

**TRENDS AND SEASONAL PATTERNS IN INTESTINAL PARASITES AMONG
PATIENTS ATTENDED GUNCHIRE PRIMERY HOSPITAL, GUNCHIRE
ETHIOPIA: A THREE YEAR RETROSPECTIVE STUDY**



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Trends and Seasonal Patterns in intestinal Parasites among patients diagnosed in
gunchire primary hospital

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ABSTRACT

Background: Intestinal parasitic infection is a serious public health problem in developing countries particularly is the major cause of morbidity in Africa, including Ethiopia. Its rate of transmission is mainly favoured by socio economic, environmental sanitation and geographical factors.

Objective: to assess trends and seasonal patterns in intestinal parasites among patients seeking stool examination at primary health facilities in gunchire primary hospital in the past three consecutive years (Jan. 1, 2019-Dec 30, 2021 G C).

Method: A retrospective study was conducted to determine the trend of intestinal parasite prevalence from laboratory registration books over the past three years at Gunchire primary hospital. The data was coded, cleaned and analysed by using statistical packages (SPSS version 20).The association between intestinal parasitic infection and different demographic variables was determined by using chi-square test

Result: 11,417 records were reviewed in GPH laboratory from 2019 to 2021 G C to determine the trends and seasonal patterns of intestinal parasites. A total of 4414(38.7%) male and 7003 (61.3%) female records were viewed from the laboratory registration books with minimum age one day and maximum age 95. Of the total 11,417; 2836(24.84%) were infected with intestinal parasite and from the total 2836 infected 1097(38.7%) male and 1739(61.3%) were female. The most dominant intestinal parasite in all three years was *E.histolytica* and the least prevalent parasite was *S stercoralis*.

Conclusion: Seasonal fluctuations in the prevalence and dominance of protozoa intestinal parasitic infections were observed.

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ABBREVIATION

IP	intestinal parasite
IPIs	intestinal parasite infections
NGO	Non-governmental organization
WHO	world health organization
CDC	Center of disease control and prevention
USA	United States of America
CI	confidence interval
Ni	number of interval
OD	odds ratio
GPH	gunchira primary hospital

CHAPTER ONE : INTRODUCTION

1.1 Background

Intestinal parasite is organisms that live in and take its Nourishment from other Organisms in the intestinal tract.

The two main types of intestinal parasites are helminths and protozoa (1)

The helminths consist of two phyla: the Platyhelminthes (flatworm) and the Nematode (round worm).

The Platy helminthes are further subdivided in to two classes: the trematode (flukes) and cestode (tapeworm) Worms have three taxonomic groups: cestode (tapeworm), nematode (round worm) and trematode (flukes).

Protozoa is single celled organisms in some classification considered a super phylum or a subkingdom comprises flagellates, ciliates, protozoans, and amoebas (2).

Intestinal parasites are frequently transmitted via contaminated food or drink water, but may also be spread from person to person through fecal-oral contact.

Intestinal parasitic protozoa and helminthic infection are widely distributed throughout the world, especially in the developing countries.

World Health organizations (WHO) estimate that some 3.5 billion people worldwide are affected and that 450millions are ill as result of this infection (3).

In general several diagnostic method such as direct fecal smear (wet mount),concentration technique formolal_ethyl acetate concentration (FECT) and zinc sulphate flotation techniques (ZSFT),harada_morifilter paper culture or nutrient agar plat culture antigen detection, antibody detection (serological method) and animal inoculation have been used to identify various diagnostic stage of intestinal parasite in the stool samples(5).

1.2 Statement of the problem

Intestinal parasites and protozoan infections are among the most common infections worldwide [6].

It was estimated that 500 million of people are affected by Amoebiasis, 200 million by Giardiasis, 800 million with as *Ascaris*, 800 million by Trichuriasis (whipworm), 900 million by hook worm, 50 –10 million by strongloidiasis, 42 million with *Entrobious* (pinworm).In developed country and about 1% of population in endemic country affected by *Taenia* (cysticercosis)[7].

The prevalence and distribution of IPIs differ from region to region due to several environmental, geographical, and social factors [8, 9].

The prevalence of IPIs would be expected higher in developing countries most likely due to low income, lack of pure water supply, inadequate sanitation, hygiene, and low level of education [10, 11].

Like other developing countries IPIs are common in Ethiopia and cause serious public health problems such as malnutrition, anemia, and growth retardation as well as a higher susceptibility to other infections [14]. And causes of outpatient morbidity in the country [12, 13]. Intestinal parasitic infections are also common problem in gurage zone studies conducted in different parts of the zone has reported a high prevalence of infection.

a retrospective study done at Atat hospital has shown that Out of 15,731 examined stool samples, 7062 (45%) were infected by intestinal protozoan parasites[28]. Most of the infected individuals were infected by *Entamoeba histolytica* (60.0%) and the least was infected by *Cryptosporidium parvum* (3.6%). The study also pinpointed that higher infection was observed among males, 5-9 year age group, and during wet seasons. So, this study will further explore the burden of the disease in the study area.

1.3 Significance of the study

- ✓ Who is interested in this study and to intervene by providing access and creating awareness about the transmission, symptoms, sign, treatment, prevention and control.
- ✓ The study will be used for health professionals, guragezone health bureau to plan how much effort they invest on these issues and to give emphasis on taking appropriate measurement on creating awareness about the parasite distribution.
- ✓ The study will serve as base line information for those who want to study on the knowledge, attitudes and the communities practice towards the impact of parasite.
- ✓ The study will also use to inform the magnitude of parasite with regard to age, sex in the study period.

CHAPTER TWO: LITERATURE REVIEW

2.1 Global status of parasite prevalence

Several study showed that intestinal parasitic infection was distributed virtually throughout the world with high prevalence rate. For example, In USA from center for disease control and prevention (CDC), intestinal parasite surveillance program parasitic forms were found in 64901 (15.6%) of over 400,000 sample examine *Giardialamblia* found in 3.8% of all stool specimens followed by ova of *Trichuristrichiura*(2.7%),*Ascarislumbericoides*(2.3%) *Entrobious vermicularlis* ova (1.6%) and *Entamoeba histologica* is 0.6% of all stool specimens [16].

Similarly, a study conducted in North Vietnam showed that, egg or cyst of at least one parasitic species was detected in 88% of stool sample (n=2522). Hook worm (52%), *Trichuristrichiura* 50% and *Ascarislumbericoides* (45%). *Ascaris* infection appears to be low among house hold owning latrine and higher among children and decreasing with age. Egg of *chlonorchisspp* was found in 126(5%) individual. *Taenia* egg found in three individuals (1.1%), *Gardíalamblia* was found in all districts and among all groups and the prevalence of infection was 3 % [14].

The study was a retrospective study. Data was reviewed from the routine stool examination record books from 2012 to 2016 at Ghana Maxwell the Ho Teaching Hospital's laboratory based on prior permission from the administration officials of the hospital. A total of 7045 patients visited the Ho Teaching Hospital laboratory for routine stool examination within the five-year period. From the 7045 patients, 703 of them were infected with at least one of the intestinal parasites. The overall prevalence of intestinal parasite infection for the five-year period was 10.0%. Intestinal flagellates (90.0%) were the most predominant intestinal parasites, and *Entamoeba histolytica* recorded 5.7%. Hookworm (0.9%) was the most prevailing soil-transmitted Helminth. *Ascaris lumbricoides* (0.1%) and *Sistosoma mansoni* (0.1%) were the least recorded parasites. Highest infection was among patients within age group 20 to 29 years. However, age groups below 10 years recorded low infection. This study showed that age was a risk factor for acquiring intestinal parasite infection ($P \leq 0.001$) [17]

A study carried out in Kono District, Eastern Sierra Leone revealed that, Out of the 1164 persons of all ages who were examined, 853 (73.5%) proved positive for at least one intestinal helminthic infection. *Ascaris lumbricoides* was the most common helminth encountered (37.5%), followed by hookworms, 12.9%; *Trichuris trichiura* 12.6%; *Sistrunculus mansoni* 5.6%; *Strongyloides stercoralis* 3.8%; tapeworms 1.0%, [18].

Study conducted on intestinal parasitic infection among inhabitant of Karaj city, Iran in 2006 –A total of 131915 human stool were examined and 649(4.7%) were positive for intestinal parasite. Among them *Entamoeba coli* 13(0.09%) had worm followed by (0.05%), *Enterobius vermicularis* (0.028%), and *Strongyloides Stercoralis* (0.03%) [19].

Study conducted in Saudi Arabia on prevalence of intestinal parasite among expatriate worker showed that, prevalence 31.4% of intestinal parasitic infection. 22.3% are single infection and 9.1% with multiple infections doubles, triple and quadruple. Hook worm and *A. lumbricoides* were the most common infection in all nationalities [20].

Similar study in North Central Nigeria showed that, prevalence rates of intestinal parasites of 72.1% and 69.9% for the rural and urban populations respectively. The prevalence of the parasites in the rural and urban populations respectively were: *Entamoeba Coli* (16.2% and 9.7%); *E. histolytic* (18.9% and 18.3%); *E. hartmani* (1.8% and 0.0%); *Endolimax nana* (16.2% and 18.3%); *Iodamoeba Butschlii* (0.0% and 1.1%); *Giardia lamblia* (7.2% and 4.3%); *Schistosoma Mansi* on (9.9% and 0.0%); *Strongyloides Stercoralis* (0.9% and 0.0%); Hookworm (4.5% and 5.4%); *Ascaris lumbricoides* (1.8% and 0.0%); *Enterobius vermicularis* (0.0% and 1.1%); *Cryptosporidium Parvum* (29.7% and 19.4%); and *(Enterocytozoon) bieneusi/Encephalitozoon intestinalis* (39.6% and 47.3%). Polyparasitism was recorded in 48.6% of the rural subjects and 36.6% of the urban subjects [21].

A retrospective study was carried out in Kashmir India- the Parasitology division in the department of Microbiology of Government Medical College, Srinagar for a period of five years. A total of 2159 stool samples were examined in five years, out of which 165(7.6%) revealed presence of parasites. Among which male patients 90(54.5%) were more common than the females, 75 (45.5%) Maximum numbers of

patients were in the age group of 16-30 years (56) followed by 0-15 years age group [39] [Table 2]. Total 165 parasites were isolated from 165 positive cases. Maximum number of parasites, 56 (33.93%) were isolated from patients in the 16-30 year age group, followed by 39 (23.63%) parasites isolated from patients in 0-15 year age group. There were five different parasites encountered. Among the isolated parasites *Ascaris lumbricoides* (71.4%) were the most [22].

Another study conducted in Nairobi, Kenya, four intestinal worms were investigated which constituted a total of 12.9%. This prevalence was found to be lower than that of two other previous studies. *Ascaris lumbricoides* had the highest frequency and *Salmonella mansoni* had the lowest. The prevalence of single worm infection constituted 8.6% of the total. (23). Similar study done in south eastern of Lake Langano showed that, 217 (83.8%) of school children had one or more parasites. The prevalence of hook worm was highest (60.2%) followed by *Salmonella Ansonia* (21.7%), *Tricuristrikuria* (14.7%), *Tania species* (13.9%), *Entamoeba histolytic* (12.7%), *A. lumbricoides* (6.2%), *Giardia diodnalis* (6.2%) and *Strongloid stercoralis* (5.8%) [24].

2.2 prevalence of parasite in Ethiopia

Study conducted in Gonder, Northwest, and Ethiopia among school children on malnutrition and intestinal parasitic infection showed that, *Ascaris lumbricoides* (17.8%), *Tricuristrikuria* (3.4%), Hook worm (4.3%), *Giardia lamblia* (9%), *Entamoeba histolytica* (2.1%), *Salmonella mansoni* (2.4%), *Hymenolipis nana* (4.7%), *Entrobious vermicularis* (0.3%) in single infection and only two cases of *Strongloides stercoralis* was found in multiple infections. The prevalence of single infection was (0.9%) [25].

Another study conducted in Metema District hospital, Northern, Ethiopia showed that, of the total 2592 attendant 44.5% had one or more intestinal parasitic infection. *Entamoeba histolytica* 143.5 (24.8%), *Gardialamblia* 694 (12.0%), Hook worm 215 (3.7%) and *Ascaris lumbricoides* 112 (1.9%) were detected as a single infection. Multiple infection found in 125 (4.8%) of total examined [15].

Cross sectional survey conducted in Mekaneslam District south Wello, Amara region. Overall prevalence 24.5% intestinal parasitic infection was determined. The internal parasite detected were *E. Histolytic/dispar* (10.83%), *Ascarislumbricoides* (7.6%), *Giardialamblia*, (1.8%), Hookworm (1.99%), *Hymenolipisnana* (3.6%), 0.9% each of *Entrobiousvermicularis* and *S.stericolaris* [26].

A retrospective study was conducted from 2009 to 2013 at Poly Health Center Gondar, Northwest Ethiopia. Samples were examined using direct saline wet mount methods. Statistical analysis was done using SPSS version 20 software and P-value of < 0.05 was considered statistically significant. The results were presented in tables and graphs. Results: during the study period, a total of 13,329 stool samples were requested for intestinal parasite diagnose and 5510 (41.3%) laboratory confirmed cases were reported with a fluctuating trend. Ten different parasites were reported in each year with *Entamoeba histolytica/dispar* (16.8%) being the predominant parasite followed by *Giardia lamblia* (11.4%) and *Ascaris lumbricoides* (6.7%). Both males (49%) and females (51%) were equally affected ($P=0.14$). Intestinal parasite was reported in all age groups in the area but the highest and the lowest prevalence were reported in age groups of 20-29 years and 40-49 years, respectively (26.5% vs. 6.4%) ($P < 0.001$)[27].

A retrospective study was conducted from 2017 to 2021 at Debre Tabor comprehensive specialized hospital to determine the trend of intestinal parasite infection. The findings of 7965 saline wet mount stool examinations were collected from the laboratory registration book by trained data collectors over the last five years. The overall prevalence of intestinal parasites during the study period (2017–2021) was 2171 (27.3%) out of 7965 patients. *Entamoeba histolytica/dispar* (18.6%) was the predominant parasite, followed by *Giardia lamblia* (5.7%) and *Ascaris lumbricoides* (1%). Males (28.6%) were infected at a higher rate than females (26.2%) ($P = 0.02$). The intestinal parasite was reported in all age groups in the area, but the highest and the lowest prevalence were reported in the age groups of above 14 years (27.7%) and under five years (23.4%), respectively ($P = 0.03$)[28].

A retrospective study was to determine the prevalence of intestinal parasitic infections among patients who had attended Hawassa University students' clinic, Southern Ethiopia. Result: Over the 10 years

period, a total of 13,679 patients visiting Hawassa University students' clinic were included in the study. A total of 6553 (47.9%) patients were positive for at least one intestinal parasite. The overall prevalence of intestinal Helminth and protozoan infections was 20.3% and 27.6% respectively. There were four dual infections and one triple infection. *E. histolytica*/*E. dispar* trophozoite was the most common identified parasite, which was seen in 18% of the patients while *Entrobious vermicularis* (0.1%) was the least reported parasite. Other parasites identified were *Ascaris lumbricoides* (15.0%), Hookworm species (2.0%), *Taenia* species (1.8%), *Hymenolepis nana* (0.7%), *Strongyloides stercoralis* (0.3%), *Trichuris trichiura* (0.2%), and *Sistosoma mansoni* (0.2%). The prevalence of helminthes was higher in females (23.3%) than in males (19.5%) ($P < 0.00001$) [29].

A retrospective analysis was conducted to determine the prevalence of intestinal parasitic protozoan infection in patients admitted at Atat Hospital from September 2014 to August 2016. Stool samples collected from the patients were examined using direct wet mount and formal-Ether concentration techniques by experienced laboratory technologists of the hospital. Out of 15,731 examined stool samples, 7062 (45%) were infected by intestinal protozoan parasites. Most of the infected individuals were infected by *Entamoeba histolytica* (60.0%) and the least was infected by *Cryptosporidium parvum* (3.6%). Higher infection was observed among males, 5-9 year age group, and during wet seasons. A total of 15731 patients were provided their stool specimens and examined for different intestinal protozoan parasitic infection in Atat hospital from September 2014 to August 2016. From the total of patients, 7062 (44.9%) were found to be positive for intestinal protozoan infections namely giardiasis, amoebiasis and cryptosporidiosis. Out of the infected individuals, 3694 (52.3%) and 3368 (47.7%) were male and female respectively. Most infections were recorded in 2014 and 2015 has least infections. Males were most infected than females in 2014 and 2016, but females were most infected in 2015 [30].

CHAPTER THREE : OBJECTIVE

3.1. General Objective

To assess trends and seasonal patterns of intestinal parasites among patients seeking stool examination at primary health facilities in gunchire town primary hospital from Jan 2019 -Dec 2021, G C

3.2. Specific Objectives

- ❖ To assess the trend prevalence of intestinal parasites in GPH in the last three years.
- ❖ To compare and contrast the seasonal patterns of the parasite with regard different demographic variables

CHAPTER FOUR: METHODOLOGY

4.1 Study Design

A retrospective study was conducted to determine the trend of intestinal parasite prevalence from laboratory registration books over the past three years at GPH.

4.2 Study Setting

The study was conducted at GPH from May 11-16/6/2022. G C gunchira town is located at, Enemor woreda, Gurage zone, SNNPR, Ethiopia. Gunchire is one of the urban towns found in Enemore woreda. It is around 192 km from the capital city of Ethiopia: Addis Ababa (southwest), 301 km from Hawassa, capital of the SNNPR, and 42 km from Wolkite. The total population of the wereda is about 153,000 and the total population of the town is about 23,345. The town comprises 4 kebeles with 9 villages.

4.3 Population

4.3.1 Study population and period

All individuals who visited GPH in the past three years for any medical case

4.3.2 Study unit

Individual patients with stool examination in the laboratory records several diagnostic methods such as direct fecal smear (wet mount), concentration technique formolalcohol-ethyl acetate concentration (FECT) and zinc sulphate flotation techniques (ZSFT), Harada-Morifilter paper culture or nutrient agar plate culture antigen detection, antibody detection (serological method) and animal inoculation have been used to identify various diagnostic stages of intestinal parasites in the stool samples.

4.3.3 Analysis and statistics technique

Data was entered directly from the laboratory register into and analyzed with SPSS software version 20 and Microsoft Excel. Descriptive statistics and graphs were used to summarize the data and to visualize trends. Frequency of infection was calculated as the number of stool tests with a positive result divided by the number of stool tests done, as documented in the

laboratory register. Frequencies were calculated for any parasite, to compare proportions stratified by gender and age groups and across seasons.

4.4 Inclusion and Exclusion Criteria

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4.4.1 Inclusion Criteria

Clients who are full filed requirement data for documentation

4.4.2 Exclusion Criteria

Incomplete data registration

4.5 Ethical considerations

Ethical approval for the study was obtained from the Ethics Committee of the college of medicine and health sciences , Wolkite University.

4.6 Study Variables

4.6.1. Dependent Variables

Status of intestinal parasitic infection

✓ Trend of intestinal Parasites

4.6.2. Independent Variables

Sex, Age, Ethnicity, Hand washing habit before meal and Hand washing habit after toilet

UNIT FIVE: RESULT

5. 1 Sociodemographic characteristics

Out of 11417 recorded and collected data in GPH laboratory from 2019 to 2021 G C for three year retrospective study of trend prevalence of intestinal parasites, 4414(38.66%) were male and 7003 (61.33%) were female. The mean age and age range of the study population were 32.24 and 90 respectively with minimum age 1 Daye and maximum age >60.

5.2 Prevalence of intestinal parasites

Of the total 11,417, 2836(24.8%) were infected with intestinal parasite and 8581(75.2%) are negative and from the total 2836 infected 1097(38.7%) male and 1739(61.3%) female. The most dominant intestinal parasite in all three years was *E. histolytica* especially in 2019 G.C, and 2020, 2021 G.C respectively and the least prevalent parasite was *S. stercoralis* in all three years. Results of Stool examination among patients utilizing GPH Laboratory in the past three years from Jan. 1, 2019-Dec 30, 2021 G C

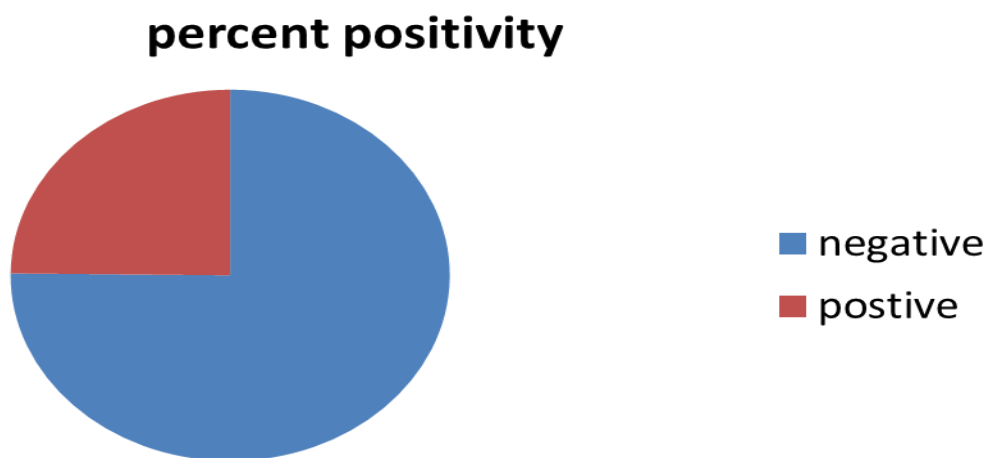


Figure 1: The chart above shows proportion of intestinal parasitic infection the in last three years in GPH 2019-2021.G C The overall prevalence of intestinal parasite in the past three years, 2836(24.8%)

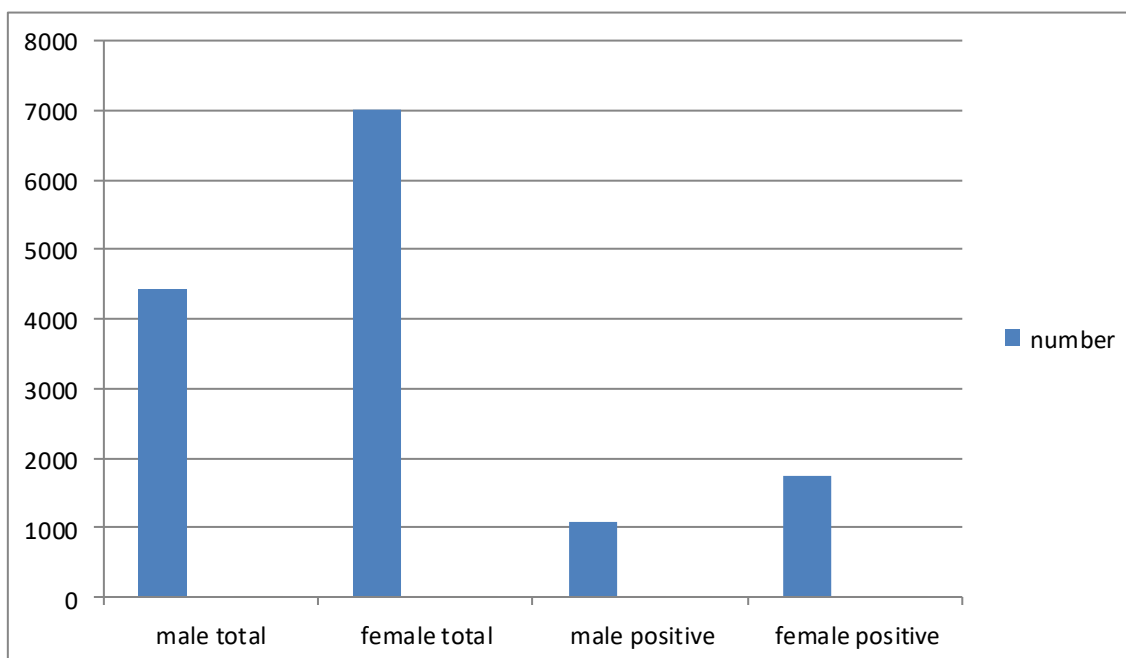


Figure 2: The distribution of intestinal parasites in sex in GPH from 2019-2021.G C

The chart above shows from total 11,417 people included in the study, 4414(38.7%) are males and 7003(61.3%) females and from the total 2836 positive 1097(38.7%) are males and the remaining 1739(61.3%) were females.

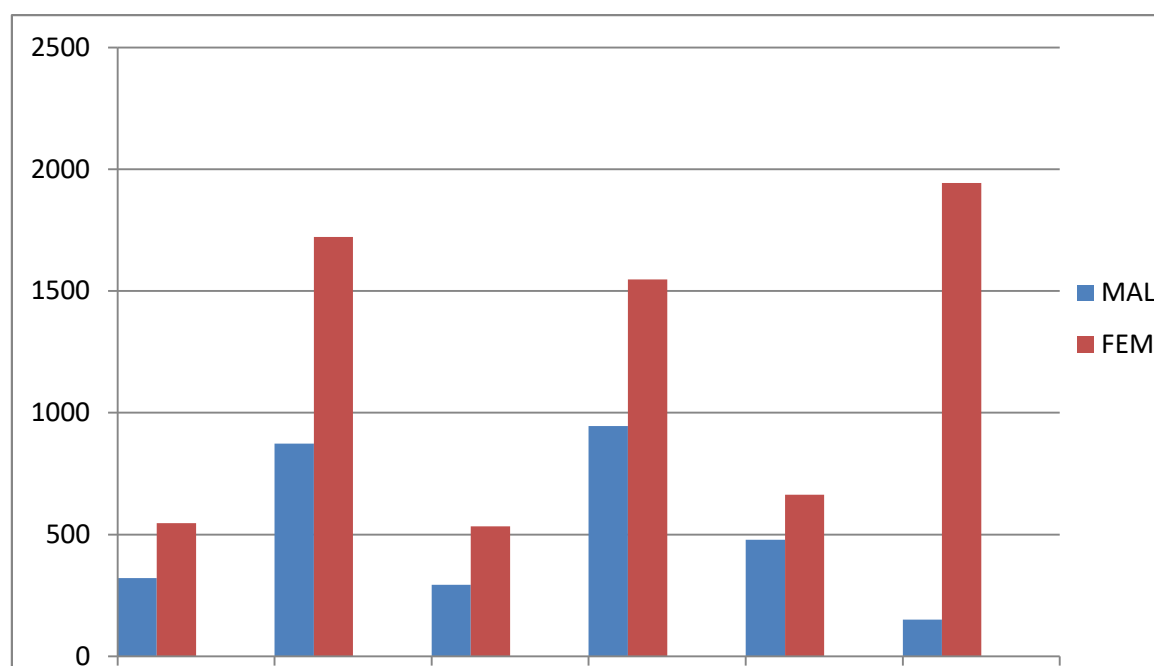


Figure.3 The distribution of intestinal parasites by sex in GPH Laboratory in the last three years respectively from 2019-2021 G C

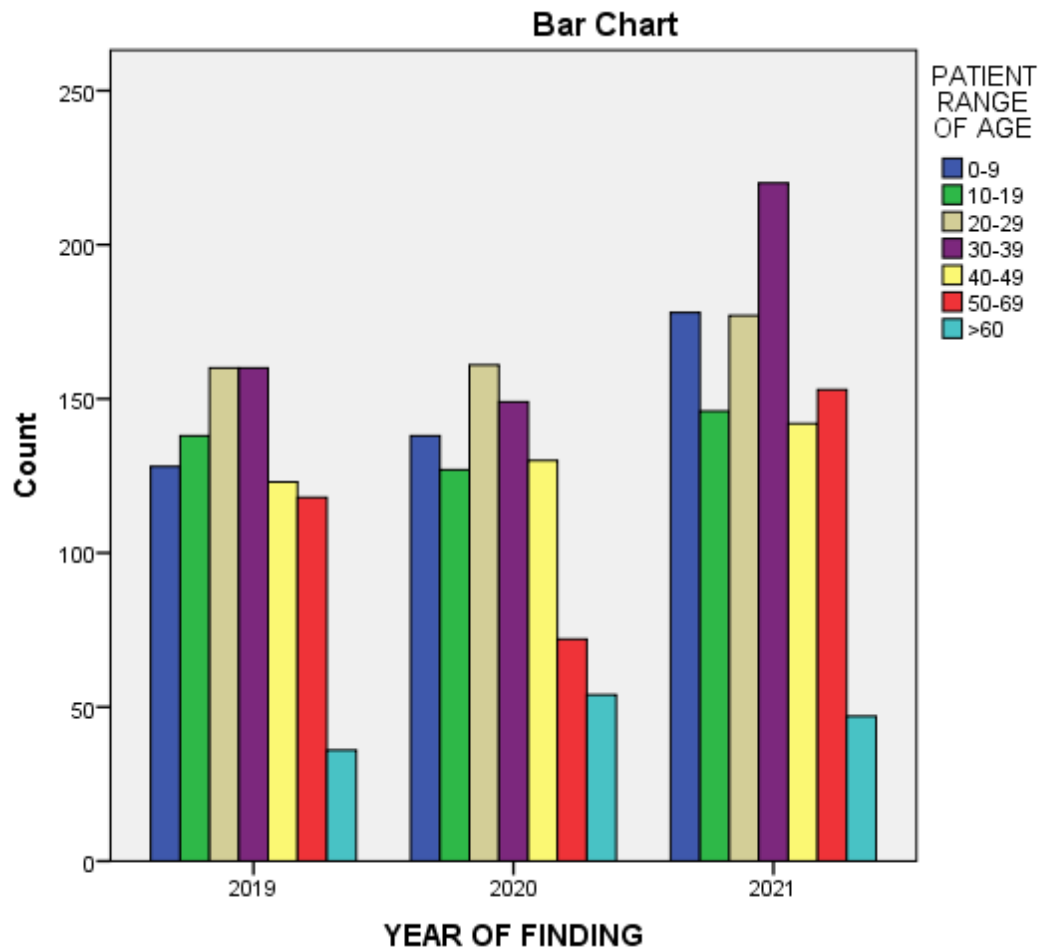


Figure 4.The distribution of intestinal parasites by age among patients positivity GPH Laboratory in the past three years from Jan. 1, 2019-Dec 30, 2021 G C

The figure below shows prevalence of each species of parasite and the most prevalent intestinal parasites are *E histolytica* 16.6%, 15.2% and 17.26% in the three consecutive years. The least prevalent parasite in all three year is *S stercoralis* 0.035%.

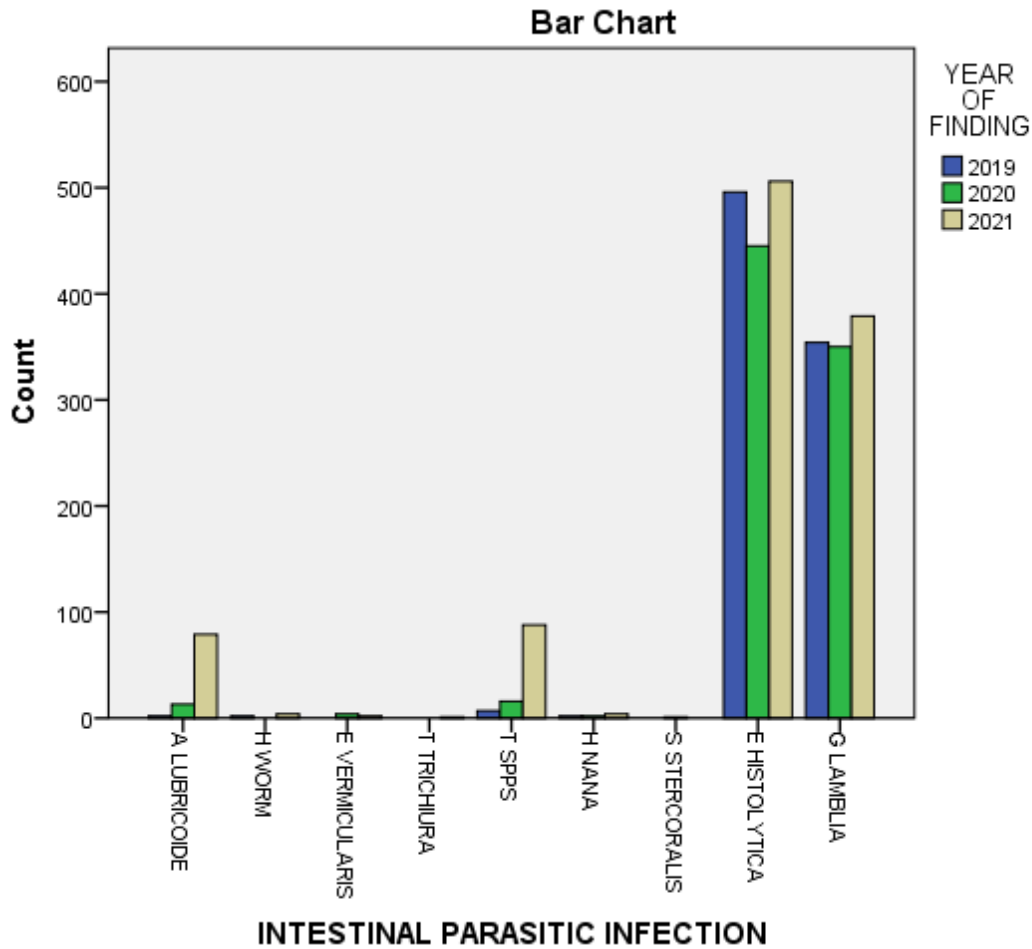


Figure5. Distribution of parasitic species among patients positivity GPH Laboratory in the past three years from Jan.1, 2019-De 30 – 2021.G C

Table1. Distribution of intestinal parasites by sex among patients utilizing Laboratory in three years, from Jan.1, 2019- , Dec 30, 2021.G C

The tables below shows females are more affected by intestinal parasite with prevalence rate than male.

Sex	Year of examination								
	2019			2020			2021		
	POS	NEG	TOTAL	POS	NEG	TOTAL	POS	NEG	TOTAL
Male	321	873	1194	293	945	1238	478	1550	2028
Female	547	1722	2269	534	1547	2081	663	1944	2607
Total	868	2595	3463	827	2492	3319	1141	3494	4635

Table 2:- distribution of intestinal parasites by age among patients positivity GPH Laboratory in three years, from Jan.1, 2019- Dec 30, 2021.G C

Intestinal parasitic infection	PATIENT RANGE OF AGE							Total
	0-9	10-19	20-29	30-39	40-49	50-60	>60	
A lumbricoides	13	13	18	19	13	18	6	100
H worm	0	0	4	1	1	1	0	7
E vermicularis	1	0	1	1	0	1	2	6
T trichiura	0	1	0	1	0	0	0	2
T spp	16	21	14	22	17	16	7	113
H nana	3	2	2	1	0	1	0	9
S stercoralis	0	0	1	0	0	0	0	1
E histolytica	280	203	268	265	217	170	79	1482
G lamblia	138	183	213	232	156	144	50	1116
Total	451	423	521	542	404	351	144	2836

Table 3:-Distribution of IPs by month among patients utilizing GPH Laboratory in the past three years from Jan 1, 2019-Dec 30, 2021.

Result	Month												Total
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
Pos	147	179	307	207	215	229	318	325	295	239	199	176	2836
Neg	422	688	895	766	1035	828	748	812	558	626	520	683	8581
Total	569	867	1202	973	1250	1057	1066	1137	853	865	719	859	11417

The table above shows the prevalence of intestinal parasite is high especially in APR (11.5%), in MAR (11.2%) and MAY (10.4%), the least prevalent in SEP (5.2%).

Table 4: Distribution of IPs by season among patients utilizing GPH Laboratory in the past three years from Jan 1, 2019-Dec 30, 2021.

Season	Year of examination								
	2019			2020			2021		
	POS	NEG	TOTAL	POS	NEG	TOTAL	POS	NEG	TOTAL
AUTUMN	215	758	973	216	629	845	202	620	822
WINTER	230	640	870	230	1265	1495	191	725	916
SPRING	275	520	795	257	950	1207	406	647	1053
SUMMMER	170	572	742	153	652	805	291	603	894

Parasitic infections are common in spring season in the three consecutive years 275(30.9%) in 2019, 275(30%) in 2020 and 406(37.2%) in 2021 and the least prevalent in summer 170(19.1%) In 2019 in summer 153(17.9%) in 2020 and in winter 191(17.5%).

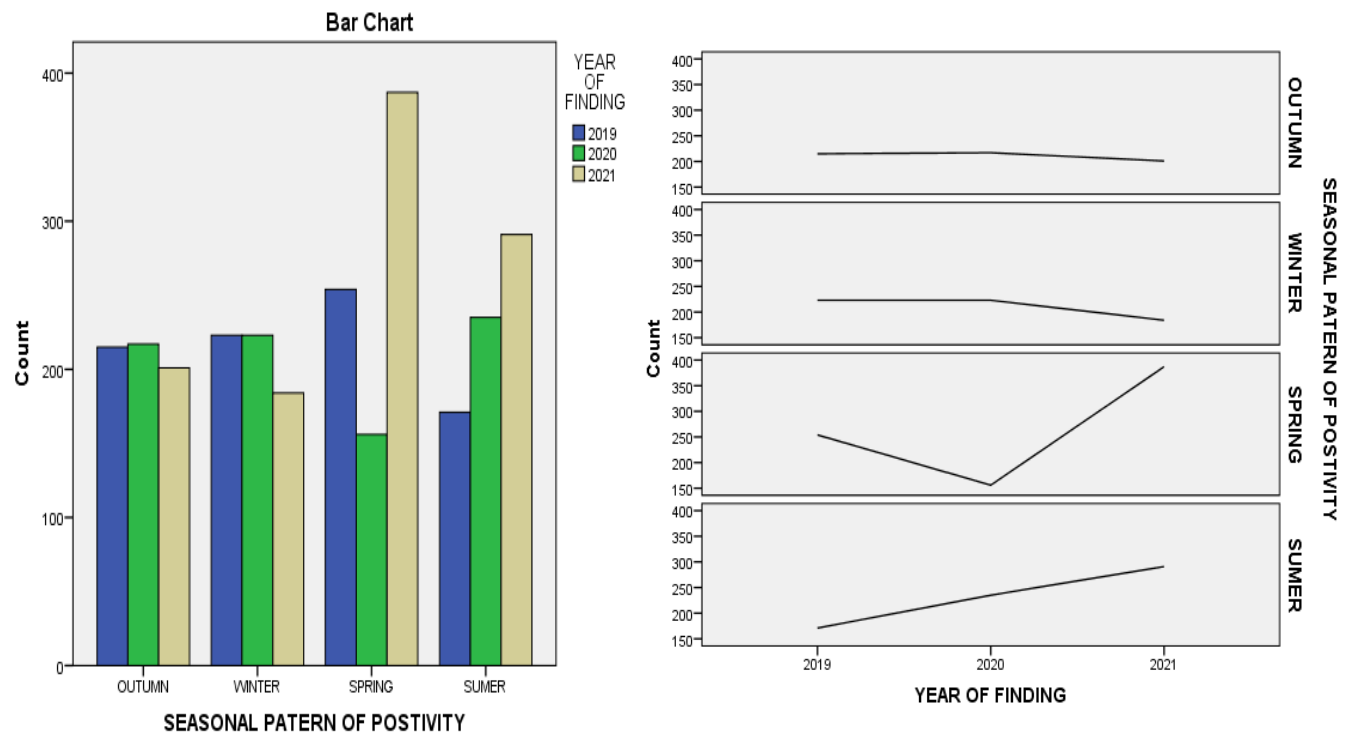


Figure 6:- Distribution of IPs by seasonal patterns among patient's positivity GPH Laboratory in the past three years from Jan 1, 2019-Dec 30, 2021 G C.

CHAPTER SIX: DISCUSSION

Intestinal parasitic infections are still the most common public health problem in the world. WHO reported about 3.5 billion people are affected, and 450 million are ill as a result of these infections, the majority being children [1]. Data's extracted from routine laboratories over long periods of time is valuable because in high-risk areas for STH (soil transmitted helminth), people with digestive disorders often receive empirical treatment. This study illustrates the large amount of data about routine stool testing that is available in the laboratory of Gunchire primary Hospital in south central Ethiopia and that allows to evaluate short-term trends in parasite infections. Patient record based retrospective study was conducted on 11,417 records to determine the trend prevalence of parasitic infection and in different season, month, sex, age and year of examination.

In this study, we have found out that, of out 11,417 individuals examined 2836 (24.84%) were infected with intestinal parasite. Female's patients were highly infected 1739 (61.3%) than male 1097(38.7%).the highest number of parasite was observed in patients who belong to 30-39 age groups. Among the isolated parasites *E.histolytica* 1482(52.3%) were the most.

When compared with A retrospective study done in 2021 Kashmir in India's, our study demonstrated a high prevalence .In contrary to our study, male patients 90 (54.5%) were more often affected than that of females [39]. Possible reason for this difference in prevalence may be difference geographical location and environmental condition, number of record patients and moreover, cultural differences feeding habit might have played a role.

In other retrospective study which was reviewed from the routine stool examination record books in Ghana Maxwell from 2012 to 2016 at the Ho Teaching Hospital's laboratory, of 7045 patients 703 of them were infected with at least one of the intestinal parasites. The overall prevalence of intestinal parasite infection was 10.0% [17]. Which is also lower than that of our finding: the most predominant intestinal parasites were protozoans such as, *E histolytica* 1482(52.3%), *G lamblia* 1116(39.4%), and helminths such as *Tania Spp* 113(3.98%), *A lumbricoides* 100 (3.5%), and *S stercoralis* 1(0.035%) were the least recorded parasites.

A similar study done In Debre Tabor comprehensive specialized hospital to determine the trend of intestinal parasite infection from 2017 to 2021 reported a prevalence of 2171 (27.3%) out of 7965 patients. *Entamoeba histolytica/dispar* (18.6%) was the predominant parasite, followed by *Giardia lamblia* (5.7%) and *Ascaris lumbricoides* (1%). Males (28.6%) were infected at a higher rate than females (26.2%) the highest and the lowest prevalence were reported in the age groups of above 14 years (27.7%) and under five years (23.4%), respectively [28]. when compared with our study the study done in Debretabor has some similarities and also differences. The overall prevalence in the study done in Debretatbor is almost similar with that of ours and protozoans such as *E.histolytica* and *giardia* were the highly reported ones which are in agreement with our work. Whereas one difference observed was that in our study females were the highly infected ones which is different from that of the Debretabor finding .we think that further investigation is needed to come up with a justifiable reason behind the finding.

Another retrospective study which was done to determine the prevalence of intestinal parasitic infections among patients who had attended from 2010 to 2019 Hawassa University students' clinic Reported, out of a total of 13,679 patients visiting Hawassa University students' clinic laboratory, 6553 (47.9%) patients were positive for at least one intestinal parasite. The overall prevalence of intestinal Helminth and protozoan infections was 20.3% and 27.6% respectively. Similar to our study *E. histolytica/E. dispar* trophozoite was the most common identified parasite, which was seen in 18% of the. Another similarity observed was that the prevalence of helminthes was higher in females (23.3%) than in males (19.5%) [29].

another retrospective study done near our study setting in patients admitted at Atat Hospital from September 2014 to August 2016 on 15,731 examined stool samples showed that 7062 (45%) were infected by intestinal protozoan parasites. Most of the infected individuals were infected by *Entamoeba histolytica* (60.0%) and the least was infected by *Cryptosporidium parvum* (3.6%). From the total of patients, 7062 (44.9%) were found to be positive for intestinal protozoan infections namely giardiasis, amoebiasis and cryptosporidiosis. Males were most

infected than females in 2014 and 2016, but females were most infected in 2015 [30]. The finding from Atat Hospital is different from that of our study in different aspects and the possible reason might be the study population involved, the experience of laboratory professionals and also the resource and infrastructural difference between the two hospitals in the diagnostic capacity. However it is also worth mentioning that, similar to our study their study also reported high protozoan's prevalence.

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

The overall prevalence of intestinal parasite in the past three years, from 2019-2021 was 24.84%, The prevalence of intestinal parasite in 2019 was 890(31.4%), 856(30%) in 2020 and 1090(38.4%) in 2021 .The most prevalent parasite species are *E.histolytica* (16.6%) in 2019, (15.2%) in 2020 and (17.26%) in 2021, *G. lamblia*(12.6%) in 2019, (12%) in 2020, (13%) in 2021 and *Taenia species* (0.23%) in 2019 ,(0.57%) in 2020 and (2.96%) in 2021 and the least prevalence intestinal parasite are *S stercoralis*(0.11%) in 2020 only. The most prevalent intestinal helminths in all three years from 2019-2021 were *Taenia species* and the most prevalent intestinal protozoa in all three years from 2019-2021 were *E.histolytica*.

Prevalence of intestinal parasite is high in the age group of 30-39 years that is 4.5% in 2019, 4.27% in 2020 and 5% in 2021. The least prevalent in age group >60years 1% in 2019, 1.5% in 2020 and 1% in 2021.Parasitic infections are more common in female than in male which is 546(31.39%), in 2019, 562(32.31%) in 2020 and 631(36.28%) in 2021. Parasitic infections are common in spring season in the three consecutive years 275(30.9%) in 2019, 275(30%) in 2020 and 406(37.2%) in 2021 and the least prevalent in summer 170(19.1%) and in months like MAR 112 (12.5%) in 2019, MAR 102 (11.91%) in 2020 and APR 159 (14.58%) in 2021.

RECOMENDATION

Intestinal parasites should be considered in Prevention of communicable diseases control strategy by the local government.

As a recommendation more research have to be conducted on fully recorded and documented data to determine exact trend prevalence of infection in the study area.

LIMITATION

The study plan was five years retrospective study but we can gate the three years documented data

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Checklist for data collection for the trend prevalence of intestinal parasitosis among GPH laboratory attendants in the past three years

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