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EVALUATION OF ANTIMICROBIAL UTILIZATION FOR DIARRHEAL DISEASES TREATMENT AMONG UNDER-5 PATIENTS

A Drug Use Study of Semen Health Center

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Abstract

Introduction: Diarrhea is defined as passage of 3 or more unusually loose stool or watery stool of any frequency within 24 hours and became second cause of death in under-5-year children globally.

Antimicrobial agents are among the most used therapeutics and widely misused of all drugs. These irrational and uncontrollable uses of antibiotics will increases resistance, potential adverse effects and cost.

Objective: This study was aimed to evaluate antimicrobial utilization for diarrheal diseases among under-5 out-patients based on IMNCI criteria at Semen health center in Arada sub city of Addis Ababa the capital city of Ethiopia in 2023.

Methods: An institutional-based retrospective descriptive cross-sectional study was employed using medication records of under-5 out-patients who treated for diarrheal diseases in 2023 at Semen health center from January 1, 2023 to December 30, 2023. A total of 75 diarrheal diseases treatment records were investigated. Systematic random samplings were employed to collect the required sample from the sampling frame. The collected data was entered into excel statistical data analyzer and computed using descriptive analysis. Descriptive statistics and cross tabulation was carried out, and the result was presented using texts, tables, and graphs.

Results: According to the finding about 78.7% of the prescribed antimicrobial drugs were appropriately managed according to IMNCI guideline. From the total 75 sample of study (n=72, 96 %) were prescribed and treated with either ORS or ORS + Zinc while about (n=65, 86 %) was given advise on breast feeding and fluid intake and told when to come for follow up. In addition to this prescribing patterns shown that the overall indications (n=71, 94.67%), dose, strength, frequency and duration (n=67, 89.33%) each and both drug-drug interaction and contra-indication (n=75,100%) were correctly prescribed.

Conclusion: This study revealed that antimicrobial use for diarrheal diseases treatment was deviated from criteria and threshold and also IMNCI guideline while other medication for diarrhea such as ORS, ORS plus zinc was slightly deviated from criteria and threshold.

Keywords: Antimicrobial use for diarrheal diseases among under-five patients.

1. Introduction

1.1. Background

Diarrhea is defined as passage of 3 or more unusually loose stool or watery stool of any frequency within 24 hours [1]. The World Health Organization (WHO) defines diarrhea as the passage of three or more loose or liquid stools per day due to an abnormally high fluid content of stool or an abnormal increase in daily stool fluidity, frequency, and volume from what is considered normal for an individual and is caused by bacterial, viral, protozoa, and parasitic organisms [1]. In low-income countries, the two most common etiological agents of moderate-to-severe diarrhea are rotavirus and Escherichia coli [2]. The management of a child presenting with diarrhea should include a thorough history and examination in line with an evaluation of hydration and nutritional status, and subsequently, a complete scientific assessment for complications is required. This implies information about ethology and appropriate management is fundamental [1]. Once this examination and evaluation have been completed, a decision then needs to be made in terms of the method of rehydration, feeding, and besides, if there are signs for any specific examinations that ought to be attempted. Adequate fluid and electrolyte replacement and maintenance are critical to overseeing diarrheal disease[3].

According to World Health Organization (2008), Vibrio cholerae is endemic in multiple locations, including Africa and Asia, and is a cause of large-scale outbreaks [4]. According to [5], for the purpose of optimal case management and of epidemiological tracking, a diarrheal episode is often diagnosed according to symptoms and is classified into three categories. The pathogens that generally lead to acute watery diarrhea include V . cholerae or E . coli bact eria , as well as rotavirus. Bloody diarrhea, often referred to as dysentery, is marked by visible blood in the stools [6]. It is associated with intestinal damage and nutrient losses in an infected individual. The most common cause of bloody diarrhea is Shigella , a bacterial agent that is also the most common cause of severe cases and persistent diarrhea is an episode of diarrhea, with or without blood that lasts at least 14 days. Undernourished children and persons with other illnesses such as AIDS, are more likely to develop persistent diarrhea, which in turn, tends to worsen their condition [7]. Diarrhea disease is a global burden. In Africa the burden of diarrhea remains high. Diarrhea disease remains the third leading cause of disease and death in children younger than 5 years of age.

1.2. Statement of The Problem

According to WHO report each year there are about 2 billion cases of diarrheal disease in under-5-year children of which 1.9 million die [8].

According to World Health Organization 2009, India is the country that has the highest childhood diarrhea prevalence with more than 380,000 children die from diarrhea and its complications. However, India has made steady progress in reducing deaths in children under-5 years where this reduction has been possible due to inception and success to many universal programs such as expanded programs on immunization. Despite the decline, the proportional mortality accounted by diarrhea in India still remains high [9]. In Africa the burden of diarrhea remains high. Diarrhea disease remains the third leading cause of disease and death in children younger than 5 years of age. Diarrhea disease in Africa was responsible for an estimated 30 million cases of severe diarrhea and 330,000 deaths in 2015 [10]. Where, the frequency and severity of diarrhea in Africa is aggravated by lack of access to sufficient clean water, poor sanitation and hygiene practices. Additionally, in Kenya diarrhea diseases remains to be among the major public health problems where the mortality rate of children under the age of five years due to diarrhea is very high about 16% surpassing deaths from HIV and Malaria combined [11]. Further, according to KNBS and ICF Macro 2014, every child in Kenya under the age of five experiences an average of three bouts of diarrhea every year [12].

According to [13], diarrhea is one of the most common childhood illnesses, in both developing and developed countries. While the disease is rarely a cause of death in developed countries, it is estimated that approximately 1.6 million children die each year from diarrhea in the developing world [13]. Evidence shows that diarrhea diseases disproportionately affect locations with poor access to health care, safe water, and sanitation, and low-income or marginalized countries [14]. For instance, in Ethiopia which is a low income country, diarrhea disease is a public health burden and remains among the top ten causes of under-five mortality and morbidity cases [15] with other African countries like Somalia still experiences childhood diarrhea burden [16]

In Africa, 800,000 children die each year from diarrhea and dehydration which account for 25% to 75% of all childhood diseases [17]. According to 2018 WHO reports, in each year, diarrhea kills more than 525, 000 under-5 years' children. Five countries accounted for 50 % of the deaths, one of which was Ethiopia [17, 18].

Diarrheal disease remains second cause of death in under-5-year children globally [19].

Though most episodes of childhood diarrhea are not always severe, acute cases can lead to significant fluid loss and dehydration. Consequently, deaths or other severe consequences can arise if fluids are not replaced at the first sign of diarrhea [19].

According to WHO Guidelines, children that will be benefited from antibiotics are only those with bloody diarrhea (probable shigellosis), suspected cholera with severe dehydration, and serious associated non-intestinal infections such as pneumonia [19].

As the vast majority of the diarrhea cases are viral and self-limiting, the pillar of diarrhea management is an oral rehydration solution (ORS) and antibiotics have less value.17–18 Despite this fact, health care providers commonly prescribe antibiotics to treat diarrhea in under-five children worldwide.[20, 21] Such misuse of antibiotics has become a global issue, with the emergence of deadly infections caused by multidrug-resistant strains. These infections greatly affect the quality of life and put a high economic burden, as a result, both direct and indirect costs.

Antibiotics are the most commonly prescribed drugs worldwide17–20 and the misuse and over use of antimicrobials is also a common problem worldwide.18–20 The inappropriate use of medicines on a wide-scale can have a significant impact on health care costs and the quality of drug therapy and medical care, as well as being a primary contributor to the spread of antimicrobial resistance (AMR) and increased likelihood of adverse drug reactions and encouraging patients in appropriate reliance on medicines.21–24

Irrational utilization of medication has been comprehended to be a significant problem in the Ethiopian healthcare system. Therefore, the Integrated Management of New-born and Childhood Illness (IMNCI) assessment chart is currently advocated to be used in all health centers and health posts throughout the country. In addition to this, the use of national standard treatment guidelines together with WHO guidelines are recommended especially in facilities where there are no available laboratory services [25-26].Therefore, We aimed to assess the appropriateness of diarrhea treatment against the IMNCI and WHO guidelines in Addis Ababa.

1.3. Significance Of The Study

- This study will help the health center, sub city and further regional health bureau in identifying whether antimicrobials were used for diarrheal disease for under-5 patients according to IMNCI band EPHCG or not.
- It will also help health center to plan on antimicrobial use for diarrheal diseases in under-5 by health care providers according to current IMNCI guide line.
- It will assist to measure antimicrobial utilization pattern to take corrective measures.
- It will also help as baseline for other antimicrobial studies.
- Furthermore, the study helps for policy makers to plan and work on antimicrobial usage in under-5 out- patient departments.

1.4. Objectives

This study was aimed to evaluate antimicrobial utilization for diarrheal disease treatment among under-5 outpatients based on current IMNCI criteria at Semen health center in Arada sub city of Addis Ababa Ethiopia from January 1, 2023 to December 30 2023.

Specific Objectives

- To evaluate whether antimicrobial drug utilization for diarrheal diseases among under-5 out patients were rationale indicated or not according to IMNCI guide line.
- To evaluate whether the process indicators such as dose, strength, frequency, duration is in accordance to guidelines used in the health center.
- To assess whether there is drug- drug interactions and contra-indication or not when treating diarrheal diseases.

2. Method And Materials

2.1. Study Area And Period

Semen health center had different departments like adult OPD, under-5 OPD, psychiatric OPD, pre-cancer OPD and emergency surgery and in patient services. Laboratory and follow up of chronic disease like TB, DM and HIV AIDS. The health center possesses outpatient OPD, emergency and ART pharmacies. An institutional –based retrospective cross-sectional study was implemented to evaluate antimicrobial utilization patterns for diarrheal disease in under-5 out patients from January 1, 2023 to December 30, 2023.

2.2. Study Design

Quantitative research method was used and it is based on the measurement of quantity.

An institutional-based retrospective descriptive cross-sectional study design was conducted from January 1, 2023 to December 30, 2023, in under-5 out-patients of Semen health center of Arada sub city, Addis Ababa, Ethiopia.

2.3. Sample Size Determination

The size of the sample population was determined according to the Joint Commission on the Accreditation of Health care Organization (JCAHO) criteria which mandates a sample size of 5% if the average number of cases per quarter is greater than 600 and at least 30 , if quarter cases are less than 600. Since the total cases of under-5 out-patients treated for diarrheal diseases for one quarter was less than 600 data the sample size for this study would be 75 data according to WHO drug use evaluation guide line.

2.4. Population

2.4.1. Source Population

All under-five patients diagnosed with diarrheal diseases in semen health center were included in the study.

2.4.2. Study Population

All under-5 out- patients or pediatric patients' medical history record cards diagnosed and treated with diarrheal disease in the time of this

2.4.3. Inclusion And Exclusion Criteria

Each data was checked before data collection for data completeness by using inclusion and exclusion criteria.

Inclusion Criteria

All completed under-5 out-patient medical history record cards diagnosed as diarrhea from January 1, 2023 to December 30, 2023 were included. Accordingly patient demographic data (i.e. age, sex) would be Compulsory to be included.

Exclusion Criteria

All adult patient record cards in general and specialty services such as anti-TB, family planning, anti-natal care, delivery and post- natal care, antiretroviral therapy, anti-psychotropic patients and minor surgery (circumcision) were excluded for the convenience of the study.

2.5. Sampling Technique

Systematic random sampling technique was used to select under-5 out-patient medical records with diarrheal diseases treated by using WHO drug use evaluation criteria. All patient history record cards with diarrheal in under 5 OPD from January 1 2023 to December 30 2023 were taken. The first number was selected randomly using lottery method.

2.6. Study Variables

2.6.1. Dependent Variable

Dependent variables are the variables that were subjected to the study under investigation. They depend on the independent variables such as patient age, sex and weight and diagnosis. Those dependent variables were as follows:-

- Indicator
- Dose
- Duration
- Contraindication
- Drug interaction
- Advise
- Follow up

2.6.2. Independent Variables

The independent variables are independent of the variables under the study, but they determines what dose of drugs to be administered, for how long it would be taken, with what condition it is contra indicated and or with which other drug or food it will interact. They were demographic data such as:-

- Weight
- Age
- Sex of the patients treated for diarrheal cases in this study.

2.7. Data Collection Procedures

2.7.1. Data Collection Instruments And Methods

Checklists or format was adapted from reviews of different standard literatures and was pre-tested in one of OPD of the OPD not included in the study sample and duration within health center. Data was collected by using data collection format developed by WHO.

2.7.2. Pre-Test

Pre-test was done out of the study population in one of rural health center before the actual data collection at the Semen Health center before the actual data collection and some correction was made on the format or checklist

2.8. Data Quality Assurance

The appropriate designed data collection instrument was used. The check list or format was checked every day the collected data was reviewed and checked for completeness and consistency of the response.

A preliminary study was conducted on a small number of medical records at Semen health center, and minor revisions were made on the structured data abstraction format. Next, data was collected retrospectively using the format from patient medication records.

2.9. Data Processing And Analysis

The collected data was entered into MS excel statistical formula data and analyzed using descriptive analysis. Descriptive statics and cross tabulation was carried out, and the result was summarized and presented using texts, tables and graph. The antimicrobial utilization for diarrheal disease treatment was evaluated through IMNCI guide lines for health center.

2.10. Ethical Consideration

Ethical clearance was obtained from the Ethical Review Board and approval was obtained from the Management of Semen health Center. Then officials at different levels in the study area were communicated through letters from Semen health center chief executive of the officer (CEO). Letters of permission was presented to Semen health center drug and therapeutic committee and to all concerned bodies of health center. Verbal informed consent was obtained from responsible body of health center prior to the collection after the purpose of the study was explained. Confidentiality of the information was assured.

2.11. Problem Encountered

Incompleteness of the patient cards while document review.

2.12. Operational Definition

Antibiotics: Chemotherapeutic agents with activity against microorganisms
Children: Age between1yearand15 years.
Adult: Age greater than15 years
Dose: The amount of drug to be taken at a time.
Drug Use Evaluation: Is an ongoing systematic process designed to maintain the appropriate and effective use of drugs
Empiric Treatment: Antibiotics administration without identification of sensitive bacterial pathogen (antibiotic therapy initiated prior to the first positive culture)
Infants: Age between1month to 12 months
Judicious Use Of Drugs: Using drugs with a sound judgment according to present and validated treatment protocol.
Definitive Treatment: Treatment undertaken after definitive identification of the causative agent (Antibiotic therapy directed at final organism).
Neonate: Age less than 30 days
Nosocomial Infection: An infection that is acquired in the hospital settings
Pediatric-A population segment that are under 15 years of age
Prophylactic Treatment: Administration of drugs to prevent possible infection before its occurrence
Rational Use Of Drugs: Is a process which involves appropriate prescribing of drugs
Appropriate: If conform to IMNCI guide lines
Inappropriate: If not comply with IMNCI guide line.
Diarrhea:- Diarrhea is defined as passage of 3 or more unusually loose stool or watery stool of any frequency within 24 hours.

3. Result

3.1. Socio-Demographic Distribution Of Patients Treated With Diarrheal Diseases

A total of 75 under-5outpatients' treated for diarrhea was included in the study. Out of the total sample taken about 38 (50.80%) were females and 37 (49.3%) were males. On the other hand 31(39.24%) under-5 children included in the study were less than the age of 1 year, whereas about 9(12%) and 53(70%) of the under-5 out-patients' record cards included in the study were in the age group of 1-3 years and 3-5 years respectively (Table 1).

Table 1: Socio-Demographic distribution of under five patients treated for diarrheal diseases from January 1, 2023 to December 30, 2023 (n=75)

Patient Demography						
	Sex classification					
Age category	Females		Males		Grand Total	
	Frequency	Percent	Frequency	Percent	Grand Total	
≤1yr.	6	8	7	9.3	13	17.3
1 -3yrs	9	12			9	12.0
3-5yrs	23	30.8	30	40	53	70.7
Grand Total	38	50.8	37	49.3	75	100

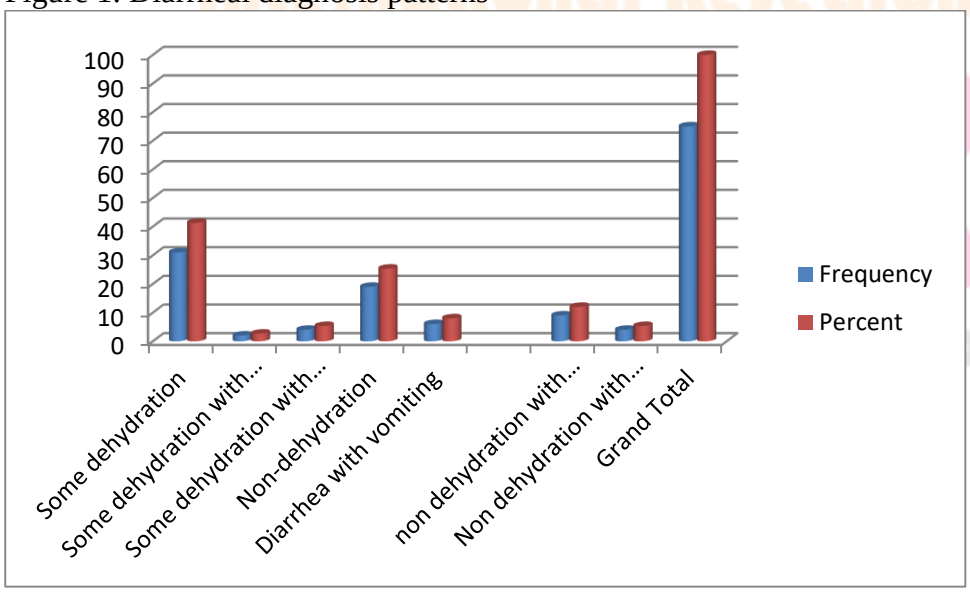
3.2. Common Diarrheal Related Ailments Treated

From the total 75 diarrheal disease treated about (n=31, 41.33%) with some dehydration, (n=2, 2.67%) with some dehydration and vomiting, (n=4, 5.33%) with some dehydration and bacilli, (n=19, 25.3%) with non-dehydration, (n=6, 8%) vomiting with diarrhea, (n=9=12%) with non-dehydration dysentery and the remaining (n=4, 5.33%) were treated with non-dehydration dysentery ameobiasis.

Table 2: Diarrheal diseases get treated from January 1, 2023 to December 30, 2023 (n=75)

Indication	Frequency	Percent
Some dehydration	31	41.33
Some dehydration with dysentery ameobiasis	2	2.67
Some dehydration with dysentery bacilli	4	5.33
Non-dehydration	19	25.33
Diarrhea with vomiting	6	8.00
Non dehydration with dysentery bacilli	9	12.00
Non dehydration with Dysentery Ameobiasis	4	5.33
Grand Total	75	100.00

Figure 1: Diarrheal diagnosis patterns



Source: Own data

3.3. Diarrheal Diseases Prescribing Patterns

From the total 75 diarrheal diseases treated indication (n=71, 94.7%), dose, strength, frequency and duration (n=67, 89.33 %) were appropriately prescribed whereas both drug interaction and contraindication (n=75,100%) were correctly managed.

Table 3: Diarrheal diseases correctly given treatment from January 1, 2023 to December 30, 2023 (n=75)

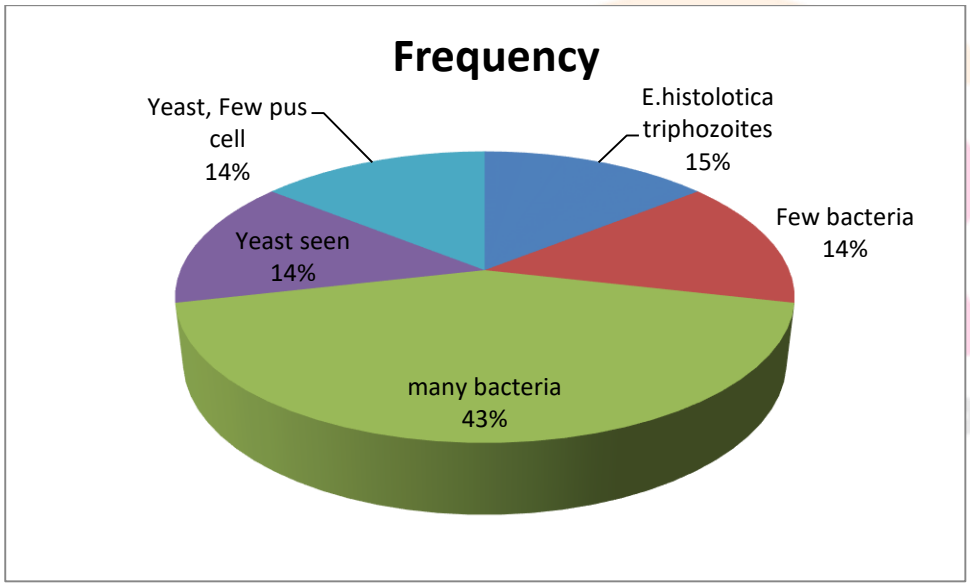
Diagnosis	Contra-indication	Drug interaction	Duration	Dose	Indication
ORS only treatment and lacking antibiotics when needed	2	2	1	1	1
ORS +Zinc only treatment	34	34	34	34	34
ORS + Zinc with ciprofloxacin	12	12	12	12	12
ORS+Zincwith Co-trimoxazole	10	12	12	12	12
ORS with co-trimoxazole and metoclopramide	4	4	4	4	4
ORS + Zinc with metrindazole	6	6	6	6	6
ORS+ZINCwith metoclopramide	4	4	0	0	4
Co-trimoxazoleand metoclopramide without ORS	2	2	0	0	0
Grand Total	75	75	67	67	71
Percent	100	100	89.3	89.3	94.7

3.4. Laboratory investigation

From the total 75 sample only (n=14, 18.7%) was laboratory investigated and the remaining all clinically treated.

Table 4: Laboratory investigation from January 1, 2023 to December 30, 2023 (n=75)

Laboratory test result			
Parameter	Frequency	Relative frequency	Percent
E.histolotica triphozoites	2	14.29%	2.67%
Few bacteria	2	14.29%	2.67%
many bacteria	6	42.86%	8.00%
Yeast seen	2	14.29%	2.67%
Yeast, Few pus cell	2	14.29%	2.67%



3.5 Antimicrobial Utilization For Diarrheal Diseases

From the total 75 patient cards about (n=34, 45.3 %) were treated with antimicrobial drugs. From the total 34 antimicrobials prescribed about (n=28, 37.3%) were treated with antibiotics. From the total 28 antibiotics prescribed for diarrheal diseases about (n=12, 16%) were treated by ciprofloxacin and the remaining (n=16, 21.3%) were treated with co-trimoxazole. From the total 34 antimicrobial drugs prescribed about (n=6,8%) were prescribed and treated with metronidazole.

Table 5: Antimicrobial utilization for diarrheal diseases January 1, 2023 to December 30, 2023 (n=75)

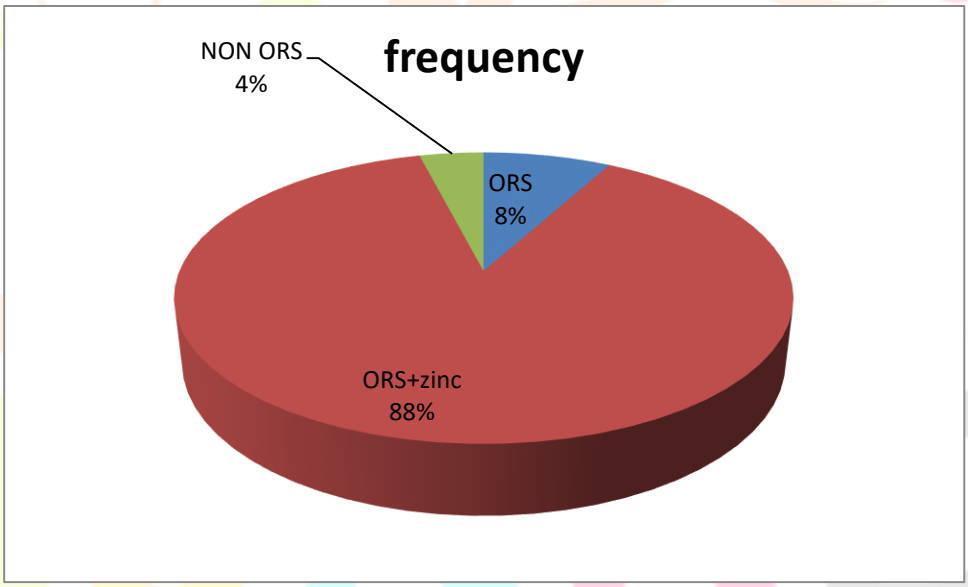
Row Labels	Frequency	Relative frequency	percent
Ciprofloxicillin-250mg tablet po 1tab bid for 03 days	12	31.58%	16.00%
Co-trimoxazole-240mg/5ml 7.5ml po bid for 05 days	4	10.53%	5.33%
Co-trimoxazole-240mg/5ml 1tsf po bid for 05 days	12	31.58%	16.00%
Metrindazole-125mg/5ml 1tsf po tid for 07 days	6	15.79%	8.00%
Grand Total	34	100%	45.33%

3.6. ORS and ORS + ZINC Utilization Pattern

From the total 75 sample of study (n=72, 96 %) were prescribed and treated with ORS and ORS + Zinc which is very good performance.

Table 6: ORS and ORS + ZINC utilization pattern January 1, 2023 to December 30, 2023 (n=75)

Parameter	Frequency	Percent
ORS	6	8
ORS+zinc	66	88
NON ORS	2	4



3.7. Anti-Emetic Use Pattern

From the total 8 patients prescribed anti-emetic drug (metoclopramide oral drop 0.2mg/drop) only (n=4, 50%) were appropriately prescribed with full direction of use because the remaining 4 patient cards were not prescribed with specific dose and frequency for effective use. The proportion of children with vomiting and get ant emetic treatments were only (n=8, 10.67 %) of the total cards reviewed.

Table 7: Anti-emetic prescribing patterns January 1, 2023 to December 30, 2023 (n=75)

Parameter	Frequency	Relative frequency	Percent
Metoclorpromide 0.2mg/drop po 5 drops prn	2	25.00%	2.67
Metoclorpromide 0.2mg/drop po 7 drops prn	2	25.00%	2.67
Metoclorpromide 0.2mg/drop po 5 drops po bid for	4	50.00%	5.33
Grand Total	8	100	10.67

3.8. Diarrheal Management Advise And Follow Up

From the total 75 data seen about (n=65, 86 %) was well advised to breast feeding and fluid intake and to come for follow up.

Table 8: Diarrheal management advises and follow up

Parameter	Advice		Follow up	
	Frequency	Percent	Frequency	Percent
Breast feeding	2	3.08	2	2.99
fluid intake	63	96.92	65	97.01
Percent	65	86.66	67	89.33

4. Discussion, Recommendation And Conclusion

4.1. Discussion

From the total 75 patient cards about (n=34, 45.3 %) were treated with antimicrobial drugs. Approximately one out of two prescriptions was prescribed and treated with antimicrobials. The result was compared with the retrospective cross sectional study done in selected health centers of Addis Ababa, Ethiopia between September 2014 and February 2015 with antimicrobials prescribed finding of 86.6% out the total prescription studied and had shown antimicrobial prescribing improvement by one half. Even though antibiotics needed only for bloody diarrheal (dysentery) co-trimoxazole antibiotics (21.3%) were prescribed for non-bloody diarrhea and other unspecified reason. Accordingly about 78.7% of the prescribed antimicrobial drugs were appropriately managed according to IMNCI guideline and had shown improvement to the study finding from selected health center within Addis Ababa Ethiopia between September 2014 and February 2015 which was managed only 45.6 % appropriately according to WHO guide lines.[27]

From the total 75 sample of study (n=72, 96 %) were prescribed and treated with ORS and ORS + Zinc which is very good performance. Almost all under-five patients treated for diarrheal diseases were prescribed and given ORS fluid replacement. The result was similar with the study conducted in Hawassa university teaching and referral hospital, Ethiopia that shown 90 % coverage with ORS fluid prescribing for diarrhea [28]. However it contradict when compared with a study conducted in selected health centers of Addis Ababa, Ethiopia between September 2014 and February 2015 that only shown 66.7 % ORS fluid prescribing result. This study shown that ORS prescribing in Semen health center has s improvement approximately by one fourth the study result of selected health center within Addis Ababa as mentioned above.

From the total 75 data seen about (n=65, 86 %) was given well advise on breast feeding and fluid intake for under five patients treated for diarrhea and also told when to come for follow up.

From the total 75 diarrheal diseases treated the overall indications (n=71, 94.67%), dose, strength, frequency band duration (n=67, 89.33%) each and both drug-drug interaction and contra-indication (n=75,100%) were correctly prescribed.

4.2. Conclusion

This study revealed that antimicrobial use for diarrheal diseases treatment was deviated from criteria and threshold and also IMNCI guideline while other medication for diarrhea such as ORS, ORS plus zinc was slightly deviated from criteria and threshold.

4.3. Limitation

Data incompleteness and Poor documentation in the facilities were the main limitation as the study used secondary data. Moreover, since the study was a descriptive cross-sectional, the underlying reasons why this problem exists could not be established at this time.

4.4. Recommendation

1. All health care professional should stick to IMNCI SOP guide line to diagnosis, prescribing and dispensing the drug or giving services for the patients.
2. Training on IMNCI guide line should be given for all health care professionals.
3. Supportive supervision and feedback should be done for health workers.
4. Close monitoring and evaluation should be done for each health services given in health center.
5. We recommend drug and therapeutic committee to establish and implement antibiotics prescribing privilege in general and amoxicillin in particular for special population such as neonate and geriatrics.
6. Any treatments and health services and care giving should be done by health care professionals according to the level of qualification and specialty they have acquired.

7. Laboratory investigation is essential to diagnose diarrheal etiology and thus help deciding wetter to give antibiotics or not.
8. As most diarrheas is caused by virus ORS with zinc should be given for diarrheal cases.
9. It is advisable to prescribe medicines with time bounded frequency and duration especially metoclopramide for pediatrics.

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5. References

1. Andersen RM. Revisiting the Behavioral Model and Access to Medical Care: Does it Matter. J Health Soc Behav. 1995;36(1):1–10.

2. Bryce J, Arnold F, Blanc A, Hancioglu A, Newby H, Requejo J, et al. Measuring Coverage in MNCH: New Findings, New Strategies, and Recommendations for Action. PLoS Med. 2013;10(5):e1001423. doi:10.1371/ journal.pmed.1001423.

3. Carter E, Bryce J, Perin J, Newby H. Harmful practices in the management of childhood diarrhea in low- and middle-income countries: a systematic review. BioMed Central. 2014, In Press.

4. Colvin C, et al. Understanding care seeking for child illness in sub-Saharan Africa: A systematic review and conceptual framework based on qualitative research of household recognition and response to child diarrhea, pneumonia and malaria. Soc Sci Med. 2013;86:66–78.

5. Countdown to, 2015. 'Countdown to 2015 for Maternal, Newborn and Child Survival. 2015. Available at http://www.countdown2015mnch.org/', Accessed 15 May.

6. Diaz, T., George AS, Rao SR, Bangura PS, Baimba JB, McMahon SA, Kabano A. 'Healthcare seeking for diarrhoea, malaria and pneumonia among children in four poor rural districts in Sierra Leone in the context of free health care: results of a cross-sectional survey'. BMC Public Health 2013;13:157.

7. Demographic and Health Surveys, DHS (2010–2014) for Burkina Faso 2010, Burundi 2010, Cameroon 2011, Cote d'Ivoire 2011–12, Democratic Republic of the Congo 2013–14, Ethiopia 2011, Mali 2012–13, Niger 2012, Nigeria 2013, Sierra Leone 2013, United Republic of Tanzania 2010, and Uganda 2011, ICF International, Calverton Maryland USA

8. Fischer Walker CL, Taneja S, LeFevre A, Black RE, Mazumder S. Appropriate Management of Acute Diarrhea in Children Among Public and Private Providers in Gujarat, India: A Cross-Sectional Survey. Glob Health Sci Pract. 2015;3(2):230–41.

9. Fischer Walker, CL Rudan I, Liu L, Nair H, Theodoratou E, Bhutta Z, O'Brien KL, Campbell H, Black RE. 'Global burden of childhood pneumonia and diarrhea'. Lancet. 2013;381(9875):1405–16.

10. Health Poverty Action HPA. Sierra Leone's free Healthcare initiative. 2012. CCM-Malawi Quality of Care Working Group. (2012).

11. Quality of sick childcare delivered by Health Surveillance Assistants in Malawi. Health Policy Plan. 2013;28(6):573–85.

12. Liu L, et al. Global, regional, and national causes of child mortality in 2000–13, with projections to inform post-2015 priorities: an updated systematic analysis. Lancet. 2015;385:430–40.

13. Mediratta RP, Feleke A, Moulton LH, Yifru S, Sack RB. Risk factors and case management of acute diarrhoea in North Gondar Zone, Ethiopia. J Health Popul Nutr. 2010;28(3):253–63.

14. Miller NP, Amouzou A, Tafesse M, et al. Integrated community case management of childhood illness in Ethiopia: Implementation strength and quality of care. Am J Trop Med Hyg. 2014;91(2):424–34.

15. Munos Melinda K, Fischer W, Christa L, Black Robert E. 'The effect of oral rehydration solution and recommended home fluids on diarrhea mortality'. Int J Epidemiol. 2010;39:i-75–87.

16. Perin J, Carvajal-Velez L, Carter E, Bryce J, Newby H. Fluid curtailment during childhood diarrhea: A Countdown analysis. BMC Public Health. 2015;15:588. http://www.biomedcentral.com/content/pdf/s12889-015-1878-z.pdf Accessed 26 June 2015.

17. Pires SM, Fischer-Walker CL, Lanata CF, et al. Aetiology-specific estimates of the global and regional incidence and mortality of diarrhoeal diseases commonly transmitted through food. PLoS One. 2015;10(12):1–17. doi:10.1371/journal.pone.0142927

18. Killer G. Global Diarrhea Burden. Centers Dis Control Prev. 2013;1–4.

19. Services H. Diarrhea: Common Illness. Global Killer:1–4.

20. Mahapatra T, Mahapatra S, Banerjee B, Mahapatra U. Predictors of rational management of diarrhea in an endemic setting: observation from India. PLoS One. 2015;1–13.

21. De Jong J, Van Den Berg PB, Visser ST, De Vries TW, De Jong-van Den Berg LT. Antibiotic usage, dosage and course length in children between 0 and 4 years. Acta Paediatr Int J Paediatr. 2009;98 (7):1142–1148. doi:10.1111/j.1651-2227.2009.01309.x

22. Kotwani A, Chaudhury RR, Holloway K. Antibiotic prescribing practices of primary care prescribers for acute diarrhea in New Delhi, India. Value Heal. 2012;15(1):S116–9. doi:10.1016/j. jval.2011.11.008.

23. Chilongola J, Msoka E, Juma A, Kajeguka DC, Semvua H. Antibiotics prescription practices for provisional malaria cases in three hospitals in Moshi, northern Tanzania. Tanzan J Health Res. 2015;17(3):1–10.

24. Carlet J. Overcoming global anti microbial resistance. Global Health Dyn. 2015;5–29 p.

25. Ismaeel AY, Al Khaja KAJ, Damanhori AHH, Reginald P, Botta GA. Management of acute diarrhoea in primary care in bahrain: self-reported practices of doctors. J Heal Popul Nutr. 2007;25 (2):205–211.

26. DACA. Standard treatment guideline for health centers: drug administration and control authority of Ethiopia. 2010; January:1–349.Tsige et al Dove press submit your manuscript | www.dovepress.com Dove Press Pediatric Health, Medicine and Therapeutics 2020:11142 Powered by TCPDF (www.tcpdf.org)

27. Arega G.assessment of the management of DiarrheaAmong Children under five in Addis Ababa, Ethiopia.

28. Wilson SE, Morris SS, Gilbert SS, Mosites E, Hackleman R, Weum KLM, et al. Scaling up access to oral rehydration solution for diarrhea: Learning from historical experience in low– and high–performing countries. J Glob Health.2013;3(No. 1):010404. doi:10.7189/jogh.03.010404.