COLLEGE OF MEDICINE AND HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

DETERMINANTS OF DELAY IN TREATMENT SEEKING FOR DIARRHEAL DISEASES AMONG MOTHERS WITH UNDER-FIVE CHILDREN IN PUBLIC HOSPITALS OF SIDAMA REGION ,SOUTHERN ETHIOPIA: UNMATCHED CASE CONTROL STUDY

MSc THESIS

BY: MENELIK MATHEWOS

MAY, 2024

HAWASSA, ETHIOPA

HAWASSA UNIVERSITY

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A THESIS REPORT SUBMITTED TO HAWASSA UNIVERSITY, COLLEGE OF MEDICINE AND HEALTH SCIENCES SCHOOL OF PUBLIC HEALTH FOR PARTIAL FULFILLMENT OF MASTERS DEGREE IN EPIDEMIOLOGY

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HAWASSA, ETHIOPIA

DECLARATION

I declare that this Research entitled "**Determinants of Delay in Treatment Seeking for Diarrheal Diseases among Mothers with Under-Five Children in Public Hospital in Sidama Region, Southern Ethiopia.** This is my own work that have not been addressed in the study area as far as my knowledge touched and all the sources I used has been indicated and acknowledged as complete reference.

Name of investigator Signature Date

Menelik Mathewos _____ _____

Ethical review board

1. _____ _____

HAWASSA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

EXAMINER'S APPROVAL SHEET

We, the undersigned members of the Board of Examiners of the Final open defense by Menelik Mathewos have read and evaluated his thesis entitled "**Determinants of delay in treatment seeking for diarrheal diseases among mothers with under-five children in public hospitals of Sidama region, southern Ethiopia: unmatched case control study**" and Examined the candidate, this is therefore, to certify that the thesis has been accepted in partial fulfillment of the requirements for the degree of Masters of Epidemiology

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Final Approval and acceptance of the thesis is contingent upon the submission of the final copy of the thesis to the school of graduate study (SGS) through the Department/School Graduate committee (DGS/SGC) of the candidate department

Stamp of the SGS Date_____

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ACRONYMS/ABBREVIATION

AOR	Adjusted odds ratio
BSc	Bachelor of science
CDD	Child with Diarrheal Diseases
CI	Confidence interval
EDHS	Ethiopian Demographic Health Survey
ETAT	Emergency Triage Assessment and Treatment
ETB	Ethiopian Birr
HCIs	Health Care Institutions
ICCM	Integrated Community Case Management
KM	Kilo-Meter
LMICs	Low and Middle Income Countries
NGOs	Non _Governmental Organization
OPD	Out Patient Department
OR	Odds Ratios
WHO	World Health Organization

ABSTRACT

Background-.A significant majority of pediatric diarrheal deaths are caused by delays in receiving timely, appropriate care. Life-threatening consequences are decreased when under-five children with diarrhea obtain medical attention promptly and appropriately. Therefore, this study looked into factors that contributed to mothers of children under five delaying of treatment for diarrheal illnesses.

Objective – To assess determinant of delay in treatment seeking for diarrheal disease among mothers with under five children in public hospitals in Sidama region, southern, Ethiopia from April 1 to May 30,2024 **Methods** - A Facility-based unmatched case control study was conducted on 414(207 Cases and 207 Controls). Cases were under-five children paired with their mothers/caregivers who sought treatment after 24 hours of the onset of signs and symptoms of diarrheal diseases, and controls were under-five children paired with their mothers/caregivers who sought treatment within 24 hours of the onset of signs and symptoms of diarrheal diseases. Data were collected using KOBO collect with smart Phone and analyzed by using SPSS 26. Bivariate and multivariable logistic regressions were computed to identify independent determinants of delay in treatment seeking. Association was described using an adjusted odds ratio along with their 95% confidence interval. Significance was declared at $p<0.05$ in the multivariable logistic regression.

Results- from 418 selected participants, 414 mothers (207 cases and 207 controls) were included. Being rural resident (AOR 3.40(95 % CI 2.03-5.72), Child age < 24 months (AOR 4.43(95 % CI=2.35-8.34), Mothers without formal education (AOR 11.679(95 % CI 3.705-36.81), difficult to pay cost of treatment (AOR 4.345(95 % CI 2.019-9.352), Absence of health insurance AOR 3.182(95 % CI 1.945-5.207), were significant determinants of delayed treatment seeking. **Conclusion-**Young age of child, rural residence, Educational level of mothers, difficulty to pay Cost of treatment and absence of health insurance were important determinants of delay in treatment seeking. Thus comprehensive strategies that might enhance health facility accessibility crucial to reduce diarrhea related complications.

Keyword- *Diarrhea, Ethiopia, Treatment, delay, under five children, Health seeking*

1. INTRODUCTION

1.1 Background

Diarrhea is defined as the passage of three or more watery or loose stools per 24 hours or an increase in stool frequency or liquidity that is considered abnormal by the mother(1) . It is usually a symptom of an infection in the intestinal tract, which has a variety of causative agents including viruses, bacteria and parasite. Diarrheal infection spreads through the ingestion of contaminated food or drinking-water, or person-to-person as a result of poor hygiene. There are three clinical types of diarrhea: (i) acute watery diarrhea which lasts several hours or days and includes cholera; (ii) acute bloody diarrhea, also called dysentery; and (iii) persistent diarrhea that lasts 14 days or longer(2).

Globally, over 910 million cases of diarrhea in children each year that are distributed unevenly. It is the second most common cause of mortality for children under five worldwide accounting for 1 in 9 deaths(3). Data from 2021, World Health Organization, showed that diarrheal illness accounts for 8% of mortality in children under the age of five (4). The vast majority of deaths from diarrhea are among children under 5 years of age living in low- and middle income countries. Furthermore, with 76 fatalities for every 1,000 live births, Sub-Saharan Africa continues to have the highest under-five mortality rate(5).Ethiopia, with a prevalence that ranges from 23% to 31.7%(6). It is a serious public health issue that accounts for 8% of children under five, who die(7) .

There are low cost and effective interventions that can prevent and treat diarrheal diseases. Thus, deaths from diarrhea are largely preventable if adequate treatment is sought timely in the course of the illness. The Ethiopian government initiated the Health Extension Program (HEP)(8).At least two Health Extension Workers were deployed at each kebeles, delivering prevention, health promotion, and curative service at the health post through the Integrated Community Case Management (ICCM) program. They also worked to improve the health-seeking behavior of mothers/caregivers of children under five with common childhood diseases. While Ethiopia has made significant progress in reducing under-five child mortality, 67 under-five children die per 1,000 live births, and 480 children die every day from easily preventable diseases in 2018(9).

In addition, immediate treatment within 24 hours was low where acute diarrhea was recognized among mothers/caregivers of children seeking care. Inability to identify situations that endanger life and poor care-seeking behaviors caused that delay treatment-seeking for the caregivers. This delay may affect children's health and result in complications that make medical treatment less safe and ineffective(10).

1.2 Statement of the Problem

Diarrhea is one of the top five worldwide causes of illness and death for children under five. In 2020, 5.4 million children under five died, with 78% of those fatalities taking place in Africa and South Asia (11). It remains a significant public health concern, contributing to 8% of deaths of under-five children worldwide(1,12). Diarrhea is a major cause of death for one in nine children globally, despite the fact that most cases can be avoided using low-cost, easily implemented preventive strategies. This indicates that diarrhea is the cause of 2,195 child deaths each day(13).

Furthermore, with 76 fatalities for every 1,000 live births, Sub-Saharan Africa continues to have the highest under-five mortality rate in the world. Diarrhea was a contributing factor in 8% of under-five mortality in Ethiopia(14). Getting the right care as soon as possible could avert long-term complications and cut down on childhood illness-related fatalities by 20%. However, Ethiopian moms of children under five had poor health-seeking behaviors, and only a tiny percentage of these children got timely, effective care.(10,13,15).

The Ethiopian Demographic and Health Surveys (EDHS) of2011 and 2016 reported that 13% and 12% of under-five children respectively were reported to have had diarrhea two weeks before the survey(15). In Ethiopia, there are regional variations in the prevalence of diarrhea among children under five (5).Diarrhea was a contributing factor in 8% of under-five mortality in Ethiopia(6,7,16).

Only a small percentage of children under five receive timely, effective treatment, and Ethiopian mothers' health-seeking behavior was low. In light of this, the EDHS 2016 study found that only 44% of children under five who had diarrheal illnesses were brought to a medical institution for guidance or treatment(6,16).

Early health service utilization combined with effective treatment will lower morbidity, disability, and death rates(17,18). In Ethiopia, different regions have different practices when it comes to using medical services to treat common children ailments. It is between 5 and 72%, or roughly 73% of those who seek counsel in government-run medical facilities. If mothers obtained adequate care as soon as possible, it would cut childhood mortality from diarrheal infections and long-term sequelae by twenty percent (19). However, the habit of seeking medical attention was not very good; as a result, very few children under the age of five receive prompt, adequate treatment.

The incidence of severe and sometimes fatal pediatric illnesses can be significantly decreased by obtaining appropriate treatment. Mothers address diarrheal bouts using home remedies, conventional

therapies, and Western-style medication(18). Additionally, among mothers and caregivers of children seeking care, the likelihood of receiving prompt treatment within 24 hours was low when acute diarrhea was identified. According to scientific studies conducted in Ethiopia, 27% of patients received treatment quickly within 24 hours of the diagnosis of acute diarrhea, and 12.2% received therapy after 24 hours of the diagnosis of urgent diarrhea sickness(16–20).

Incapacity to recognize life-threatening circumstances and poor care-seeking habits resulted in the caregivers delaying seeking treatment. The health of the kids could be impacted by this delay, which could lead to issues that compromise the safety and efficacy of medical care(6,21). Nonetheless, it has been determined that socio-demographic, economic, and illness-related factors affect mothers' and caregivers' decision to seek treatment for their children's diarrhea(18,20).

By seeking timely and adequate care, childhood illness-related fatalities could be lowered by 20% and long-term complications could be avoided(16,19,20). However, mothers of children under five in Ethiopia had poor health-seeking behaviors, and very few of these children got timely, effective care.

The Global Pneumonia and Diarrhea Control Action Plan of the World Health Organization and United Nations Children's Fund (WHO) lists the ability of parents to recognize and promptly treat their children as one of the most important suggested actions(6,21–23).

Treatment for diarrhea in children is frequently ineffective and delayed. The ability to access a medical institution is still a significant barrier to treating childhood diarrhea. To cure childhood diarrhea quickly, mothers' lack of education and awareness of oral rehydration salts needs to be addressed(3,22,24).

In Sidama there is no studies conducted regarding treatment delays on diarrhea and there is increases number of diarrhea related complications due to delayed treatment seeking throughout my observations during my professional experience in the area. Therefore, this study aimed to identify determinant factors of delay in care seeking for diarrheal diseases among mothers with under-five children who visit the public health facility Sidama, Southern Ethiopia.

1.3 Significance of the study

This study provides hint on determinants of delay in timely treatment seeking for diarrheal diseases among mothers/caregivers with under-five children in study area.

The finding of this study able professionals/organizations to design effective interventions on identified determinants of delay to maximize early treatment seeking for diarrheal disease among mothers /caregivers with pediatrics. When evidences are available there will also be high chance of Non-Governmental Organizations (NGOs) and donor agencies to be attracted and bring projects to the area that will benefit caregivers of under-five children.

The finding of this study could also use as important literature for the future researchers who want under take similar study. Additionally, it could help stakeholders and policy manager who work on this area to develop further plan and policy on identified determinants of delay.

Moreover, it is advantageous for Kebele Health extension workers to act up on the identified determinants of delay in treatment seeking for diarrheal disease among mothers/caregivers with under five children so that, it facilitate rapid recovery without complication.

2. LITERATURE REVIEW

This section presents the different factors reviewed in empirical studies of various sources. The literatures reviewed in this study assumed to be recent contains published articles on Google scholars; PubMed and data base were browsed. More specifically, it covers of determinants delay in seeking treatment for diarrhea in under five children identified by different studies by categorizing into four major thematic area. The factors are reviewed in different sections below.

2.1 socio demographic determinants

According to a study done in Bangladesh study, factors including the age and sex of the children, the age and education of the moms, the income index, all have a major impact on the pattern of people seeking health care(17). In Cameroon, a study revealed that the following factors were independently linked to diarrhea: age of mothers/caregivers, sex, education level, child's age (≤ 12 months), mothers'/caregivers' knowledge of diarrhea (5).

According to the study conducted in North Western Ethiopia, 2020, sex and age of child, mother/caregiver educational status, wealth index, health insurance, and self-medication were statistically significant for delayed treatment-seeking among mothers/caregivers of under-five children with diarrheal disease (26). Study from Arba Minch which reported that mothers with poor socio economic status significantly associated with delay treatment seeking(10).Other socio-demographic variables that significantly determine delay in treatment seeking among mother's/care givers paired with under five children included: higher household income, age of the child and the child's sex.(25) Another study found that children's gender and age to be a critical determinant delay in treatment seeking(27).A study conducted in Ethiopia Healthcare utilization of mothers for Child with Diarrheal Disease (CDD) was associated with age of the child. Those mothers who had children aged 6–11 months were 2.16 times more likely to use HCIs for CDD treatment(28).

A number of factors can delay in treatment seeking for diarrhea disease among under five children. According to study conducted south west Ethiopia, Children from rural areas had higher odds of delay to be taken to health facilities for medical care for diarrheal diseases than children from urban areas. This study also revealed that children of mothers/caregivers who lived in more than 10 km from a nearby health facility had higher odds of delayed treatment-seeking compared to those who lived within a 10 km radius(6). This study also found that, Children of mothers/caregivers who had more than two children demonstrated higher odds of delayed treatment seeking compared to those from

mothers/caregivers who had two or fewer children and delayed treatment-seeking were observed among mothers/ caregivers who had no TV or radio(6).

2.2 Enabling factors

Childhood diarrhea places a financial burden on affected households, according to a study done in three south Asian settings (Bangladesh, India, and Pakistan) to estimate the costs borne by households due to the illness, including direct medical costs, direct nonmedical costs, and productivity losses(17,23,29).Based on A study conducted in Western Nepal showed that Socioeconomic development of the urban poor may overcome their financial constraints to seek 'appropriate' and 'prompt' care during the childhood illness(30).

A study conducted in Rural Uganda revealed Caregivers who stayed near the health units (≤5km) were 0.57 times likely to seek timely health care compared to those who stayed in far places. Health care seeking within 24 hours for diarrheal episodes among children under five by caregivers was found to be high in the selected study(12).According to A study Conducted in North western Ethiopia low monthly income absence of health insurance and self-medication were determinants of delayed treatment-seeking(6,31).

2.3 Disease Related Factors

According to A study conducted in Kenya, three factors emerged as having significant effects on health care seeking practices of the caregivers. First is the duration of illness before seeking care. The longer the duration before treatment was sought, the lower the likelihood of caregivers seeking appropriate care. It is possible that the caregivers did not perceive the illness as serious or that the caregivers were administering homemade remedies, which prolonged the period to seeking appropriate care. Illness severity or perceived severity by caregivers has been shown to be a predictor of better health care seeking(32).

A study in rural Uganda also found Caregivers who knew the signs of diarrhea were 0.97 times more likely to seek timely treatment (adjusted odds ratio (AOR) =0.97, compared to caregivers who did not know the signs of diarrhea(12).

According to A study conducted in Northern Ethiopia in Mekele showed that there is a diversity of perception on the causes and treatment options of child hood diarrhea. The study also revealed Severity of diarrhea and blood in stool were the independent determinant factors for health care seeking behavior of mothers(33).

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2.5 Conceptual Framework

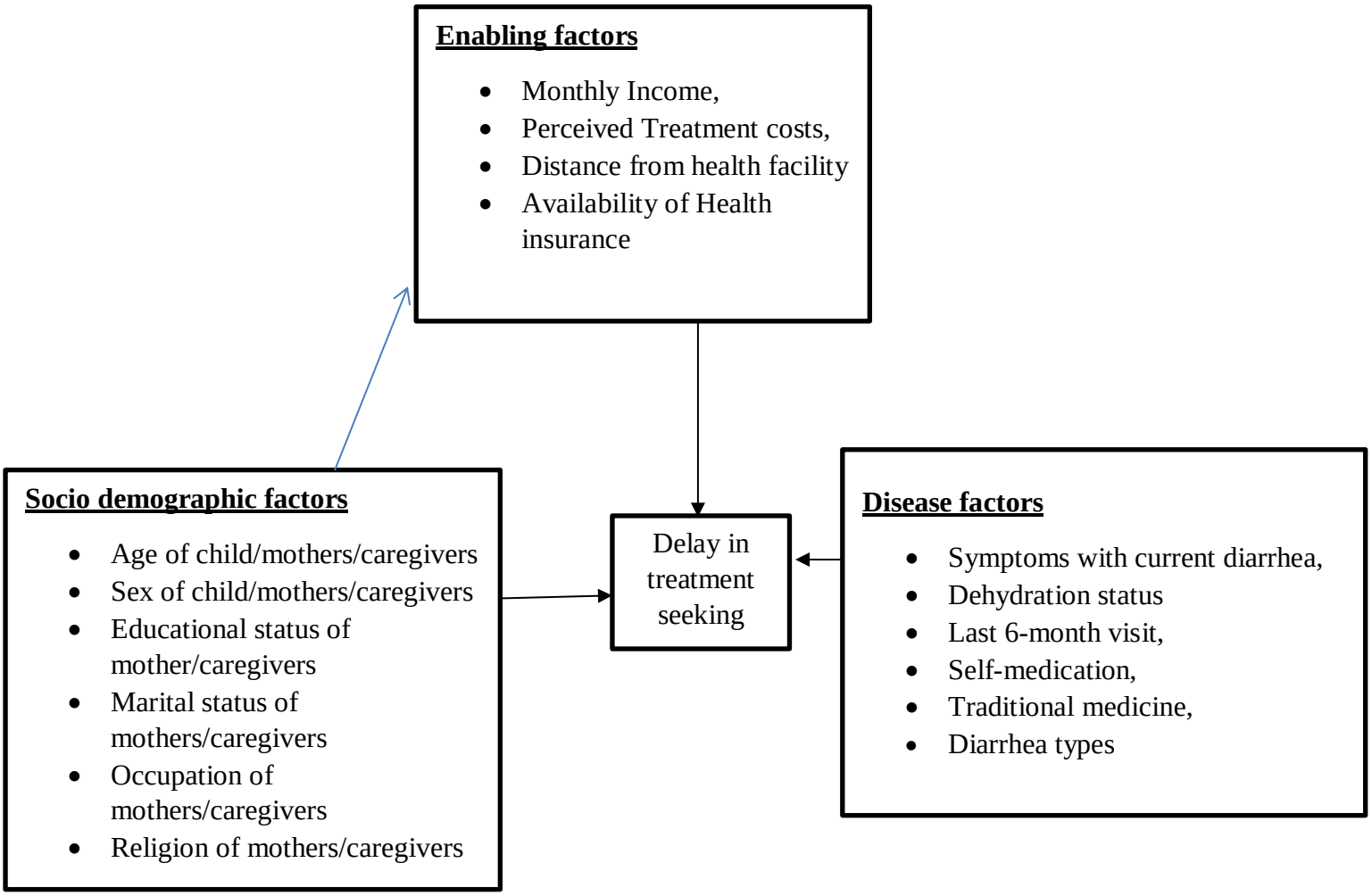

Figure 1- Conceptual framework to determine determinants of delay in treatment seeking for diarrheal disease among under five children paired with their mothers/caregivers public Hospitals, Sidama, Southern Ethiopia, May 2024(34)

3. OBJECTIVE

To identify determinant of delay in treatment seeking for diarrheal disease among mothers with under five children attending Public hospitals in Sidama region, Southern Ethiopia, from April1 to May 30.

4. METHODS AND MATERIALS.

4.1 Study Area and Study Period.

The study was conducted from April 1 to May30, 2024 in public hospitals of Sidama region. The region is one of 13 region of Ethiopia. Hawassa is the capital city of the region and It is located 272 km to the south east of Addis Ababa, the capital city of Ethiopia. The region has a total area of 6981.8 square kilometers and is administratively divided into 4 zones 6 town administrations. According to the 2018 estimate, the region has a total population of 4,294,730 (49% females and 51% males).

The region has 26 hospitals (1 comprehensive specialized hospital, 5 general & 20 primary hospitals). The study was done at three public hospitals namely; Yirgalem, Daye and Bona general hospitals. Among the general hospitals Bona hospital is the one and It is located 486 km from south west of Addis Ababa and 112km from south west of Hawassa in Bona zuria woreda. The hospital was upgraded from health center to district hospital in 1999 E.C. It provides services for about 1.6 million people including southern part of Oromia regional state. Which gives services for under five children at two regular OPDs and one ETAT Pediatric Ward with one Pediatrician four general practioner and four Pediatrics nurses and six clinical nurses.

The other hospital is Yirgalem General Hospital which is found in Sidama Region, Central Sidama zone Dalle District, was built 1958 EC by Norwegian king IV the total bed of the hospital 171, with total of 287 Human power, 60 Nurses, health officer 5, General practitioners16, Senior Physicians 8, Clinical Pharmacist 2, Pharmacist 8, Pharmacy technician 19, and X-Ray Technician 6.

The other hospital is Daye general hospital which is located 131Km from Hawassa. It provides service for Diarrhea treatment with 1 regular under five OPDs, 1 ETAT &pediatric ward.

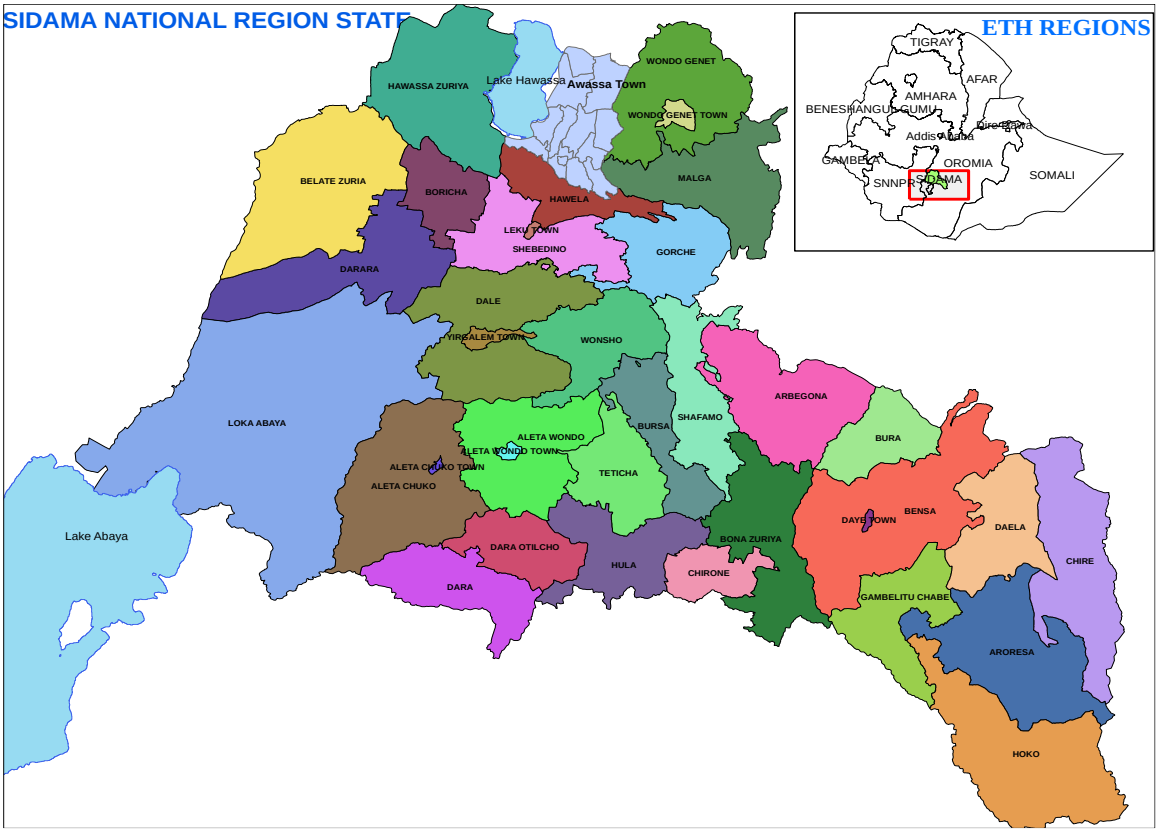

Figure 2 Map of Sidama Region, Southern Ethiopia, January, 2024GC.

4.2 Study Design: Facility based unmatched case control study from April 1 /2024 to May 31/2024 was employed.

4.3 Source and Study Population

4.3.1 Source population

All children under the age of five years with diarrhea attending Yirgalem, Bona and Daye General Hospitals

4.3.2 Study population

All children under the age of 5 years paired with mothers/Caregivers who seek treatment in Yirgalem Bona and Daye general hospitals due to diarrhea from April to May 2024

Controls – were under-five children with signs/symptoms of diarrhea whose mothers sought treatment within 24-hours of the recognition of diarrhea.

Case- were under-five Children with signs/symptoms of diarrhea whose mothers sought treatment after 24-hours of the recognition of diarrhea.

4.4 Inclusion and Exclusion criteria

4.4.1 Inclusion Criteria

All children under 5 years paired with their mothers/caregivers who sought selected health facilities due to diarrhea during study period.

4.4.2 Exclusion Criteria

A child who admitted in pediatrics ward for other Diagnosis and develop new onset of diarrhea.

Neonates less than one month who admitted to NICU were excluded from the study.

4.5 Sample Size Determination and Sampling Procedures

4.5.1 Sample Size Determination

The sample size was estimated using Epi info software for unmatched case control study by considering case to control ratio(R= 1) 80% of power, 95% confidence level. Different variables were used and the highest Sample size was selected (i.e. 376). By considering 10% nonresponse rate (42) the total sample size for this study was 418(209case and 209 control) (**Table 1).**

Table 1: The Sample size estimation for determinants of delay in treatment seeking for diarrheal disease among mothers with under five children attending public Hospitals, Sidama, Southern Ethiopia,2024

Variables	**Percent of control to exposure**	**AOR**	**Percent of case with exposure**	**Sample size after 10%**			**Reference**
				Case	**Control**	**N**	
Child Age <24months	60.1%	1.9	75.9%	209	209	418	(27)
Perceiving diarrhea can cure without treatment	21%	2.1	37%	138	138	276	(6)
mothers'/caregivers without formal education	19.5%	4.61	25,8%	29	39	78	(31)
Female sex	45%	1.93	64,5%	175	175	350	(10)

4.5.2 Sampling Technique

Among five general hospitals in Sidama region three Public Hospitals (Yirgalem Bona &Daye general hospital) were selected by simple random sampling technique using lottery method. According to HMIS report Last year, 2015EFY, in March and April month, (235Yirgalem general hospital Bona general hospital; -217, Daye general hospital; - 186) under five diarrheal cases were reported, which were used to estimate number of participants from facilities. Then depending on that number i.e. out of total 638 patients received care last year, sampling interval K, calculated, which is1.52 ~2. Then Proportional allocation of respondent to health facilities was conducted.

We selected respondents by systematic random sampling technique. Cases were every other person included and controls were patients who came to the same health facility following the cases. The first participant of the case group was selected by lottery method while the control was under-five child with diarrheal illness who came to the health facility following the cases but within the 24 hours of onset of diarrheal illness. When mothers/caregivers complained of diarrhea in their child completed their consultation with a health care professional, they moved to a private room for an interview until the total required sample size obtained.

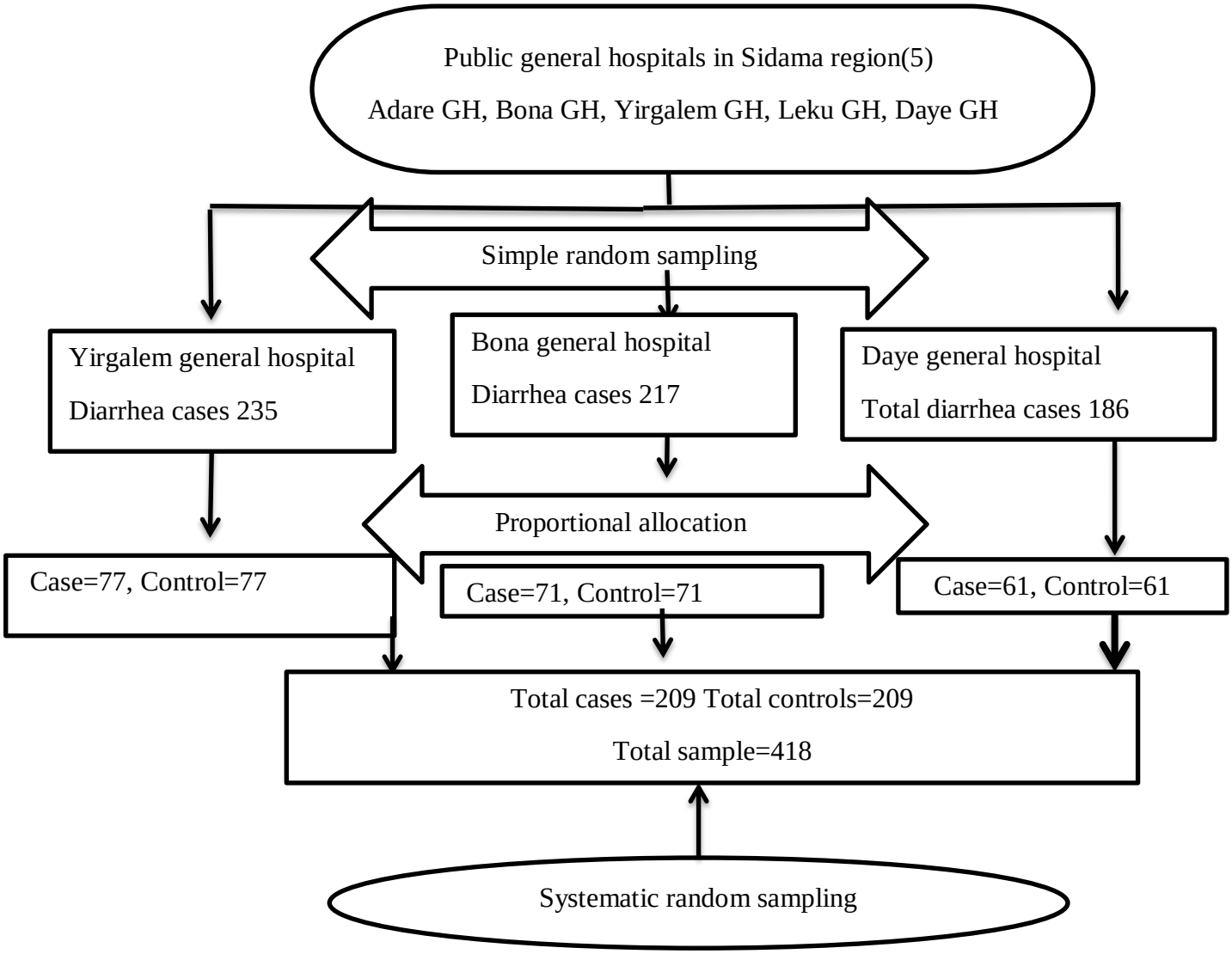

Figure 3 Diagrammatic presentation of sampling technique of under-five children in Public Hospitals in Sidama, Southern Ethiopia 2024.

4.6 Study Variables

4.6.1 Dependent Variable

Delay in treatment seeking

4.6.2 Independent Variables

Socio demographic variables: (age of child, sex of child, marital status of mothers/caregivers, religion of mothers/caregivers, residence of mothers/caregivers, educational status of mothers/caregivers**,** and occupation of mothers/caregivers.

E**nabling factors**: (Monthly income, treatment costs, health insurance, distance to the nearest health facility, preferred health facility,);

Disease factor :(symptoms with current diarrhea, dehydration status, last 6-month visit, self-medication, traditional medicine, and diarrhea types).

Health system-related factors: (client perception toward service, waiting time, counseled on early visit).

4.7 Operational Definitions

Mother Caregiver: Any person above 18 years of age who is directly responsible for the child's care at the study time(31).

Self-medication. Purchasing and utilizing medicine from a pharmacy or shops without a prescription.

Timely treatment seeking: seek care or treatment within 24 hours from recognizing diarrhea in under-five children (6,10).

Treatment delay: Care or treatment sought from after 24 hours from recognizing the presence of diarrhea in under five children (6,10).

Treatment seeking: Any treatment was sought from a defined governmental health facility for a child with diarrheal disease.

Self-medication. Purchasing and utilizing medicine from a pharmacy or shops without a prescription.

Traditional Medicine. Experience-based knowledge, skill, and practice are applied to treat apparent illness and sickness patients by traditional healers, herbalists.

4.8 Data Collection Methods and Tools.

Data was collected using Pre-tested, structured questionnaire by face to face interviewee that was adapted from previous literature. The questionnaire contains four main parts: socio-demographic factors, enabling factors, Disease related Factors and Health system Related factors, on Average the interview was take 20-25 minutes.

Data was collected by face to face interview with Mothers/caregivers using structured questionnaires prepared for this purpose. We used patient chart to check dehydration status. The interview was conducted in a private room to create an atmosphere of empathy and confidence with in a secure environment.

Data was collected by trained three BSC nurses under the supervision of trained Health Officers at pediatrics emergency and under five OPD. Delay to seek treatment and exposure variables was measured by the mother's /caregivers' report. KOBO collect was used to collect the data.

4.9 Data Quality Assurance

The questionnaire was adapted from previously conducted related studies and some change were made after reviewing relevant literature according to local context. The English version of the questionnaire is translated in to Sidamu Afoo, commonly used local language, for better understanding by the respondents. Pre-test of questionnaire on 5%(20,10cases and 10 controls) of respondent was done in Leku general hospital to know whether a respondents understanding the questionnaires in the same way and to find out how long it takes to complete the survey in real time. The result of pre-test showed that, out of total respondents, 9 (90%) among cases and 10 (100%) among controls were responded to all the questions fully without missing any question and only 1(10%) among cases responded incompletely. Again the pre-test showed that, 25- 30 minutes were needed to complete one questionnaires and no question made discomfort to the respondent. After that, two day training for data collectors and supervisor was given to ensure the quality of data. Data collectors were supervised continuously by supervisor and they had reviewed every questionnaire for completeness and for logical consistency. The same interviewer was used to interview both cases and controls to control information bias. A mark (√) was put on medical chart of the interviewed patients to avoid repeated inclusion of study participants upon revisiting the health facility due to failure of recovery or experiencing another episode of diarrhea within the data collection period. . After entry, data clearance and exploration was done to see outliers, but we did not found any outliers and no missing value

4.10 Data Processing and Statistical Analysis.

Data Exported from Kobo collect to SPSS Software version 26 for further analysis. Data was summarized and presented using descriptive statistics that we had run for frequency statistics to measure a central tendency and dispersion. Socio demographic and economic variables, enabling factors, disease factors and health system related and behavioral factors were analyzed by using descriptive and analytic statistics and described by using sentences, tables and charts. In addition Chi square was computed to see cell adequacy for all variables. Bivariate and multivariate logistic regressions were computed to identify the presence and strength of associations. Variables with p value<0.25 in binary logistic regression were taken to multiple logistic regression for further analysis. But, before taking variables to multiple logistic regressions, multi-Collinearity was checked for all candidate variables using Collinearity diagnostic test in linear regression model. The result of Collinearity diagnostic test showed that no multi-Collinearity as the maximum Variance Inflation Factor (VIF) result was which is below ten and we did not remove any variables from analysis due to multi Collinearity. At the end we had run for multiple logistic regression, odds ratio with 95% CI was computed and variables having p-values less than 0.05 in the multiple logistic regression models were considered as a significantly associated with the dependent variable (delay in treatment seeking). Finally model was fitted using backward elimination methods and Hosmer-Lemeshow goodness of fit test was used to the test the model fitness which provided with p- value of 0.341 that indicates the model is fitted well.

4.11 Ethical Consideration

The study was conducted after ethical clearance letter obtained from Hawassa University institutional review Board College of medicine and health science. Formal letter of permission were obtained from Sidama Region Health Bureau. Each health facility was contacted after official letter summited to them. Interview was held after informed verbal consent obtained from each study subjects after the objective of the study was understood by participants and confidentiality secured.

4.12 Data Dissemination Plan.

The result of this study will be submitted and presented to Hawassa University collage of Health Sciences department of Epidemiology. Then after, result will also disseminated to Regional Health offices and other concerned bodies who want support that population. Furthermore, the finding will also be presented in training, workshops and conferences in Ethiopian and at international level. Further, it will be published in internationally or nationally recognized journals.

5. RESULTS

5.1 Socio-demographic Characteristics of study participants

In this study 414(207 cases and 207 controls) children along with their mothers/ caregivers were included, providing a response rate of 99% among cases and controls. According to current study 129(62.3%) of mothers/caregivers with cases and 127 (61.4%) for that of controls were falls in age group of 15-25 years. The mean age for mothers/caregivers with cases was 24.71 and Standard Deviation (SD) of ±4.31 and for that of controls was 24.99 (±4.13 SD). Out of 414 children included in the study, 163 (82.7%) among cases and 148 (67.2%) in that of controls were in age group of <24 months. The mean age for cases was 16.27 (± 9.94 SD) and 25.19 (± 12.92 SD) months for that of controls. 98(47.3%), respondents were female children among cases and 109 (52.7%) were male among cases.

Majority, 161 (77.8%) of cases were reside in rural area with their mothers/caregivers , while 123(59.4%) among controls were urban dwellers along with their mothers/caregivers. 137 (66.2%) of mothers/caregivers with cases and 140(67.6%) mothers/caregivers for controls where married and only 31(15%) among cases and 25(12.1%) for that of mothers/caregivers with controls were single. Majority of respondents 91 (44.6%) of mothers/caregivers with cases were follower of protestant religion while Orthodox religion flowers were 60(29%) among mothers/caregivers with controls. **(Table2)**

Table 2*-Socio-demographic Factors for determinants of delay in treatment seeking for diarrheal disease among mothers with under five children attending public Hospitals in Sidama region, Southern Ethiopia, 2024.*

Variables		**Patient category**	
		Cases (n=207)	**Controls (n =207)**
		No (%)	**No (%)**
Age of mothers/caregivers	15-25 years	129(62.3)	127(61.4)
	26-34 years	62(30)	66(31.9)
	>=35 years	16(7.7)	14(6.8)
Marital status of mothers/caregivers	Married	137 (66.2)	140(67.6)
	Divorced	16(7.7)	13 (6.3)
	Single	31 (15)	25(12.1)
	Widowed	23(11.1)	29(14)
Residence area of mothers/caregivers	Urban	46(22.2)	123 (59.4)
	Rural	161 (77.8%)	84 (40.6)
Religion of mothers/care givers	Orthodox	63(30.4)	60 (29)
	Protestant	91(44)	108(52.2)
	Muslim	29(14)	30 (14.5)
	Others	24(11.6)	9 (4.3)
Occupation of mothers/caregivers	Housewife	114 (55.1)	81 (39.1)

	Merchant	56 (27.1)	61 (29.5)
	Gov't employee	27(13)	58 (28)
	Others	10 (4.8)	7(3.4)
Education category of mothers	No formal education	26(12.6)	9(4.3)
	Primary	127(61.4)	89(43)
	secondary	39(18.8)	53(25.6)
	Collage and above	15(7.2)	56(27.1)
Age of child	<24 months	186(89.9	119(57.5)
	≥ 24 months	21(10.1)	88(42.5)
Sex of child	Male	109(52.7)	102(49.3)
	Female	98(47.3)	105(50.7)
Birth order of child	First	73(35.3)	79(38.2)
	Second or more	134(64.7)	128(61.8)

5.2 Enabling factors

Seventy-four (35.7%) cases and 66(31.9%) controls home was at a distance of greater than 120 minutes from preferred health facility by foot.

The current study also found that, 101 (48.8%) of mothers/caregivers with cases and 132 (63.8%) for that of controls were get monthly income >=2500 Ethiopian Birr (ETB). Similarly, majority 127(61.4)of cases and 113(54.6)of controls were preferred to treat their child with diarrhea at

government. Three-fourth of Cases 144(69.6%) and 80(38.6%) Controls were not member of community health insurance**.(Table3)**

Table 3 *Enabling Factors for determinants of delay in treatment seeking for diarrheal disease among mothers with under five children attending public Hospitals in Sidama region, Southern Ethiopia, 2024.*

Variables		**Patient category**	
		Cases (n=207)	**Controls (n=207)**
		No (%)	**No (%)**
Distance from nearby health facility	< 15min	27(13)	22(10.6)
	15-30min	24(11.6)	22(10.6)
	30-60min	49(23.7)	59(28.5)
	60-120min	33(15.9)	38(18.4)
	>120min	74(35.7)	66(31.9)
Cost of treatment	Easy to pay	109(52.7)	131(63.3)
	Difficult to pay	46(22.2)	63(30.4)
	Very Difficult to pay	52(25.1)	13(6.3)
Place preferred to treat child with diarrhea health facility	Government health facility	127(61.4)	113(54.6)
	Private clinic	35(16.9)	66(31.9)
	Traditional Healer	45(21.7)	28(13.5)
Community based Health insurance member	Yes	63(30.4)	127(61.4)
	No	144(69.6)	80(38.6)
Average Monthly	< =1250	58(28)	34 (16.4)

income of mothers/care givers	1250-2500	48 (23.2)	41(19.8)
	>=2501	101(48.8)	132(63.8)

5.3 Clinical/disease related factors

According to this study 81 (39.1%), among cases and 39(18.8) controls were presented with watery diarrhea. Also record review showed that, 108(52.2) and 138(66.7among cases and controls were presented with severe dehydration respectively. In addition to this, 50(24.2) among cases and 41(19.8) among controls were had fever in addition to diarrhea. Most of the mothers'/caregivers'141(68.1) among cases, and 148(71.5) among controls responded to diarrhea of children by taking them to the health facility at the first episode. more than three-fourth of cases157(75.8) and controls 156(75.4)had previous history of diarrhea. Fifty one (24.6%) of cases and 25(12.1%) controls mothers/caregivers believe that diarrhea can be cured by itself**.(Table4**)

Table 4*Disease Related factors for determinants of delay in treatment seeking for diarrheal disease among mothers with under five children attending public Hospitals in Sidama region, Southern Ethiopia, 2024*

Variables		**Patient category**	
		Cases (n=207)	**Controls (n=207)**
		No (%)	**No (%)**
Status of dehydration	No dehydration	37(17.9)	46(22.2)
	Some dehydration	62(30)	23(11.1)
	Severe dehydration	108(52.2)	138(66.7)
Type of diarrhea	Watery	81(39.1	50(24.2)
	Bloody	47(22.7)	39(18.8)
	Mucoid	79(38.2)	118(57)
Sign and symptoms	Bloody Mixed diarrhea	41(19.8)	32(15.5)

other than diarrhea	Presence of fever	50(24.2)	41(19.8)
	Increased frequency and duration of diarrhea	63(30.4)	54(26.1)
	Sunken eye ball	14(6.8)	21(10.1)
	Change of behavior/irritability	39(18.8)	59(28.5)
First Response to diarrhea	Take to health facility	141(68.1)	148(71.5)
	Take to traditional healer	30(14.5)	28(13.5)
	Treat with drug from pharmacy	36(17.4)	36(17.4)
Who decides first	Mother	50(24.2)	78(37.7)
	Father	38(18.4)	54(26.1)
	Both	83(40.1)	56(27.1)
	Grand Parents	36(17.4)	19(9.2)
Previous history of diarrhea	Yes	157(75.8)	156(75.4)
	No	50(24.2)	51(24.6)
Visit health facility for previous diarrhea	Yes	147(93)	157(100)

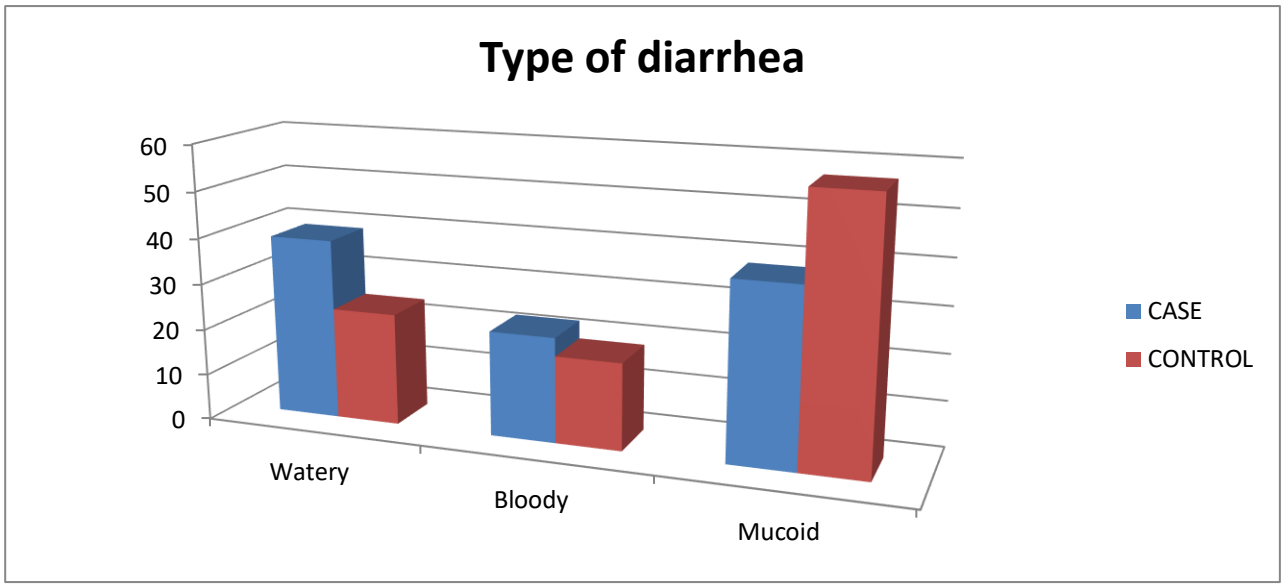

Figure 4 Types of diarrhea delay in treatment seeking among mothers/caregivers with unde-five children in public hospitals of sidama region,2024

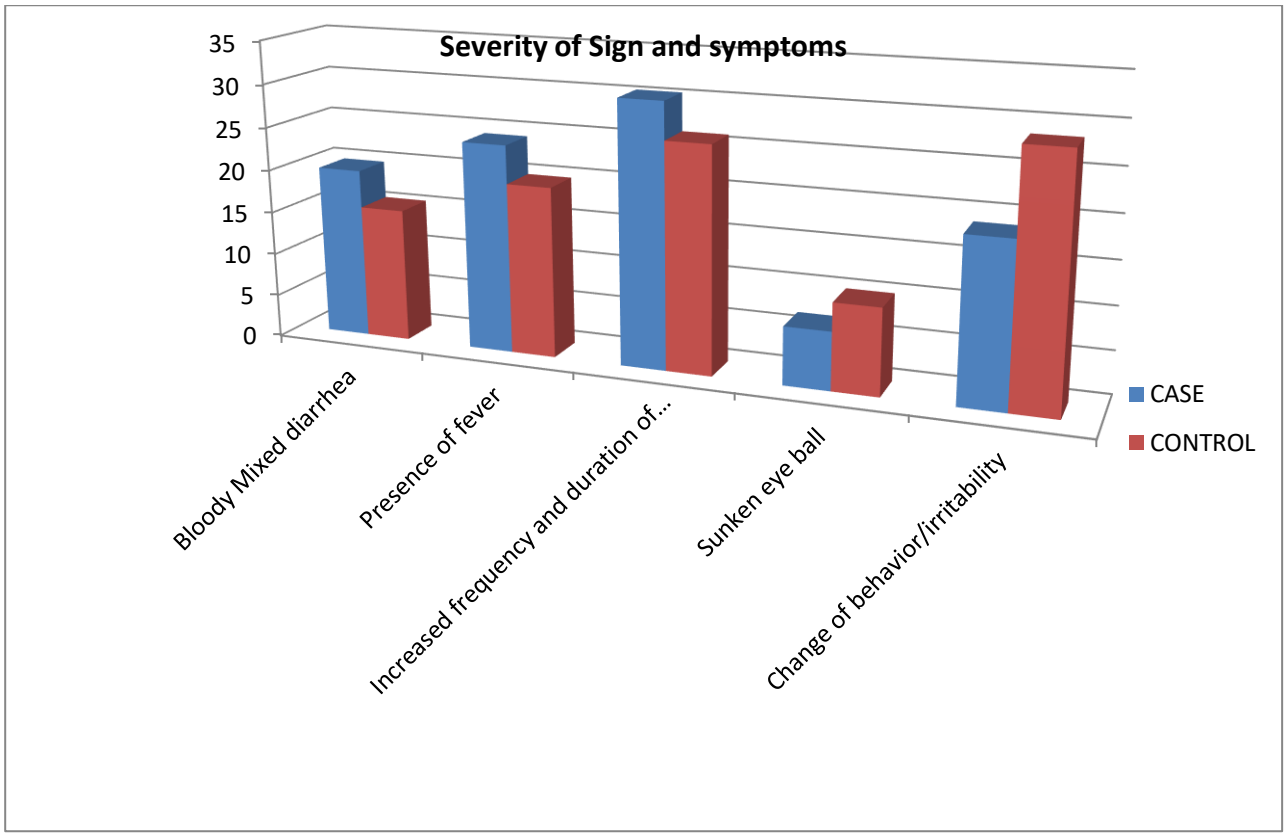

Figure 5 symptoms of diarrhea delay in treatment seeking among mothers/caregivers with unde-five children in public hospitals of sidama region,2024

5.5 Determinants of Delay in Treatment Seeking

Determinants of delay among mothers/caregivers with under five children for diarrheal disease was determined by classifying its determinants into four thematic areas. Thus, Socio demographic factors, enabling factors, disease factors, were assessed to identify factors that determine delay in treatment seeking. Accordingly, Variables that had a p-value <0.25 on bivariate analysis were three variables (educational status of mothers/caregivers, place of residence, age of the child,) were among variables from socio demographic theme were became candidate for multiple logistic regression. Ability to pay treatment cost, member of health insurance from enabling factors were variables that were candidate for multiple logistic regression.

Finally all variables (educational status of mothers/caregivers, residence area of mothers/caregivers ability to pay treatment cost, health insurance membership and age of children,) were significantly associated with delay in treatment seeking among mothers/caregivers with under five children for diarrheal disease.

According to result from multiple logistic regression output, children < 24 months were [AOR 4.43(95 % CI= (2.353-8.343) P-value<0.001] times more likely delayed in treatment seeking than children ≥ 24 months. Again children with mothers/ caregivers residing in rural area were [AOR 3.40(95 % CI 2.03-5.72), P<0.001] times more likely delayed for treatment of diarrheal disease when compared with their urban counterparty.

Mothers/caregivers of under-five children with diarrheal disease who did not attend formal and primary education were eleven times more likely to delay in treatment-seeking with the diarrheal disease to that of mothers/caregivers who attended college and above education respectively[AOR 11.679(95%CI 3.705-36.81),P<0.001], [AOR3.27895%CI=(1.487-7.226),P<0.003]. The odds of delayed treatment-seeking among children whose mothers/caregivers were not able to pay their treatment cost were four times[AOR 4.345(95%CI=2.019-9.352),P<0.001 higher when compared to easy to pay their cost of treatment.

In addition, the odds of delay in treatment seeking were [AOR 3.182 (95 %, CI, = (1.945-5.207) P<0.001] times higher among mothers/caregivers who was not member of community based health insurance compared to those member of health insurance.

Table 5Binary and multivariable logistic regression and 95 % CI with adjusted odds ratio of determinants of delay in treatment seeking for diarrheal disease among mothers with under five children attending public Hospitals in Sidama, Ethiopia,2024 ***(414)***

Variables		**Patient category**		**COR(95%CI**	**AOR(95%CI)**
		Cases(n=2077)	**Controls(n=207)**		
		No (%)	**No (%)**		
Age mothers/caregiver	15-25 years	129(62.3)	127(61.4)	0.889(0.416-1.897)	
	26-34 years	62(30)	66(31.9)	0.822(.371-1.823)	
	>=35 years	16(7.7)	14(6.8)	1	
Marital status	Married	137 (66.2)	140(67.6)	1	
	Divorced	16(7.7)	13 (6.3)	.789(.443-1.405)	
	Single	31 (15)	25(12.1)	.993(.403-2.446)	
	Widowed	23(11.1)	29(14)	0.640(0.299-1.367)	
Residence	Urban	46(22.2)	123 (59.4)	1	
	Rural	161 (77.8%)	84 (40.6)	5.125(3.33-7.87)*	3.409(2.09-6.064)**
Religion	Orthodox	63(30.4)	60 (29)	1	
	Protestant	91(44)	108(52.2)	0.802(0.512-1.259)	
	Muslim	29(14)	30 (14.5)	0.921(0.495-1.713	
	Others	24(11.6)	9 (4.3)	2.540(1.0-5.905	

Occupation	Housewife	114 (55.1)	81 (39.1)	1	
	Merchant	56 (27.1)	61 (29.5)	0.862(0.55-1.349	
	Gov't employee	27(13)	58(28)	0.427(0.445-1.409)	
	Others	10 (4.8)	7(3.4)	1.015(0.371-2.779)	
Average Monthly income of mothers/care givers	< =1250	58(28)	34 (16.4)	2.229(1.357-3.662)	
	1250-2500	48 (23.2)	41(19.8)	1.53(0.937-2.499)	
	>=2501	101(48.8)	132(63.8)	1	
Education catagory of mothers	No formal education	26(12.6)	9(4.3)	10.785(4.178-27.84)*	11.67(3.70-36.81)**
	Primary	127 (61.4)	89 (43)	5.327(2.835-10.012)*	3.278(1.48-7.22)**
	secondary	26 (13.2)	61 (30.0)	2.747(1.359-5.555)*	Not significant
	Collage and above	15(7.2)	56(27.1)	1	
Age of child	<24 months	186(89.9	119(57.5)	6.550(3.860-11.113)*	4.43(2.35-8.34)**
	≥ 24 months	21(10.1)	88(42.5)	1	
Sex of child	Male	109(52.7)	102(49.3)	1	
	Female	98(47.3)	105(50.7)	1.145(0.779-1.684)	
Birth order of child	First	73(35.3)	79(38.2)	1	
	Second or	134(64.7)	128(61.8)	1.133(0.759-1.690)	

	more				
Distance from nearby health facility	< 15min	27(13)	22(10.6)	1	
	15-30min	24(11.6)	22(10.6)	.889(0.397-1993)	
	30-60min	49(23.7)	59(28.5)	0.677(0.343-1.334)	
	60-120min	33(15.9)	38(18.4)	0.708(0.341-1.470)	
	>120min	74(35.7)	66(31.9)	0.914(0.475-1.756	
Cost of treatment	Easy to pay	109(52.7)	131(63.3)	1	
	Difficult to pay	46(22.2)	63(30.4)	0.878(0.556-1.386)	
	Very Difficult to pay	52(25.1)	13(6.3)	4.807(2.488-9.289)*	4.345(2.09-9.35)**
Place preferred to treat child with diarrhea health facility	Government health facility	127(61.4)	113(54.6)	1	
	Private clinic	35(16.9)	66(31.9)	0.82(0.691-1.764)	
	Traditional Healer	45(21.7)	28(13.5)	1.43(0.837-2.443)	
Community based Health insurance member	Yes	63(30.4)	127(61.4)	1	
	No	144(69.6)	80(38.6)	3.629(2.415-5.453)*	3.18(1.94-5.20)**
Previous history	Yes	157(75.8)	156(75.4)	1	

of diarrhea	No	50(24.2)	51(24.6)	0.974(0.622-1.526)

1: reference category,*=p-value<0.25, Significant at **p<0.05 at MLR, COR, crude odds ratio; AOR, Adjusted odds ratio; CI, confidence interval)

6. DISCUSSION

Residence area of mothers/caregivers, age of children, Educational status, Absence of health insurance, cost of treatment were determinants of delay in treatment seeking among mothers/caregivers with under five children for diarrheal disease.

According to current study, the odds of delay in seeking treatment for diarrhea was 3.4 times more likely among mothers/caregivers who were reside in rural area when compared to mothers/caregivers who were reside in urban area [AOR=3.4; 95% CI: 2.03-5.72]. This is supported by the finding from Kenya((32) Meta-analysis from Ethiopia(35) and case control study from south west Ethiopia(6) which states, children from rural areas had higher odds of delay to be taken to health facilities for medical care for diarrheal diseases than children from urban areas. On other hand, study from Gambia(36)From central Ethiopia(27)from north western Ethiopia (31)did not found place of residence as determent of delay in timely treatment seeking among mothers/caregivers with under five children for diarrheal disease.

The possible explanation for why mothers/caregivers from rural area would not sought health facilities timely might be various. One possible reason can be mothers/caregivers from rural areas have limited access to health information for different reasons than urban ones. Again other possible justification might be due to clustering of health facilities in urban area than rural, as a result, rural residents might face difficulty in accessing health facilities. Moreover, challenges related to transportation might hinder timely treatment seeking.

The other determinant of delay identified by current study was age of child. Thus, if the child age was <24 months, the chance to be taken to health facility within 24 hours were decreased by four when compared with older (≥ 24 months) children *[AOR 4.43(95 % CI= (2.353-8.343)*. This is in parallel with studies from India(37) Central Ethiopia(15) Arba Minch(10), southern Ethiopia, and North western Ethiopia(31), which suggest the caregivers of younger children (<24 months) were more likely to delay than those with older (>24 months) children. Similarly study from China said that age of children was negatively associated with treatment seeking in such way that, older children were protected against late treatment seeking for diarrheal disease(38). Again the global reports on the trend in care seeking and access to health service utilization justify our finding in which it stated that, older children were more likely to seek early health care than young children(37)

Also this finding has an implication that, the implementation of government program targeting to reach children under 2 years was not met. According to strategic approach the first two years were the honey moon period for children development. Thus, strategic approach like treating children with diarrhea with ORS and Zink early, treating pneumonia with antibiotics and under two years Growth Monitoring and Promotion (GMP) were among some strategies to tackle the problem related with those disease if treatment was sought early. But children < 24 moths were sought treatment lately that indicates, further work up should be installed.

Educational status was also a determinant factor for mothers seeking treatment for their under-five children with diarrhea. This is consistent with studies from central Ethiopia(27,39,40) and Yemen(41) but it is inconsistent with a study done in Niger(42). This variation may be mothers/caregivers who attended school are thought to have a better opportunity to learn health information than those who did not attend school. Moreover, illiterate mothers/caregivers may not have basic knowledge on the impacts of the potential risk of delay in seeking treatment timely.

In addition, this study indicated mothers/caregivers who was not member of health insurance were more likely to delay in treatment seeking [AOR 3.182 (95 %, CI, = (1.945-5.207) P<0.001] compared to those member of health insurance. This is consistent with studies done in in north western Ethiopia(31). Therefore, child health improvement programmers should design intervention strategies that encourage health insurance package in health service delivery and free service for under-five children in public health facilities.

On the other hand, the finding from the current study showed that cost of treatment in health facility was determinant factor. Were the odds of delayed treatment-seeking among children whose mothers/caregivers were not able to pay cost of treatment were four times [AOR 4.345(95%CI=2.019-9.352),P<0.001 higher when compared to easy to pay their cost of treatment. However this finding is contrary to the study done in Arba-minch southern Ethiopia(10). The difference may be due to the fact that capacity to pay for service fee or medicine cost at health facilities may vary to a large extent, so that most of them report that cost is difficult to pay.

7. LIMITATIONS OF THE STUDY

The limitation of the study was recall bias linked to the difficulty of remembering the events that happened in the past i.e. might be introduced during asking onset of illness.

As the study was facility-based, it may not be good as a population-based study to generalize to the general population. i.e. might not represent Mothers/Caregivers of under five children with diarrhea who didn't visit health facility.

Also the other limitation of this study was not include under-five children with diarrhea who visits health center, primary hospitals and private health facility.

8. CONCLUSION

The study revealed statistically significant associations of different determinants such as age of children, educational status mothers/caregivers, residence area, Cost of treatment and member of health insurance were determinants of delay to seek treatment within 24 hours of recognition of diarrhea in under-five children. As a result, preventive care programs is crucial in reducing diarrhea related morbidity and mortality.

9. RECOMMENDATIONS

Following this study finding we would like to recommend

Sidama Region Health Bureau

- ✓ To take into account intervention strategies like health education and communication about the misinterpretation of diarrheal disease in children under 24 months old and cultural beliefs that associate diarrhea with the eruption of milk teeth, with a focus on low-income and less educated families.
- ✓ Create comprehensive strategies that might enhance utilization of health insurance.

To Local NGO

- ✓ Strengthen programs targeting under five children who reside in rural area, less educated families to have largest impact on diarrhea related morbidity and mortality

To Health Extension workers

- ✓ In collaboration with cluster Primary Health Care Unit (PHCU) and Woreda Health Office should strength awareness creation among mothers/caregivers about the importance of early treatment seeking targeting rural resident to improve treatment under-five children with diarrheal diseases is essential.
- ✓ Create awareness on the importance of Community based health insurance

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11. ANNEX

11.1 Information sheet

Determinants of Delay in Treatment Seeking For diarrheal diseases among Mothers With Under-Five Children in public hospital, Sidama, Southern Ethiopia: 2024

Title of the research project: – Determinants of delay in treatment seeking for diarrheal Diseases Among Mothers With Under-Five Children in Bona, Yirgalem &Daye General Hospital, Sidama, Southern Ethiopia: 2024

Name of principal investigator: - Menelik Mathewos

Name of organization: - Hawassa University college of Medicine and Health science

Name of sponsor: Self sponsorship

Introduction: - This information sheet and consent form is prepared for participant of this study that conducted from March 1 to April 2024. The main aim of this study is to identify the determinant of delay in treatment seeking for diarrheal disease among mothers with under five children in Bona, Yirgalem &Daye General Hospital. The investigators include four BSc nurses' data collectors and supervisors.

Purpose of the research project: - the aim of this research is to identify the determinant of delay in treatment seeking for diarrheal disease among mothers with under five children in Bona,Yirgalem &Daye General Hospital. The result of this study will be contribute for policy makers, implementing body and mother/caregiver to improve timely treatment seeking behaviors.

Procedure: - the study will be conducted by using interviewer based standardized questionnaire systematic random sampling. The interview started by inviting the randomly selected participant to give us her written / verbal consent to participate in the study. After we get consent question on socio-demography, enabling factors and health related factors are presented for participant by our data collectors.

Risk /discomfort: - Except your time, the research have no any other risk that endanger your mental, physical, psychosocial and wellbeing.

Benefit: - the result of this study will contribute to improvement of mothers/care giver on timely treatment seeking for diarrheal disease among under five children.

Incentive/payment for participation: - you will not have any payment or incentive to participate in this study.

Confidentiality: - The information collected for this research project will be kept confidential and used only for this research purpose. Information collected from you for this study will be stored in file without any individual identifiers and the principal investigator is the only who overview this data.

Right to refuse or withdrawal: - you have full right to refuse to participate in this research and even after you agree to participate you have full right not to answer question that you can't need. At any time in process of research you have the right to with draw form the research without any penalty.

Person to contact: - this research project will be reviewed and approved by the ethical committee of the Hawassa University and you will look for the ethical clearance or contact the committee with given address. If there is any unclear and others thing you want to clarify you can use the following address.

Menelik Mathewos (BSc): phone +251919741151
E-mail- milamathew.02@gmail.com

11.2 Consent Form

Hello! My name is …….. I am here on behalf of Menelik Mathewos. He is conducting a research project on Determinants of Delay in Treatment Seeking for Diarrheal Diseases among Mothers with Under-Five Children in Bona ,Yirgalem and Daye General Hospital, Sidama, Southern Ethiopia: 2024. He has received permission from Hawassa University to conduct this study. The main part of the study involves collecting information from mothers/care givers. You were selected for the study because your cooperation is an important for us. We are kindly requesting you to answer the questions that we have prepared for you. We assure all information gathered during the course of the study will be kept completely confidential. All the information that you are going to deliver to us will be coded for anonymity. Only the principal investigator and the research assistants collecting the data will have access to the data.

Could I have your permission to continue?

1. If yes, continue the interview.

2. If no, skip to the next participant by writing reasons for his/her refusal.

Informed consent Certified by:

Interviewer: Code---------- signature----------

Date of interview----------Time started---------- Time completed-------

Result of interview:

1. Completed 2.Respondent not available, 3, Refused, 4. Partially completed

Checked by:

Supervisor Name----------signature----------Date------

11. 3 Questionnaires (English Version)

Questionnaires on Determinants of delay for Treatment Seeking for Diarrheal Diseases Among Mothers with Under-Five Children in Bona ,Yirgalem Daye General Hospital, sidama southern Ethiopia: 2024GC.

Questionnaire identification number ----------

Part I - Socio-Demographic Determinants

101	Residence	_____
102	Age of the mother/caregiver	_____
103	Age of the child	_____ in month
104	Sex of the child	1.Male 2.Female
105	Educational status of mothers	1. No formal education 2 Primary Education 3, Secondary Education 4 collage and above .
106	Marital status of mother/ Caregiver	1. Married 2.Single 3.divorced 4. Widowed

107	Religion of households	1 Orthodox 2.Muslim 3 Protestant 4.Other
109	Occupation of mother/Caregiver	1.House wife 2.Government Employees 3.Merchants 4.Others
111	Birth order of child	1.First 2 Second or more

Part II, Enabling factors

201	How much is Average monthly incomeof your family?	_____ETB
202	How far is your home to the nearest health facility?(in minutes)	1. <15min 2. 15-30min 3. 30-60min 4. 60-120min 5. ≥120min
203	Cost of treatment	1. Easy to pay 2. Difficult to pay 3. Very difficult to pay
204	Where did you Prefer for treatment of children with diarrhea?	1. Government health facility 2. Private clinic 3. Traditional healers
205	Do you have health insurance?	1. Yes 2. No
206	Who decides first to take the child to the Health facility?	1. Mother 2. Father

		3. Grand parents 4. Both

Part III Disease Related Determinants

301	What are signs and symptoms of severity you can identifies for child with diarrhea disease?	1,Increased frequency and duration of diarrhea 2,Presence of fever 3,Bloody diarrhea 4,Sunken fontanel 5,Change of child behavior 6,Weakness of the child with diarrhea
302	What is your First response to your child with diarrhea?	1. Take to health facility 2. Take to traditional healer 3. Treat with drug from Pharmacy
303	What is the color of diarrhea?	1.Watery 2. bloody 3.Mucoid
304	What is Dehydration Status of child?	1. No dehydration 2. Some dehydration 3. Severe Dehydration
305	Does your child have Previous history of diarrheal episode?	1. Yes 2. No
306	Did your child visit health facility for previous Diarrhea illness?	1. Yes 2. No

11.4. Sumuumme/Consent in Sidamu afoo

Hajo;-Ane suma ---------- Ani kawira dayyomohu Minilik Maatiwosihu isi xinxallo assannohu Wodiidi itoyphiyu sidaamu qoqqowi 2016 MD, Booni, Daye na yirgalamete Xaphoomu Hospital De'eu dhibbinni xisasantanno ontu dirri wori qaqquulli rakke fayyimate minira abinanniki gede assannori maati yannohu a'annati.

Tenne mashalaqe afinannihu qaqqu amuwinnitinna qaqqullu agarranno manniwiniti konne baala assinanna atehu sumikki\ maayimakki woleho lelitannokki gede assine lonisonni.

Mashalaqqe affanori xinatete Aanatinna isira kaalo assitannosi manna callaati.

Xamemohe gedde mahoyyamatae ?

1, Ee yiiro ,hananifanni.

2, De'enni yiiro Agurannisi ,giwwino korrikatta Anife .

Sumuu yiiha ikkiro

Xamamaanichu code ----------malaate ----------

Xamamaano barra ----------hanafi saate ----------Gudi saate --------

Xa'mote gumi

1 , *G*udino 2, Daayikkinni hosino 3,Giwwino 4, Taaloho Agurino .

Buuxinnohu

Qorqorishu anna ----------malaate ----------Barra

11.5 Questionnaires (Sidaamu Afoo Version)

Wodiidi itoyphiyu sidaamu qoqqowi 2016 MD,Booni Daye na yirgalamete Xaphoomu Hospital Deeu dhibbinni xisasantanno ontu dirri wori qaqquulle ranke fayyimate minira abinanniki mayira keeshitannoro xama .

Gafa 1: mayimmate xawishsha

101	Heeranno base	_____
102	Qaaqqu Diiro	_____ Aganunni
103	Koo\Tee	1.Labbaha 2.meyaata
104	Amaate Rosu deera	1. Gattamarishu Rosi Dinose 2 umkki Deera Rosino 3, Layyinkki Deera Rosinno 4 ,Hakkuyi ale Rosinno .
105	Adhamate garra	1. Adhanitinnote 2.Diadhanitinnote 3.Tirritinnote 4. Gasashanni Reyinnote
106	Maatetee Amanno	1 Orthodoxte 2.Isilamaho 3 Amanannote 4 woleho
107	Amatee /agaranchote Loosi	1.Minni ama 2.Manigistete Losasiincho 3.Dadadalanicho

		4Wole
108	Ilaamishu Aanite	1.umiho 2 Layinkkiho

Gafa Lame;- Minne Keeshitanno geede assanori maati?

201	Maatete Agannu Eoo	_____birra
202	Doggote Fanifee	1. <15daqiqqa 2. 15-30 daqiqqa 3. 30-60 daqqiqa 4. 60-120 daqqiqa 5. ≥120 daqiqqi ale
203	Baatoshu Laisinsanni yannara	1. Baatate shottaho 2. Ayirannoho 3. Danbette Ayirannoho
204	Qaqqulinne xissamiro mamira hadhinne hadhinanni	1 mangistete urrinsha 2 gillete urrinsha 3 Baadi xagisanichiwa
205	Xeena medinne no one	1. Ee 2. Deeni
206	Qaqqullu Xissamirro Akkimete minnira harr0nna yannohu ayeeti?	1. Amaate 2 Aannaho 3 Ahahoho 4 Lamenkko

Gafa Sase: Dhibbu Ledo Amadaminoha Lainohunni

301	Deeu dhibbi yannara mayi maalate laittta	1,mule mule deeishannota 2,ibabbillu herrannota 3,munide deeishannota 4,samichu xeannota 5,akkattu sorro 6,daffurisannota

		7,wolere
302	Qaaqqu deeiro umo hikkira massitinanni	1. Fayyimatate urrinnisha 2. Baadi xagisaaqnichiwa 3. Xaggichu mininni xaggicho harrema
303	Deeu Dana	1.waa lawanno 2. mundee karisaminnoho 3.manigerammoho
304	Moollete Akati	1. Molle dinosi 2. Shims molle noosi 3. Jawa moolle noosi
305	Albanni Deuu xiisso noosi	1. Eee 2. Deeni
306	Albaanni xissamenna fayyimatte urrinsha abbite eggenota	1. Eee 2. Deeni
307	Deeu umisinni Hura danidanno	1. Eee 2. Deeni
308	Deeu qaqqulle gawwajja danidanno	1. Eee 2. Deeni