14. Type of diarrhea

a. Acute
b. Persistent
c. Chronic

15. Frequency of stools/24 hours

a. Three times
b. Four time
c. More than four/ day
d. Other specify……
e. Unstated

16. Does the child has diarrhea with cough or difficult to breath

a. Yes
b. No
c. Unstated

17. Duration of cough ----------

18. Diarrhea with nausea and vomiting

a. Yes
b. No
c. Unstated

19. Duration of vomiting ……

20. Signs of some dehydration or severe dehydration:

a. Restlessness or irritability
b. Lethargy/reduced consciousness
c. Sunken eyes
d. Skin pinch returns slowly or very slowly
e. thirsty/drinks eagerly
f. Drinking
g. Poorly or not able to drink

21. Vaccination Status

a. Complete
b. Up to date
c. Default
d. Unvaccinated at all
e. Unstated

22. Vitamin A administration (if the child id 6 months or older)

a. Up to date c. Not taken at all

b. Not up-to-date d. Unstated

23. Albendazole administration in the past 6 months (if the child is 15 months or older)

a. Up to date c. Not taken at all

b. Not up-to-date d. Unstated

24. Other problem

a. …….

b. …….

c. …….

25. *Sign of malnutrition and anemia*

a. *Visible severe wasting* d. *Weight for age*

b. *Palmar pallor* e. *Dermatosis*

c. *Edema of both feet*

f. *Eye signs (Bitot's spots, pus, inflammation, corneal clouding, corneal ulceration)*

26. *Determine weight for age*

a. *Very low* b. *Not very low*

27. Laboratory test order

a. Microscopy (Stool examination) f. Urine culture

b. Serum electrolytes g. Blood culture

c. Organ function test h. Blood glucose

d. Urine analysis i. Unstated

e. Stool culture

j. Others……..

28. Laboratory result……..

29. Classification

a. ……

b. ……

c. ……

30. Oral rehydration therapy

a. Yes a. No

31. Parenteral fluid resuscitation:

a. Yes b. No

If yes, what is the parenteral fluid resuscitation for child?

a. ……..

b. ……

c. ……

32. Zinc acetate administration

a. Yes b. No

33. Drugs prescribed (name, dose, dosage form, duration)

a. ……

b. ……

c. ……

d. ……

34. Counseling given to the mothers

a. Give extra fluids c. When to return

b. Continue feeding if breast feeding d. Others

35. Defined date for follow up

a. days

b. days

c. 14 days

d. 30 days

e. Other

36. Outcome stated during follow up

a. Improved

b. The same

c. Worsen

d. Return of appetite

37. Remark……

9.2 Annex 2

Classification of diarrhea and recommended treatment for each classification (FMOH, WHO 2012)

Two of the following signs: • Lethargic or unconscious • Sunken eyes • Not able to drink or drinking poorly • Skin pinch goes back very slowly	SEVERE DEHYDRATION	• If child has no other severe classification – Give fluid for severe dehydration (Plan C) O If child also has another severe classification: – Refer URGENTLY to hospital with mother giving frequent sips of ORS on the way Advise the mother to continue breastfeeding • If child is 2 years or older and there is cholera in your area, give antibiotics for cholera.
Two of the following signs • Restless, irritable • Sunken eyes • Drinks eagerly, thirsty • Skin pinch goes back slowly	SOME DEHYDRATION	• Give fluid, zinc supplements and food for some dehydration (Plan B). • If child also has a severe classification: – Refer URGENTLY to hospital with mother giving frequent sips of ORS on the way Advise the mother to continue breastfeeding • Advise mother when to return immediately.
Not enough signs to classify as severe or some dehydration	NO DEHYDRATION	• Give fluid, zinc supplements and food to treat diarrhea at home (Plan A). • Advise mother when to return immediately.
• Dehydration present	SEVERE PERSISTENT DIARRHOEA	• Treat dehydration before referral unless the child has another severe classification • Refer to hospital
• No dehydration	PERSISTENT DIARRHOEA	• Advise the mother on feeding a child who has PERSISTENT DIARRHOEA • Give multivitamin and minerals (including zinc) for 14 days • Follow-up in 5 days
• Blood in the stool	BLOOD IN STOOL	• Treat for 3 or 5 days with an oral antimicrobial recommended for Shigella in your area. Treat dehydration and give zinc • Follow-up in 2 days