WOLKITE UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

SCHOOL OF HEALTH SCIENCES

DEPARTMENT OF MEDICAL LABORATORY SCIENCE

Prevalence of Intestinal Parasites among Human Immune Virus Positive Patients Attending Antiretroviral Treatment inWorabeComprehensive Specialized Hospital

BY

AMIRA MOHAMMED

ABDULHAMID SADIK

TADESSE ENDALE

BRUIKHAILU

A RESEARCH PAPER SUBMITTED TO WOLKITE UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCE, DEPARTMENT OF MEDICAL LABORATORY SCIENCE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE BACHELOR OF SCIENCEINMEDICALLABORATORYSCIENCE

AUGUST,2023

WOLKITE, ETHIOPIA

Prevalence of Intestinal Parasites among Human Immune Virus Positive Patients Who Attend Antiretroviral Treatment inWorabe Comprehensive Specialized Hospital

By

AMIRA MOHAMMED

ABDULHAMID SADIK

TADESSE ENDALE

BRUIK HAILU

ADVISORES: HABTAMU .B ,(BSc, MSC)

ASNAKE.S(BSc, MSC)

MARCH, 2023

WOLKITE,ETHIOPIA

ACKNOWLEDGEMENT

First, we want to express our gratefulgratitude to WerabeComprehensive Specialized Hospital for their willingness to engage in the research and provideus with the necessary materials that helped us achieve our goals in our research. We would like to express our sincere gratitude toWolkite University College of Medicine & Health Sciences Department of MedicalLaboratory.We are also strongly indebted to our advisorMr.:Habtamu. B and Mr. Asnake.S from Wolkite University College of Health Science & Medicine for their invaluable help, guidance, and support through the work by devoting their valuable time.

Table of Contents

LIST OF FIGURES

LIST OF TABLE

ABBREVIATIONS

AIDS	Acquired Immuno Deficiency Syndrome
ART	Anti-Retroviral Treatment
CD_4	Cluster differentiation
HIV	Human Immunodeficiency Virus
IP	Intestinal Parasite
WHO	world health organization
SOP	standard operating procedure
HAART	Highly active anti –retro viral treatment

ABSTRACT

Background: *Intestinal parasites are a major concern in most developing countries where HIV/AIDS cases are concentrated and almost 80% of AIDS patients die of AIDS-related infections. The Humanimmunovirus is one of the greatest challenges facing mankind. An estimated 33 million adults and children are living with the virus globally. Sub-Saharan Africa was the most affected region. People with advanced stages of HIV infection are vulnerable to parasitic diseases that are generally termed parasitic infections. This is because they take advantage of offered by a weakened immune system. Opportunistic infections account for about 80% of deaths among HIV/AIDS patients than the virus itself, and of these, more than 47% happen due to intestinal parasitic infections which usually affect the gastrointestinal system and spread to other body parts. Intestinal parasites are the major cause of morbidity and mortality in many tropical countries including Ethiopia where HIV/AIDS is endemic*.

Objective *This study aimed to determine the prevalence of intestinal parasitic infection in HIV/AIDS patients taking ART in Worabe Comprehensive Specialized Hospital, south-central Ethiopia.*

Method: *-A health facility-based cross-sectional study was conducted among HIV/AIDS patients taking ART at Worabe Comprehensive SpecializedHospital from March to August 2023.Stool samples were collected and wet mount smear was processed with 0.98% physiological saline and intestinal parasites were identified. Data was analyzed usingSPSSSoftware. A Conventional sampling technique was used. Non-probability sampling techniques/convenience sampling / was used as a sampling technique. Our final sample size including 10% of the non-responding rate was 246*.

Result: *Out of 114 study participants 62 (54.4%) individuals were infected with intestinal parasites. The prevalence was high in G.lamlia(23.7%), followed by E. histolytica(28%),S. stercolaris(8.8%),Taenia species (3.5%), and lastly Hookworm species(1.8%).*

Keywords words: intestinal parasite, ART,

CHAPTER ONE

1. Introduction

1.1 Background of the study

Intestinal parasitic infection is a major source ofmorbidity in tropical countries, especially among human immunodeficiency virus (HIV) patients. Opportunistic infection poses major health problems among HIV patients, particularly in the late stage of the disease, when the immune system is severely depleted [1].

HIV and AIDS is the leading cause of morbidity and mortality worldwide. The prevalence of intestinal parasites is high in sub-Saharan Africa, where the majority of HIV/AIDS cases are concentrated, and factors including poverty and malnutrition could promote transmission of both infections in the region [2].

Currently, the rapid expansion of the HIV/AIDS pandemic has brought about a significant change in the fauna of intestinal parasites all over the world, especially in developing countries. Several factors also contribute to the expansion and newly emerging intestinal parasites [3]. Intestinal parasitic infections play an important role in the progression of HIV infection by disturbing the immune system while it is already involved in the fight against HIV [3].

In HIV-infected individuals, the progressive decline in their immunological responses makes them extremely susceptible to a variety of opportunistic and other intestinal infections. In recent years, numerous studies have outlined the emergence of important gastrointestinal protozoa, such as *Cryptosporidium parvum*, *Cystoisospora*, *Cyclospora*

cayentanensis,*Microsporidia*, *Entamoebahistolytica/dispar*and *Giardia lamblia*, which account for a significant number of cases of diarrhea in this population. Non opportunistic parasites, such as *Entamoeba histolytica* and *Giardia lamblia*, are also parasites causing diarrheal diseases that occur in individuals living with HIV/AIDS [4]

Unfortunately, in the absence of antiretroviral therapy (ART), HIV-positive individuals in developing countries continue to suffer the consequences of opportunistic parasites [5]. Patients with very low CD4 cell counts who enroll in ART programs have a heightened risk of morbidity and mortality before ART [6]. ART increases the length quality of life and productivity of HIV

patients by improving survival and decreasing the incidence of opportunistic infections through a reduction of the viral load and an increase in the level of CD4 cells [7]. There is evidence that the control of these opportunistic parasitic infections in HIV-positive people under highly active antiretroviral therapy(HAART) is also induced by the inhibition of the aspartyl proteases of the parasites and by the reconstitution of the immune system of the patient [8]. However, patients in resource-limited settings typically start ART programs with advanced symptomatic disease and very low blood CD4 cell counts, which predisposes them to high rates of both clinical and subclinical opportunistic infections [6]. A considerable decline in the mortality of adult AIDS patients was shown to be related to the start of ART in Addis Ababa, Ethiopia, and other parts of the country [9]. Although there has been an improvement in the survival of HIV patients, parasitic infections pose a serious challenge in reducing the morbidity and mortality of these individuals. Most of the health institutions in Ethiopia lack appropriate diagnostic methods to detect low levels of parasite burden. In addition, some of the diagnostic methods for specific intestinal parasites, especially for the newly emerging opportunistic intestinal parasites, are not available to peripheral health institutions. There is a paucity of information regarding the prevalence of intestinal parasites among HIV/AIDS patients in Ethiopia. Therefore, this study aimed to determine the prevalence of opportunistic and other intestinal parasites among and on-ART HIV/AIDS patients attending WorabeComprehensiveSpecialized Hospital.

1.2. STATEMENT OF THE PROBLEM

HIV is a challenging health problem worldwide. Based on a joint report from the World Health Organization (WHO) and the United Nations Programme on HIV/AIDS, about 38 million individuals were living with HIV by the end of 2019 globally and more than 1 million had died due to AIDS-related complications and diseases, about 69% of them residing in the sub-Saharan Africa region [10].

Intestinal parasitic infections are a major public health burden in tropical countries. An estimated 33 million adults and children are living with the virus globally. Sub-Saharan Africa was the most affected region.[11] Although all HIV/AIDS patients are susceptible to parasitic infections, those having lower immune status are at greater risk.Twenty-seven studies with 8946 individuals were included, the estimated pooled prevalence of intestinal parasitic infections among people living with HIV/AIDS on anti-retroviral therapy was 40.24%. Opportunistic infections account for about 80% of deaths among HIV/AIDS patients than the virus itself, and of these, more than 47% happen due to intestinal parasitic infections which usually affect the gastrointestinal system and spread to other body parts. More than 2 billion people are chronically infected with intestinal parasites. Above all, more than 200,000 deaths occur due to intestinal parasite infections every year. The global disease burden report showed that approximately 800 million people had Trichuriasis, and one billion had Ascariasis and Hookworm infections [12].

When the immune system is suppressed, intestinal parasitic infections can be fatal usually resulting in death in less than 2 years unless the patient receives specific therapy for HIV infection which is highly active anti-retroviral treatment (HAART) with anti-parasitic infections. Treatment for amoebiasis and giardiasis involves nitroimidazoles such as metronidazole (Flagyl), which have been used successfully for more than four decades. Undesirable side effects including anorexia, nausea, vomiting, malaise, metallic taste, potential teratogenicity, and failures in treatment in normal and HIV patients have been reported[13]

Intestinal parasitic infections play an important role in the progression of HIV infection, by further disturbing the immune system while it is already engaged in the fight against HIV. The gastrointestinal pathology associated with HIV infection comprises significant enteropathy with increased levels of inflammation and decreased levels of mucosal repair and regeneration HIV infection leads to the loss of $CD4^{+}$T cells, which leaves affected individuals mortally susceptible

to opportunistic infections. Many of the opportunistic infections that ultimately plague such individuals involve infectious agents that are normally checked by the mucosal barriers which include*Giardia lamblia, Entamoeba histolytica, Ascarislumbricoides,* hookworm infection, Schistosoma spp and *Strongyloidesstercoralis* are important cosmopolitan intestinal parasites that are common among children and immunocompromised individual. The pathogenic intestinal parasites such as *E. histolytica* and *Giardia lamblia*, can last for months in patients with AIDS, causing malabsorption of nutrients, gradual debilitation through dehydration, and metabolic abnormalities and are responsible for severe diarrhea episodes. Wetried to show the prevalence of HIV/AIDS and intestinal parasite coinfection in the Duna local area and give the statistical data for the municipals and related officials to take measures.

Even if most studies on HIV/AIDS-positive and negative individuals were carried out to determine the prevalence of parasitic infection, this study tried to address the magnitude of parasitic infection in patients taking ART at WorabeComprehensive Specialized Hospital.

1.3. SIGNIFICANCE OF THE STUDY

As indicated in the statement of the problem, the severity and magnitude of IP in HIV/ AIDS patients require attention and study, especially in countries like Ethiopia and other developing countries where there is high HIV/AIDS and parasite prevalence. It will helpthe policymakers to implement measures to prevent the spread of IP in HIV/AIDS patients. if the patient is found infected in IP then will start the appropriate treatment.

It has helpedthe patients to know their infection status and take measures. The main issue is hadprovide the health officials with how the infection is spreading make changes in the hospital's measurement and provide information for non-governmental civic organizations.

Chronic immune activation by parasitic infection could be one of the several causes of T. cell depletion in HIV infection and could considerably contribute to the progression of HIV disease. Therefore, studies on such problems are highly significant. Sothis study tried to provide baseline data on the prevalence of IP in HIV/AIDS-infected patients who are taking ART. It also provided a clue to other researchers to do more on the effect of ART on IP infection ofthe patient.

CHAPTER TWO

2. LITERATURE REVIEW

Gastrointestinal involvement in HIV/AIDS is almost Universal and disease occurs in 50- 96% of patients. Diarrhea can be of presenting manifestation or a life-threatening complication of infection with HIV sometimes during the disease. Infections causedby diarrhea have been found in 30-80% of patients depending on the extent of the study and the patient'scharacteristics. [14]

Several species of protozoa have been associated with acute and chronic diarrhea in HIV disease. This includes: *C. parvum*, I. belli, *Microsporidia* species, *G. lamblia*, *E. histolytic/ dispar*, cyclospora species, Blastocysts hominies, and Dientamoebafragilis, but convincing evidence is lacking as to the causality of last two protozoa. Besides this S. stercolaris can cause diarrhea and hyperinfection in patients with a variety of immunosuppressive disorders including HIV/AIDS [15].

Opportunistic IP infection showed the highest prevalence in patients with a low immune level (CD4 < 200/µL and diarrhea. There was no significant predominance of non-opportunistic IP at any immune level. [16]

In a study carried out in Thailand, the prevalence of IP among the HIV infected patients was about 50%, H. worm, and *A. lumbricoid* appeared to have the highest prevalence (13.33%) and (10.33%) followed by *opisthorchisviverrini*(10%), *I. belli* (5%), *S. stercoralis*(3.33%,),*c.parvum* (3.33%) and Microsporidium (1.67%). The prevalence of IP was significantly higher in patients with diarrhea. [17]

A similar study was conducted on HIV-infected adults in Cameroon, and IPs were found in 33% of the patients studied. Helminthes were identified in 12.3% of patients, of whom 26.3% had *S. stercoralis* Larvae. Non-opportunistic protozoa mainly non-pathogenic amoeba were identified in 18% of patients. 4.5% of patients had *E. histolytica* /despair and 29% of patients had diarrhea. Opportunistic protozoa were found in 3.9% of patients, half of them had diarrhea and 1. 9% of patients had I. belli. [18]

A study carried out to determine the parasitic profile of Ethiopia HIV-positive patients shows that the incidence of IP infections like *A. lumbricoid*, *E. histolytic*/despair, *G. lamblia*, and *T.*

Stagnate, was higher in HIV-positive than HIV-negative, and the difference increases with increasing level of immunodeficiency. [19]

A variety of intestinal protozoa and helminths were found in 50% of HIV/AIDS patients and 42% of thecontrol. Cryptosporidiosiswasdetectedin38(25.9%), I belli in 2 (1.4%), and Blastocystosis in 1(0.7%) of AIDS patients with diarrhea, in a study conducted on 246 stool specimens collected in 6 hospitals of Addis Ababa. [20]

In a similar study conducted in Shenen Gibe Hospital among HIV/AIDS-infected patients, the parasites detected were *A. lumricoid* (30.8%), blastocyst species (14.1%), and E. histolytic/despair (10.3%). *T. Trichuria*(6.4*%), S. stercoralis* (5.1%), *G. lamblia* (3.8%), and multiple infections were common among HIV/AIDS-infected patients. (16) In another study conducted to determine the prevalence of IP infection in HIV/AIDS patients at shonen gibe Hospital, stool specimens from HIV/AIDS infected and HIV negative individuals were examined and the following result were obtained. Out of 78 HIV/AIDS patients 52.6 (41/78) and of 26-HIV negative individuals 42.6% (11/26), were infected with one or more parasites. Multiple infections were common among HIV/AIDS patients Blastocystisis species were found to be significantly higher in HIV/AIDS patients. [21]According to a study conducted in Dessie Referral Hospital North East Ethiopia in 2013, the overall prevalence of intestinal parasites among on ART was 17.6% and from these the prevalence of protozoan and helminthic was 12.5% and 5.1% respectively. However, none of the ART patients were identified with opportunistic parasites and mixed infection. The most prevalent protozoan parasites and helminths among ART patients were trophozoites of *E.histolytica*/dispar and *A. lumbricoides* with respect prevalence of 5.1% and 2.2%. The overall prevalence of intestinal parasites in the pre-ART was 39% higher when compared with the ART groups (17.5 % indicating a statistically significant decrease in intestinal parasites in ART patients ($p<0.001$). The overall prevalence of intestinal parasites among the study participants was 37.7% (125/137). It was significantly higher in ART naïve group (45.5%) (51/112) compared to ART (28.6%) (74/259) ($P=0.002$). Even parasite species were detected *in E.hitolytica*/dispar(13.4%) in ART naïve groups and 13.5% in ART group ($p>0.05$) and *G.lamblia*(7.1%) in ART naïve group and 8.5% in ART group when the common ones opportunistic parasites like Cryptosporidium (7.1%) and *I.belli*(4.5%) were found only in ART naïve group. Some of the ART naïve group (28.8%) and few of the ART

(17.4%) subjects were diarrheic (p>0.05), Cryptosporidium species, *I.belli*, and *S.stercora.*The overall prevalence of intestinal parasites was significantly higher among diarrheic 53.5%, (40/75) as compared to none diarrheic 28.7 %(85/259) study participants. [22]

CHAPTER THREE

3. OBJECTIVES

3.1. General objective

•To determine the prevalence of intestinal parasites in HIV /AIDS patients who are taking ART at Worabe Comprehensive Specialized Hospital.

3.2. Specific objective

- To determine the prevalence of Intestinal Parasites in HIV/AIDS patients onART

CHAPTER FOUR

4. Methods and materials

Study Area and Period

4.1.1 Study Area

This study was conducted in WCSH in Worabe city, which is 170.3 km away from Addis Ababa in the southern part of Ethiopia 147.4 km from Hawassa, and 85.1 km from wolkite town. The sub-city has an altitude of about 2113m above sea level, with temperature ranges from 170c to 290c and rainfall ranges between 200mm to 2200mm Worabe Comprehensive Hospital is a government health institution providing healthcare services to > 1 million people.

4.1.2 Study period

The study was conducted in a comprehensive specialized hospital from May to August**.**

4.1.3 Study design

A cross-sectional study design was conducted todetermine the prevalence of intestinal parasites among HIV-positive patients who are attending ART in WCSH.

4.2 Population

4.2.1 Source population

All HIV-positive patients who were attending ART and visited the hospital**.**

4.2.2Study population

All HIV-positive patients who attend ART in the hospital

4.2.3 Study subjects

All HIV-positive patients whoattend ART and who fulfilled our inclusion criteria.

4.3 Inclusion and Exclusion Criteria

4.3.1 Inclusion Criteria

HIV patients who are attending ART

4.3.2 Exclusion Criteria

HIV-negative and unable to comprehend

4.4. Sample size and sampling technique

4.4.1. Sample size

According to the study carried out in Debratabor General Hospital, the overall previous prevalence of intestinal parasites in study participants who were on ART was 17.6% of the sample size will be; [23]

$$n = \frac{(Z_{a/2})^2 * P (1-P)}{d^2}$$

Where: n is the minimum sample size required

Z is the critical value for a given confidence interval

P is the prevalence of intestinal parasites among people with HIV/AIDS

d is margin of error is 5%

Then $n = (1.96)^2 * (0.176 \times 0.824) / (0.05)^2$

$3.8416 * 0.1450 / 0.0025 = 223$

Our final sample size including 10% of non-responding rate will be 246.

4.4.2. Sampling technique

A convenience sampling technique was employed on HIV/AIDS patients who came for ART during the study period.

4.5. Variables

4.5.2. Dependent variable

Prevalence of intestinal parasites

4.6. Data Collection and Sample Processing

4.6.1. Data Collection

The patients were provided with appropriate specimen containers and applicator sticks to bring a sufficient amount of stool specimens. During data collection, the occupational status of children depended on their families. For children, the data was collected with the help of their parents and guardians (relatives). Interviewing and pre-tested structured questionnaire was used to collect data on socio-demography and other independent variables. Then the stool was examined macroscopically before and microscopically using a wet mount. Data generated from the laboratory results and questionnaires of similar groups were collected together for analysis.

4.6.2. Sample Processing

The stool sample was collected from the study participants (subjects) labeled with specific codenumbers. The stool sample was examined both macroscopically and microscopically.

Macroscopically its appearance was observed while microscopically it was examined using a wet mount.

4.7. Data Processing and Analysis

The collected data was stored in the prepared format for processing in SPPS and analysis. The result was analyzed manually using a scientific calculator to determine the prevalence of each parasite and the prevalence of other factors.

4.8. Data Quality Assurance

The quality of normal saline and formal ether concentration was checked by preparation of a positive slide from the positive preserved sample in the laboratory. The investigator used the standard Operational Procedure (SOP) of microscopic examination of intestinal parasites. To avoid technical errors encountered during sample collection and microscopic examination, internal quality control was performed. The data collection format of each data collector was checked daily for completeness of missed or other relevant information on meetings and supervision during data collection as well as by the principal investigators. Special emphasis will

be given to diarrhea stool samples. In addition to this formed and semi-formed stool was preserved by formalin to further examining by microscope. Questionnaires were checked for their consistency and completeness by the investigators.

4.9. Ethical Consideration

A letter of support will be obtained from Wolkite University, College of Health and Medical Sciences Department of Medical Laboratory Science. Permission was obtained from WCSH. The participant was informed about the purpose of the study and the importance of their participation in the study. Only the volunteer individuals were involved and the study participant will have the right to withdraw from the study at any time. Those participants who will be positive for intestinal parasites will be treated by communicating with the concerned body of the hospital. Results will be kept confidential.

4.10 Operational Definitions

Co-infection: - An infection by two or more parasites.

Diarrhea: - is loosely defined as the passage of abnormally liquid or unformed stools at an increased frequency and chronic if 4 weeks in duration.

Illiterate: A person who is not able to read and write

Literate: A person who can read and write

Immuno-compromisation: - A state of the body in which some elements of the immune system either fail to respond or respond less optimally.

Host: - an organism that harbors the parasite

Opportunistic infection: - Is an infection with an organism such as Bacteria, fungi, and parasites that does not cause disease in a healthy person, but threatening illness in the personae of immunodeficiency.

Cyst: - A stage in the life cycle of certain parasites during which they are enclosed within a protective sac.

Host: - is an organism that harbors the parasite and gives nutrition and or physical protection to the parasite.

Specimen: - sample selected for diagnosis, study, or testing

4.11. Plan for Dissemination of the finding

The result of this research will be submitted to, Wolkite University, College of Health and medical science, department of medical laboratory science. In addition to this, the information will be provided to WCSHand any concerned organization as needed.

CHAPTER FIVE

5.1Results

Socio-demographic characteristics of the study participants

A total of 114 Hiv positive individuals participated in this study 52 males(45.6%) and 62 females (54.4%) respectively. The age of the study participants ranges from 6-65 years old. Age of the participants 18.4% were within the range of 6-25. 57.9% were within the range of 26-40. 23.7% were within the range of 41-65. Regarding their educational status from a total of 114, 25.4% were illiterate 28.9% had primary education 30.7% had secondary educational status and 14.9% were participants with tertiary educational status. some of them were university students currently.

Table 1. Prevalence of intestinal parasite in socio-demographiccharacters of study participantsin Worabe Comprehensive Specialized Hospital, south-central Ethiopia from May to August 2023.

VARIABLES		**INTESTINAL PARASITE**							**Positivity rate (%)**
		G.L	E.H	H.W	S.S	Tae.	Other	Total	
Sex (number)	Male (52)	8	7	2	7	4	1	29	**45.4**
	Female (62)	19	11	0	3	0	2	35	**55.6**
	Total (114)	27	18	2	10	4	3	64	**100**
Age	6-25 (21)	5	6	0	4	0	0	15	**23.4**
	26-40 (66)	16	9	1	2	2	2	32	**50**
	41-65 (27)	6	3	1	4	2	1	17	**26.6**
	Total (114)	27	18	2	10	4	3	64	**100**
Educational status	Illiterate (29)	9	7	0	2	3	0	21	**32.8**
	Primary (33)	6	3	1	4	0	2	16	**25**
	Secondary (35)	6	6	1	2	1	1	17	**26.6**
	Tertiary (17)	6	2	0	2	0	0	10	**15.6**
	Total (114)	27	18	2	10	4	3	64	**100**
Occupation	Private (30)	6	4	1	2	1	1	15	**23.5**
	Civil servant (20)	3	4	0	2	0	0	9	**14**
	Farmer (16)	3	4	0	3	1	1	12	**18.8**
	Merchant (15)	6	0	0	0	1	1	8	**12.5**
	Student (8)	4	1	0	1	0	0	6	**9.4**
	Driver (9)	0	3	1	0	0	0	4	**6.2**
	Housewife (13)	4	2	0	1	0	0	7	**10.9**
	Others (3)	1	0	0	1	1	0	3	**4.7**
	Total (114)	27	18	2	10	4	3	64	**100**
Resident	Urban (78)	18	12	2	1	2	1	36	**56.3**
	Rural (36)	9	6	0	9	2	2	28	**43.7**
	Total (114)	27	18	2	10	4	3	64	**100**

G.L;G.lamblia, E.H;E. histolytica, H.W; H.ookworm, S.S;S.stercolaris,Tae;taenia specie

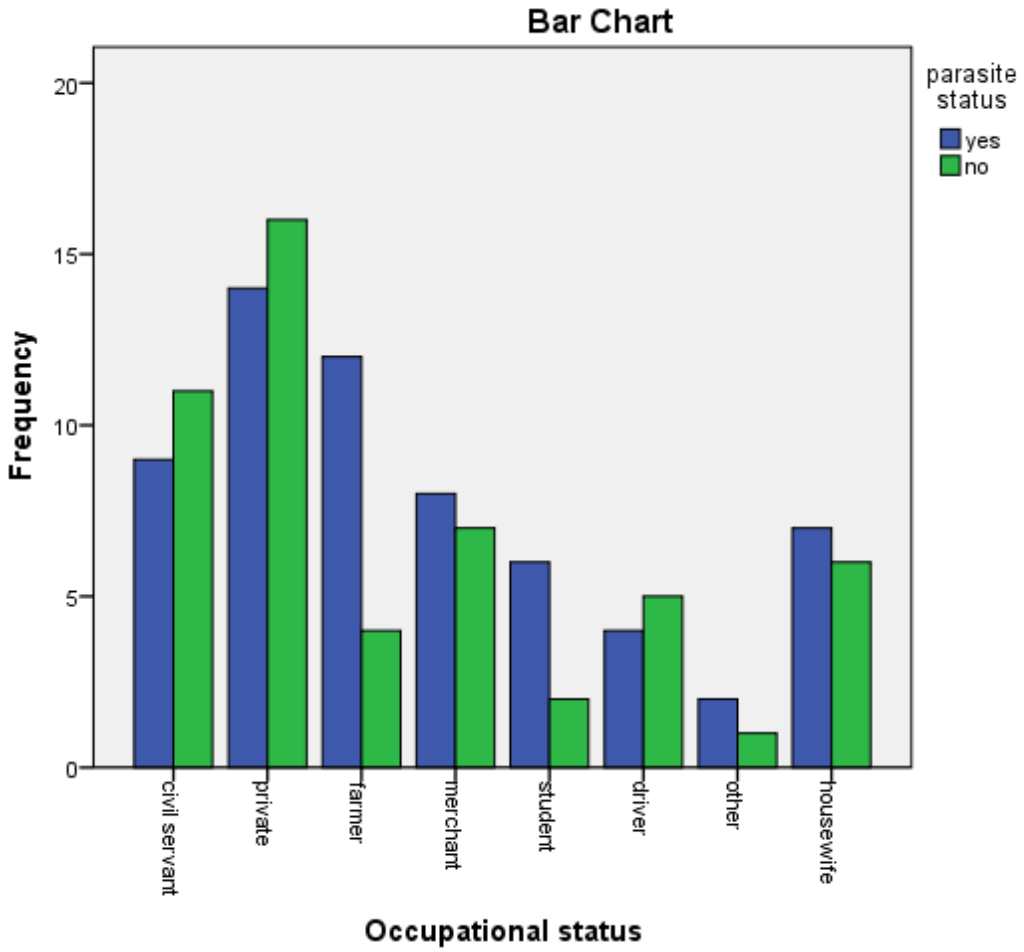

Figure 1 Intestinal parasite distribution in different occupational statuses in Worabe Comprehensive Specialized Hospital, south-central Ethiopia from May to August 2023.

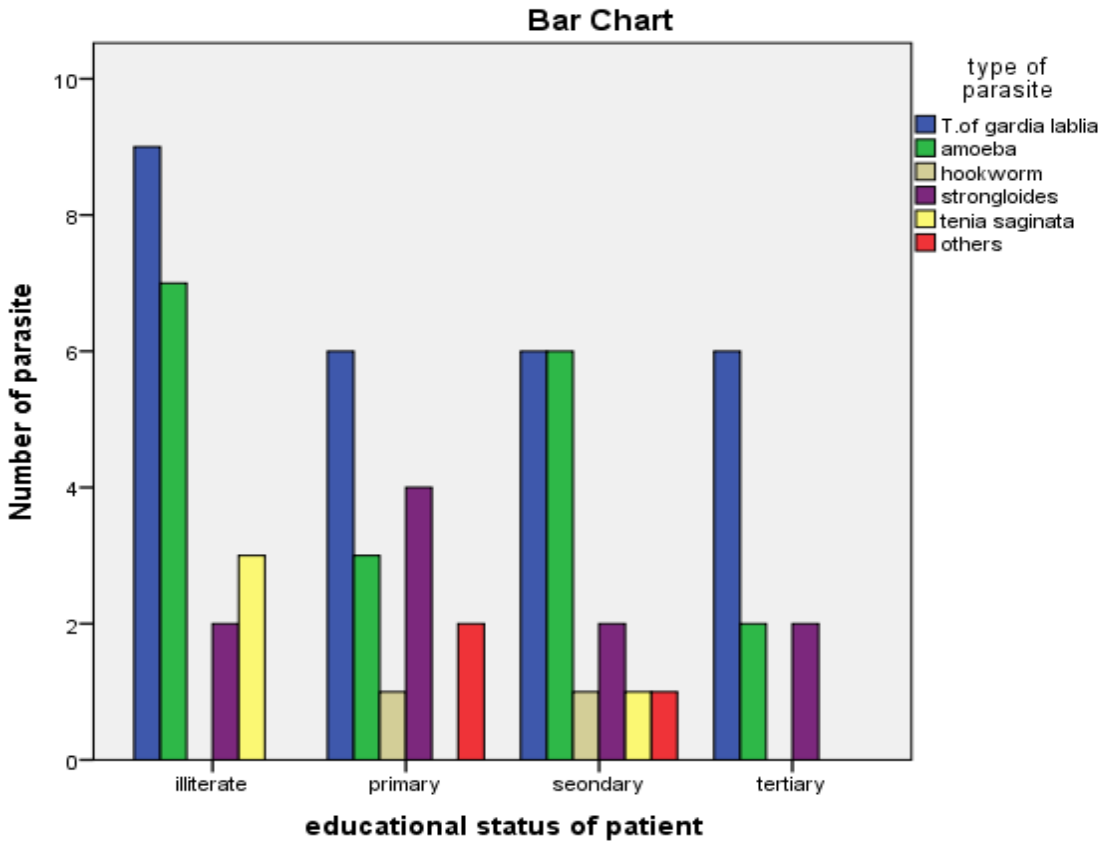

Figure 2 Distribution of intestinal parasites in educational status in Worabe Comprehensive Specialized Hospital, south-central Ethiopia from May to August 2023.

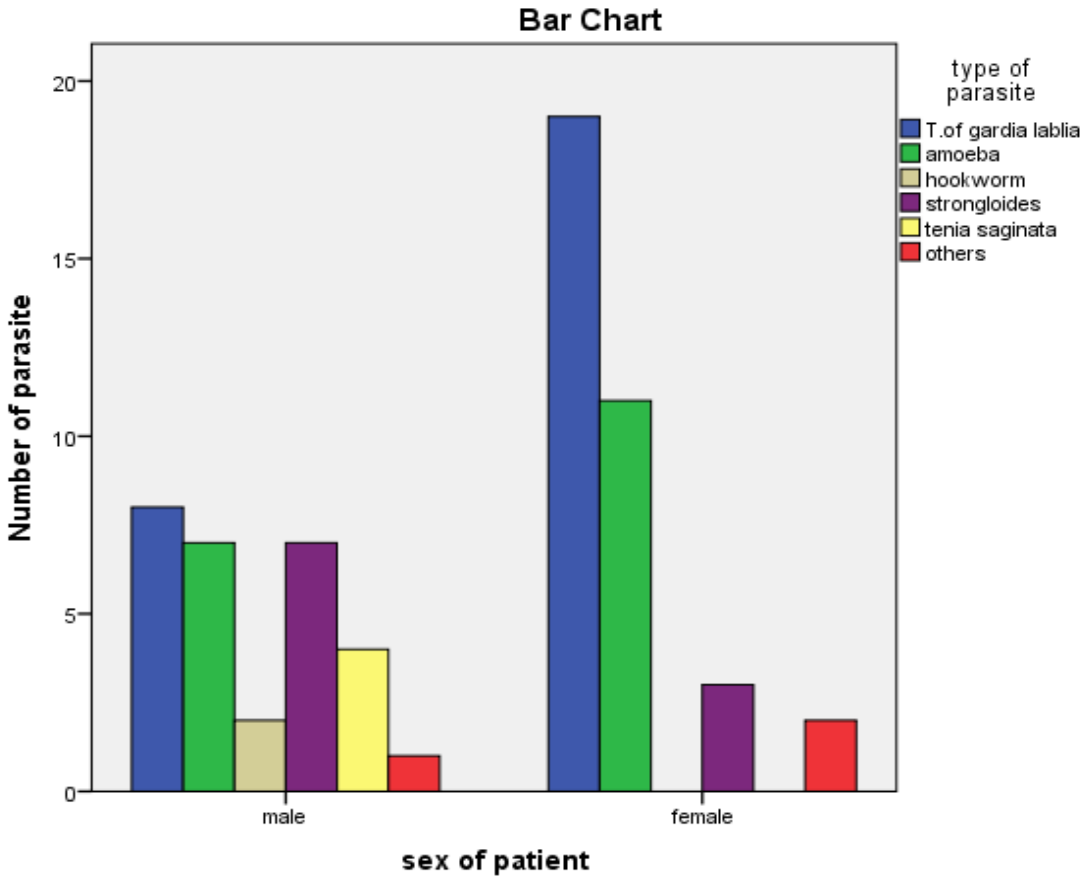

Figure 3distribution of intestinal parasite in sex groups in Worabe Comprehensive Specialized Hospital, south-central Ethiopia from May to August 2023.

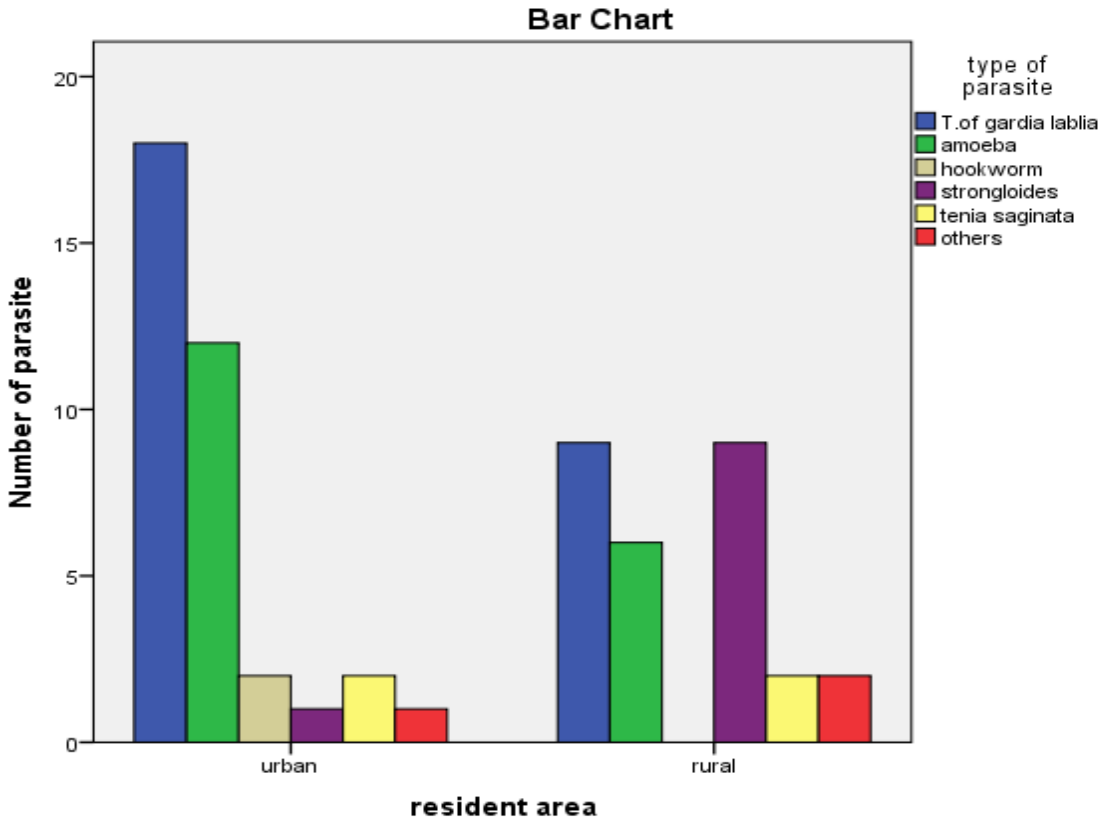

Figure 4 Distribution of intestinal parasites in male and female patients in Worabe Comprehensive Specialized Hospital, south-central Ethiopia from May to August.

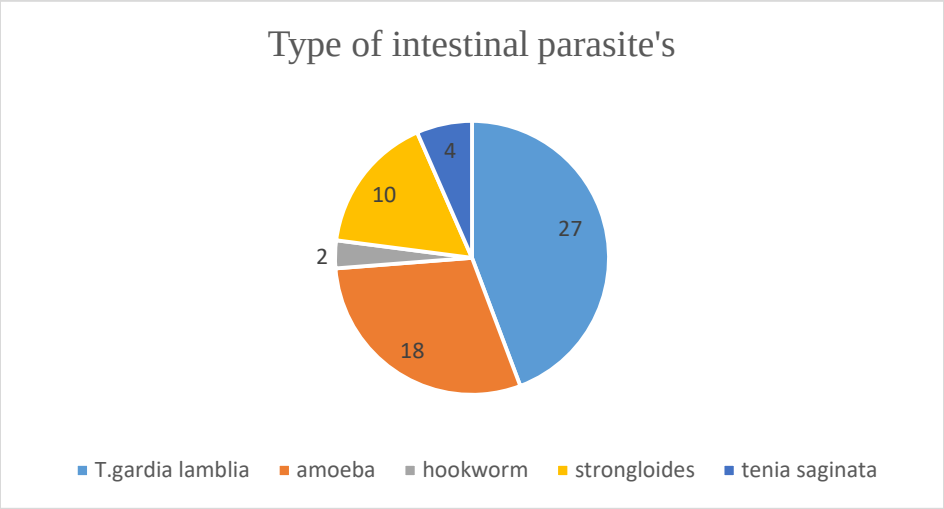

Figure-5 Prevalence of intestinal parasites

Among 114 of the study subjects 32(28.1%) had no habits of washing their hands. However, 82(71.9%) subjects did have good hand-washing practices.

For species-specific assessment of intestinal parasites, about 114 HIV-positive individuals were involved during the study, according to the study, intestinal parasites found were 62(54. 4%).the species-specific prevalence of parasites found were 27(43.5%) giardia lamblia, 18(29%) amoeba, 2(3.2%) hookworm, 10(16%) strongholds 4(6.4%) *T.saginata*

CHAPTER SIX

Discussion

Intestinal parasite infection is highly prevalent in Ethiopia and it has been one of the major health problems in HIV-infected individuals. This study determined the prevalence of intestinal parasites among HIV-infected patients taking ART participants. In addition to this, It will helpthe patients to know their infection status and take measures, aid the health officials in identifying how the infection is spreading make changes in the hospital measurement and provide information for non-governmental civic organizations, and lastly for the policymakers to identify related causes and implement measures to prevent the spread of IP in HIV/AIDS patients.

In our study, the total magnitude of prevalence of intestinal parasites among HIV patients is 54.4%. Similar research conducted among patients at Jimma Hospital indicates a magnitude of 52.6% prevalence (25). Another research done among HIV/AIDS patients on ART therapy at Bule Hora General Hospital, West Guji, Ethiopia indicates a lower prevalence of 29.1%. [26] The higher prevalence number in our study may be a result of environmental conditions, low clean water access, and low educational status.

The prevalence of intestinal parasites among on–ART patients was 20%, which is comparable with studies conducted in Dessie Hospital in Ethiopia (17.6%), in Brazil (24%), and in eastern Tigray (25.5%) [26][27]. however, prevalence is lower than that reported in Nigeria (30%) and in selected ART centers of Adama, afar, and dire-dawa 48%[28]. This might be due to better follow-up through laboratory tests, and better awareness on the part of patients in adopting prevention and treatment measures against intestinal parasites. In addition, anti-helminths may have been given to certain groups of on–ART patients for deworming.

The results show that Giardia Lambilia is the most prevalent followed by EntameobaHistolitica and hookworm respectively.

Limitations of the study

- Lack of willingness in the patients and is very eager to finish and go without to let as finishing filling our questionnaire.
- Many of Our study participants came for medications within three to six months so we couldn't fulfill our sample size.

Conclusion and recommendation

Conclusion

Public health measures should continue to emphasize the importance of environmental and personal hygiene as well as provide and monitor the quality of drinking water aiming to obtain a better standard of life for those patients. As a result, a holistic approach that includes periodic screening and deworming as well as sanitation is required to eradicate parasites and provide them with optimal health and a high quality of life.

Recommendation

Based on the study the following recommendations were given:-

Health education should be given to HIV/AIDS patients to practice good personal hygiene and environmental sanitation.

Health education on the mode of transmission and method of prevention of the parasite should be given to HIV/AIDS patients.

References

1)A. O. Y. O. H. Okodua M, "Age and sex distribution of intestinal parasitic infection among HIV infected subjects in Abeokuta Nigeria," *Online Journal of Health and Allied Sciences,* p. 2(4), 2004.

2)WHO, "AIDS epidemic update," 2018.

3)E. B. M. G. A. Z. S. T. Assefa S, "Intestinal parasitic infection about HIV/AIDS status diarrhea and CD4 T-cell count.," *BMC Infectious Disease,* p. (1):155, 2019

4)S. N. Nissapaton V, "Parasitic infection in HIV infected individuals diagnostic and therapeutic challenges," *The Indian Journal of Medical Research,* p. 134(6):878, 2011.

5)L. A. Q. M. S. G. B. O. A. G. Maggi P, "Effects of antiretroviral therapy on cryptosporidiosis and microsporidiosis in patients infected with human immunodeficiency virus type 1.," *European Jornal of Clinical Microbiology and Infectious Diseases.,* pp. 213 -220, 2000.

6)M. L. O. C. B. L.-G. W. R. Lawn SD, "Early mortality among adults accessing a community-based antiretroviral service in South Africa: implication for program design.," 2005.

7)Y. B. K. C. C. K. O. M. S. M. Hogg RS, "Improved survival among HIV infected patients after initiation of triple-drug antiretroviral regiments.," *Canadian Medical Association Journal,* pp. 160(5):659-65, 1999.

8)M. L. Alfonso Y, "HIV protease inhibitors: effects on the opportunistic protozoan parasites.," *The open Medicinal Chemistry Journal.,* 2011.

9)A. T. D. G. N. N. B. Y. C. R. Reniers G, "Steep declines in population-level AIDS mortality following the introduction of antiretroviral therapy in Addis Ababa Ethiopia," 2009.

10)UNAID, "Global AIDS epidemic," UNAID, Switzerland, Geneva, 2019.

11)N. C. ,. V. Nkenfou CN, "Intestinal parasitic infection in HIV infected and non-infected patients in low HIV prevalence region," Western Cameroon, 2013.

12)e. a. Wadilo F, "Intestinal parasitic infection and associated factors among food handlers in south Ethiopia," WolaitaSodo Tow, WolaitaSodo Tow, 2016;.

13)S. S. J. Phillips MA, Chemotherapy of protozoal infections: Amebiasis, giardiasis, trichomoniasis, trypanosomiasis, leishmaniasis, and other protozoal infections 12th ed, New York: Goodman & Gilman's the pharmacological basis of therapeutics. , 2001.

14)yg and e. R. S. T. M. Htal, "Prevalence of intestinal parasite among HIV/AIDS," goverment, 1990.

15)D. D. C. a. J. M, "HIV infection and the gastrointestinal immune system.Mucosalimmunol," pp. 1(1):23-30., 2008 Jun.

16)W. A. G. Markos E, "Adherence to ART in PLW HA at Yirgalem Hospital South Ethiopian," *Journal of Health Science,* p. 23(3), 2008.

17)T. e. H/Michael, "Increased incidence of Intestinal parasitic infection in HIV positive when compared with negative individual," Ethiopian health minister, 1999.

18)M. S. e. Mohammed A., " Prevalence of intestinal parasites in HIV infected adult patients in the west Ethiopia," *Ethiopia J. Health.* ,pp. 71-74, 2003 Dec.

19)USAIDS, "USAIDS report on global HIV/AIDS epidemic," USAIDS, Jun 2007.

20)F. H. p. o. i. m. 1. ed, prevalence intestinal parasite in HIV/AID seropositive patient, USA: USA MC grow will Book Company, 2005.

21)S. C.etal, "Prevalence of intestinal parasites including microsporidia in HIV infected adult," Amit Trop.Medhys, 2006.

22)S. T. d. W. T. T. W. T. Y. H. a. C. R. A. Fontanet A L, ". Epidemiology of intestinal parasites and human immunodeficiencies virus among sugar-estate residents in Ethiopia," Annal of Tropic Medicine and parasitology, 2000.

23). Missaye A, Dagnew M, Alemu A prevalence of intestinal parasites and associated risk factors among Hiv/AIDS patients with pre-ART and on-ART attending Dessie Hospital ART clinic, northeast Ethiopia.AIDS Research and Therapy 2013

24)E. B. M. G. A. Z. S. T. Assefa S, "Intestinal parasitic infection about HIV/AIDS status diarrhea and CD4 T-cell count.," *BMC Infectious Diseases,* p. (1):155, 2009.

25) Hailemariam G, Kassu A, Abebe G, Abate E, Damte D, Mekonnen E, OteF.Inestinal parasitic infections in HIV/aids and HIV seronegative individuals in a teaching hospital, Ethiopia. jpn j infect dis 2004 Apr;57(2):41-3

26) Aliyo A, Gemechu T. Assessment of intestinal parasites and associated factors among HIV/aids patients on antiretroviral therapy at Bole Hora General Hospital, West Guji, Ethiopia.SAGE Open med.2022 Sep 15

27) Missaye A, Dagnew M, Alemu A prevalence of intestinal parasites and associated risk factors among Hiv/AIDS patients with pre-ART and on-ART attending Dessie Hospital ART clinic, northeast Ethiopia.AIDS Research and Therapy2013 ;

28) Kiros H, Nibret E Munshea A, Kerisew B, Adal M. Prevalence of intestinal protozoan infections among individuals living with HIV/AIDS at FelegehiwotreferralHospital, Bahir dar, Ethiopia.

ANNEX I

QUESTIONER IN ENGILSH

Questionnaire for investigation of the prevalence of Intestinal parasites among HIV/AIDS patients at shennen gibe Hospital, Jimma Ethiopia

Socio-demographic Data

A. Patient identification

1. code No_____
2. Age _____
3. Sex _____

B. **Occupation status**

1. Government □
2. Privates □
3. Student □
4. Farmer □
5. House wife □
6. Merchant □
7. Driver □
8. Sex worker □
9. Other /specify

C. Educational status

1. Illiterate □
2. Read and write only □
3. 1-4 grades □
4. 5-8 grades □
5. 9-12 grades □
6. >12 grade □

D. Marital status

Single □ Married □ Divorced □ Widowed □

E. Predisposing factors for intestinal parasites

1. Habit of hand washing before meal Yes □ No □
2. Habit of hand washing after toilet Yes □ No □
3. Habit of using latrine Yes □ No □
4. Eating fresh fruit Yes □ No □

Source of water supply for drink

1. Pipe water □
2. - Well □
3. - Spring □
4. Stream □
5. - River □
6. Public stand point □

ANNEX II

QUESTIONARY AMHARIC VERSION

ወልቂጤዩኒቨርሲቲየጤናናሕክምናሳይንስኮሌጅየሕክምናላብራቶሪሳይንስትምህርትክፍል

እኛበወልቂጤዩኒቨርሲቲየሕክምናላብራቶሪሳይንስተማሪነን።

እኛበአሁኑወቅትጥገኛየአንጀትትላትሎች(ተዋህስያን)

በኤችአይቪኤድስህሙማንላይያላቸዉንስርጭትናመንስኤዎቻቸዉንለማወቅጥናትእያደረግንነዉ።

የጥናቱአላማጥገኛየአንጀትትላትሎችበኤችአይቪኤድስሕሙማንላይያላቸዉንስርጭትናመንስኤዎቻቸዉን

ለማዎቅነዉ።እርሰዎበዚህጥናትላይለመሳተፍፈቃደኛከሆኑ፣

ትንሽየሰገራናሙናይሰጡንናመጠይቁንይሞሉልናል።

የሱጡንየሰገራናሙናናመረጃበርሰዎላይምንምአይነትተጽእኖየለዉም፡

መረጃዎቹሁሉሚስጥራዊነታቸዉየተጠበቀነው።

ተሳትፎውበፈቃደኝነትላይየተመሰረተበመሆኑእርሰዎየመሳተፍምያለመሳተፍምመብትአለዎት።

መጠይቁንበመሳተፍላይሳሉምንምአይነትያልተመቸዎትነገርካለተሳትፎዎንማቁአረጥይችላሉ።

ነገርግንበጥናቱላይበመሳተፍዎተጠቃሚየሆናሉ።

ይህምማለትየአንጀትትላትልከተገኝብዎትመድሀኒትይወስዳሉ።

ስለዚህእርሰዎመጠይቁንለመሙላትፈቃደኛነዎት

ሀ.አዎ ለ.አይደለሁም

ፊርማ----------

ክፍልአንድ፡- <u>ማህበራዊሁኔታ</u>

1.**ጾታ**ሀ. ወንድለ. ሴት

2.**ዕድሜ**ሀ. 0-5 ሐ. 25-40

ለ. 6-25 መ. ከ40-65 ሰከ65 በላይ

3.**ሐይማኖት**ሀ. ኦርቶዶክስሐ. ፕሮቴስታንት

ለ. ሙስሊምመ. ካቶሊክሠ. ሌላ

4**. ብሔር**ሀ. ስልጤሐ.ሀዲያሠ. ወላይታ

መ. ጉራጌለ. ሃላባረ. ሌላ----------

5**. የጋብቻሁኔታ**ሀ. ያላገባ(ባች) ለ. ያገባ(ባች)

ሐ. የፈታ(ታች) መ. የሞተችበት(ባት)

ሐ. ሁለተኛደረጃ (9 12) መ. ከ 12ኛክፍልበላይ

7.**የስራሁኔታ**ሀ.የመንግስትሰራተኛለ. የግልሰራተኛ

ሐ.ገበሬመ. ነጋዴ

ሠ. ተማሪረ. ሾፌርሸየቤትእመቤት

8**የገቢሁኔታ** …

ሀ) ከ>1500 በላይለ)ከ1500 3000)ከ3000 በላይ

9.**መኖሪያ**ሀ. ከተማ

ለ.ገጠር

10) **ከሽንትቤትስንወጣእጅመታጠብ……?**

ሀ.አዎ

ለ. አይደለሁም

11)**ጥሬስጋመመገብ**

ሀ)አዎ

ለ)አይ

12)**መዳጃቤት**

ሀ)ክፍትቦታ

ለ) የተከለለቦታ

13)**ከእንሣትጋርንክኪ**

ሀ) አዎ

ለ)አይ

14)**የውሀምንጭ**

ሀ)የዝናብ ውሀ

ለ)የቧንቧ ውሀ

መ)የወንዝ ውሃ

ሰ)ሌላ

15)**አትክልትመመገብ**

ሀ)አዎ

ለ)አይ

ANNEX III
LABORATORY PROCEDURES

Specimen collection

Leak proof wide mouth specimen container will be given to patient with applicator stick.

Brief explanation will be given to patient about type and amount of specimen.

Labeling specimen with patient code No. The specimen will be examined microscopically and macroscopically after sample collection.

A. Direct microscopy

Stool of patient well be mixes with normal saline or lodine (lugol) on the slide, the size of stool is usually match head size.

Cover with cover slide.

Examine systematical for entire preparation for lavae, ciliates, helminthes, ova, cysts, trophozoites, oocysts and sometimes for adults worm macroscopically.

Use 10x objectives with the condenser iris diagram is closed sufficiently.

Always exam several microscopic fields before report says

"No O/P is seen"

B. Formol-ether Oocyst concentration technique.

using by applicator stick, emulsity and estimated 1 gm (pea- sized of stool in about 4 ml of 10% formol water contained in a screwed – cup bottle.

Add further 3-4 ml of 10% formol water, cap the bottle and mix well by shaking.

Sieve the emulsified stool, collecting the sieved specimen in a beaker.

Transfer the suspension to a conical tube made up of strong glass, copolymer or poly propylene, Add 3-4 ml of diethyl ether.

Stopper the tube and mix for about 15 seconds.

With tissue or a pieces of cloth wrapped around the tube of loosen the stopper (considerable pressure will applied upside the tube)

Centrifuge immediately at low speed i.e. RCF (300- 400g about 100rpm)for 1 minute.

8. Using a pasture pipette, carefully remove the entire column of fluid below the fecal debris and ether, transfer this to centrifuge tube.

9. Add a formol water to make the volume up to 10 -15 ml, centrifuge at RCF (750 – 1000g about 3000 RPM) for 1 minute.

10. Remove the supernatant. Tap the bottom of the tube re-suspend and mix the sediment. Transfer the sediment to the slide and examine using 40X objective.

.

Annexy iv
Declaration form

The undersigned declares that this thesis complies with the university's regulations and meets the accepted standards concerning originality and quality. Principal investigators also agree to take responsibility for the research project's scientific, ethical, and technical conduct and the provision of required progress reports.

BSc candidate students name:

1. Abdulhamid Sadik Signature: _____Date of submission: 18/12/2015 E.C

2. Biruk Hailu Signature: _____Date of submission: 18/12/2015 E.C

3. Tadesse Endale Signature: _____Date of submission: 18/12/2015 E.C

4.Amira Mohammed Signature: _____ Date of submission: 18/12/2015E.C

APPROVAL OF THE ADVISORS

This research paper approved by University advisors:

1. Name of 1st advisor: Mr. Habtamu B. (BSc, MSc,)

Signature: _____ Date of submission: _____/_____/_____

2. Name of 2nd advisor: Mr. Asnake S. (BSc, MSc)

Signature: _____ Date of submission: _____/_____/_____

Examiner

Name: _____Signature: _____Date_____/_____/_____

Name: _____ Signature: _____Date_____/_____/_____

Name of School head: Mr. KASSAHUN HAILE (BSc, MSc,)

Signature: _____ Date of submission: _____/_____/_____

AUGUST, 2023

WOLKITE, ETHIOPIA