• Investigation •

Active trachoma prevalence and its associated factors among children aged 1-9 years in rural residents of Lare District, Southwest Ethiopia

Yitayeh Belsti[1], *Sofonias Addis Fekadu*[2], *Abel Sinshaw Assem*[2]

[1]Department of Physiology, College of Medicine and Health Sciences, University of Gondar, Gondar 196, Ethiopia
[2]Department of Optometry, College of Medicine and Health Sciences, University of Gondar, Gondar 196, Ethiopia
Correspondence to: Sofonias Addis Fekadu. Department of Optometry, College of Medicine and Health Sciences, University of Gondar, Gondar 196, Ethiopia. addissofi2007@gmail.com
Received: 2021-01-08 Accepted: 2021-04-30

Abstract

● **AIM:** To determine the prevalence of active trachoma and its associated factors among children in Lare District, Southwest Ethiopia, 2019.

● **METHODS:** A community-based cross-sectional study was conducted. A total of 620 participants were recruited using a multi-stage sampling technique. A structured questionnaire, torch, and magnifying loupes were used for data collection. The data was entered into epidemiological information and exported to statistical package for social science version 20 for analysis. The bi-variable and multivariable Logistic regression analysis model was fitted to identify factors associated with active trachoma. Odds ratio with a 95%CI was used to show the direction and strength of association between independent and outcome variables.

● **RESULTS:** A total of 610 children participated in this study with a response rate of 98.39%. The prevalence of active trachoma was 132 (21.60%; 95%CI: 18.40-24.70). Family size being 6-9 (AOR=2.34; 95%CI: 1.14-5.02), presence of more than two preschool children in a house (AOR=2.04; 95%CI: 1.12-3.70), open field waste disposal system (AOR=2.62; 95%CI: 1.00-6.80) and type of latrine being uncovered (AOR=4.12; 95%CI: 2.00-8.51) were positively associated with active trachoma. On the other side, water consumption being 40-60 liters per day was a protective factor for active trachoma.

● **CONCLUSION:** The prevalence of active trachoma is high among children aged 1-9y in Lare District. Uncovered latrine, open field waste disposal system, family sizes of 6-9, and the presence of more than two preschool children in a house are associated with the occurrence of active trachoma. On the other side, water consumption of 40-60 liters is a protective factor.

● **KEYWORDS:** active trachoma; children; Lare District; Gambella Regional State; Ethiopia
DOI:10.18240/ijo.2021.11.16

Citation: Belsti Y, Fekadu SA, Assem AS. Active trachoma prevalence and its associated factors among children aged 1-9 years in rural residents of Lare District, Southwest Ethiopia. *Int J Ophthalmol* 2021;14(11):1756-1764

INTRODUCTION

Trachoma is an ocular disease caused by a bacterium called *chlamydia trachomatis*. It is the most common infectious cause of blindness worldwide which is highly prevalent in developing countries including Ethiopia[1-4]. In endemic areas, where active trachoma prevalence is low, most of it is caused by non-chlamydial bacterial pathogens[5]. Active trachoma attacks mostly children aged under 10y due to repeated reinfection[2,5].

According to the reports of WHO, about 1.9 million people are blind or had moderate to severe visual impairment due to trachoma. Trachoma is also one of the 18 neglected tropical diseases that affect more than one billion the world's poorest people[6]. In Africa, there are 27.80 million cases of active trachoma (68.50% of all trachoma cases) and 3.80 million cases of trichiasis (46.60% of all cases of trachoma) which is endemic in 33 countries of the region including Ethiopia[1]. According to the results of different studies done in Ethiopia at national, regional, zonal, and district level, active trachoma was found as a major public health problem in the country. A nationwide survey conducted in all parts of the regions of Ethiopia indicated that the proportion of active trachoma among children aged 1-9y as 40.14%[7]. Recent studies done in Lemo District, Southern Ethiopia, and Gazegibela District, Northeast Ethiopia indicated that active trachoma prevalence was 15.20%[8] and 52.40%[9] respectively.

According to the World Health Organization (WHO)[2], trachoma was graded as trachomatous follicular inflammation (TF), trachomatous intense inflammation (TI), trachomatous conjunctival scarring (TS), and trachomatous corneal opacity (CO). Both TF and TI are active forms of trachoma that are contagious from person to person during direct contact[2,10]. Active trachoma is transmitted by personal contact from infected children to other healthy children with nasal and ocular secretions *via* hands (fingers), clothes, and eye-seeking flies (Musca sorbens)[11].

Left untreated, active trachoma leads to scarring of the tarsal conjunctiva that compresses the lids inward (towards the cornea) which leads to trachomatous trichiasis (TT). This will in turn continuously rub the cornea leading to complications like CO and blindness[1,12].

Different pieces of literature indicated that the most common risk factors of trachoma are related with poverty which includes poor hygienic condition, limited access to health facilities, lack of facial cleanliness, poor access to latrine and waste disposal, unavailability of sufficient water source, presence of flies, large family size, and crowded living conditions[13-17].

Blindness from trachoma is irreversible if not prevented well during its active stage[2]. According to the recommendations of WHO the acronym "SAFE" (surgery, antibiotics, facial cleanliness, and environmental hygiene) are the best management options of trachoma[5,17]. Once the disease is distributed to the community level, mass treatment of azithromycin and tetracycline 1% eye ointment are given at the community level with other management options recommended by WHO when the prevalence of active trachoma is 10% and above in children aged 1-9y[18].

Ethiopia is one of the five countries in which 49% of the global burden of active trachoma is located. More than 75 million people are living in trachoma endemic areas in Ethiopia and more than 71 and 42 million people are without access to adequate sanitation and safe drinking water respectively[6]. Understanding of the magnitude, geographical distribution, and risk factors of active trachoma is important to plan appropriate intervention. Even though, studies are available in Ethiopia that shows the magnitude of active trachoma, assessing the up-to-date nature of the diseases and related factors are essential to WHO and other concerned organizations to take appropriate action plans to eliminate active trachoma. Besides, no recent studies are showing the determinants of active trachoma in the study area. So, this study aimed to assess the proportion of active trachoma and different factors associated with it among children aged 1-9y in Lare District, Southwest Ethiopia.

SUBJECTS AND METHODS

Ethical Approval Ethical clearance was obtained following tenets of the Declarations of Helsinki. It was obtained from the University of Gondar College of Medicine and Health Sciences ethical review committee and a letter of permission was obtained from Gambella Regional Health and Lare District Health Offices. Written informed consent was obtained from each parent/guardian aged 18y and above. In addition, assent was taken from school age children active to give feedbacks. Though the present study has not faced gradian/parent under the age of 18y, minors who were married/parents were given full right to decide on the behalf of children with formal written consent. Confidentiality was kept by avoiding personal identifiers like names and by coding and locking the data. Study participants had also given a full right to refuse/withdraw from the study process at any time in the study process.

Study Design and Setting A community-based cross-sectional study was conducted from March 5 to 25, 2019. The study was conducted in Lare District which is found in Gambella Regional State located 842 kilometers away from Addis Ababa, the capital city of Ethiopia, and 65 kilometers away from Gambella town, the capital city of Gambella Regional State. Gambella Regional State is one of the most remote areas in Ethiopia with low socio-economic conditions. Lare District has hot and dry climates with 28 kebeles. It has a population size of 52 452 of which 19 240 accounts to children fewer than 10y (according to pooled population estimation). It has an area of 685.17 km^2 and has an altitude of 527 meters above sea level which makes it dry and hot[19]. The district has only 4 health centers and two private clinics with no eye care service providers.

Source and Study Population All children aged 1-9y who were living in Lare District were the source population and those children who were living in the selected households were study populations and all children aged 1-9y who were living in Lare District for a minimum of 6mo were included in the study. Children with acute ocular infection, recent ocular trauma, or surgery during the data collection period were excluded from the study.

Sample Size Determination The sample size was calculated using EPI INFO software using a single population proportion formula with the following assumption; 95% confidence interval (CI), proportion of active trachoma from similar study as 36.70%[20], maximum allowable error (marginal error) 5%, a design effect of 1.50, and 10% for non-response rate. Finally, the minimum sample size was determined as 620 after fitting the above assumptions.

Sampling Technique The study participants were selected using a multi-stage sampling technique. At the first stage, 6 kebeles were selected from a total of 28 kebeles of Lare District using a simple random sampling technique. Then, alist of households was taken from Lare District administration

office and the final sample size was allocated proportionally to the selected 6 kebeles. In the second stage, a systematic random sampling technique was applied after the interval K was calculated to each of the selected kebeles. Every K^{th} interval of the households was included in the study after selecting one of 1 to K using lottery method to decide the starting household. When the selected households had more than one child aged 1-9y, lottery method was used to select one child per household. Next households were included when the selected houses were closed after double-checking.

Operational Definitions Active trachoma: a trachomatous inflammation which is either TF or TI. Household was defined as any type of house/roof in which one or more people are living together and share meals together; TF: the presence of five or more follicles on the upper central tarsal conjunctival with a minimum diameter of 0.50 mm; TI: the presence of inflammatory thickening on the upper tarsal conjunctiva that obscures/covers more than half of the deep tarsal vessels of the conjunctiva that can be seen with the naked eye; Inactive trachoma: this includes, trachomatous scar, trachomatous trichiasis, and CO that are progressive stages of active trachoma that do not transmit from person to person during personal contact[2,10,21]; Clean face: children who had no eye discharge, nasal discharge, and hose flies to their faces during data collection[6]; Face washing: this was determined by asking the mother/caregiver as "how many times did the child wash his/her face in a day?"[22]; Water access: the source of water, the distance of water source from the house, time to fetch water, and the amount of water used per day were assessed by asking the mother/caregiver of the child[22].

Data Collection Tools and Procedure The data collection tool/questionnaire was developed by reviewing different literature that had a similar approach to this study[11,23-25]. A pre-tested structured version of the questionnaire was used for face-to-face interview. A 2.5× adjustable magnifying binocular loupes and ophthalmic torches were used for physical examination/diagnosis of active trachoma. Visual acuity was taken with illiterate E chart for active children who were able to show directions of E position and pictures/light follow were done for those who can't show direction of illiterate E. Observation of behavioral and environmental-related factors was also part of the data collection. The data were collected by five BSc integrated eye care workers (IECWS) and two BSc Optometrists who had taken approved certificates on the trachoma grading system which is simplified by WHO[1,6].

After explaining the purpose of the study and getting permission to continue with a formal written consent, the household heads were interviewed with their local language to address different socio-demographic characteristics of the study participants. Facial cleanliness of the children, presence, and qualities of a latrine, waste disposal system, water access, and house conditions of participants was checked by observation. The outcome variable was the presence of active trachoma (TF/TI) which was confirmed by examination of eligible children. All children had an examination of both eyes starting from the right eye. By using the simplified trachoma grading system of WHO, the children's right eye was first everted smoothly and inspected carefully using binocular loupes and ophthalmic torches. A thorough examination of their tarsal conjunctiva was done to assess the presence of active trachoma using magnifying loupes and ophthalmic torches. Active trachoma was recorded as TF, TI, and both TF&TI when it was diagnosed in either eye. Finally, advice was given about the nature of the disease, transmission, prevention, and treatment mechanisms to all study participants. Children who were diagnosed with active trachoma was given tetracycline 1% eye ointment. Participants with trachomatous trichiasis and other ocular disorders were referred to the nearest health centers accordingly.

Data Quality Control English version of the questionnaire was translated into the local language (Nuer) and back to English versions of the questionnaire to ensure accuracy and consistency by language professionals. One day training was given for data collectors and supervisors before the data collection period. A pretest was done in 5% of the participants in adjacent kebele which was outside from the study area to look common understanding and adaptability of the tools. Then modification was done accordingly before real data collection begins. After completing the data collection, each questionnaire was checked for completeness by the principal investigator to reduce errors.

Data Processing and Analysis After cleaning, the data were entered into Epi-Info software version 7 and exported to the statistical package of social sciences (SPSS) version 20.0 for analysis. The descriptive statistics were presented using frequency tables, graphs, percentage, mean, and standard deviations. The association between different demographic, socioeconomic, and behavioral factors and the development of active trachoma was indicated by using odds ratio (OR) with a significant test (*P* value) and a 95%CI.

The effect of independent variables on each other was checked using a multicollinearity test and model fitness was checked using the Hosmer-Lemeshow goodness of fit test. All variables with a $P \leq 0.20$ in bi-variable Logistic regression were entered into multivariable Logistic regression and variables with $P<0.05$ were taken as statistically significant. Adjusted OR with a respected 95%CI was used to determine the strength and direction of the statistical association between the independent variables and active trachoma.

RESULTS

Demographic Characteristics of the Study Participants A total of 610 study participants were involved in this study with a response rate of 98.39%. The mean age of the children participated in this study was 4.73±2.14y. More than half 327 (53.60%) of children aged 1-9y who were participated in the study were females and 343 (56.20%) of the household heads of the participants were married. Less than half 261 (42.80%) of the participants were in the age group of 4-6y. More than two-thirds 409 (67.00%) of the children didn't join formal education (school) and only 38 (6.20%) of household heads had an educational level of college/university (Table 1).

Socio-Economic and Behavioural Factors More than three-fourth 489 (80.20%) of participants had a functional latrine. Only 142 (23.30%) of the study participants had a monthly income of 3400 and above Ethiopian Birr and nearly half 260 (42.60%) of the study participants used 20-40 liters of water per day. More than half 316 (51.80%) of children were facially clean and flies were seen in exactly half 305 (50%) of the participants/children. Nearly two-thirds 386 (63.30%) of the participants had domestic animals and only 59 (9.70%) of children washed their bodies more than once per day (Table 2).

Prevalence of Active Trachoma The overall prevalence of active trachoma among children aged 1-9y in Lare District was 132 (21.60%; 95%CI:18.40%, 24.70%). Among which 88 (66.70%) of them were TF, 33 (25.0%) were TI, and the remaining 11 (8.30%) were both TF and TI respectively (Figure 1). Almost all 121 (91.70%) of children had bilateral trachoma and the rest had unilateral trachoma. The proportion of active trachoma was high 60 (45.50%) in the age group of 4-6y followed by 46 (34.80%) in the age group of 1-3y (Figure 2). The highest proportion of active trachoma 25 (18.90%) was seen in children aged 3 and 4y and children aged 1y had the smallest 3 (0.50%) proportions of active trachoma.

Factors Associated with Active Trachoma After checking all sociodemographic, environmental and behavioral variables in bi-variable logistic regression, 11 variables including: mother educational level, family size of 6-9, daily water consumption of 40-60 liters, type of latrine being uncovered/traditional, use of soup for face washing, monthly income of 2301-3400 Ethiopian birr, type of waste disposal being uncovered/open field, child educational level, rural residence, frequency of face washing, and preschool children being more than two in a house were independently associated with the occurrence of active trachoma with $P \leq 0.20$.

Finally, when these variables were entered to multivariable Logistic regression to control the effect of confounding, 4 variables including family size being 6-9 in a house (AOR=2.34; 95%CI: 1.14-5.02), preschool children more than two in a house (AOR=2.04; 95%CI: 1.12-3.70), uncovered/traditional latrine (AOR=4.12; 95%CI: 2.00-8.51), and open field waste disposal system (AOR=2.62; 95%CI: 1.00-6.80) were positively associated with active trachoma with $P<0.05$. Whereas daily water consumption of 40-60 liters (AOR=0.23; 95%CI: 0.54-0.95) was negatively associated with active trachoma (Table 3).

Table 1 Demographic characteristics of study participants in Lare District, Southwest Ethiopia, 2019 *n*=610

Variables	Frequency	Percentage
Age group of the children		
1-3y	208	34.10
4-6y	261	42.80
7-9y	141	23.00
Age group of the household head		
20-32y	167	27.40
33-36y	140	23.00
37-45y	204	33.40
46-76y	99	16.20
Sex		
Male	283	46.40
Female	327	53.60
Educational level of household head		
Unable to read and write	128	21.00
Able to read and write	180	29.50
Primary school	156	25.60
Secondary school	108	17.70
College/university	38	6.20
Educational level of children		
No school	409	67.00
Kindergarten	79	13.00
Primary school	122	20.00
Residence		
Urban	215	35.20
Rural	395	64.80
Marital status of the household head		
Single	90	14.80
Married	343	56.20
Divorced	119	19.50
Widowed	58	9.50
Occupation of the household head		
Employed	112	18.40
Farmer	213	34.90
Merchant	158	25.90
Housewife	100	16.40
Others[a]	27	4.40
Family size, *n*		
2-5	105	17.20
6-9	347	56.90
≥10	158	25.90
Number of preschool children, *n*		
≤2	259	45.20
>2	351	57.50

[a]Others: Priests, daily labor workers.

Table 2 Socio-economic and behavioral factors of study participants in Lare District, Southwest Ethiopia, March 2019 *n*=610

Variables	Frequency	Percentage
Monthly income		
≤1232 ETB	153	25.10
1233-2300 ETB	177	29.00
2301-3400 ETB	138	22.60
≥3401 ETB	142	23.30
Water source		
Unprotected/running	145	23.80
Protected/spring	323	53.00
Pipeline	142	23.20
Amount of water used per day		
<20 L	159	26.10
20-40 L	260	42.60
41-60 L	146	23.90
>60 L	45	7.40
Time to fetch water		
≤30min	390	63.90
>30min	220	36.10
Presence of latrine		
Yes	489	80.20
No	121	19.80
Type of latrine		
Covered and traditional	57	11.70
Uncovered and traditional	217	44.30
Covered with water sinker	215	44.00
Latrine usage		
Children only	98	20.00
Both children and others	391	80.00
Presence of waste disposal		
Yes	377	61.80
No	233	38.20
Type of disposal		
Covered	195	51.70
Uncovered	145	38.50
Burnout	37	9.80
Distance of waste disposal		
≤10 m	218	57.80
>10 m	159	42.20
Use of soup		
Yes	377	61.80
No	233	38.20
Use of towel		
Yes	239	39.20
No	371	60.80
Share towel		
Yes	157	65.70
No	82	34.30
Frequency of bathing		
Occasionally	335	54.90
Once a day	216	35.40
More than once a day	59	9.70
Presence of animals		
Yes	386	63.30
No	224	36.70

Table 2 Socio-economic and behavioral factors of study participants in Lare District, Southwest Ethiopia, March 2019 (continue) *n*=610

Variables	Frequency	Percentage
Animals sleeping place		
The same room with family	92	23.90
Separate room with family	212	54.90
Separate house from family	82	21.20
Cooking place		
Within the living room	107	17.50
Open field outside the house	240	39.30
Separate house/kitchen	263	43.20
Flies observed		
Yes	305	50.00
No	305	50.00
Frequency of face wash		
Occasionally	165	27.00
Once a day	260	42.60
More than once a day	185	30.30
Presence ocular discharge		
Yes	177	29.00
No	433	71
Presence of nasal discharge		
Yes	92	15.10
No	518	84.90
Facial cleanliness		
Yes	316	51.80
No	294	48.20

ETB: Ethiopian Birr.

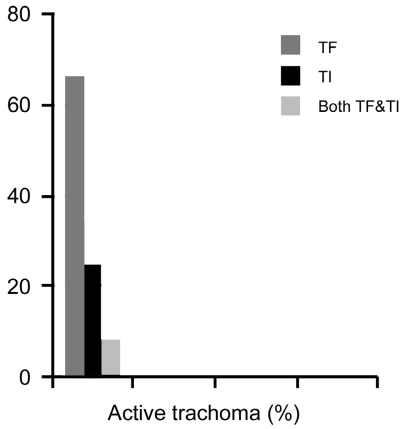

Figure 1 The proportion of active trachoma among children living in Lare District, Southwest Ethiopia, March 2019 (*n*=132).

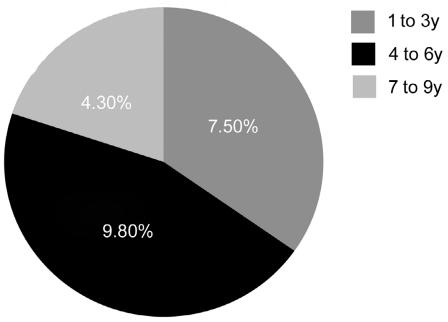

Figure 2 Prevalence of active trachoma by age groups in Lare District Southwest, Ethiopia, 2019 (*n*=610).

Table 3 Factors associated with active trachoma among children living in Lare district, Southwest Ethiopia, March 2019 *n*=610

Variables	Active trachoma		COR (95%CI)	AOR (95%CI)	*P*
	Yes	No			
Mother education					
Unable to read and write	37	91	0.57 (0.23, 1.37)		0.20
Able to read and write	36	144	0.90 (0.37, 2.22)		0.82
Primary school	30	126	0.95 (0.38, 2.36)		0.91
High school	22	86	0.88 (0.34, 2.27)		0.80
College/university	7	31	1.00		
Child education					
No school	96	313	0.64 (0.38,1.10)		0.09
Kindergarten	16	63	0.77 (0.37, 1.60)		0.49
Primary	20	102	1.00		
Monthly income					
0-1232 ETB	36	117	0.69 (0.40, 1.23)		0.21
1233-2300 ETB	36	141	0.84 (0.48, 1.47)		1.50
2301-3400 ETB	35	103	0.63 (0.35, 1.12)		0.12
3400 and above ETB	25	117	1.00		
Family size, *n*					
10 and above	30	128	1.71 (0.96, 3.10)		0.07
6-9	72	275	1.53 (0.93, 2.51)	2.34 (1.14, 5.02)	0.09
2-5	30	75	1.00		
Preschool children No., *n*					
>2	61	290	1.80 (1.22, 265)	2.04 (1.12, 3.70)	0.003
≤2	71	188	1.00		
Amount of water used					
<20 L	32	127	0.61 (0.24, 1.57)		0.31
20-40 L	59	201	0.52 (0.21, 1.30)		0.16
40-60 L	35	111	0.50 (0.20, 1.25)	0.23 (0.54, 0.95)	0.01
>60 L	6	39	1.00		
Type of latrine					
Covered/water sinker	66	149	1.00		
Uncovered traditional	27	190	3.12 (1.90, 5.12)	4.12 (2.00, 8.51)	0.00
Covered/traditional	15	42	1.24 (0.64, 2.40)		0.52
Use of soup					
Yes	74	303	1.00		
No	58	175	0.74 (0.50, 1.10)		0.12
Type of waste disposal					
Covered/traditional	44	151	1.45 (0.67, 3.17)		0.35
Uncovered/open	22	123	2.37 (1.02, 3.470)	2.62 (1.00, 6.80)	0.04
Burnout	11	26	1.00		
Residence					
Urban	39	176	1.00		
Rural	93	302	0.72 (0.47, 1.10)		0.122
Frequency of face wash					
Occasionally	55	110	0.43 (0.26, 0.71)		0.001
Once a day	44	216	1.10 (0.65, 1.75)		0.80
More than once a day	33	152	1.00		

ETB: Ethiopian birr; COR: Crude odds ratio; AOR: Adjusted odds ratio.

DISCUSSION

Despite trachoma is both a preventable and treatable disease, it is still a major public health problem in sub-Saharan regions of Africa including Ethiopia[3]. This study aimed to determine the prevalence of active trachoma and its associated factors among children aged 1-9y in Lare District.

The overall prevalence of active trachoma among children in this study was 132 (21.60%; 95%CI: 18.40%-24.70%). This result is in agreement with similar studies done in Guinea Bissau 22%[26], Dembia District, Ethiopia 18.20%[25], Baso Liben, Ethiopia 24.10%[27], Madda Walabu, Ethiopia 22%[28], and Gonji Kolella, Ethiopia 23.10%[16]. This might be due to similarity in study design and relatively similar socio-economic conditions of the study areas.

On the other side, this result is higher than other similar studies done in the Western division of Fiji 2.80%[29], Senegal 5.1%[30], Zimbabwe 5%[31], Tanzania 13.70%[5], different studies in Ethiopia 1.30%-15.20%[3,8,15,22]. The possible justification might be the present study area has a hot, dry, and humid environmental conditions that might contribute to the occurrence of the disease[32]. Another possible source of variation could be low socio-economic conditions of the above study areas[30] with poor water access and sanitation which had a high contribution to the development of active trachoma[24]. Most of the above studies done in Ethiopia are school-based and included urban areas where better access to water and latrine is seen and family planning is better exercised which might contribute in decreasing the burden of active trachoma[2]. Aside from the above reasons, poor health-seeking behaviors and lack of access to eye care service programmers might increase the proportion of active trachoma in our study area.

The prevalence of active trachoma in the present study is lower as compared to studies done in Israel 27.50%[18], Mali 34.90%[14], and different areas in Ethiopia 36.70%-72%[9,19,33]. This might be due to the above studies were conducted some years before intervention programs of active trachoma were implemented and progressed. Besides, weak intervention programs of SAFE strategy either due to the governmental, non-governmental, or joint weakness of the organizations could also contribute to the high prevalence of the disease[34].

The present study also tried to investigate different factors associated with active trachoma in the study area. As a result, the odds of developing active trachoma among participants having a family size of 6-9 were 2.34 times more likely as compared to those who had a family size of <5 (AOR=2.34; 95%CI: 1.14-5.02). This is supported by other similar studies done in Ethiopia[8,15] and Guinea Bissau[26]. The possible justification might due to overcrowding conditions in the family that could affect the hygienic conditions of the family as well as the community and this in turn contributes to the occurrence of active trachoma[35].

The presence of more than two children in a house was 2.04 more likely to develop active trachoma as compared to those with two or fewer children in a house (AOR=2.04; 95%CI: 1.12-3.70). This is in agreement with studies done in Tanzania[13] and Ethiopia[20]. As the number of preschool children increases in a house, it might be difficult to fulfill both their hygienic and economical needs. Increased mobility needs of children might expose them to have an unclean face, nasal, and ocular discharges which could attract flies to them that in turn contributes to the development and transmission of active trachoma easily[2,33].

Participants having uncovered/traditional latrine were 4.12 more likely to acquire active trachoma as compared to those with covered/water sinker latrine (AOR=4.12; 95%CI: 2.00-8.51). This finding is in line with studies done in Ethiopia[8,32]. The possible reason could be due to exposed/open field latrines are the main breeding site of flies that are responsible for trachoma transmission[27-28,36-37]. Vector Musca sorbens has been shown preferably to breed in human faces. Flies seen in open field latrine have positively associated with the occurrence of active trachoma[26-27,31]. The provision of covered pit latrine to each house reduces flies' eye contact by 30% which intern accompanied by a reduction in the proportion of trachoma by 30%[38].

The present study has also shown that participants having open field/uncovered waste disposal systems were positively associated with the occurrence of active trachoma which is supported by studies done in Dembia District, Ethiopia[25], Madda Walabu, Ethiopia[28], and Gonji Kollela, District Ethiopia[16]. Improving environmental hygiene like having covered/burnt out disposal systems in the community inhibits the breeding ability of flies (Musca sorbens) that in turn reduces the risk of developing active trachoma[35,39-40].

Also, daily water consumption being 40-60 liters (AOR=0.23; 95%CI: 0.54-0.95) was a protective factor for active trachoma. This is supported by similar studies in Tanzania[13,41]. Having a sufficient amount of water whatever the source (running, spring, or well piped) has a paramount advantage to keep good hygienic conditions which intern reduce the risk of acquiring trachoma[31,39]. The unclean face is observed in the water inaccessible area and this condition is linked to the risk of trachoma[39,42]. Clean face and frequent face washing were a protective factor in a study conducted in South Sudan[18]. This can be achieved when water access is sufficient in the house. Strong relation was seen between the availability of water in households <20 liters and the prevalence of active trachoma[14] and this was also significantly associated with the time required to fetch water from the source[28,42].

Generally, even though governmental and non-governmental organizations tried to put their effort in local and national level of Ethiopia, active trachoma is still a major health problem in Gambella region, mainly in Lare District which needs special attention and prevention program. So, as the diseases is a blinding condition, a special attention should be given for active trachoma control. Both governmental and non-governmental organizations must assess their program on trachoma prevention ways basically on addressing water constraints and keeping environmental hygienic conditions.

Limitation of the Study The study did not confirm definitive cause and effect relationship. Additionally, the study may prone to reporting bias since some of the data was collected based on self-reported information and this study did not use the qualitative method to explore other factors contributing to active trachoma.

In conclusion, the prevalence of active trachoma was 21.60% among children aged 1-9y in Lare District. Family size being 5-9, presence of more than two children per household, uncovered/traditional latrine, and open field waste disposal system was positively associated with active trachoma. On the other side, amount of water being 40-60 liters was a protective factor for the occurrence of active trachoma. Active trachoma is a major public health problem among children living in Lare District which needs strong intervention programs.

ACKNOWLEDGEMENTS

We would like to thank University of Gondar College of Medicine and Health Sciences, Gambella Regional Health Office, and Lare District Administrative Office for their technical support to carry out this study.

Authors' contributions: Belsti Y: designing the study, conceptualization, formal data analysis, supervision, visualization, drafting of the manuscript, interpretation of the result, and reviewing the manuscript. Fekadu SA: formal data analysis, reviewing the manuscript, and supervision. Assem AS: involved in reviewing the manuscript, data analysis, designing the study, and supervision. All authors read and approved the final manuscript.

Conflicts of Interest: Belsti Y, None; **Fekadu SA,** None; **Assem AS,** None.

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