

# Knowledge, Attitude and Practices Related to Visceral Leishmaniasis and Its Trend in Libo Kem Kem Wereda, Northwest Ethiopia: A Cross-Sectional and Retrospective Study

Walegn Azene Demelash<sup>1, \*</sup>, Dagim Jirata Birri<sup>2</sup>

<sup>1</sup>Ethiopian Biodiversity Institute, Addis Ababa, Ethiopia

<sup>2</sup>Department of Microbial, Cellular and Molecular Biology, Addis Ababa University, Addis Ababa, Ethiopia

## Email address:

waliaazene@gmail.com (W. A. Demelash), walegn.azene@ebi.gov.et (W. A. Demelash), dagimj@yahoo.com (D. J. Birri)

\*Corresponding author

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**Abstract:** Leishmaniasis is a disease caused by protozoan parasites of the genus *Leishmania*. Visceral leishmaniasis (VL) affects many people in some parts of Ethiopia, with occasional outbreaks. Community participation and disease trends are of paramount importance in the control of infectious diseases, including VL. The aim of this study was to assess the knowledge, attitude and practice related to VL in four endemic kebeles (sub-districts) of Libo Kemkem wereda (district), Northwest Ethiopia, and to determine the trend of VL in the same district in the last fourteen years (April 2005- December 2018). In order to assess the knowledge, attitude and practice (KAP) related to VL, a community-based cross-sectional study was conducted in four endemic kebeles of Libo Kemkem wereda, Northwest Ethiopia. Three hundred ninety-eight (398) study participants (200 males and 198 females) were selected by systematic random sampling and questionnaires were used to collect data. A retrospective study was done to determine the trend of VL in Libo Kemkem wereda in the past fourteen years (April 2005-December 2018) using data collected from patients' registration book at the Addis zemen hospital and local health centers. The results from the questionnaire survey revealed that 97.7% of the respondents heard about VL before, but only 12.8% and 5.3% knew the etiologic agent and the vector of the disease, respectively. Nearly all respondents (97.2%) believed that health education is necessary to minimize the challenges of the disease. Close to half (44.5%) of the respondents believed that a complete cure of the disease is possible. Approximately 88% of the respondents did not practice anything to protect themselves from the Sand fly bite. The occurrence of VL in Libo Kemkem wereda decreased from 2005 to 2008 and then gradually increased in the next five years (2008 to 2013) and slightly decreased over the last five years (2013-2018). The disease spread to 27 kebeles (subdistricts) in recent years. The overall study revealed that the local societies have a low level of knowledge, attitude, and practice related to VL. VL showed a little decreasing trend over the recent consecutive years. Hence, educating the local community about VL and mobilizing them to take preventive measures is crucial in effective control of VL in the study area.

**Keywords:** Knowledge, Attitude, Practice, Visceral Leishmaniasis, Trend

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## 1. Introduction

Species of the genus *Leishmania* (Kinetoplastida, Trypanosomatidae) cause leishmaniasis and are usually transmitted between vertebrate hosts by the bite of blood

sucking female sandflies (Diptera, Psychodidae) [1]. The disease is categorized into cutaneous, mucosal and visceral leishmaniasis.

Diagnose is and treatment of the disease is difficult and about 95% of VL patients are likely to die if left untreated

[2]. Humans, wild animals and domestic dogs are known to serve as reservoir hosts. Its generalized clinical syndrome involves the reticulo-endothelial system infection (spleen, bone marrow, and liver), weight loss and anemia. Leishmaniasis is mainly affecting the poor, particularly those with vulnerable housing and environmental conditions. Loss of income and health care costs exacerbate the economic situation of already disadvantaged households [3].

Visceral leishmaniasis (VL) is a common deadly parasitic disease in the study area and is caused by *Leishmania donovani* complex. Currently, it is a growing health problem in Ethiopia with many endemic sites from which it spreads. VL is found in many regions of the Ethiopia such as Tigray, Amhara, Oromia, Afar, Somali and Southern Nations with the burden of 4,000 new cases per annum [4]. The largest focus of VL in Ethiopia is located in the lowland region bordering Sudan, where hundreds of thousands of agricultural workers migrate for work every year during the planting and harvesting seasons [5].

Despite its widespread, control of visceral leishmaniasis in Ethiopia had less attention. For the success of control programs against VL, the most important prerequisites are assessment of disease-related knowledge, attitude and practice (KAP) of the community and the trend of the disease [6]. So far, very few attempts have been made to study the KAP of the community related to VL and no attempts were done and the progress the disease is not known in Bura Egzi Abhier Ab, Shina Tsion, Yifag Town and Angot kebele,

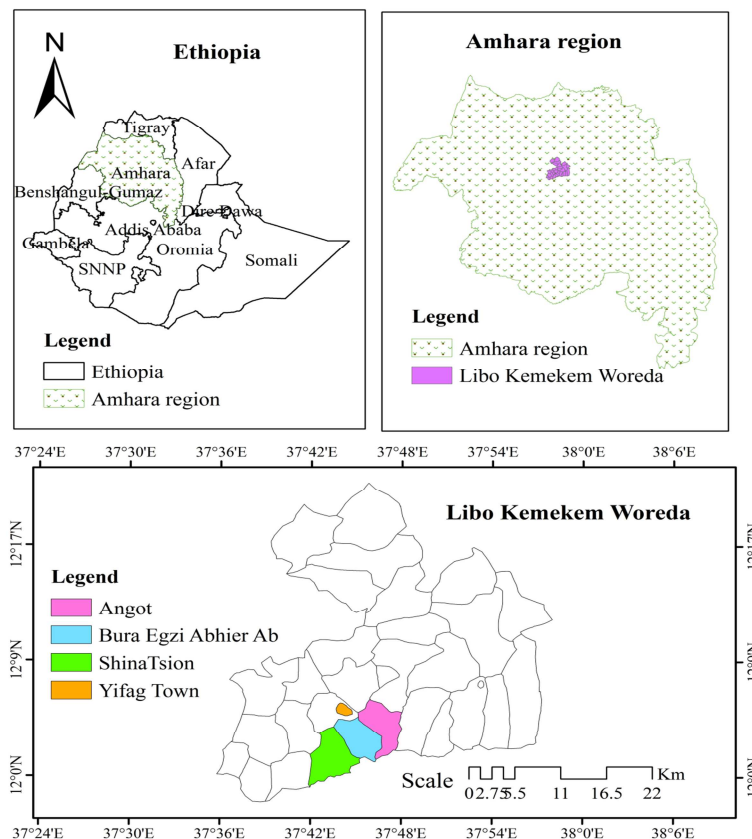
which are the most VL affected sub district of Libo Kemkem wereda. Thus, this study aimed at assessing VL related knowledge, attitude and practice of the inhabitants of Bura Egzi Abhier Ab, Shina Tsion, Yifag town and Angot kebele and the trend of the VL in Libo Kemkem wereda over the past fourteen years.

## 2. Materials and Methods

### 2.1. Description of the Study Area

The present study was conducted in Bura Egzi Abhier Ab, Shina Tsion, Yifag Town and Angot kebele, which are located in Libo Kemkem Woreda, South Gondar Zone, Amhara Regional State, Northwest Ethiopia (Figure 1). The study area is characterized by having an altitude of 1800–2000 meters above sea level, mean annual temperature of 25–28°C, relative humidity of 31–52.7% and average annual rainfall of 900–1200 mm.

Libo Kemkem woreda (district) consists 37 kebeles (sub districts) inhabited by a total population of 269,970 in 2018. The district has one recently established hospital, two health centers, ten health posts and a few private drug vendors. Bura Egzi Abhier Ab, Angot, Shina Tsion and Yifag town comprise 7110 households and a population of 30,682 (15,287 females and 15,295 males) (Table 1). Bura Egzi Abhier Ab, Angot, Shina Tsion and Yifag town were selected from other kebeles since they have the highest burden of VL.



**Figure 1.** Map of Libo Kemkem wereda (District) and four endemic kebeles (Sub districts).

**2.2. Design of the Study**

A community-based cross-sectional study was carried out from November to December 2018 in order to assess the knowledge, attitude and practice among inhabitants the four endemic kebeles. A retrospective study based on secondary data obtained from the hospital and health centers was used to determine the trend of VL in Libo Kemkem Wereda (District).

**2.2.1. Sample Size Determination**

Since there is no published report on visceral leishmaniasis among the rural population of the present study area, the sample size was calculated based on the assumption that at least 50% of the population had a good knowledge, attitude and practice towards visceral leishmaniasis. By using the following single population proportion formula, the sample

sized was calculated to be 398.

$$n = z^2 p (1-p) / w^2$$

Where,  
 p = proportion (50%)  
 n = sample size  
 z = confidence interval (with 95% level of certainty)  
 w = margin of error (5%)

**2.2.2. Sampling Technique**

The study participants from each study sub-districts were selected by systematic random sampling technique. Every nineteenth household was selected and those members of the chosen households were kindly requested to fill and return the questionnaire.

*Table 1. Population of the four study kebeles and sample size.*

Kebele (Sub-district)	Number of Households	Total Population	Sex		Sample size		
			Male	Female	Male	Female	Total
Bura Egzi Abhier Ab	1979	8634	4387	4247	55	53	108
ShinaTSION	1484	6218	3087	3031	44	41	85
Yifag Town	1621	6972	3480	3492	47	47	94
Angot	2026	8858	4341	4517	54	57	111
Total	7110	30,682	15,295	15,287	200	198	398

**2.3. Data Collection**

**2.3.1. Questionnaire Survey**

A structured questionnaire that was first prepared in English and then translated into the local language (Amharic) was used for primary data collection. The questionnaire contained questions on demographic characteristics, and knowledge, attitude and practice related to VL. The questionnaire was pre-tested using 40 persons outside the study area (Yifage akababi kebele) before starting the actual survey.

**2.3.2. Collection of Health Records**

In order to determine the trend of VL in Libo Kemkem Wereda, secondary data were collected from health records such as reports prepared by hospital and health Centers and patient’s registration book for the past fourteen years.

**2.4. Data Analysis**

All data entry and analysis was done using SPSS version 24.

**3. Results and Discussion**

**3.1. Socio-demographic Characteristics of Study Participants**

The socio-demographic characteristics of the study participants are summarized in Table 2. A total of 398 individuals, 200 (50.3%) males and 198 (49.7%) females, participated in the study. The majority (84.7%) of the study participants were older than 27 years of age. The education

level of most (81.1%) of the participants was below secondary school.

*Table 2. Socio-demographic characteristics of study participants (n = 398).*

Character	No (%)	Character	No (%)
Age (years)		Kebeles	
18-27	61(15.3)	Bura EgziAbhier Ab	108(27.1)
28-37	129(32.4)	ShinaTSION	85(21.4)
38-47	103(25.9)	Yifag Town	94(23.6)
≥48	105(26.4)	Angot	111(27.9)
Sex			
Female	198(49.7)		
Male	200(50.3)		
Occupation		Education	
Student	25(6.3)	Illiterate	153(38.4)
Farmer	173(43.5)	Elementary	170(42.7)
Housewife	152(38.2)	Secondary	56(14.1)
Merchant	38(9.5)	Diploma and above	19(4.8)
Government employee	10(2.5)		

**3.2. Knowledge of Study Participants About Visceral Leishmaniasis**

Out of 398 respondents, the majority, 389 (97.7%), had heard about VL before and a few 37 (9.3%) knew how it is acquired and transmitted (Table 3). The result of this study is comparable to studies conducted in a rural area of Bihar state, India and walkait district of Ethiopia, where most of the respondents (97.4%) and 100% had heard the name VL respectively [6, 7]. This result is higher than that of a study conducted in Addis Zemen town of Ethiopia, where 87.6% heard about VL [8]. This might be due to the endemicity and a disease is more prevalent in rural areas which make the community more informed about the name of a disease.

Only a negligible proportion of the respondents i.e. 21 (5.3%), knew that VL is spread by Sand fly bite. Our finding is in agreement with a study conducted in Sudan, where only 6% of respondents indicated that the disease is transmitted by Sand fly bite [9]. The majority of the respondents, 329 (82.7%), had no idea of the signs and symptoms of the disease, whereas 7% and 2.3% of the respondents said that abdominal swellings and fever, respectively, are the signs and symptoms of the disease. The result that the majority (82.7%) of the respondents had no idea of the sign and symptoms of the disease is higher than that from a study conducted in endemic rural area of India, where a significant proportion of the respondents (32.3%) had no idea about the signs and symptoms of the disease [10]. This variability might be due to lack of community health education, community awareness, socioeconomic status of the different areas, since VL is a recently established disease in the Libo Kemkem wereda.

Some of a study participants, 54 (13.6%), knew some of the risk factors that predispose to VL. Our result is lower than that from a study conducted in India, where 73% of the respondents had an awareness about the causes of kala-azar [11]. This variability might be due to lack of knowledge about the disease, lack of community health education, and the absence of an integrated controlling mechanism. Regarding preventive knowledge of VL, 158 (39.7%) of respondents said that the disease can be prevented by drying, water bodies and 17.5% of respondents had no idea at all (Table 3). About 17.5% respondents had no idea at all about the preventive measure of VL. This result is comparable to the study conducted in Addis Zemen town of Ethiopia, where 13.5% of the respondents had no idea about the preventive measure [8].

The majority of study participants 297 (74.6%), 316 (79.4%) and 323 (81.2%) didn't know the vector of the disease, breeding site and controlling methods of the vector respectively (Table 3). Our finding that 74.6% and 79.4% of respondents didn't know the vector of the disease and breeding sites respectively, which is comparable to the study conducted in walkait district of Ethiopia, where 69.32% and 74.62% of the participants didn't know the vector of the VL and the breeding sites of Sand fly [7].

**Table 3.** Respondents' level of knowledge about visceral leishmaniasis.

Question items	Level of response	
	Frequency	Percentage (%)
1. Previous information about visceral leishmaniasis		
Yes	389	97.7
No	9	2.3
2. Mode of transmission the disease, VL		
Yes	37	9.3
Sand fly	21	5.3
Mosquito	16	4
No	361	90.7
3. Knowledge about symptoms and signs of disease, VL		
Yes	69	17.3

Question items	Level of response	
	Frequency	Percentage (%)
Abdominal swelling	28	7
Fever	9	2.3
Others	31	7.8
No	329	82.7
4. Knowledge about the cause of the disease, VL		
Yes	51	12.8
No	347	87.2
5. Knowledge about factors that predispose someone to VL		
Yes	54	13.6
No	344	86.4
6. Knowledge about how the disease can be prevented		
Yes	328	82.5
Insect repellent	13	3.3
Bed net	99	24.9
Chemical sprays	58	14.6
Drying water bodies	158	39.7
Do not know	70	17.5
7. Do you know the vector of the disease VL?		
Yes	101	25.4
No	297	74.6
8. Do you know breeding places of the vector?		
Yes	82	20.6
No	316	79.4
9. Do you know the control methods of the vector?		
Yes	75	18.8
No	323	81.2
10. Have you ever taken community health education on VL		
Yes	91	22.9
No	307	77.1

### 3.3. Attitude of Study Participants Towards Visceral Leishmaniasis

Concerning attitudes about control of VL, nearly all 387 (97.2%) respondents believed that health education is useful to control the disease. This finding is comparable to the study conducted in wolkait district, Ethiopia where, about 73.11% respondents indicated that community participation is an essential tool to control VL [7]. The great majority of the respondents 375 (94.2%) believed that VL is not the result of a curse (the evil deed) (Table 4). Regarding, the seriousness of the disease, about half (58.8%) of respondents termed that VL is more serious than malaria. This result is also comparable to the reports that 71% and 80% of respondents in a rural area of Bihar state, India and a highly endemic rural area of India termed that VL is a very serious disease compared to malaria respectively [6, 10].

VL was thought to be completely a curable disease by 44.5% of respondents. This result is lower than that of the studies conducted in wolkait district and Addis Zemen town of Ethiopia, where the Majority 88.26% and 86.4% of participants believes that VL is a curable disease respectively [7, 8]. This difference might be due to the community that live in the rural area (our study site) are mostly illiterate.

About the family income, most (95.5%) of respondents had the attitude that, when a person gets VL, not only the individual, but also the whole family has been affected economically. This result is in line with the study conducted in endemic rural area of India where, 100% of respondents said that VL infection affects family income [10]. In addition, 85.7% respondents believed that the disease can be treated (Table 4).

**Table 4.** Respondents' (n = 398) attitude towards visceral leishmaniasis.

Question items	Level of response	
	Frequency	Percentage (%)
1. Believing that education can alleviate the problem or VL		
Yes	387	97.2
No	11	2.8
2. Thinking that the disease is the result of evil deed		
Yes	23	5.8
No	375	94.2
3. Thinking that kala-azar is a more serious disease compared to malaria		
Yes	214	53.8
No	184	46.2
4. Believing that complete cure of the disease is possible		
Yes	177	44.5
No	221	55.5
5. Thinking that the disease affects the family income		
Yes	380	95.5
No	18	4.5
6. Do you think that the disease can be treated?		
Yes	341	85.7
No	57	14.3

### 3.4. Practice of Study Participants in Prevention and Control Visceral Leishmaniasis

About 39.7% of respondents preferred specific medicine for the treatment of VL, whereas 2.5% preferred Indigenous medicine for the treatment of VL (Table 5). Our finding that 2.5% preferred indigenous medicine for the treatment of VL which is in line with the report from endemic areas of rural India, where a negligible proportion (1.2%) believed in traditional medicines (leaves, root and herbs) [10].

Concerning health services, public health center was the first choice for the treatment by 52.5% of respondents if suspected VL case occurred in the household, followed by private clinics (34.7%). This study is comparable to the study in Addis Zemen town, Ethiopia where, majority 94.4% preferred to get treatment at health centers [8]. But a study conducted in a rural area of Bihar state, India revealed that Private Doctors were the first choice for treatment by 47.6% of the respondents if a suspected case of Kala-azar occurred in the household, followed by non-government organizations (NGOs) /charitable hospitals 24.0% [6]. This difference is because of their views of the inadequacy of the health system and public health systems are not enough facilities.

Only few 8% and 5.8% respondents use a bed net and avoid outdoor sleeping habit to avoid Sand fly biting

respectively. This study is in line with a study conducted in Welkait District, Ethiopia where, more than half, 62.88% had an experience of outdoor sleeping specially during high temperature [7]. Even majority 70.6% of respondents doesn't use any kind of preventive methods (Table 5). This study is comparable to the study conducted in Welkait District, Ethiopia where, majority 94.50% of the respondents declared that, they had never ever applied insecticide spray into their house/ surrounding area [7].

In addition, 12.1% of respondents used some practice (using bed net) to avoid the access of Sand fly to human which is in agreement with the studies reported from Welkait District and Addis Zemen town of Ethiopia who showed 23.11% and 19.8% of the respondents use some practices like only bed nets to avoid the access of Sand fly to human respectively [7, 8]. This variability might be due to that fact that peoples in towns have more awareness about the use of bed net to avoid the access of sand fly to human compared to rural people.

**Table 5.** Respondents' practice in prevention and control of visceral leishmaniasis.

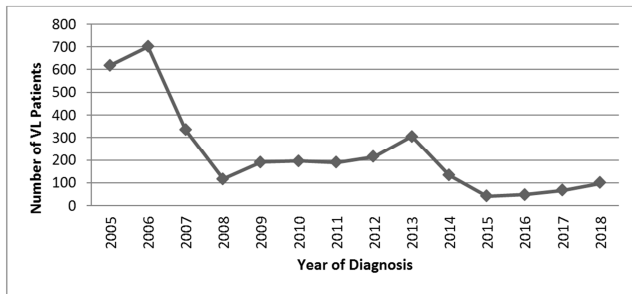
Question items	Level of response	
	Frequency	Percentage (%)
1. Drug preference in the treatment of kala-azar		
Specific medicine	158	39.7
Indigenous medicine	10	2.5
Do not know	230	57.8
2. Some traditional practices to prevent the disease, VL		
Yes	61	15.3
No	337	84.7
3. Some practices to prevent the access of Sand fly to human		
Yes	48	12.1
No	350	87.9
4. First choice for the treatment of the suspected disease, VL		
Health post	51	12.8
Public health center	209	52.5
Private clinics	138	34.7
Traditional healer	0	0
5. Which one of the following methods you use to prevent Sand fly.		
Use of bed net	28	7.0
Use of DDT	32	8.0
Cleanness	34	8.5
Note use any preventive methods	281	70.6
Avoid outdoor sleeping	23	5.8

### 3.5. Trends of Visceral Leishmaniasis in Libo Kemkem Wereda

Health records of VL and patient registration books obtained from Addis Zemen hospital and Addis Zemen health center showed that the incidence of VL in the study area decreased steadily from 2006 to 2008, then gradually increased to five years (2008 to 2013) and decrease in the last three years (Figure 2). This gradual decrement of VL result is in agreement with the studies conducted Humera town, Ethiopia and Eastern Sudan, where the results showed that

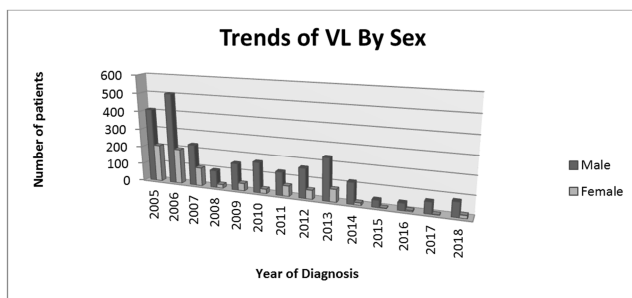
leishmaniasis cases decreased across the study years with the highest recorded in 2014 and There was a clear decline in the cumulative case and fatality rate from the year 2002 to the year 2015 respectively [12, 13]. VL spread to thirteen new kebeles that were virtually free before 2009.

Currently, VL is distributed in 27 kebeles out of 37 kebeles in Libo Kemkem woreda. At the time of the 2003-2005 outbreaks, most of the kebeles were free from VL but nowadays only ten kebeles are free from VL. These are Derita, Goza, Mayitad, Womba, Asta Mariam, Bulbuha, Mendere Mariam, Libo Georgis, Ameno and Martadios.



**Figure 2.** The trend of visceral leishmaniasis in Libo Kemkem woreda for the past fourteen years (April 2005- December 2018).

VL in the study area is more prevalent in males than in females (Figure 3). This finding is the same as the results of the studies conducted in Humera town, Ethiopia and Eastern Sudan, where Leishmaniasis cases were higher in males than females in all study years and The disease was observed to be more prevalent among adults and males respectively [12, 13]. This might be due to the fact that males spend most of their time working outdoors, increasing the likelihood of being bitten by Sand fly vectors.



**Figure 3.** Trend of visceral leishmaniasis by sex in study area over the last fourteen years (April 2005- December 2018).

## 4. Conclusions

Although the great majority of the study participants have heard about VL, their level of knowledge about its transmission, symptoms and predisposing factors is low even after about 14 years of VL outbreak. Most knew the methods of VL prevention in spite of the fact that they did not practice

them. Most people believe that education is important in the control of VL and VL is curable. Moreover, VL trend analysis shows that recently, VL is gradually increasing in the district. Therefore, a regular community-based education on transmission and implementation of preventive measures by health institutions and bureaus must be delivered to reverse the situation.

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