

Prevalence of Giardia Lamblia, Entamoeba Histolytica, Pin Worms and Cryptosporidium Parvum Parasites among People in Al - khoms City, Libya

Fathi Saad Dagdag¹, Rehab Massoud Wheda¹, Kamal Faraj Zaed²

¹Biology Department, Faculty of Arts and Science, Almergib University Kasr Khair, Libya.

²Microbiology Department, Higher Institute of Science, and Medical Technologies Al-khoms, Libya.

Received: 19/04/2023

Accepted: 05/05/2023

ملخص البحث :

تعد الإصابة بالطفيليات المعوية من أهم المشكلات الصحية التي تواجه العالم وخاصة البلدان النامية , وتساهم الظروف الاجتماعية والاقتصادية لهذه الدول بالإضافة إلى سوء التغذية وتلوث الغذاء في تفاقم هذه المشكلة، كما أن السبب الرئيسي وراء دراستها هو مدى انتشارها، وتوزيعها الجغرافي وملائمتها لجميع البيئات المختلفة حيث تنتشر بمعدل من 30% إلى 60% عالمياً.

الهدف من الدراسة: تهدف الدراسة إلى تحديد معدل انتشار أربعة أنواع من الطفيليات المعوية التي تصيب الإنسان في مدينة الخمس وهي Entamoeba histolytica . Giardia lamblia . Pin worms . cryptosporidium parvum. حيث أجريت الدراسة على 769 حالة في مستشفى الخمس التعليمي في الفترة ما بين مارس 2022 إلى أغسطس 2022 . وجمعت بيانات عن 769 حالة حيث كان عدد الذكور 401 حالة (52.14%) و 368 حالة (47.85%) بالنسبة للإناث.

النتائج: أظهرت الدراسة ارتفاع نسبة انتشار الطفيليات المعوية في الفئة العمرية 11 إلى 20 سنة بالمقارنة بالفئات العمرية الأخرى، والنسبة كانت 68.53% في المدن مقارنة 31.46% بالنسبة لسكان الأرياف. لوحظ في هذه الدراسة أربعة أنواع من الطفيليات هي Giardia lamblia, Entamoeba histolytica, Pin worms. and cryptosporidium parvum. ومن النتائج اتضح أن انتشار الطفيليات المعوية مرتبط بالجنس، حيث كان معدل انتشار G. lamblia أكثر في الذكور عنه في الإناث.

Pin worms و E.histolytica متواجدة بكثرة في الإناث أكثر من الذكور ومن إجمالي 769 حالة 93.76% غير مصابين ولم يكتشف أي نوع من الطفيليات المعوية . عموماً بالنسبة للأطفال والمراهقين أكثر عرضة للإصابة من كبار السن، ويمكن تجنب الإصابة بالطفيليات بالاهتمام بالوضع البيئي والصحي وتوعية أفراد المجتمع بالاهتمام بالنظافة الشخصية والكشف الطبي الدوري والعلاج لمنع انتشار المرض.

ABSTRACT:

Intestinal Parasitic Infections are the most prevalent diseases in the world, predominantly in developing countries. Intestinal parasites are responsible for one of the major health problems like food contamination with socioeconomic effects in the world with a prevalence rate of 30-60%, in developing countries. This study aims determine the prevalence of four intestinal parasites that infect human in Al'khomes, namely *Entamoeba histolytic*, *Giardia lamblia* pin worms and *cryptosporidium parvum*. This study was conducted with 769 patients in the Al-Khoms teaching hospital, Al-khoms, Libya between March 2022 to August 2022. The

prevalence rate was 401 (52.14%) for male and 368 (47.85%) for female. The prevalence of intestinal parasites was high in age group of 11-20 years compared to other age groups. The residence of patients lies in both urban (68.53%) and rural (31.46%) areas. In this study, four types of intestinal parasite were detected, namely: *Giardia lamblia*, *Entamoeba histolytica*, Pin worms and *cryptosporidium parvum*. The data on the prevalence of parasites with respect to gender, *G. lamblia* has more prevalence in male than the females. But *E.histolytica* and Pin worms presents more in female cases than the male cases. From the participate 769 people, 93.76% of people were healthy and not detected any kind of parasitesites in their intestinal area. Further, with respect to age, children and teenagers had surplus parasites compared to old age groups. These parasites could be prevented by possible grouping of better ecological design and hygiene. Conclusively, the examination of personal hygiene as well as routine medical examination and treatment is strongly recommended in the low socio-economic areas.

Keywords: Intestinal parasites, Intestinal parasitic infection, Giardia Lamblia, Entamoeba histolytica, Libya.

1. INTRODUCTION:

Intestinal parasites (IPs) are present throughout the world in varying degrees of prevalence and have particular relevance as they affect the poorest and most deprived areas in tropical and subtropical regions (Teimouri & Others, 2022). The spread of disease by food handlers is a common and persistent problem globally. Food handlers with poor personal hygiene working in the foodservice settings can be infected by different enteropathogens, where they can cause fecal contamination of foods by their hands during food preparation and which may be transmitted to the public (Alasvand & Others, 2019). Therefore, a proper screening procedure for food handlers is helpful in the prevention of probable morbidity and the protection of consumer health (Shahnazi & Others, 2019) (Abera & Others, 2022). The risk of food contamination, therefore, depends largely on the health status of the food handlers, their hygiene, knowledge and practice of food hygiene.

The helminthes *Taenia saginata*, *Hymenolepis nana*, *Ascaris lumbricoides*, *Strongyloides stercoralis*, *Trichuris trichiura* and *Enterobius vermicularis* and hookworms predominantly *Necator americanus* and *Ancylostoma duodenale* as well as the protozoans mainly *Giardia lamblia* and *Entamoeba histolytica* are the major intestinal parasites leading to digestive disorders (Yimam & Others, 2020). Nutritional impairment is often associated with chronic helminthiasis, as with those suffering from protein-energy malnutrition, iron-deficiency anemia and vitamin A deficiency. The pathogenic protozoa are a common cause of diarrhea and have a worldwide distribution (Addis & Others, 2015). This remain an important cause of deaths among children less than 5 years old. This is due to poorly developed immune systems. Therefore, severity of infection depends on virulence of the strain, host susceptibility and immune status as well as mixed infections. Estimation of the global prevalence of the soil-transmitted helminths; 1000 million cases for *Ascaris lumbricoides*, 900 million for hookworms and 500 million for *Trichuris trichiura* .(Hajare & Others, 2022). It has been reported that, probably 480 million people carried *Entamoeba histolytica* and 36 million develop invasive forms of amoebiasis. In addition, 200 million occur per year in Africa, Asia and Latin America (Chege & Others, 2020) (Abera & Others, 2022). Therefore, a proper screening procedure for food handlers is helpful in the prevention of probable morbidity and the protection of consumer health. The risk of food contamination, therefore,

depends largely on the health status of the food handlers, their hygiene, knowledge, and practice of food hygiene (Njenga & Others, 2022). In most cases, establishments give attention only to the availability and service of food, but not on its safety and quality. Furthermore, data regarding the food handler's health status before and after employment and training certificate are scarce. As a result, consumers may easily be threatened by food-borne diseases of the enteric pathogens and other disease-causing agents contaminating the food (Erismann & Others, 2016).

Therefore, the aim of this study was to determine the prevalence and risk factors of intestinal parasites among Libyan. The findings of this study might help in strengthening the information available so far and encourage policy makers to design effective strategies to combat intestinal parasitic infections in the study area.

2. METHODOLOGY:

2.1 Study place:

This study was carried out on 769 patients in Al – Khoms teaching hospital, Al – Khoms, Libya.

2.2 Study period:

The study period conducted from March 2022 to August 2022.

2.3 Data Collection Techniques;

A semi structured questionnaire was prepared in English and translated into the local language (Arabic) to collect data on sociodemographic variables, behavioral habits and environmental factors.

2.4 Stool Sample Collection and Processing:

A total of 769 were examined to bring about 5 g of fresh stool sample in labeled plastic. 401 for males and 368 for females mainly, the nature of the sample was examined microscopically. Microscopy was performed by direct wet mount method and formalin-ether concentration methods following procedures in WHO guidelines. A 2 g sample of stool was examined by direct wet mount technique and the remaining 3 g by formalin-ether concentrate. Both x10 and x40 targets were used to identify intestinal parasites. Intestinal parasite positivity was confirmed when it was observed in any of the methods used

2.5 Inclusion and exclusion criteria:

Intestinal parasite infections are associated with many symptoms such as diarrhea, abdominal pain or tenderness, nausea, vomiting, weight loss, indigestion/dyspepsia, bloating, constipation loss of appetite, weight loss, intestinal blood loss and others. Individuals who received anti-intestinal parasite drug/s within two weeks before data collection and those who did not provide the samples at the time of stool collection were excluded from the study.

2.6 Statistical analysis:

Statistical analysis was performed using the SPSS version 23.0 (IBM Statistical Product and Service Solutions, NY, USA). Data were subjected to normality test. The normally distributed data are expressed as mean \pm standard deviation and compared with one way analysis of

variance (ANOVA) among three groups. Data with abnormal distribution were compared with the non-parametric test. Qualitative data are expressed as number or percentage, and rates were compared using the χ^2 test. A value of $P < 0.05$ was considered statistically significant.

3. RESULTS:

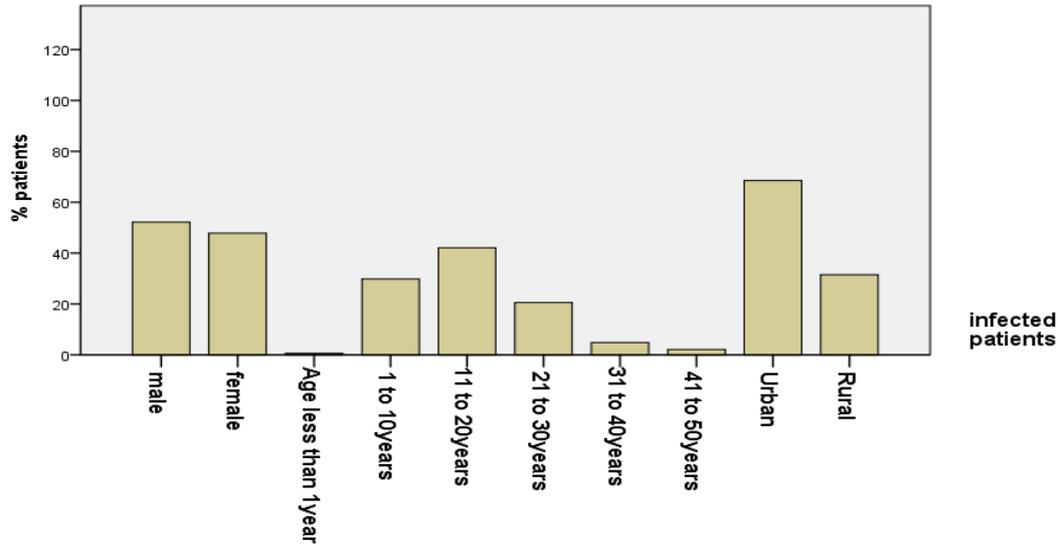
Intestinal Parasitic Infections are the most prevalent diseases in the world, predominantly in developing countries. Intestinal parasites remain a challenging public health problem wherever sanitation and health measures are limited in Libya. A total of 769 participants with gastrointestinal symptoms who were attending at Al- Khoms teaching hospital within the study period were included in the present study.

Table 1: Socio-demographic characteristics of the study participants.

S.No.	Variables	Patients (n=769)	Mean	P-Value
1	Gender			0.0435
	Male	401	52.14	
	Female	368	47.85	
2	Age (Years)			
	Less than 1 year	03	0.39	
	1-10	242	31.46	
	11-20	323	42	
	21-30	148	19.24	
	31-40	37	4.81	
	41-50	16	2.08	
3	Residence			
	Urban	527	68.53	
	Rural	242	31.46	

(% is calculated from the total case of 769)

Socio-demographic characteristics of the study participants is dealt in Table 1 and Graph 1. The prevalence rate was 401 (52.14%) for male and 368 (47.85%) for female. The prevalence of intestinal parasites was high in age group of 11-20 years compared to other age groups. The residence of patients lies in both urban (68.53%) and rural (31.46%) areas.



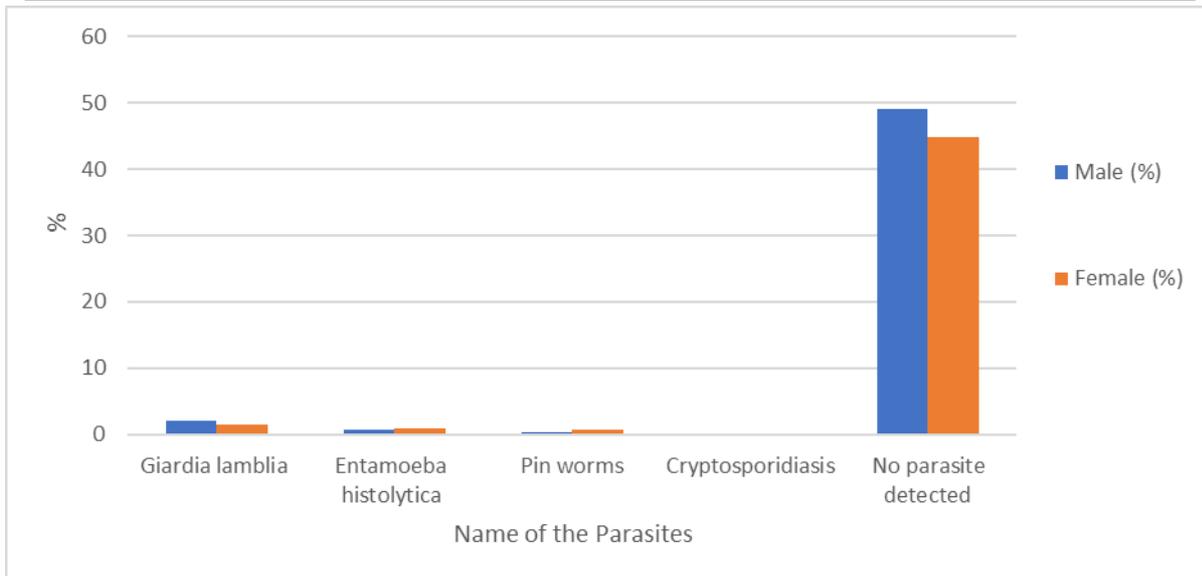
Graph 1: Socio-demographic characteristics of the study participants.

Table 2: Distribution of intestinal parasite species among study participants.

S.No.	Type of intestinal parasite detected	Number of patients infected (n=769)						P-Value
		Male		Female		Total		
		No.	%	No.	%	No	%	
1	<i>Giardia lamblia</i>	16	02.08	11	01.43	27	03.51	0.0034
2	<i>Entamoeba histolytica</i>	05	00.65	07	00.91	12	01.56	
3	Pin worms	02	00.26	05	00.65	07	00.91	
4	<i>Cryptosporidium parvum</i>	01	00.13	01	00.13	02	00.26	
5	No parasite detected	377	49.02	344	44.73	721	93.76	
	Total	401	52.14	368	47.85	769	100.00	

(% is calculated from the total case of 769)

Table 2 and Graph 2 reveal with distribution of intestinal parasite species in different gender among study participants. In this study, four types of intestinal parasite detected they are *G. lamblia*, *E.histolytica*, Pin worms and *C. parvum*. Patients affected with *G. lamblia* in male is 2.08% and in female cases is 1.43%, *E.histolytica* in male is 0.65% and in female is 0.91%, Pin worms in male is 0.26% and in female cases is 0.65% and *C. parvum* is observed equally of 0.13% in both male and female. *G. lamblia* has more prevalence in male than the female.



Graph 2: Distribution of intestinal parasite species among study participants.

4. DISCUSSION:

93.76% of participated people are healthy and highly maintaining their hygiene. The P-value is 0.0435 and very significant. One study in Iraq (12) shows that the high prevalence of Amebiasis and Giardiasis in the age group from 1 year to 12 years. The high prevalence of protozoan infection in the age group of under 1 year can be attributed to their lack of developed immunity system and resistance. In higher adult ages, the high prevalence is due to unhygienic conditions. But this study results related age group not similar to this present study results. In this study the highest prevalence occur above 12 years of age. Male has more prevalence rate of both *E. histolytica* and *G. lamblia* than the females. This result is similar to the study in Iraq (Dhubyan, 2022).

But *E. histolytica* and Pin worms presents more in female cases than the male cases. 6.24% of people were +ve to the parasitic infection during the study. The P-Value is 0.0034 and it is highly significant.

G. lamblia is the highest prevalence (3.77%) one here. The similar result is observed by Alayyar et al., (2022) (Al-Ayyar & Others, 2022) in Kuwait.

5. CONCLUSION:

The present study showed that the prevalence of intestinal parasitosis is low in the study area. It also revealed that *E. histolytica*, *G. lamblia* and *Pin worms* are common parasite species that causes infection in the study area. *G. lamblia* has more prevalence in male than the female. But *E. histolytica* and Pin worms presents more in female cases than the male cases. Only 6.24% of the people were positive to the parasite infection from the total 769 participants. This informal settlement of Libya may be attributed to improvements in hygiene and sanitation, deworming and general good health practices that are facilitated by the Department of Public Health, Libya. Therefore, the provision of education on personal hygiene and environmental sanitation for students and their parents may enhance their awareness of fecal-oral transmissions of intestinal parasites and its control measures.

6. REFERENCES:

1. **Teimouri A, Alimi R, Farsi S and Mikaeili F** (2022) Intestinal parasitic infections among patients referred to hospitals affiliated to Shiraz University of Medical Sciences, southern Iran: a retrospective study in pre- and post-COVID-19 pandemic. *Environ Sci Pollut Res*, 29(24):36911-36919.
2. **Alasvand Javadi R, Kazemi F, Fallahizadeh S and Arjmand R** (2019) The Prevalence of Intestinal Parasitic Infections in Ahvaz, Southwest of Iran, during 2007-2017. *Iran J Public Health*, 48(11):2070-2073.
3. **Shahnazi M, Abdollahpour H, Alipour M, Sadeghi M, Saraei M, Hajjalilo E and Heydarian P** (2019) Prevalence of intestinal parasites in food handlers of the city of Saqqez in 2016. *J Parasit Dis*, 43(1):113-119.
4. **Abera W, Gintamo B, Shitemaw T, Mekuria ZN and Gizaw Z** (2022) Prevalence of intestinal parasites and associated factors among food handlers in food establishments in the Lideta subcity of Addis Ababa, Ethiopia: an institution-based, cross-sectional study. *BMJ Open*, 12(7):e061688.
5. **Yimam Y, Woreta A and Moheballi M** (2020) Intestinal parasites among food handlers of food service establishments in Ethiopia: a systematic review and meta-analysis. *BMC Public Health*, 20(1):73.
6. **Addis A, Daniel K and Mekonnen D** (2015) Prevalence of intestinal parasites, Salmonella and Shigella among apparently health food handlers of Addis Ababa University student's cafeteria, Addis Ababa, Ethiopia. *BMC Research Notes*, 8(1):17–18.
7. **Hajare ST, Mulu T, Upadhye VJ, Chauhan NM and Eriso F** (2022) Prevalence of *Ascaris lumbricoides* infections among elementary school children and associated risk factors from Southern Ethiopia. *J Parasit Dis*, 46(3):643-652
8. **Abera W, Gintamo B, Shitemaw T, Mekuria ZN and Gizaw Z** (2022) Prevalence of intestinal parasites and associated factors among food handlers in food establishments in the Lideta subcity of Addis Ababa, Ethiopia: an institution-based, cross-sectional study. *BMJ Open*, 12(7):e061688
9. **Chege NM, Ondigo BN, Onyambu FG, Kattam AM, Lagat N, Irungu T and Matey EJ** (2020) The prevalence of intestinal parasites and associated risk factors in school-going children from informal settlements in Nakuru town, Kenya. *Malawi Med J*, 32(2):80-86.
10. **Njenga D, Mbugua AK, Okoyo C and Njenga SM** (2022) Intestinal Parasite Infections and Associated Risk Factors among Pre-School Aged Children in Kibera Informal Settlement, Nairobi, Kenya. *East Afr Health Res J*, 6(1):86-97.
11. **Erismann S, Diagbouga S, Odermatt P, Knoblauch AM, Gerold J, Shrestha A, Grissoum T, Kaboré A, Schindler C, Utzinger J and Cissé G** (2016) Prevalence of

intestinal parasitic infections and associated risk factors among schoolchildren in the Plateau Central and Centre-Ouest regions of Burkina Faso. *Parasit Vectors*, 9(1):554.

12. **Dhubyan Mohammed Zaki Z** (2022) Prevalence of *Entamoeba histolytica* and *Giardia Lamblia* Associated with Diarrhea in Children referring to Ibn Al-Atheer Hospital in Mosul, Iraq. *Arch Razi Inst.*, 77(1):73-79.

13. **Al-Ayyar RM, AlAqeel AA and AlAwadhi M** (2022) Prevalence of Giardiasis and Entamoeba Species in Two of the Six Governorates of Kuwait. *J. parasitology research*, 2022: Article ID 5972769.