

Research Article

Prevalence of Intestinal Helminths Among Mogadishu Residents Attending Somali Sudanese Specialized Hospital, Mogadishu, Somalia

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Abstract

Intestinal helminths infection remains a public health concern in the developing countries. Over 1.5 billion people on a global scale are infected with one or more intestinal helminths. Sub-Saharan Africa is considered among the most affected areas with helminths infections. These infection rates are linked with factors such as socioeconomic status, personal hygiene, overcrowding and poor waste management. This study aimed to investigate the frequency of intestinal helminths infections among Mogadishu residents attending Somali Sudanese specialized hospital. The presented study was designed as a descriptive cross-sectional hospital-based study conducted at Somali Sudanese specialized hospital at Mogadishu, Somalia, during the period from November 2022 to April 2023. Stool samples were collected from 1865 Mogadishu residents attending Somali Sudanese Specialized Hospital. Helminths infections were confirmed by identification of the diagnostic stage of the parasite under light microscope. The study findings indicated that the prevalence of intestinal helminths was 2.0%. The distribution of the parasitic infections was 0.7%, 0.6%, 0.4%, 0.3% (*Trichuris trichiura*, *Enterobius vermicularis*, *Hymenolepis nana*, and *Ascaris lumbricoides*) respectively. This result showed that the most common infection is caused by *Trichuris trichiura* followed by *Enterobius vermicularis* with *Ascaris lumbricoides* being the least common. The high prevalence of intestinal helminths infections among Mogadishu residents highlights a poor personal hygiene.

Keywords

Helminths, *Trichiura*, *Vermicularis*, *Nana*, *Lumbricoides*, Somalia

1. Introduction

“An intestinal parasite is an organism that infects the human (and other animals) gastrointestinal tracts”. Even though they prefer to live on the walls of the intestines, they may be found in other parts. They are transmitted through the ingestion of under-cooked food, infected water or through penetration via the skin [1].

Intestinal parasites are a group of parasites that include protozoan and helminths [2]. Symptoms of infection range from fatigue, anemia, malnutrition to fever, dehydration and

vomiting [3-6]. Helminths infections may last a long time within the body, even up to 20 years [7].

The infections caused by intestinal helminths are distributed all around the world. The ten most prevalent infections worldwide include Ascariasis, hookworm infection, and trichuriasis [8].

On a global scale, over one and half billion people are infected with one or more intestinal helminths, Additionally, 700 million were contaminated with hookworm, 807 million

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were tainted with *Ascariasis lumbricoides*, and 587 million were *Trichuris trichiura*. Intestinal helminths contaminations are common among children under 5 years old with diverse causes such as playing with soil, sucking fingers, and defecation in an open field, All-inclusive [9].

Most areas affected by helminths are sub-saharan Africa, Asia, Latin America and Caribbean. Reported frequencies of helminthiasis in sub-Sahara Africa ranges from 9.1% to 90.3% [10].

The prevalence of intestinal parasite infections is linked to various factors. Studies conducted in different parts of the world suggested that different infection rates depended on socioeconomic status, sanitary and environmental conditions, water access, overcrowding, malnutrition, and poor waste management [2].

Primary data for the prevalence of intestinal helminths provides general view about the magnitude of helminths infections and serves as corner stone for control programs and policies that target reduction of tropical diseases.

There is insufficiency of data when it comes to the prevalence of helminths infections in Somalia, This necessitates further investigation. To address this gap, the presented study was designed to determine the prevalence of intestinal helminths in Somalia.

2. Materials and Methods

The presented study was descriptive cross-sectional hospital-based study executed at Somali Sudanese Specialized Hospital (SSSH) in Mogadishu, Somalia during the time between November 2022 to April 2023. 1,865 study subjects in total have participated in this study, all Mogadishu residents attending Somali Sudanese Specialized Hospital during the aforesaid study time were included in this study, while subjects who refused to give consent were excluded. Fresh stool samples were collected into clean, pre-labeled and spoon-covered stool containers for microscopic detection. A small amount of the specimen was placed on a microscope slide, it was mixed with one drop of normal saline. Two smears were prepared on each slide and a coverslip was placed on top of the slide. The cover slip area was systematically scanned using the 10x objective lens of a light microscope, and higher magnification was used for confirmation [4]. A positive case indicates morphological identification of the diagnostic stage for helminths. A structural designed questionnaire was used to collect this data, later on to be statistically analyzed using the statistical package for social science (SPSS) 26.0 statistical software (SPSS Inc., USA). Additionally, this study was licensed by the ethical committee of SSSH.

3. Results

1865 samples in total were received from the study group. The participants age had a range from (1 month - 104 years) with a mean age of 23.7 ± 21.9 years. 1032 of these study subjects were females (55.3%), while the remaining 833 were males (44.7%). (2%) of the total study subjects were found to be infected with intestinal helminths. The most frequent infection was *Trichuris trichura* (0.7%), followed by *Enterobius vermicularis* (0.6%), while *Hymenolepis nana* and *Ascaris lumbricoides* were (0.4%) and (0.3%) respectively. One study subject had mixed infection with two helminths; *Trichuris trichura* and *Hymenolepis nana*. Regarding to the month of infections, the highest infections were on December, 2022 and February, 2023 (0.4%) while the remaining study period showed a constant infections rate of (0.3%), however, the link between the infections rate and the months of infection was found to be insignificant (p value 0.798). There was no significant difference regarding prevalence of infections between males and females (p value 0.41), as there was insignificant difference between infections rate among different age groups (p value 0.42). The results are illustrated in Tables 1, 2, 3, 4, 5, 6.

Table 1. Gender diversity in the study group.

Gender	Frequency	Percent
Female	1032	55.3
Male	833	44.7
Total	1865	100.0

Table 2. Age diversity in the study group.

Age (years)	Frequency	Percent
≤ 9	705	37.8 %
10 – 19	153	8.2 %
20 – 29	358	19.2 %
30 – 39	228	12.2 %
40 – 49	127	6.8 %
50 – 59	126	6.8 %
≥ 60	168	9.0 %
Total	1865	100.0 %

Table 3. Frequency of intestinal helminths infections in the study group.

Helminths frequency		
	Frequency	Percent
No parasite	1828	98.0 %
Trichuris trichura	13	0.7 %
Ascaris lumbricoides	6	0.3 %
Enterobius vermicularis	12	0.6 %
Hymenolepis nana	7	0.4 %
Total	1866	100.0 %

Table 4. Frequency of intestinal helminths infections among gender groups.

		Helminths detection			Total
		No infection	Helminths infection		
Gender	Female	Count	1014	18	1032
		% of Total	54.4%	1.0%	55.3%
	Male	Count	814	19	833
		% of Total	43.6%	1.0%	44.7%
Total	Count	1828	37	1865	
	% of Total	98.0%	2.0%	100.0%	

Table 5. Frequency of intestinal helminths infections throughout study duration.

		Helminths detection			Total
		No infection	Helminths infection		
Month	November	Count	297	5	302
		% of Total	15.9%	0.3%	16.2%
	December	Count	343	9	352
		% of Total	18.4%	0.4%	18.9%
	January	Count	300	5	305
		% of Total	16.1%	0.3%	16.3%
	February	Count	260	8	268
		% of Total	13.9%	0.4%	14.4%
	March	Count	293	6	299
		% of Total	15.7%	0.3%	16.0%
	April	Count	335	5	340
		% of Total	18.0%	0.3%	18.2%

		Helminths detection		Total
		No infection	Helminths infection	
Total	Count	1828	37	1865
	% of Total	98.0%	2.0%	100.0%

Table 6. Frequency of intestinal helminths infections among different age groups.

		Helminths detection		Total
		No infection	Helminths infection	
≤ 9	Count	693	12	705
	% of Total	37.2%	0.6%	37.8%
10 - 19	Count	148	5	153
	% of Total	7.9%	0.3%	8.2%
20 - 29	Count	348	10	358
	% of Total	18.7%	0.5%	19.2%
Age group (years)	Count	225	3	228
	% of Total	12.1%	0.2%	12.2%
30 - 39	Count	126	1	127
	% of Total	6.8%	0.1%	6.8%
40 - 49	Count	125	1	126
	% of Total	6.7%	0.1%	6.8%
50 - 59	Count	163	5	168
	% of Total	8.7%	0.3%	9.0%
≥ 60	Count	1828	37	1865
	% of Total	98.0%	2.0%	100.0%

4. Discussion

Intestinal helminths represent a major public health problem in tropical and subtropical countries. Infections caused by these helminths can cause diarrhea, nutritional depletion, weakness and poor immunity in infants. The current study was a descriptive cross sectional hospital based study executed at Somali Sudanese specialized hospital in Mogadishu, Somalia, to estimate the intestinal helminths prevalence rate among Mogadishu residents attending the hospital.

1865 stool samples in total were received from the study subjects, their age falls between 1 month to 104 years with a mean age of 23.7 ± 21.9 years. The helminths infection rates did not have a significant relation with the age. These results

disagree with a research conducted by Liyih M, et al, who found the odds of having intestinal helminths infections in children up to the age of 14 years were 1.66 times higher than in adults [11]. This disagreement could be a result of the environmental variation and different living circumstances of the study group.

Regarding gender, there was no significant difference between infection rates between males and females. This finding are consistent with a research done by Tadege B, et al [12], and K. Mohammed, et al [1].

Regarding to the frequency of intestinal helminths infections; 2% of the total study participants had intestinal helminths infections, The prevalence of the infections in this study was lower when compared with the results reported by Liyih M [11] which showed a high percentage of infection rate (33.35%), the results reported by Yong TS [13] which

concluded an infection rate of (26.2%), the results presented by Periago MV [2] that showed an infection rate of (11.1%) of intestinal helminths, and the results reported by Teshale T [14] which showed a higher percentage of infection rate (12.7%), this difference might be due to demographic differences as well as characteristics of the populations.

5. Conclusion

The presence of intestinal helminths infections highlights a poor personal hygiene. The study shows that the most common intestinal helminths infections among Mogadishu residents were *Trichuris trichiura*, *Enterobius vermicularis*, *Hymenolepis nana*, and *Ascaris lumbricoides* respectively. Larger prevalence studies that cover different regions needs to be conducted, and the association between these prevalence rates and the environmental conditions and behavioral differences of residents of each region needs to be explored.

Abbreviations

SPSS: Social Package for Statistical Science
SSSH: Somali Sudanese Specialized Hospital

Ethics Approval

Written ethical approval has been obtained by the author in accordance to the international standard.

Consent to Participate

Written consent from the study participants has been obtained by the author in accordance to the international standard.

Author Contributions

Motaz Obeidallah Hamad Mohammed is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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