

Determinants of delay in seeking treatment for Diarrhea in under-five children among caregivers in Hadero Tunto Zuriya District, Southern Ethiopia: A case control study



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Abstract

Back ground: Ensuring timely treatment of diarrhea prevent most cases of diarrhea from progressing to severe and fatal illness. The reason why caregivers delay in seeking treatment for diarrhea in under-five children is not studied in the study area. Identifying determinants of delay in seeking treatment for diarrhea in under-five children among caregivers can help to reduce morbidities and mortalities of diarrhea.

Objective: To identify determinants of delay in seeking treatment for diarrhea in under-five children among caregivers in Hadero Tunto Zuriya district, Southern Ethiopia, 2018.

Methods: Facility based case control study was conducted from March 1 to April 20, 2018. The study was done on consecutively selected 338 cases and 338 controls. Data was collected by face to face interview using structured questionnaire. Data were entered into Epidata and analyzed by SPSS version 20. Bivariable and multivariable Logistic regression analysis were conducted to identify determinants of delay in seeking treatment for diarrhea in under-five children among caregivers.

Results: A total of 338 cases and 338 controls was participated. The mean age of study participants was 32.21 years ($SD\pm 5.655$) for cases and 28.97 years ($SD\pm 5.798$) for controls. Caregivers being aged 40-49 years ($AOR=7.89;95\%CI:2.48,25.11$), Being female child ($AOR=3.71;95\%CI:2.30,5.99$), illiterate mothers ($AOR=6.70;95\%CI:2.33,19.28$), monthly income less than or equal 500 ETB ($AOR=3.08;95\%CI:1.68,5.65$), uses walking ($AOR=4.37;95\%CI:2.31,8.26$), caregivers who believe that health centers may not have medicine ($AOR=5.40;95\%CI:2.64,11.04$) and self-medication ($AOR=7.64;95\%CI:3.80,15.39$) were found to be determinants of delay in seeking diarrhea treatment for under five children.

Conclusion and recommendation

Caregivers being aged 40-49 years, being female child, illiterate mothers, monthly income less than or equal 500 ETB, uses walking, no history of child death, caregivers who believe that health centers may not have medicine and self-medication were in favor of delay in seeking treatment for diarrhea in under five children in Hadero Tunto Zuriya District. Hadero Tunto Zuriya district health office and stakeholders who work on disease prevention and control program should promote advantage of early treatment of diarrhea.

Key words: Diarrhea, under-five children, timely treatment, delay, Ethiopia

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List of Abbreviations and Acronyms

AOR: Adjusted odds ratio

CBHI: community based health insurance

CHERG: Child Health Epidemiology Research Group

COR: Crude odds ratio

CSA: Central Statistical Agency

EDHS: Ethiopian Demographic Health Survey

GAPPD: Global Action Plan for Pneumonia and Diarrhea

GBD: Global burden of disease

HC: Health center

HSB: Health Seeking Behavior

IMNCI: Integrated Management of Neonatal and Child Hood Illness

LMICs: low-and middle-income countries

NGO: Non-governmental organization

ORS: Oral Rehydrating Salt

PATH: Program for Appropriate Technology in Health

SDG: Sustainable development Goal

SNNPRG: Southern nation's nationalities people's regional government

UNICEF: United Nations International Children's Emergency Fund

WHO: World Health Organizations

1. Introduction

1.1 Back ground

Diarrhea is a worldwide issue and epidemiologically characterized as three or more loose or watery stools in a 24-hour period (1). Diarrhea is a general symptom of gastrointestinal infections caused by a variety pathogen such as bacteria, viruses and protozoa. Rotavirus is the main source of intense loose bowels, and is accountable of around 40% hospitalizations of children under the age of five. There are three main forms of diarrhea; watery diarrhea, persistent diarrhea and bloody diarrhea(2). Infection is spread through contaminated food or drinking contaminated water or from person to person as a result of poor hygiene and sanitation(3,4).When diarrhea occurs, treatment options such as oral rehydration solution(ORS) and zinc treatment speed recovery and save lives(5).

Diarrhea is one of the most common health complaints and accounts 5% of health loss to disability for under five years children(6). Diarrheal disease and its complications remain as a major cause of morbidity and mortality in children, especially in developing countries. Dehydration is the principal immediate reason for death from severe diarrhea; early and appropriate fluid replacement is a main intervention to prevent death(7,8). Inability of caregivers to recognize early signs of dehydration and under management results in more fluid loss and electrolyte imbalance, which contribute to child mortality.

Early treatment of Diarrhea within 24 hours of onset of symptoms considered as crucial window of opportunity to prevent most cases of diarrhea from progressing to severe and fatal illness(9).

In Ethiopia, health care seeking behavior is poor and only 43 percent of children with diarrhea sought treatment from a health facility(10,11).

The burden of diarrheal diseases is much lower in developed countries; it is an important public health problem in developing countries. A two-week period prevalence of 12% was documented in Jimma zone south west Ethiopia(12). According to 2016 EDHS; 12 % in Ethiopia and 13.9% in SNNPRG child under age of five years experienced diarrhea(11).

Diarrhea presents an economic burden to both healthcare systems and patient families. In sub Saharan Africa treating water-borne diseases like diarrhea costs governments at least 12 % of their total health budgets each year (5,13).

1.2 Statement of the problem

Diarrheal disease remains as one of the major killer of young children(14). Diarrheal diseases account for 1 in 9 child deaths worldwide, 2195 children die every day globally making diarrhea the second leading cause of death among children under the age of five years old and more than 801, 000 children die every year worldwide(4). Of all under five children deaths ,18% die due to preventable diarrhea in developing countries (15). Sub-Saharan Africa has made the least progress in the reduction of infant and child mortality(2). The highest rates of under-five years children mortalities due to diarrhea were in sub-Saharan Africa and South Asia; India(105 000 deaths), Nigeria (103 000 deaths) ,Chad (594 deaths per 100 000) and Niger (485 deaths per 100 000) under-five years children deaths due to diarrhea in 2015(16).

Figures from the three EDHS also confirm that diarrhea is the second common causes of under-five mortality in Ethiopia. Based on the WHO/CHERG estimates, diarrhea contributes to(13%)child deaths in Ethiopia(11). Despite the improvements in case management and diagnostic technologies over the last decades. However, significant number of children continue to die without appropriate treatment, ever reaching health facility or die due to a delay in seeking care or advice from, a health facility(17–19).

Rapid and appropriate management of acute diarrhea is critical in preventing dehydration and childhood deaths (2,20). Thus, the ability of caregivers to recognize and seek appropriate care for these common childhood illness is instrumental in reducing child deaths in LMICs and in reaching the SDG target of reducing child mortality by 70% in the WHO African Region; in order to reduce under-five mortality to less than 25 deaths per 1000 live births (21).

Existing interventions could prevent many deaths among children if they are presented for appropriate and timely care(20). Majority of diarrhea related deaths are prevented by early diagnosis, timely use of oral rehydration solution (ORS), continued feeding of appropriate diet and utilization of qualified health care providers(2).

In 2013, WHO and UNICEF published the integrated Global Action Plan for Pneumonia and Diarrhea (GAPPD), which outlined a framework for ending preventable and treatable child deaths due to diarrhea and pneumonia by 2025(14).

Ensuring timely treatment of diarrhea will prevent most cases of diarrhea from progressing to severe and fatal illness. To avoid this progression, treatment must begin as soon as possible,

generally within 24 hours after symptom onset. Communities should be aware of the importance of seeking early treatment of diarrhea(9,22).

Timed targeted counseling(TTC) program has been under implementation by world vision Uganda. 76% of caregivers of under five children sought treatment for a child within 24 hours from first time of observing sign and symptoms. This high proportion of timely treatment of diarrhea shows that with effective interventions, it is possible to improve timely treatment of diarrhea in rural areas(23).

poor or delayed care seeking contributes up to 70% of all under five child deaths(15). Study conducted in India(24),Yemen(25), Burkina Faso(26) and Tanzania(27) was showed that 33.8%, 82.57%, 77.3% and 78.5% caregivers reported to have taken their children to the health facility after 24 hours of onset of symptoms respectively. The study conducted in rural Ethiopia shows that the magnitude of delay in seeking treatment for diarrhea in under five children were 54.24%; also appears to be considerable regional variation in healthcare-seeking behavior, with households in Amhara being most likely to seek care and those in SNNPR most likely to delay seeking care(28). Study done in Jeldu district, Ethiopia shows that 86.5% of children seek care after 24 hour of onset of illness(10).

As different studies revealed that, the major factors that affect early treatment of diarrhea among under five children are; sex of the child, age of the child, age of care givers, sex of care givers, place of residence, educational status of caregivers, family economic status, distance from home to nearest health facility, knowledge of care givers on signs and symptoms of diarrhea were factors counted for delay in seeking treatment for diarrhea in under five children among caregivers (23,24,29,30).

According to Hadero Tunto Zuriya district health office report diarrhea is one of the leading under five years' children out patient department health complaint. Different studies conducted in Ethiopia shows only magnitude of delay in seeking treatment for diarrhea in under-five children among caregivers. There were few studies regarding determinants of delay in seeking treatment for diarrhea in under five years' children among caregivers. To the investigator's knowledge in Hadero Tunto Zuriya district, no study has yet been done to identify determinants of delay in seeking treatment for diarrhea in under-five children among caregivers. So that this study aimed to identify determinant factors that contribute for delay in seeking treatment for diarrhea in under-five children among caregivers in Hadero Tunto Zuriya District.

1.3 Significance of the study

The aim of this study was to identify determinants of delay in seeking treatment for diarrhea in under five children in Hadero Tunto Zuriya district. The expected result from this study were what factors facilitate delay in seeking treatment for diarrhea in under five children.

The findings from this study will be used as an input for policy makers, regional and zonal health planners, decision makers and NGO by showing the most important local context factors that facilitate delay in seeking treatment for diarrhea in under five children. To give recommendation for specific intervention areas to improve delay in seeking treatment for diarrhea in under five children as a result, can help to reduce diarrhea related morbidity, mortality, as well as interrupt transmission, likelihood of developing life-threatening complications. Also encourage better communication with caregivers of under five children.

Caregivers of under five children in the study area will also be potentially benefited from the findings of this study, in the way that when factors which prevented them from seeking timely treatment for diarrhea in under-five children were clearly identified and that information will be disseminated to health managers, then evidence based decisions will be made and the right interventions will be designed and their problems will be solved properly.

When evidences are available there will also be high chance of NGOs and donor agencies to be attracted and bring projects to the area that will benefit caregivers of under-five children.

Also the study aimed to provide a baseline data on the determinants of delay in seeking treatment for diarrhea in under-five children among caregivers in Hadero Tunto Zuriya District, SNNRP of Ethiopia.

2. Literature review

This section presents the different factors reviewed in empirical studies of various sources. More specifically, it covers the three major factors for delay in seeking treatment for diarrhea in under five children identified by different studies. The factors are reviewed in different sections below.

2.1 Determinants of Delay in seeking treatment for diarrhea

2.1.1 Socio- demographic and economic factors

Age of caregivers is one of the socio demographic factor that have significant relationship with delay in seeking treatment for diarrhea in under five children. Community based crosssectional study done in rural Uganda shows that caregivers who were aged 30-39 years were less likely to seek timely diarrhea treatment for under five years' children compared to caregivers who were aged 19-29 years(23). Study conducted in central Ethiopia found that caregivers who were aged 15-25years were more likely delay in seeking treatment for diarrhea when compared to caregivers who were aged ≥ 36 years (31). Also study done in Bangladesh show similar finding(32). But, studies conducted in India indicated that there was no association between age of caregivers and delay in seeking treatment for diarrhea in under five children(24).

Study conducted in rural Uganda revealed that female caregivers were more likely to seek timely diarrhea treatment for under five children than male caregivers(23). But, studies conducted in India and central Ethiopia show that there was no association between sex of caregivers and delay in seeking treatment for diarrhea in under five children among caregivers(24,31).

Different studies show that there was gender bias in seeking treatment for diarrhea in under-five children; female child has more likely delay in seeking treatment for diarrhea compared to male child (24,31,32). However, Community based crosssectional study done in rural Uganda indicated that there was no association between sex of a child and delay in seeking treatment for diarrhea in under five children(23).

Findings of different studies show that age of under five children was associated with delay in seeking treatment for diarrhea in under five children. Study done in India found that Children aged 0–5 months and 6–8 months had higher experience of delayed-treatment

compared with those aged 12– 60 months (24). Also study done in central Ethiopia shows that children aged <24 months were more likely delay in seeking treatment for diarrhea compared to children aged \geq 24 months(31). But, Study done in rural Uganda show that there was no association between age of a child and delay in seeking treatment for diarrhea among caregivers(23).

Survey done in Bangladesh shows that number of under five children in particular household were significantly associated factors for health care seeking behavior(32). But, study done in India and slums of Addis Ababa, Ethiopia shows that number of under under-five children in the family were not associated with health seeking behavior for under five children diarrhea(24,30).

Study done in India and slums of Addis Ababa, Ethiopia shows that birth order of under five children, family size and the relationship between the child and caregiver (Biological parents) had no relationship with health seeking behavior for under five children diarrhea(24,30).

The study done in Jeldu district, Ethiopia shows that marital status of the caregivers was associated with health care seeking behavior; married women's were more likely health care seeking behavior for under five children than unmarried women's(29). But, study conducted in India, Uganda and central Ethiopia indicated that there was no association between marital status of caregivers and delay in seeking treatment for diarrhea in under five children(23,24,31).

Different studies conducted in Malaysia and Ethiopia shows that caregivers who reside in urban were more likely to seek timely diarrhea treatment for under five years children compared to care givers who reside in rural(10,33,34). But, studies conducted in India, Uganda and central Ethiopia show that there was no association between residence of caregivers and delay in seeking treatment for diarrhea in under five children(23,24,31).

The findings of different studies show that caregivers of under five children who did not attend school were more likely delay in seeking treatment for diarrhea in under five children compared to those who attend school(23,25,31). But, study conducted in India indicated that there was no association between educational status of caregivers and delay in seeking treatment for diarrhea in under five children(24).

Also study conducted in slums of Addis Ababa, Ethiopia found that occupation of caregivers were significantly associated with health care seeking behavior for under five children

(30,32). But, studies conducted in India, rural Uganda and Central Ethiopia show that there was no association between occupational status of caregivers and delay in seeking treatment for diarrhea in under five children (23,24,31).

Family economic status is also an important predictor of delay in seeking treatment for diarrhea in under five children. Study done in India shows that in children belonging to the poorest category of wealth index; seeking delayed diarrhea treatment were higher compared to those belonging to middle, richer and richest categories(24). Community based cross-sectional study done in slums of Addis Ababa, Ethiopia shows that having household monthly income of 50US\$ and above were positively associated with health seeking behavior when compared to family who had monthly income less than 50US\$ (30). But, study conducted in enteral Ethiopia and rural Uganda indicated that there was no association between Family economic status and delay in seeking treatment for diarrhea in under five children(31)(23).

2.1.2 Physical accessibility factors

A reasonable standard for physical access to primary health facility, defined as living with in 5kms or 1hour away from nearest health facility(35). Physical distance is one of the major constraints that prevented caregivers from seeking timely treatment of diarrhea for under five children.

Study conducted in India show that; distance to the nearest health facility was reported to be a major problem there was a delay in seeking treatment for diarrhea in under five children (24). Study done Uganda show similar finding; caregivers living with in 5km distance from nearest health facilities were more likely to seek timely diarrhea treatment for under five children compared to caregivers who live further than 5km from a health facility(23). Also study done in slums of Addis Ababa, Ethiopia shows that availability of nearest health facilities within 15 min walking distance have high odds of experiencing health-seeking behavior compared to health facility above 15min walking distance (30). But, study done in enteral Ethiopia show that there was no association between distance to nearest health facility and delay in seeking treatment for diarrhea in under five children(31).

Study conducted in western Kenya show that means of transportation used to arrive nearest health facility had no relationship with delay in seeking treatment for diarrhea in under five children(36).

2.1.3 Behavioral factors

Factors influencing caregivers' timely response to diarrheal episode was associated with several behavioral factors. Caregivers of under five children who knew the signs of diarrhea were more likely to seek timely treatment of diarrhea compared to caregivers who did not know the signs of diarrhea(23).

Caregivers who perceived the cost of treating diarrhea to be cheap were high odds of experiencing timely treatment of diarrhea compared to those who perceived the cost of treatment to be high(23). But, Study done in central Ethiopia indicated that cost of treatment had no relationship with delay in seeking treatment for diarrhea in under five children (31).

Caregivers who rated the transport cost to the health unit to be fair were high odds of experiencing timely diarrhea treatment compared to caregivers that rated transport cost to the health unit to be high. Caregivers who believed that diarrhea kills were more likely to seek timely diarrhea treatment compared to caregivers who did not believe that diarrhea kills. Those caregivers who believed that health unit may have medicine were high odds of experiencing timely diarrhea treatment compared to those did not believe that health centers may have medicine(23).

Home treatment of under five children diarrhea without health provider's advice and visiting traditional healers to seek treatment for under five children diarrhea were not associated with health seeking behavior (24,30).

The finding of different literatures revealed that the major factors that affect early treatment of diarrhea among under five children are age and sex of the child, age and sex of caregivers, Residences of care givers in rural or urban settings, educational status of caregivers, occupation of caregivers, family economic status and cost of treatment affect early treatment of diarrhea, distance to nearest health facility , knowledge of caregivers about diarrhea, cost of treatment, caregivers didn't believe that diarrhea kills and caregivers who believe that health centers may not have medicine affect early recognition of disease for early treatment of diarrhea.

Whereas, family size, biological parents, birth order of under five children, mode of transportation, home treatment and visiting traditional healers before health facility had no relation with delay in seeking treatment for diarrhea in under five children among caregivers.

2.2 Conceptual frame work

Socio-demographic and economic factors, accessibility and behavioral factors play a role in determining delay in seeking treatment for diarrhea in under five children. This factors may contribute to delay in seeking treatment for diarrhea in under five children among caregivers. This relationship between dependent and independent variables is illustrated by conceptual frame work developed by reviewing different literatures on figure-1 below.

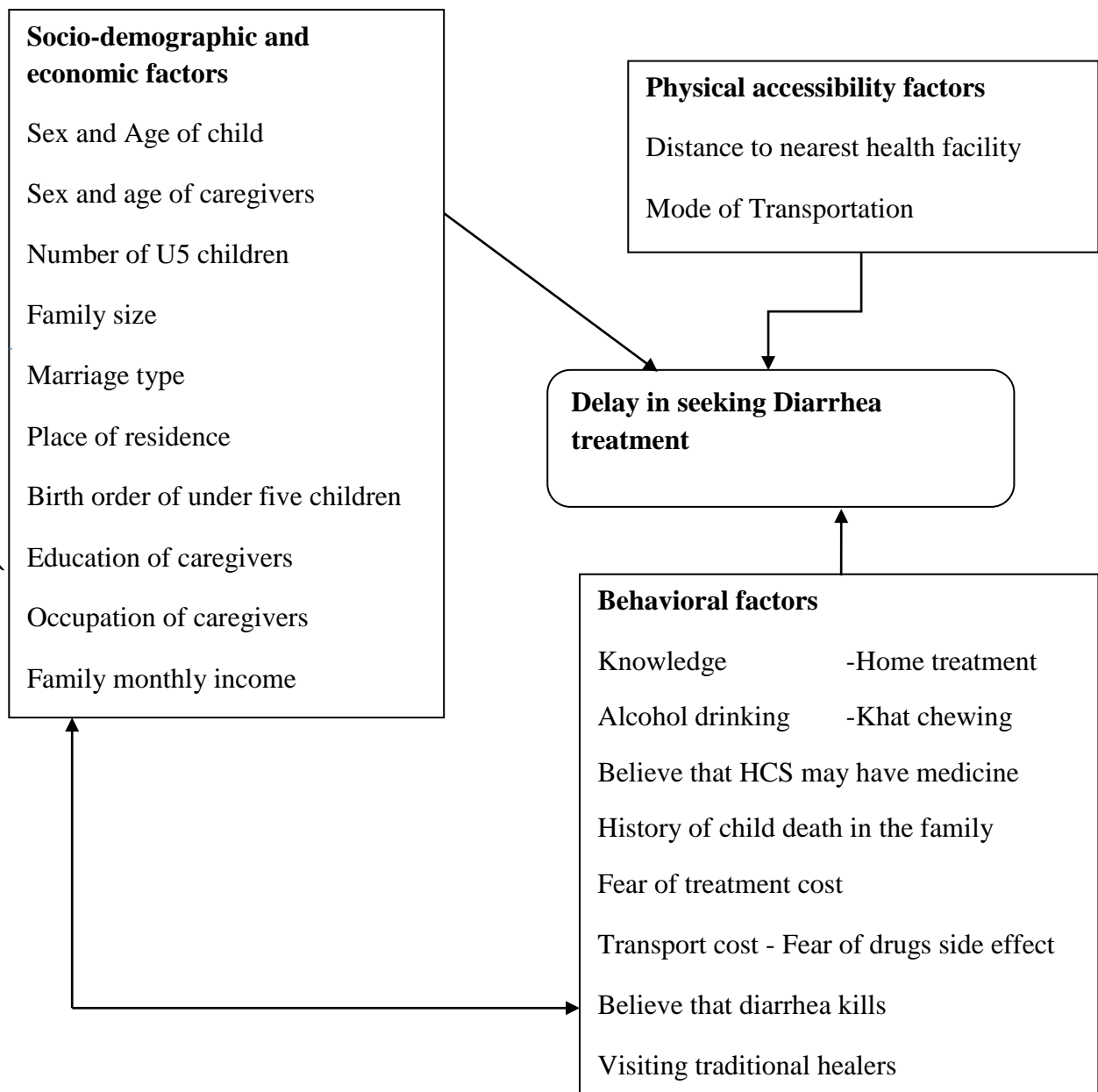


Figure 1: Conceptual frame work of the study developed after reviewing relevant literatures(23,24,31).

3. Objectives

3.1 General objective

To identify determinants of Delay in seeking treatment for diarrhea in under-five children among caregivers in Hadero Tunto Zuriya District, Southern Ethiopia, march 1 to April 20,2018.

3.2 Specific objectives

- To determine socio-demographic factors associated with delay in seeking treatment for diarrhea in under-five children among caregivers in Hadero Tunto Zuriya District.
- To identify physical accessibility factors associated with delay in seeking treatment for diarrhea in under-five children among caregivers in Hadero Tunto Zuriya District.
- To determine behavioral factors associated with delay in seeking treatment for diarrhea in under-five children among caregivers in Hadero Tunto Zuriya District.

4. Methods and materials

4.1 Study area and period

The study was conducted in under five years' children outpatient department of four health centers of Hadero Tunto Zuriya district. The district is found in Kembata Tembaro Zone, SNNPRs of Ethiopia. It is located 297 km away from Addis Ababa to southern part of Ethiopia, 158kms from regional city Hawassa to southwest and 33km from Zonal town Durame. The district has a total of 139,165 populations reside and out of this 21,723 are under five children(37). Its main town is Hadero. It is bordered: by North Hadiya zone, West Tembaro District, North East Kacha-bira District and South east Wolaita zone. The district has 14 rural and 2 urban kebeles, four health centers, twenty health posts, and seven Private health facilities are found. All health centers of Hadero Tunto Zuriya district are providing IMNCI service. Previous year one-month diarrhea treatment record shows that 94,109,117 and 75 under-five children visited Hadero, Tunto, Lesho and Mendoye health centers for diarrhea treatment respectively. The study was conducted in Hadero Tunto Zuriya District from March 1 to April 20, 2018.

4.2 Study Design

Facility based case control study was conducted

4.3 Population

4.3.1 Source population

Caregivers of under-five years' children who came to health centers of Hadero Tunto Zuriya district for diarrhea treatment.

4.3.2 Study population

Cases: Caregivers of Under-five children with clinical diarrhea and sought treatment after 24 hours from first time of observing signs and symptoms of diarrhea.

Controls: Caregivers of Under-five children with clinical diarrhea and sought treatment within 24 hours from first time of observing signs and symptoms of diarrhea.

4.3.3 Study units

Caregiver of under five children with clinical diarrhea

4.4 Eligibility criteria

4.4.1 Inclusion criteria

For cases: - Caregivers of under-five children with any form of diarrhea, that was decided by health personnel by using IMNCI protocol and their Caregivers visiting health centers for treatment of diarrhea of the child after 24 hours from first time of observing signs and symptoms of diarrhea.

For controls: - Caregivers of under-five children with any form of diarrhea, that was decided by health personnel by using IMNCI protocol and their caregivers visiting health centers for treatment of diarrhea of the child within 24 hours from first time of observing signs and symptoms of diarrhea.

4.4.2 Exclusion criteria: For cases/controls: -

- ❖ Caregivers mentally unstable and therefore unable to respond to interview.
- ❖ Caregivers whose children are in need of urgent referral and
- ❖ Caregivers who sought treatment from other health facility before they came to this health facility were excluded from study.

4.5. Sample size determination

The sample size was calculated by using two population proportion formula for case control study design by using EPI info 7.1.1 statistical software by considering sex of caregiver as an exposure variable. It was found that proportion of exposure among controls was 81.9 % with 1.95 odds ratio which is taken from study done in rural Uganda(23). 95% CI, 80% power of the study and case to control ratio of 1:1 and 5 % nonresponse; the final large sample size considered were 688 children (344 cases and 344 controls).

Table 1:Sample size determination of determinants of delay in seeking diarrhea treatment among caregivers of under-five children in Hadero Tunto Zuriya District, Southern Ethiopia,2018

Variables	% controls exposed	OR	CI	Non response rate(5%)	Case to control ratio	Calculated sample size(Fleiss w/cc)		
						cases	controls	Total
Residence (urban)	41.4%	3.03	95%	6	1:1	65	65	130
Sex of care giver(female)	81.9%	1.95	95%	34	1:1	344	344	688

4.6 Sampling procedures

Hadero, Tunto, Lesho and Mendoye health centers were included in the study. Cases and controls were recruited consecutively from the same health center until the required sample size was fulfilled. The sample size was allocated for each health centers based on previous year two months' records of under-five years' children diarrhea.

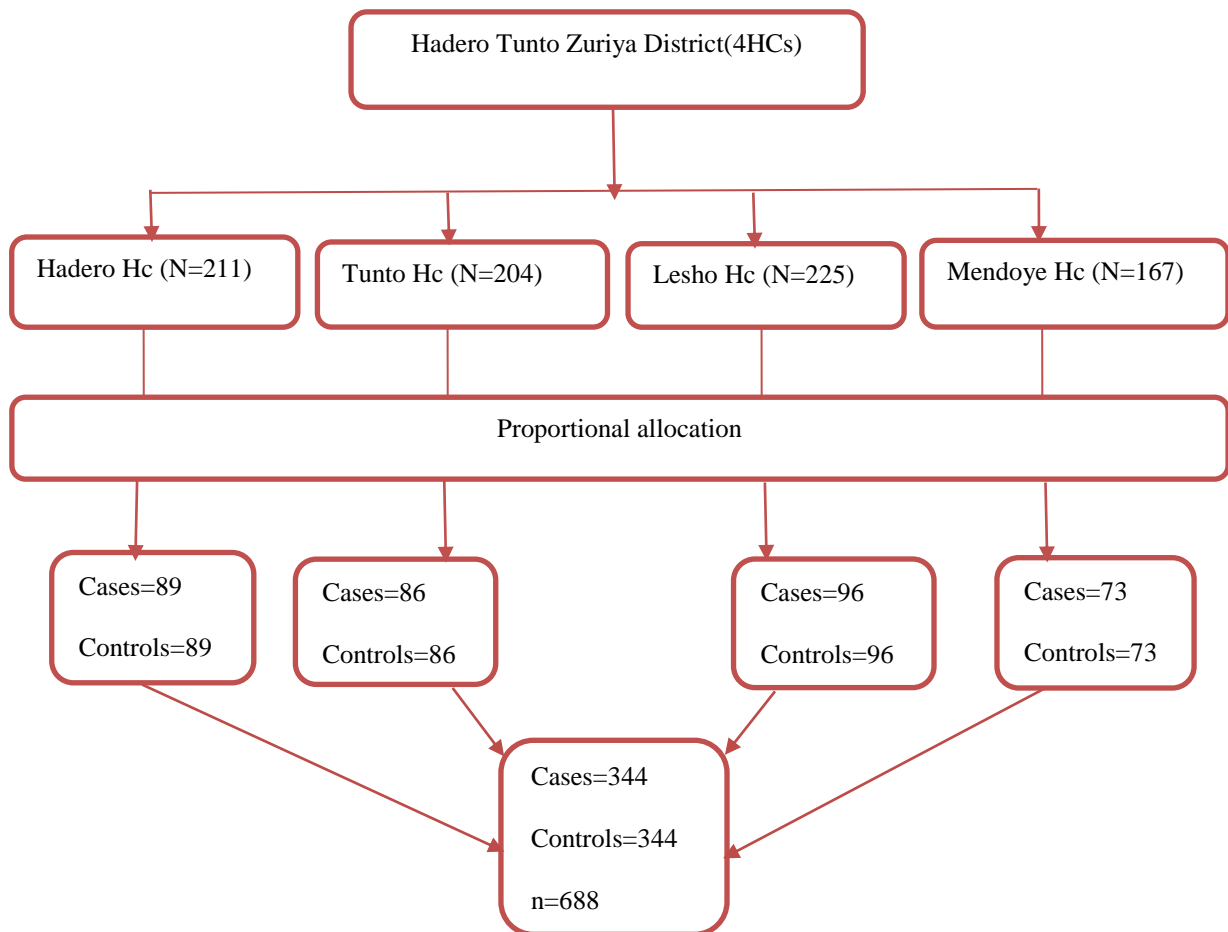


Figure 2: Schematic presentation of sampling technique

4.7 Study Variables

4.7.1 Dependent variable: Delay status in Seeking Diarrhea treatment

4.7.2 Independent variables

Socio demographic and economic factors

- Sex of caregivers
- Age of caregivers
- Age of the child
- Sex of the child
- Marriage types
- Place of residence
- Family size
- Birth order of under five children
- Occupation of caregivers
- Education of caregivers
- Family monthly income

Accessibility factors

- Distance to nearest health facility
- Mode of transport

Behavioral factors

- Knowledge about diarrhea
- Alcohol drinking
- Khat chewing
- History of child death
- Self-medication
- Visiting traditional healers
- Fear of treatment Cost
- Fear of drug side effect
- Distrust health providers
- Cost of Transportation
- Believe that diarrhea kills
- Believe that HCs may have medicine

4.8 Operational Definitions

1. Timely treatment of diarrhea: Caregivers time of seeking diarrhea treatment for under five children from health facilities within 24 hours from first time of observing signs and symptoms of diarrhea.

2. Delay treatment of diarrhea: Caregivers time of seeking diarrhea treatment for under five children from health facilities after 24 hours from first time of observing signs and symptoms of diarrhea.

3. Knowledge: Knowledge was measured by the participants' responses to 10 knowledge related questions to cause of diarrhea, signs and symptoms, mode of transmission, prevention of diarrhea and on advantage of early treatment of diarrhea. Correct responses were given a value of "1" and incorrect responses were given "0". The sum was computed and 50% score was used as a cut-off point. Respondents who had scored 50% and above considered as having **good knowledge** whereas respondents who had scored below 50% were labeled as having **poor knowledge**(38).

4. Caregivers: Mothers and fathers or any person responsible for the care of the child during study period.

5. Integrated management of neonatal child hood illness /IMNCI/: A protocol used to treat different types of under five years' childhood illnesses.

6. Alcohol drinker: If caregiver of a child currently (at least for past one week) drinks alcohol, he/she was considered as alcohol drinker.

7. Khat chewer: If caregiver of a child currently (at least for past one week) chews khat, he/she was considered as khat chewer.

8. Self-medication: Caregivers treat under five children diarrhea at home without health provider's advice by using any amount and type of treatment was considered as self-medication.

9. Visiting traditional healers: Care givers visit traditional healers to seek diarrhea treatment for under five children at least one time before going to health facility was taken as visitors of traditional healers.

10. Distance from home to nearest health facility: was measured by how many kilometers found between caregiver's home and the nearest health facility.

4.9 Data collection tool and Procedures

Data on socio demographic and economic characteristics, physical accessibility factors and behavioral factors were collected from caregivers of under five children by using face to face interviewers administered structured questionnaires adapted from different literatures of similar studies and modified according to the local context and objectives of this study to include factors. Four diploma nurses (data collectors) and two Bsc nurses (supervisors) were recruited, based on the ability of speaking kembategna (local language) and training was given to them by the principal investigator on the objective of the study, methods of data collection and confidentiality of information for one day.

Caregivers of under-five children with diarrhea; who fulfilled eligibility criteria were recruited as study participants, that was decided by health personnel working in under five years' children outpatient department. The health personnel classify as cases and controls by asking when the first time observed signs and symptoms of diarrhea. Caregivers visit health facilities within 24 hours from first time of observing signs and symptoms of diarrhea were taken as controls (code 0 in prescribed area in the tool) and caregivers visit health facilities after 24 hours from first time of observing signs and symptoms of diarrhea were taken as cases (code 1 in prescribed area in the tool), then data collectors conduct interview for (25-30 minutes) in isolated room. The supervisors were informed about the strict supervision and the cross-checking procedure that was take place during data collection. The principal investigator supervises the overall activities.

4.10 Data Quality Control

In order to ensure the quality of the data; pre-test was conducted in one of neighboring Kacha bira district (Hobichaka health center) on 34 caregivers of under-five years' children. Before the actual data collection takes place some items of questions were modified accordingly. One-day training was given to data collectors and supervisors to have common understanding on data collection process. The English version questionnaire was translated into kembategna (local language) and again translated back to English version by independent translators to check consistency of the two versions.

Every day after data collection, questionnaires was reviewed and checked for completeness by the supervisors and principal investigator and the necessary feedback was given to data collectors in the next morning.

4.11 Data processing and analysis

After data collection, each questionnaire was checked for completeness and code was given before data entry. Data was entered and cleaned by using Epi-data version 3.1 and exported to SPSS version 20 for analysis. Frequency, percentage and descriptive summaries were used to describe the study variables. Binary logistic regression was performed to identify candidate variables. Variables which found to be significant at 0.2 p-values in bivariable logistic regression analysis were selected as a candidate for multivariable logistic regression analysis. Multicollinearity was checked for predictor variables with p-value ≤ 0.2 using variance inflation factor(VIF) and no significant Multicollinearity was observed(< 2 VIF). Finally adjusted odds ratios with their 95% confidence intervals and 0.05 p-values was considered to determine determinant factors. Hosmer -Lemshow's statistics was used to test goodness - of - fit of the model to the data and the model was fit with p-value > 0.05 .

4.12 Ethical consideration

Ethical clearance was obtained from Ethical Review Board of Institute of Health, Jimma University. Formal letter of cooperation was obtained from Hadero Tunto Zuriya District health office. Verbal Informed consent was obtained from each study participants. Any study participants who were not willing to participate in the study were not be forced to participate. They were also informed that all data obtained from them would have been kept confidential by using codes instead of any personal identifiers.

4.13 Dissemination of the results

Results will be presented and submitted to department of epidemiology, Jimma University. Also there will be possible efforts to disseminate through publication (local or international journals). A copy of it will be offered to Hadero Tunto Zuriya District health office, Kembata Tembaro Zone Health Department and other concerned bodies so that they can use the results for planning and implementation on ending treatable and preventable death from diarrhea.

5.Results

5.1 Descriptive analysis of Socio demographic and economic characteristics

A total of 338 caregivers of under five children as cases and 338 caregivers of under five children as controls were included in this study with response rate of 98.5%. The median age of study participants were 28 years (SD \pm 5.655) and 26 years (SD \pm 5.798) for cases and controls, respectively. With regarding to marital status, 338(100%) of cases and 338 (100%) of controls were married. Majority of the participants, (76%) of cases and (75.1%) of controls were protestants in religion.

Among the study participants 138(40.8%) of cases and 128(37.9%) of controls were Donga in ethnicity; whereas 124(36.7%) of cases and 125(37%) of controls were Kembata in ethnicity. In terms of educational status of the mother of under-five children, highest proportion 118(34.9%) of cases could read and write whereas that of controls 179(53%) was secondary education. Approximately one third 109(32.2%) of fathers of under-five children of cases was primary education whereas half 158(46.7%) of fathers of under-five children of controls had secondary education.

Most of the mothers, 251 (74.3%) of cases and 218(64.5%) of controls were housewives. The main father's occupations were farming and merchant. Farmer was accounts 251(74.3%) of cases and 177(52.4%) of controls and merchant were account 57(16.9%) of cases and 80(23.7%) of controls.

Family whose average monthly income less than or equal to 500 ETB was reports, 118(34.9%) of cases and 55(16.27%) of controls and whose average monthly income greater or equal 1000 ETB was accounts 107(31.7%) of cases and 226(66.9%) of controls. In terms of gender of study participants, 199(58.9%) of cases and 251(74.3%) of controls were female gender. Most of caregivers were came from rural community 237 (70.1%) of cases and 207(61.2) of controls. 310(91.7%) of cases and 326(96.4%) of controls had monogamy marriage type.

More than half of respondents 283(83.7%) of cases and 228(67.5%) of controls had family size in between 4-6 family members. Most of the caregivers had one children in family which accounts 228(67.5%) of cases and 193(56.8%) of controls.

Most of children were females, 231(68.3%) of cases while males, 216(63.9%) of controls. The minimum and maximum of age of children for both cases and controls were 1-58 months

and 2-58 months respectively and the mean age of cases were 31.21 months with (SD±13.761) and controls were 28.4 months with (SD±14.442). The mean family size of study participants was 4.54 with (SD ±1.025) for cases and 4.26 with (SD±1.136) for controls.

Table 2: Socio-demographic and economic characteristics of caregivers and under five children in Hadero Tunto Zuriya District, Southern Ethiopia, March-April 2018(n=676).

Variables	Cases(n=338) Number(%)	Controls(n=338) Number (%)	COR(95% CI)	P-value
Sex of caregivers				
Female	199(58.9)	251(74.3)	1	<0.01*
Male	139(41.1)	87(25.7)	2.015(1.45,2.79)	
Age of caregivers				
20-29	95(28.1)	199(58.9)	1	<0.01*
30-39	203(60.1)	130(38.5)	3.271(2.35,4.54)	
40-49	40(11.8)	9(2.7)	9.31(4.34,19.97)	
Religions				
Protestant	258(76.3)	254(75.1)		0.720
Orthodox	80(23.7)	84(24.9)	1	
Ethnic group				
Donga	138(40.8)	128(37.9)	1	0.04*
Kembata	124(36.7)	125(37)	0.920(0.65,1.30)	
Hadiya	29(8.6)	35(10.4)	0.769(0.44,1.32)	
Tembaro	12(3.6)	29(8.6)	0.384(0.18,0.78)	
Wolaita	23(6.8)	16(4.7)	1.333(0.67,2.63)	
Amhara	12(3.6)	5(1.5)	2.226(0.76,6.49)	
Mother's education				
Illiterate	59(17.5)	25(7.4)	7.58(3.54,16.23)	<0.01*
Read and write	118(34.9)	36(10.7)	10.53(5.19,21.3)	
Primary school	80(23.7)	53(15.7)	4.85(2.42,9.70)	
Secondary school	67(19.8)	179(53)	1.20(0.62,2.33)	
Above secondary	14(4.1)	45(13.3)	1	
Father's education				
Illiterate	32(9.5)	10(3)	8.61(3.71,19.97)	<0.01*
Read and write	103(30.5)	40(11.8)	6.93(3.88,12.37)	
Primary school	109(32.2)	60(17.8)	4.891(2.82,8.47)	
Secondary school	68(20.1)	158(46.7)	1.159(0.68,1.97)	
Above secondary	26(7.7)	70(20.7)	1	

Table2:(continued)

Mother's occupation				
House wife	251(74.3)	218(64.5)	6.90(2.85,16.70)	
Merchant	75(22.2)	68(20.1)	6.61(2.62,16.68)	
NGO employee	6(1.8)	16(4.7)	2.25(0.62,8.05)	
Gov't employee	6(1.8)	36(10.7)	1	<0.01*
Father's occupation				
Gov't employee	19(5.6)	65(19.2)	1	<0.01*
NGO employee	8(2.4)	16(4.7)	1.711(0.63,4.60)	
Merchant	57(16.9)	80(23.7)	2.437(1.31,4.50)	
Farmers	254(75.1)	177(52.4)	4.90(2.84,8.47)	
Average monthly income				
≤500	118(34.9)	55(16.27)	4.53(3.05,6.72)	
501-999.9	113(33.4)	57(16.86)	4.18(2.82,6.20)	
≤1000	107(31.7)	226(66.9)	1	<0.01*
Residences				
Rural	237(70.1)	207(61.2)	1.485(1.07,2.04)	
Urban	101(29.9)	131(38.8)	1	<0.01*
Marriage types				
Polygamy	28(8.3)	12(3.6)	2.454(1.22,4.91)	
Monogamy	310(91.7)	326(96.4)	1	<0.01*
Family size				
≤3	39(11.5)	103(30.5)	1	<0.01*
4-6	283(83.4)	228(67.5)	3.278(2.18,4.92)	
>6	16(4.7)	7(2.1)	6.037(2.30,15.79)	
Age of children/Month				
1-12	36(10.7)	57(16.9)	1	<0.01*
13-24	84(24.9)	101(29.9)	1.317(0.79,2.18)	
>24	218(64.5)	180(53.3)	1.918(1.20,3.04)	
Sex of children				
Female	231(68.3)	122(36.1)	3.822(2.77,5.25)	
Male	107(31.7)	216(63.9)	1	<0.01*

Table2:(continued)

Number of <5 years children				
1	228(67.5)	193(56.8)	1	<0.01*
2	110(32.5)	145(42.9)	0.642(0.46,0.87)	
Birth order of <5yrs children				
First	79(23.4)	114(33.7)	1	<0.01*
Second	131(38.8)	117(34.6)	1.616(1.10,2.36)	
Third	93(27.5)	56(16.6)	2.396(1.54,3.71)	
Fourth and above	35(10.4)	51(15.1)	0.990(0.59,1.66)	
Decision maker				
Mother	139(41.1)	167(49.4)	1	<0.01*
Father	68(20.1)	29(8.6)	2.817(1.72,4.59)	
Both	131(38.8)	142(42)	1.108(0.79,1.53)	

1 Reference, p-value* variables associated in bivariable logistic regression analysis with p-value of less than 0.2

5.2 Descriptive analysis of accessibility factors

Most of respondents 208(61.5) of cases came to health centers from above 5km while 229(67.8) of the controls came from 5km or less. Majority of respondent, both in the cases 238(70.4) and controls 230(68) came to health centers by Walking.

Table 3: Accessibility factors related to delay in seeking diarrhea treatment among caregivers of under-five children in Hadero Tunto Zuriya District, Southern Ethiopia, March-April 2018(n=676).

Variables	Cases(n=338) Number (%)	Controls (n=338) Number (%)	COR(95% CI)	P-value
Distance				
≤5km	130(38.5)	229(67.8)	1	<0.01*
>5km	208(61.5)	109(32.2)	3.36(2.45,4.61)	
Mode of Transport				
Walking	238(70.4)	230(68)	2.07(1.37,3.12)	
Horse back	58(17.2)	24(7.1)	4.83(2.64,8.83)	
Car	42(12.4)	84(24.9)	1	<0.01*

1 Reference, p-value* variables associated in bivariable logistic regression analysis with p-value of less than 0.2

5.3 Descriptive analysis of Behavioral factors

Majority of the caregivers 295(87.3) of cases and 313(92.6) of controls had good knowledge about diarrhea. A total of 33(9.8) of cases and 51(15.1) of controls had history of child death in the family. Most of the caregivers didn't fear the side effect of diarrheal drugs while 96(28.4) of the cases and 71(21) of the controls had fear the side effects of diarrheal drugs.

A total of 93(27.5) of cases and 85(25.1) of controls of caregivers were distrusting the health care providers. 63(18.6) of cases and 46(13.6) of controls of caregivers were drink alcohols. 28(8.3) of cases and 19(5.6) of controls of caregivers were chewing khat. Most of the caregivers didn't fear paying treatment cost but only 92(27.2) of cases and 83(24.5) of controls had fear of paying treatment cost.

Most of the caregivers believe that diarrhea kills 225(66.6%) of cases and 275(81.4%) of controls. A total of 237(70.1%) of cases and 312(92.3%) of controls believe that health centers may have medicine. Most of the caregivers didn't treat the child at home without health providers' advice but 64(18.9%) of cases and 23(6.8%) of controls treat at home. 43(12.7%) of cases and 23(6.8%) of controls visit traditional healers before coming to health facility (**Table4**)

Table 4: Behavioral factors related to delay in seeking diarrhea treatment among caregivers of under-five children in Hadero Tunto Zuriya District, Southern Ethiopia, March-April 2018(n=676).

Variables	Cases(n=338) Number (%)	Controls(n=338) Number (%)	COR(95% CI)	P-value
Knowledge about diarrhea				
Good	295(87.3)	313(92.6)	1	0.023*
Poor	43(12.7)	25(7.4)	1.825(1.08,3.06)	
Believe that Transport cost to the H/facility				
High	6(14.28)	14(16.67)	1.527(0.50,4.61)	<0.01*
Fair	20(47.7)	13(15.5)	5.48(2.24,13.36)	
Cheap	16(38.09)	57(67.85)	1	
History of child death				
Yes	33(9.8)	51(15.1)	1	<0.01*
No	305(90.2)	287(84.9)	1.642(1.03,2.61)	
Fear of side effect				
Yes	96(28.4)	71(21)	1.492(1.04,2.12)	0.026*
No	242(71.6)	267(79)	1	
Distrust health providers				
Yes	93(27.5)	85(25.1)	1.13(0.80,1.59)	0.485
No	245(72.5)	253(74.9)	1	
Fear of medication cost				
Yes	92(27.2)	83(24.5)	1.149(0.81,1.62)	0.430
No	246(72.8)	253(75.5)	1	
Believe that diarrhea kills				
Yes	225(66.6)	275(81.4)	1	<0.01*
No	113(33.4)	63(18.6)	2.192(1.53,3.12)	
Believe that HCs may Have medicine				
Yes	237(70.1)	312(92.3)	1	<0.01*
No	101(29.9)	26(7.7)	5.11(3.21,8.12)	
Self-medication				
Yes	64(18.9)	23(6.8)	3.19(1.93,5.29)	<0.01*
No	274(81.1)	315(93.2)	1	
Visiting traditional Healers				
Yes	43(12.7)	23(6.8)	1.996(1.17,3.39)	0.011*
No	295(87.3)	315(93.2)	1	
Alcohols drinkers				
Yes	63(18.6)	46(13.6)	1.454(0.96,2.20)	0.076*
No	275(81.4)	292(86.4)	1	
Khat chewing				
Yes	28(8.3)	19(5.6)	1.516(0.83,2.77)	0.176*
No	310(91.7)	319(94.4)	1	

1 Reference, p-value* variables associated in Bivariable logistic regression analysis with p-value of less than 0.2

5.4 Results of Bivariable and Multivariable logistic regression analysis for Determinants of delay in seeking treatment for diarrhea in under five children among caregivers

In bivariable logistic regression analysis all socio demographic and socio economic factors were nominated with p-value ≤ 0.2 for multivariable logistic regression analysis; except religion. Whereas in terms of accessibility and behavioral factors; except fear of medication cost and distrust health care providers all variables were nominated for multivariable logistic regression analysis with p-value ≤ 0.2 for determinants of delay in seeking treatment for diarrhea in under five children among caregivers in Hadero Tunto Zuriya District.

In multivariable logistics regression analysis; Caregivers being aged 40-49 years, being female child, Illiterate mothers, monthly income less than or equal 500 ETB, uses walking to arrive nearest health facility, no history of child death in the family, caregivers who believe that health centers may not have medicine and self- medication were associated with delay in seeking treatment for diarrhea in under five children among caregivers.

The odds of delay in seeking treatment for diarrhea was 7.89 times more likely among caregivers who were aged from 40-49 years when compared to caregivers who were aged from 20-29 years [AOR=7.89; 95% CI:2.48,25.11]. The odds of delay in seeking treatment for diarrhea was 3.71 times more likely among Female child when compared to male child [AOR=3.71; 95% CI: 2.30,5.99].

The odds of delay in seeking treatment for diarrhea was approximately 6.70 times more likely among Illiterate mothers when compared to who were educated above secondary school [AOR=6.70;95% CI:2.33,19.28]. The odds of delay in seeking treatment for diarrhea was 3.08 times more likely among family who had monthly income of 500 ETB compared to family who had average monthly income 1000 ETB and above [AOR= 3.08; 95% CI:1.68,5.65]. The odds of delay in seeking treatment for diarrhea was 4.37 times more likely among caregivers who uses walking as a means of transportation to arrive nearest health facility when compared to those caregivers used car [AOR=4.37;95% CI: 2.31,8.26].

Odds of delay in seeking treatment for diarrhea was 5.42 times more likely among caregivers who had no previous history of child death when compared to that had previous history of child death in the family [AOR=5.42; 95% CI:2.40,12.23]. Odds of delay in seeking treatment for diarrhea was 5.40 times more likely among caregivers who believe that health centers may not have medicine when compared to who believe that health centers may have

medicine [AOR= 5.40;95% CI:2.64,11.04]. The odds of delay in seeking treatment for diarrhea was 7.64 times more likely among caregivers who treat the child at home when compared to who did not treat the child at home [AOR=7.64;95% CI:3.84,15.39].

Table 5: Variables associated with delay in seeking treatment for diarrhea in under-five children among caregivers in Hadero Tunto Zuriya District, Southern Ethiopia, March-April 2018(n=676).

Variables	Cases Number	Controls Number	COR(95% CI)	AOR(95% CI)	P-Value
Respondents					
age					
20-29	95	199	1	1	<0.01*
30-39	203	130	3.271(2.35,4.54)	1.27(0.66,2.41)	0.464
40-49	40	9	9.31(4.34,19.97)	7.89(2.48,25.11)	0.001
Sex of children					
Female	231	122	3.822(2.77,5.25)	3.71(2.30,5.99)	<0.01*
Male	107	216	1	1	
Mothers education					
Illiterate	59	25	7.58(3.54,16.23)	6.70(2.33,19.28)	<0.01*
Read and write	118	36	10.53(5.19,21.3)	7.96(3.06,20.68)	<0.01*
Primary school	80	53	4.85(2.42,9.70)	3.02(1.16,7.82)	0.023
Sec. school	67	179	1.20(0.62,2.33)	1.07(0.45,2.55)	0.865
Above sec.	14	45	1	1	
Monthly income					
≤500	118	55	4.53(3.05,6.72)	3.08(1.68,5.65)	<0.01*
501-999.9	113	57	4.18(2.82,6.20)	3.86(2.20,6.75)	<0.01*
≥1000	107	226	1	1	<0.01*
Means of transport					
Walking	238	230	2.07(1.37,3.12)	4.37(2.31,8.26)	<0.01*
Horse back	58	24	4.83(2.64,8.83)	5.09(2.27,11.43)	<0.01*
Car	42	84	1	1	<0.01*
History of child death					
Yes	33	51	1	1	
No	305	287	1.642(1.03,2.61)	5.42(2.40,12.23)	<0.01*
HCs may Have medicine					
Yes	237	312	1	1	
No	101	26	5.11(3.21,8.12)	5.40(2.64,11.04)	<0.01*
Self-medication					
Yes	64	23	3.19(1.93,5.29)	7.64(3.80,15.39)	<0.01*
No	274	315	1	315	315

Hosmer-Lemshow's test 0.561, Reference category 1, Model prediction 82.7%

6. Discussion

This study identified determinants of delay in seeking treatment for diarrhea in under-five children among caregivers in Hadero Tunto Zuriya District. Caregivers being aged 40-49 years, being female child, Illiterate mothers, monthly income less than or equal 500 ETB, uses walking to arrive nearest health facility, no history of child death in the family, caregivers who believe that health centers may not have medicine and self- medication were determinants for delay in seeking treatment for diarrhea in under-five children among caregivers in Hadero Tunto Zuriya District.

In the current study age of caregivers was one of the determinant factor associated with delay in seeking treatment for diarrhea in under-five. The odds of delay in seeking treatment for diarrhea was 7.89 times more likely among caregivers who were aged from 40-49 years when compared to caregivers who were aged from 20-29 years [AOR=7.89; 95% CI:2.48,25.11]. This finding is in agreement with the study done in Uganda(23) and central Ethiopia(31) which showed that caregivers age significantly associated with delay in seeking treatment for diarrhea in under five children.

The possible explanation for delayed care seeking might be older caregivers believe that teeth development as cause diarrhea and their level of education is lower than young caregivers. The other possible justification might be older caregivers gained experience in home treatment of diarrhea, so they can use self-treatment as source of initial treatment and perceiving the illness was not series; which prevented them from seeking timely treatment for diarrhea in under five children.

This study shows that age and number of under five children were not determinant factor for delay in seeking treatment for diarrhea but Sex of the child was one of the determinant factor for delay in seeking treatment for diarrhea in under-five children among caregivers. The odds of delay in seeking treatment for diarrhea was 3.71 times more likely among female child when compared to male child [AOR=3.71; 95% CI: 2.30,5.99]. This finding was supported by the study done in India(24), central Ethiopia(31) and Malaysia(33) which showed that female child has high odds of experiencing delayed treatment compared to male child. This might be due to cultural influence and gender inequality in the community.

The odds of delay in seeking treatment for diarrhea in under five children among caregivers was approximately 6.70 times more likely among Illiterate mothers when compared to who

were educated above secondary school [AOR=6.70;95% CI:2.33,19.28]. This finding was supported by study conducted in Malaysia(33), Uganda(23) and central Ethiopia(31) which showed that mothers educated secondary school and above were more likely sought treatment early than illiterate mothers. This implies that the higher the level of school education; the better timely diarrhea treatment seeking behavior. This might be due to School education increase mother's knowledge about biological aspect of human being and educated mothers more likely be able to read comprehensively and understand better.

Average family monthly income was found to be determinant factor for delay in seeking treatment for diarrhea in under-five children among caregivers. The odds of delay in seeking treatment for diarrhea was 3.08 times more likely among family who had monthly income of 500 ETB compared to family who had average monthly income 1000 ETB and above [AOR= 3.08; 95% CI:1.68,5.65]. This finding was supported by study conducted in India(24) which showed that in children belongs to poorest categories of wealth index; the odds of delayed treatment were higher compared with those belongs to middle, richer and richest categories of wealth index and study done in Ethiopia(30) showed that having monthly income of 50 US\$ and above were significantly associated with health seeking behavior. This could have explained by family economic status influences caregiver's decisions regarding timely diarrhea treatment for under five children.

Different studies conducted in India, Uganda and slums of Addis Ababa Ethiopia showed that distance from home to nearest health facility was associated with delay in seeking treatment for diarrhea in under five years' children among caregivers (23,24,30). But this study showed that there was no association between distance and delay in seeking treatment for diarrhea in under five years' children. This might be due to above half of study participants live within five kilometers distance.

The odds of delay in seeking treatment for diarrhea in under five years' children was 4.37 times more likely among caregivers who uses walking as a means of transportation to arrive nearest health facility when compared to those caregivers used car (AOR=4.37;95% CI: 2.31,8.26). This might be due to transportation cost and bad topography to reach health facility.

This study revealed that caregivers who had no history of child death in the family was one of behavior related factor associated with delay in seeking treatment for diarrhea in under five years' children among caregivers. Odds of delay in seeking diarrhea treatment was 5.42 times

more likely among caregivers who had no previous history of child death when compared to that had previous history of child death in the family [AOR=5.42; 95% CI:2.40,12.23]. This might be explained by caregivers who had previous history of child death due to diarrhea has taken lesson from previous child death; diarrhea would cause harm or death.

Odds of delay in seeking treatment for diarrhea in under five years' children was 5.40 times more likely among caregivers who believe that health centers may not have medicine compared to who believe that health centers may have medicine [AOR= 5.40;95% CI:2.64,11.04]. This finding was supported with study done in Uganda(23),which showed that caregivers who believe that health centers may have medicine were more likely to seek timely treatment compared to those who believe that health centers may not have medicine. This might be due to caregivers looked at this as waste of time moving all the way to health centers to seek treatment in absence of drugs at government health facilities, which made them to treat the child at home or visit traditional healers instead of visiting health facilities.

The odds of delay in seeking treatment for diarrhea in under five years' children was 7.64 times more likely among caregivers who treat the child at home without health provider's advice when compared to who did not treat the child at home (AOR=7.64;95% CI:3.84,15.39). This could have explained by caregivers seek care from Health facilities when the illness gets worsened regardless of their family monthly income and health facilities too far from their home. So, they try to treat the child by using drugs available at home or purchased from shops.

Strength of study

Cases and controls were selected by using the same inclusion and exclusion criteria. Case and control selection process was done by health personnel working in outpatient department of under five children.

Limitation of study

The focus of the study was government health facility only; this is due to most of private clinics had no regularly full time working health professionals and few clients flow per day to conduct the study. Generalization done by this study might not represent Caregivers of under five children with diarrhea who didn't visit health facility. Recall bias might be introduced during asking on set of illness.

7. Conclusion and recommendations

7.1 Conclusion

Caregivers being aged 40-49 years, being female child, Illiterate mothers, monthly income less than or equal 500 ETB, uses walking to arrive nearest health facility, no history of child death in the family, caregivers who believe that health centers may not have medicine and self- medication were found to be in favor of delay in seeking treatment for diarrhea in under five children among caregivers in Hadero Tunto Zuriya District.

7.2 Recommendations

Federal ministry of health/education

- Encourage women to continue their education secondary school and beyond that can maximize timely child health care, by reducing female students drop out.

Woreda administration/health office/Stakeholders

- Should design strategies to enable community to seek timely treatment of diarrhea within 24 hours of symptoms onset for under five children.
- Strengthen community based health insurance(CBHI) scheme and implementation of fee waiver system to overcome the economic obstacles to seek timely child health care.
- Ensure gender equality in the community, by facilitating continuous training for women's health development army.
- Emphasis on determinants of delay in seeking diarrhea treatment among caregivers of under five children while community forums were conducted at each health center catchment area in quarterly base.
- Allocate enough budget to equip health centers with diarrhea treatment medicines.
- Strengthen universal road access project(URAP) to connect all kebeles with main roads to health facilities, that can facilitate transportation access to arrive nearest health facility for timely treatment of under five children diarrhea.

For researchers

The association between female child and delay in seeking treatment for diarrhea in under five children needs to be explored in more in-depth interview.

References

1. Course DL. WHO: imci (integrated management of childhood illness) distance learning course Module 4 Diarrhoea. 2014;
2. UNICEF/WHO, “Diarrhea: why children are still dying and what can be done,” 2009. http://apps.who.int/iris/bitstream/10665/44174/1/9789241598415_eng.pdf. 2009.
3. Walker CLF, Rudan I, Liu L, Nair H, Theodoratou E, Bhutta ZA, et al. Global burden of childhood pneumonia and diarrhoea. *Lancet* [Internet]. 2013;381(9875):1405–16. Available from: <http://www.sciencedirect.com/science/article/pii/S0140673613602226>
4. Services H. CDC:U.S. Department of Health and Human Services, Centers for Disease Control and Prevention Diarrhea : Common Illness , Global Killer. 2016. 1-4 p.
5. Disease D. PATH(A catalyst for global health): diarrheal disease:Solutions to Defeat a Global Killer 1. 2009;
6. Fischer Walker CL, Perin J, Aryee MJ, Boschi-Pinto C, Black RE. Diarrhea incidence in low- and middle-income countries in 1990 and 2010: A systematic review. *BMC Public Health* [Internet]. 2012;12(1):220. Available from: <http://www.biomedcentral.com/1471-2458/12/220>
7. ML C, Department of Paediatrics and Child Health SU. Causes and management of diarrhoea in children in a clinical setting. 2010;23(1):42–6.
8. unicef. Pneumonia and diarrhoea;Tackling the deadliest diseases for the world’s poorest children. 2012.
9. UNICEF WHO. who / unicef joint statement Integrated Community Case Management An equity-focused strategy to improve access to essential treatment services for children. 2012;(iCCM).
10. Kolola T, Gezahegn T, Addisie M. Health Care Seeking Behavior for Common Childhood Illnesses in Jeldu District , Oromia Regional State , Ethiopia. 2016;1–11.
11. Ethiopia DHS 2016 KIR Central Statistical Agency Addis Ababa, Ethiopia The DHS Program ICF Rockville, Maryland, USA - Final 10-17-2016.pdf. 2016.
12. Town S, Zone J, West S. Assessment of the Prevalence of Diarrheal Disease Under-five Children Clinics in Mother and Child Health. 2018;15(1):1–6.
13. Burke RM, Rebolledo PA, Embrey SR, Wagner LD, Cowden CL, Kelly FM, et al. The burden of pediatric diarrhea : a cross-sectional study of incurred costs and perceptions of cost among Bolivian families. 2013;
14. Plan GA. Ending Preventable Child Deaths from Pneumonia and Diarrhoea by 2025

- The integrated Global Action Plan for Pneumonia and Diarrhoea (GAPPD). 2013;
15. World Health Organization. WHO | Child mortality [Internet]. Who. 2011. Available from:
http://www.who.int/pmnch/media/press_materials/fs/fs_mdg4_childmortality/en/
 16. Bill F, Foundation MG. Estimates of global, regional, and national morbidity, mortality, and aetiologies of diarrhoeal diseases: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet Infect Dis.* 2017;17(9):909–48.
 17. Progress for children Achieving the MDGs with Equity. 2010.
 18. Geldsetzer P, Williams TC, Kirolos A, Mitchell S, Ratcliffe LA, Kohli-lynn MK, et al. The Recognition of and Care Seeking Behaviour for Childhood Illness in Developing Countries : A Systematic Review. 2014;9(4).
 19. Wiens MO, Gan H, Barigye C, Zhou G, Kumbakumba E, Kabakyenga J, et al. RESEARCH ARTICLE A Cohort Study of Morbidity , Mortality and Health Seeking Behavior following Rural Health Center Visits by Children under 12 in Southwestern Uganda. 2015;1–15.
 20. WHO The management and prevention of diarrhoea Practical guidelines World Health Organization Geneva. 1993;Third edit.
 21. The HFOR. world health statistics, monitoring health for the sdg s,sustainable development goals. 2016;
 22. Eisele T. DHS working papers Global Trends in Care Seeking and Access to Diagnosis and. 2015;(March).
 23. Muhumuza J, Muhirwe LB, Ssentamu C, Conteh MM, Dunne NM, Karumuna R. Factors Influencing Timely Response to Health Care Seeking for Diarrheal Episodes Among Children Under Five by Caregivers in Rural Uganda To cite this article : 2017;5(3):246–53.
 24. Malhotra N, Upadhyay RP. Why are there delays in seeking treatment for childhood diarrhoea in India ? 2013;413–8.
 25. Bin-gouth AS. Factors affecting health seeking behavior for common childhood illnesses in Yemen. 2013;1129–38.
 26. Hess SY, Wilson SE, Vosti SA, Brown KH, Oue JB. Caregiver Recognition of Childhood Diarrhea , Care Seeking Behaviors and Home Treatment Practices in Rural Burkina Faso : A Cross-Sectional Survey. 2012;7(3).
 27. Kahabuka C, Kvale G, Hinderaker SG. Factors associated with severe disease from malaria , pneumonia and diarrhea among children in rural Tanzania – A hospital-based

- cross-sectional study. *BMC Infect Dis* [Internet]. 2012;12(1):1. Available from: *BMC Infectious Diseases*
28. Mebratie AD, Poel E Van De, Yilma Z, Abebaw D, Alemu G, Bedi AS. Healthcare-seeking behaviour in rural Ethiopia : evidence from clinical vignettes. 2014;
 29. Kolola T, Gezahegn T A. Health Care Seeking in Jeldu District, Oromia Regional State, Ethiopia. 2016.
 30. Adane M, Mengistie B, Mulat W, Kloos H, Medhin G. Utilization of health facilities and predictors of health-seeking behavior for under-five children with acute diarrhea in slums of Addis Ababa, Ethiopia: a community-based cross-sectional study. *J Heal Popul Nutr* [Internet]. 2017;36(1):9. Available from: <http://jhpn.biomedcentral.com/articles/10.1186/s41043-017-0085-1>
 31. Degefa G, Gebreslassie M, Meles KG, Jackson R. Determinants of delay in timely treatment seeking for diarrheal diseases among mothers with under-five children in central Ethiopia : A case control study. 2018;1–12.
 32. Sarker AR, Sultana M, Mahumud RA, Sheikh N, Meer R Van Der, Morton A. Prevalence and Health Care – Seeking Behavior for Childhood Diarrheal Disease in Bangladesh. 2016;
 33. Tee GH, Kaur G, Ramanathan P, Amal NM, Chinna K. health seeking behavior among malaysians with acute diarrheal disease. 2011;42(2).
 34. Gelaw YA, Biks GA, Alene KA. Effect of residence on mothers ’ health care seeking behavior for common childhood illness in Northwest Ethiopia : a community based comparative cross – sectional study. 2014;1–8.
 35. WHO/ Choosing interventiona that are cos effective(WHO - CHOICE) Estimates of Unit Costs for Patient Services for Ethiopia. 2005.
 36. Omore R, Reilly CEO, Williamson J, Moke F, Were V, Farag TH, et al. Health Care- Seeking Behavior During Childhood Diarrheal Illness : Results of Health Care Utilization and Attitudes Surveys of Caretakers in Western Kenya , 2007 – 2010. 2013;89(Suppl 1):29–40.
 37. Central Statistical Agency. Population Projection of Ethiopia for All Regions At Wereda Level from 2014 – 2017. *J Ethnobiol Ethnomed* [Internet]. 2013;3(1):28. Available from: http://www.csa.gov.et/images/general/news/pop_pro_wer_2014-2017_final
 38. M. OR, U. A, I. AR, R. AO, A. UK, K. JA. Caregivers knowledge, home treatment of diarrhoea disease and predictors of child diarrhoea disease in a semi urban community

of Sokoto, North-west, Nigeria. J Public Heal Epidemiol [Internet]. 2017;9(2):16–23.
Available from: <http://academicjournals.org/journal/JPHE/article-abstract/981D7ED62647>

Annex-1: English version questionnaire

Dep't of epidemiology, Institute of health, Jimma University

Questionnaire to assess determinants of delay in seeking diarrhea treatment among caregivers of under five children in Hadero Tunto Zuriya District, Southern Ethiopia, 2018.

Questionnaire identification No. / _____ / _____ / _____

Study participants: 0) Within 24 hours 1) After 24 hours

"My name is _____ I am student in Jimma University. We are interviewing caregivers here in _____ health center in order to find out information about determinants of delay in seeking diarrhea treatment among caregivers of under five children. I am going to ask you some questions related to Diarrhea treatment.

Purpose of the study: To identify determinant factors that contribute for delay in seeking Diarrhea treatment for under-five children in Hadero Tunto Zuriya District. the findings of this study will provide input and direction to governmental policy makers and NGO on ending preventable and treatable deaths from Diarrhea. Moreover, the aim of this study is to write a thesis in partial Fulfillment for the Requirement of Masters of General Public Health.

Risks and benefits: The risk of participating in this study is very minimal, the interview will take 25 to 30 minutes to ask the questions. There would not be direct payment for participating in this study. But the findings from this research may reveal important information for the district health office and government strategy implementers.

Confidentiality: Your answers are completely confidential. Your name will not be written on this form, and will never be used in connection with any of the information you tell me.

Rights: Participation for this study is fully voluntary. You have the right to declare to participate or not in this study. You don't have to answer any questions that you don't want to answer, and you may end this interview at any time you want to. Would you be willing to participate?"

No (Thank you. Stop interviewing)

Yes (Proceed to the next)

(Signature of interviewer certifying that informed consent has been given verbally by respondent) -----

Date of data collection-----

Name of data collector----- signature-----

Name of supervisor----- signature-----

Thank you for your cooperation!

I) Socio-demographic and economic data

S.N	Questions	Response	Skip to
101	Record sex of the respondent	1.Female 2.Male	
102	What is your age from last birthday?	-----in completed years	
103	What is your place of residence?	1.Rural 2.Urban	
104	What is your current marital status?	1. Single 2. Married 3. Divorced 4. Widowed 5.Separated	
105	What type of marriage do you have?	1.Monogamy marriage 2. Polygamy marriage	
106	What is your ethnicity?	1. Kembata 2. Tembaro 3. Donga 4. Hadiya 5.Others(Specify)-----	
107	What is your religion?	1. Protestant 2. Orthodox 3.Others(Specify)-----	
108	What is educational status of mother?	1.Illiterate 2. Read and write only 3. Primary 4. Secondary 5.Above secondary	
109	What is educational status of father?	1.Illiterate 2. Read and write only 3. Primary 4. Secondary 5.Above secondary	
110	What is occupational status of mother?	1.House wife 2. Gov't employee 3.NGO employee 4. Merchant 5.others(specify)-----	

111	What is occupational status of father?	1.Gov't employee 2.NGO employee 3. Merchant 4. Farmer 5.others(specify)-----	
112	What is your monthly income?	-----in ETB	
113	How many families you have?	-----in numbers	
114	Record sex of the child	1.Female 2.Male	
115	What is the age of this child (in completed month)?	-----in completed months	
116	How many under-five children you have?	-----in numbers	
117	Birth order of under-five children?	1.First 2.Second 3.Third 4.Fourth and above	
118	Which biological parents live in home?	1. Mother only 2. Father only 3. Both mother and father 4. None	
119	Who makes the decision to take the child to a health facility when sick?	1. Mother 2. Father 3. Both father and mother 4. others(specify)-----	

II. Knowledge on Diarrhea prevention methods

S.N	Questions	Response	Skip
201	Do you know the cause of Diarrhea?	1.Yes 2.No	If No Q203
202	If yes, what is that / or what are they?	1.Evil eye 2.Teething 3.Infection 4.Drinking contaminated water 5.Eating contaminated food 6.Poor hygiene and sanitation 7. others(specify)-----	
203	Can it be transmitted from one person to another's	1.Yes 2.No	If No Q205
204	If yes, how?	1. Fecal oral route 2.Contaminated foods or water 3.Via dirty hands 4.I don't know 5.Others(specify)-----	
205	Do you know sign/symptoms of Diarrhea	1.Yes 2.No	If No Q207
206	If yes, what is that?	1. three or more loose stools in a day 2. vomiting 3.consciousness /Lethargy 4.abdominal pain 5.Dry mouth 6.others(specify)-----	
207	Do you know the advantage of timely treatment?	1.Yes 2.No	If No Q209
208	If yes, how?	1.Prevent complication 2.Save money, time 3.Save child	
209	Do you know how to prevent	1.yes	If No

	diarrhea infection(transmission)?	2.No	Q310
210	If yes, how can you prevent Diarrhea infection(transmission)?	1.Treat water before use and dispose of waste safely 2.vaccination 3.keeping personal hygiene and sanitation 4.I don't know 5.others(specify)-----	

III) Behavioral and physical accessibility factors related to delay in seeking Diarrhea treatment.

S.N	Questions	Response	Skip
301	How far your home from nearest health center?	1.<5km 2.>5km	
302	What mode of transport did you use?	1.Foot 2.Horse back 3.Car 4. If others (specify)-----	If 1&2 Q304
303	Do you believe that transport cost to the health facility	1.high 2.fair 3. cheap	
304	Did you have fear of side effects of Diarrheal drugs?	1.Yes 2.No	
305	Did you have history of child death?	1.Yes 2.No	
306	Do you believe that diarrhea kills?	1.yes 2.No	
307	Did you have fear of treatment cost?	1.Yes 2.No	
308	Do you believe that health center may have medicine?	1.Yes 2.No	

309	Did you distrust health care providers?	1.Yes 2.No	
310	Did you treat the child at home without health providers' advice?	1.Yes 2.No	
311	Did you visit traditional healer before coming to this health facility?	1.Yes 2.No	
312	Is there alcohols drinker in the family members?	1.Yes 2.No	If 2 Q314
313	If yes, who is drink alcohols?	1.Father 2.Mother 3.Both	
314	Is there khat chewer in the family members?	1.Yes 2.No	If 2 Stop
315	If yes, who is chew khat?	1.Father 2.Mother 3.Both	

Thank you for your cooperation!

Annex-2: Kembategna Version Questionnaire

Kambaatissa Afee laaga xa, aamatuuta Jimmi univeerstee fayimaata qoorabi Roshsha miniha

Muugiti moosuha fayimaata qoorabi mineen xuudaamu hooguha teemi daleen maaru hooguha ebaa xawwakata enkeeneno xamataakata, Haadaro Xuunxo zuuri wooraadani, muugeeni minaadabina minaaboki killila, 2018M.W.

01. Xammatoosi anaanoma wooluuta _____

02. Xaamusii xa, aamamano manna; 0) 24 saati azeen 1) 24 saatich zaakin

Aaagaa

Su, umuee _____ Jimmi univeeristiaa rosaanchu.

Teesu naooti kanni _____ faayimata qoorabeeno mineeni ossuusa qoorabaa teem kaalita mannakata muugiti mossuha daaleeni xuudisuuha hoogua ebaa xaawaka xammatuuta xaaminayoom. Hikkan ikoo biiki taaneha, teesu anii muugit moosi akaansisitane xammokeetati. Faanqashshuuki wimma wiimini wolu daguumboga qorabameha. Xamataakachisi faanqashu giibi qooduki qoorabamehaani meererooni ikoo uriisiha daanditaanti teemi kesaaha maakeeke jeechchoon xamatuusi xammantoota daanditaanti. Xaawwu ikooda kii daanamikee kaalatuuti Oonto wooge ummuri woroodin yoo osoo muugiti mossuha jeechchoon akaanssiisu hoogu ebaaxawwakata daagiha abaati kaalatuuti yoosi. Xamaatuuntisi xaali 25tchch 30duma daaqiqa xoofota daanditaa. kaaliitooneta teemi xaamantoota faaqaadagnani?

Aayii ☐ faaqaadagnaba (abishi gaalaxankee)

Aa,a ☐ faaqaadagnani (Insiitoota daanditaant)

(Xa, ammusi xaammano manchu xa, aamamano manchihaansi, ka, aalaqanchiha afeen kuulihaansi xuudisaano angaa fuurima) _____

Xammossi faanqashuuta quma, aano baari _____

Xamohaansi faanqashuuta quma, aano mannichu _____ fuurima _____

Hujjissi Zaakisano manchi suumu _____ fuurima _____

Kaalatoohanke abishshi gaalaxankee

I) Mahibaraa wena economee xammkata

k.w	Xaamuta	Faanqashuuta	Aguurit higgs
101	Asaanchusi gonchu te mentiichuta ihusaa	1. Menitaa 2. Gonaa	
102	Umuuruki me'otii?	----- wimaanika wogeeni afushii	
103	He'annit maniiti hakabaati?	1.gaaxara 2.kataama	
104	Agisii hagarru hatigotii?	1. agisuu hoggu 2. agichaantehaara 3. annana iheeni hehuu 4. baliitetaata 5.Hiraakantehaara	
105	Agiichaami hagarru hatigutaan?	1. mexuu agichaamu 2. laamichi aluudu ikke agiisu	
106	Minaadaabuk mahaani?	1. kambaata 2. Tembaaruta 3. Donigaa 4. Haadiyaata 5. woolotinido(annanisi kulii)-----	
107	Amaannatuki mahaani?	1. Amanaacho 2. Oritoodokisaa 3. woolotinido(annanisi kulii)-----	
108	amaaneti roshaa gardabbu me'otii?	1. mexuraa rosuumbua 2. qera'uaha xaafuha xaala daandu 3. wonna garidaabi roshaata 4. Lankkii garidaabi roshaata 5.Lankkii garidaabi roshaachi aluuduhaa	

109	aniineti roshaa gardabbu Me'otii?	1. mexuraa rosuumbua 2. qera'uaha xaafuha xaala daandu 3. wanna garidaabi roshaata 4. Lankkii garidaabi roshaata 5.Lankkii garidaabi roshaachi aluuduhaa	
110	amaaneti hujjee hagaru hatigotii?	1. Miniita ammaa 2. Maniigisti hujaataniicho 3. Dirigitaan hujaatanicho 4. zaazaalancho 5. Wollu yooda kuli-----	
111	aniineti hujjee hagaru hatigotii?	1. Maniigisti hujaataniicho 2. Dirigitaan hujaatanicho 3. zaazaalancho 4. Hoga'anniicho 5. Wollu yooda kuli-----	
112	Agannani daqitaanti me'otii?	Itopee birgiini affushii-----	
113	Hawaaniku mini maanu yohaani te yoo'u?	-----Woologini affushii	
114	Chiilata te chiila ihusaa-----	1. Meseeleta 2. Adabaa	
115	Kaani chili umurru me'otii? (wiimmaa aganiigini)	-----wiimmaa aganiigini	
116	Mee'itii osuuti onitoo wogeechi woorodiini yooru yooke?	-----Wooloni affushii	
117	Onitoo wogeechi woorodiini yoo osuuta qalaanchisaa awonisoogini affushi?	1. Wanna 2.Laanke 3. Saake 4. Shoolikiina isiichi aluudu ikoo	

118	Amaatando annaa tessuu minnee yoobbii?	1.amaata xellaa 2. Annaa xellaa 3.laamanka annaani amaatanii 4.ayyetinbba	
119	Ayeeti chiilaa tijooda qoomitaa ikkii faayima miini maasaano?	1.amaata 2. Annaa 3.laamanka annaani amaatanii 4 Wollu yooda kuli-----	

II) Muugiti moosu kaamameeno wooqaa daagi xammkata

K.W	Xa,aamuta	Faanqashshuta	Aguurit higgs
201	Muugiti moosu eebaa xawwakata daagani?	1.Aa, a 2.A,aaaa.aa	2 ikooda 203 hiigi
202	Dagaantiida, ayeetana teem karoochi dorritan	1.Goormoti Ileeneet 2.Inquta leeisuaa 3.Xinxeelekaan afaamua 4.Muucuurumbu woa aggineet 5.Muucuuritumbu Ichchata ituaa 6.Muucurimata qoorabi hoogua 7.Wollu yooda kuli-----	
203	Wollo manchchi wolliba higaanondoo?	1.Aa, a 2.Aa,aa aa.aa	2 ikoda 205 hiigi
204	Higaano yitoontichi haatigooni?	1.Shuumabiin teem afeen 2.muucurtumbuta ichchan teem woin 3.Muucurtumbuta angaan 4.Daagaamiba 5.Wollo yooda kuli-----	
205	Muugiti mossi maalaata	1.Aa, a	2 ikoda

	daagani?	2. A,aa a.aa Daagaamiba	207 higgs
206	Dagaantida mahaakaatani?	1.Sase koodachi abaa baaren qacuuta abaata shumata shuumau 2.Bizaau/tuufanati 3.Gaaga daagu hoogu 4.goddabba tidduaa 5.Afooha moshshu 6. Wollu yooda kuli-----	
207	Muugiti moosu daaleeni fayimaata qoorabanin xuudisi kaalatuuta daagan?	1.Aa, a 2.Aayyi Daagaamiba	2 ikoda 209 higgs
208	Dagaanitida haatigooni?	1. Abseen geenaamu qooraabano 2.Womashsha teem jeechchuta qooraabano 3. ooso fooliha qooraabano	
209	Muugit mossu higuumboga kamameenogaa daagan?	1.Aa, a 2.Aayyi Daagaamiba	2 ikoda 310 higgs
210	Muugit mossu higuumboga teem afaameenumboga haatita kamameeno?	1.Woa aggichch birre mucuurimasi qoorabisisin 2.Osuuta kiiitibaata kaatabisiisin 3.Gaagi muucuurimata qoorapin teen hegeegi mucuurimata qooraabin 4.Daagumba 5.Wollu yooda kuli-----	

III) xebayee teem hichitee hunetakaa apantee yoo xaawaka xaamuta

K.W	Xa,aamuta	Faanqashshuta	Aguurit higgs
301	Fayyima minu miniichike Hawanka qe'era?	1. Onto kilomeetriichi woroodua 2. Onto kiloomeetriichi aluudua	
302	Fanqalaamiha ko'reenora mahaa ta'mitaantihu?	1.Lokkata 2. faarsua 3. makinaha 4.Woluarra,(yooda caakkis)-----	1&2 ikoda 304 higgs
303	Fayyima mini fanqalaalameenoru Itisa ihu amma'initanindo?	1. Abbaa 2. Mereeranchua 3. ubaa	
304	Muggitti zabbu aaqqu eebano hawwa waajjitaninido?	1. Aa, a 2. Aa,aa aa.aa	
305	Kannichi bire ciillat baeuu ikke?	1. Aa, a 2. Aa,aa aa.aa	
306	Muggitu sheei yit amma'initan?	1. Aa, a 2. Aa,aa aa.aa	
307	Zabbu hi'iriin fulano aphuta waajitan?	1. Aa, a 2. Aa,aa aa.aa	
308	Fayyima miniha zabbu heanosa yit amma'innitan?	1. Aa, a 2. Aa,aa aa.aa	
309	Fayyima lubbamata amma'nnu hoogan?	1. Aa, a 2. Aa,aa aa.aa	
310	Fayimma luubamata xamituna ci,llaki mine kalitan?	1. Aa, a 2. Aa,aa aa.aa	
311	Ka faayimata qoorabi min walichike bire wole Roshsha lubbama min marteent?	1. Aa, a 2. Aa,aa aa.aa	
312	Dimbissano aga agano Manchu mineenta'ine yoondo?	1. Aa, a 2. Aa,aa aa.aa	2 ikoda 314 higgs
313	Yooda agaanchus ayeet	1.Annaha 2. Amata 3.Lamoonti 4. Woloot cilia	

		qorabanua	
314	Caata iixano Manchu mineenta'ine yoondo?	1. Aa, a 2. Aa,aa aa.aa	2 ikoda Orrisse
315	Yooda ayeet iixanoohu?	1. Annaha 2. Amata 3. Lamoonti 4. Woloot cilia qorabanua	

Kaalatoohanke abishshi gaalaxankee!