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Prevalence of Soil Transmitted Helminthic Infection (STH) and Assessment of Knowledge, Attitude and Practice of Deworming Among Students and Professionals in Erode District, Tamilnadu



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ABSTRACT

Introduction: Soil-transmitted helminths (STH) refer to the intestinal worms like *Ascaris lumbricoides*, *Trichuris trichiura*, *Ancylostoma duodenale*, and *Necator americanus* that infect humans and are transmitted through contaminated soil. According to 2021, as per the WHO, in India, 339 million children are at high risk of STH infection, and they require preventive chemotherapy for STH. Due to a lack of sanitation and hygiene, STH illnesses affect people of all ages. **Aim and objectives:** The main objectives are to identify the prevalence of STH among students and professionals in the Erode district, to measure the level of deworming knowledge, attitude, and practise among students and professionals in the Erode district. **Materials & Methods:** Responses were gathered using a Google Form during the study period, which ran from February 1 to March 15, 2023, using a standard questionnaire. A total of 1026 responses were gathered with the consent of the concerned participants. **Results:** The prevalence of STH among participants is 17.8%. 67.84% of participants were paramedical students. 526 participants were female. The level of knowledge is good among paramedical professionals but poor among school students. The level of attitude is mostly favorable among paramedical professionals. While paramedical students and paramedical professionals adhere to proper practice, school students and homemakers don't have proper practice. **Conclusion:** Awareness of STH and the importance of the deworming process is significantly low among schools, so awareness should be created within the school itself through health camps.



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INTRODUCTION:

An estimated 1.5 billion individuals, or 24% of the world's population, are afflicted with soil-transmitted helminth (STH) diseases, making it one of the most widespread illnesses in the world. Over 260 million preschool-age children, 654 million school-age children, 108 million teenage females, and 138.8 million pregnant and lactating women live in locations where these parasites are widely spread and need treatment and prevention¹. India makes up 21% of the estimated 1.45 billion people who have been diagnosed with soil-transmitted helminths (STH) worldwide⁵. In India, the prevalence ranges from 12.5% to 66%, with a varying prevalence for individual parasites⁹. The overall prevalence of helminths infection in school-age children in India is about 50% in Urban and 68% in rural area⁸.

According to the World Health Organisation's estimates for 2021, 339 million children in India are at high risk of contracting STH and need preemptive treatment. The three primary worm species that affect humans are **hookworms** (*Necator americanus* and *Ancylostoma duodenal*), **whipworms** (*Trichuris trichiura*), and **roundworms** (*Ascaris lumbricoides*). Tropical and subtropical regions with the highest frequency recorded are sub-Saharan Africa, China, South America, and Asia. They are affected by these illnesses the most, especially the poorest people with inadequate access to clean water, sanitation, and hygiene. They are spread by eggs found in human feces, which pollute the soil in places with poor sanitation. Children who play in polluted soil and then put their hands in their mouths without washing them, as well as those who eat unwashed fruits and vegetables and drink contaminated water, may spread helminth eggs via these methods. STH is among the most prevalent infections, and it has a significant negative impact on intestinal health, anemia, appetite loss, protein loss, bleeding, physical development retardation, and cognitive function in children^{1,6}.

Abdominal discomfort, fever, diarrhea, vomiting, dysentery, and other gastrointestinal symptoms are symptoms of a worm infestation. Roundworm and hookworm, in that order, are related to intestinal blockage and anemia, respectively⁷. Deworming is a method for preventing soil-transmitted helminth infections that reduces morbidity by routinely treating at-risk individuals in endemic regions¹. Every year on February 10, the chosen 12 states and UTs of the nation, including Tamil Nadu, shall celebrate National Deworming Day (NDD). In India, the National Deworming Day (NDD), one of the biggest mass drug administration (MDA) campaigns, was started in 2015 by the Ministry of Health and Family Welfare (MoHFW), which dewormed all children between the ages of 1 to 19 with albendazole⁴. The

WHO suggests that regular deworming, instruction in health and hygiene, and proper sanitation all contribute to lowering morbidity by reducing worm burdens¹.

Anthelmintic medications were distributed to approximately 576 million PSAC and SAC in endemic countries in 2018, covering 39% (120 million PSAC) and 60% (456 million SAC) of all children at risk³. To achieve and maintain the elimination of STH morbidity, the World Health Organization (WHO) NTD road map 2030 has set a target of reducing moderate and heavy intensity (M&HI) infection among preschool and school-aged children (PSAC and SAC) and other vulnerable populations, including adolescent girls, pregnant women, and breastfeeding women, to below 2% through deworming, with a target of 75% coverage^{1,2}. In countries with endemic disease in 2021, anthelmintic medications will be administered to nearly 500 million children or 62% of all children at risk. In addition, via the lymphatic filariasis eradication initiatives, albendazole was administered to almost 99 million women of reproductive age. The number of disease-adjusted life years (DALYs) lost annually as a result of STH decreased by more than 50% between 2010 and 2019. Training of medical students and health care professionals can effectively prevent worm infestation by the process of deworming¹⁶. Hence, we have done this study to evaluate the prevalence of soil-transmitted helminthic infection (STH) and the knowledge, attitude, and practice of deworming among students and professionals in Erode district, Tamil Nadu.

Need for the study:

As per current evidence, the prevalence of STHs is high, which highlights the need for periodical deworming for better control of associated complications. To evaluate the prevalence of STH and the level of practice of deworming.

Aim:

To evaluate the prevalence of soil-transmitted helminthic infection (STH) and assess the knowledge, attitude, and practice of deworming among students and professionals in Erode district, Tamil Nadu.

Objectives:

- To identify the prevalence of STH among students and professionals in the Erode district.

- To measure the level of deworming knowledge, attitude, and practice among students and professionals in the Erode district.
- To give a better understanding to those who are less aware of deworming.

Methodology:

Study design and study size:

A cross-sectional online survey was conducted among college students and professionals in and around Erode District. A total of 1026 responses were gathered with the consent of the concerned participants.

Subject selection:

The study took two months, from February 2023 to March 2023. Data collection and analysis were done for one month. The participants for this study have been selected depending on inclusion and exclusion criteria.

Inclusion criteria:

- Participants who gave consent to participate in this study.

Exclusion criteria:

- Individuals who were not given informed consent.
- People who forwarded incomplete questionnaires were also excluded.

Study procedure:

The questionnaire included a consent statement and demographic details with specific questions on deworming, and it was distributed through online media to various school and college students and professionals. The questionnaire (**Annexure-1**) includes seven knowledge-based questions about deworming, seven attitude-based questions about deworming, seven practice-based questions about deworming, and one question based on the prevalence of STHs.

Statistical analysis:

The collected data were analyzed using an MS Excel spreadsheet and descriptive analysis.

Results:

There were 1026 participants included in this study. Among the 1026 participants, 526 were female and 500 were male (**Table 1**).

Table 1: Gender-wise distribution

Gender wise distribution	Number of participants
Male	500
Female	526
Total	1026

Most of the respondents are in the age group of 18–30 years old (**Table 2**).

Table 2: Age-wise distribution

Age-wise distribution	Number of participants
Below 18 years	90
18 – 30 Years old	916
31 – 45 Years old	18
Above 45 years old	2
Total	1026

Most of the respondents with educational qualifications were paramedical students, and a smaller number of respondents were medical professionals (**Figure 1**).

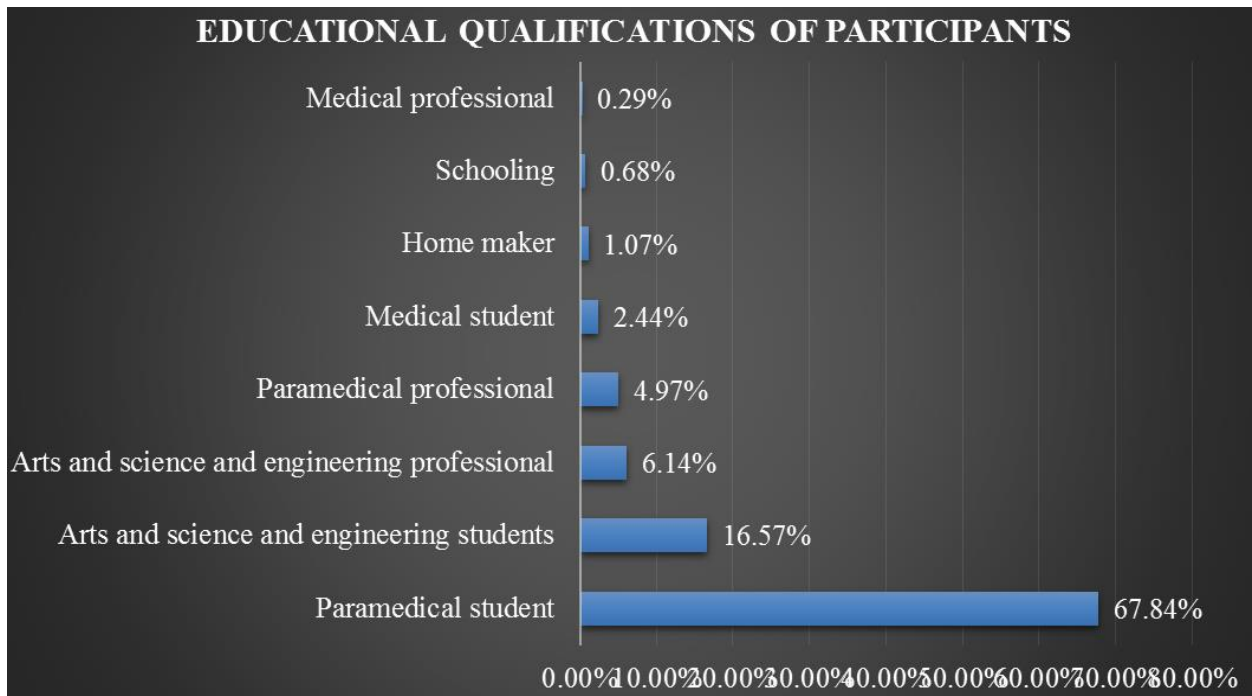


Figure 1: Educational qualification of participants

17.8% of the respondents were affected by soil-transmitted helminths. 82.2% of the respondents were unaffected by soil-transmitted helminths (**Figure 2**).

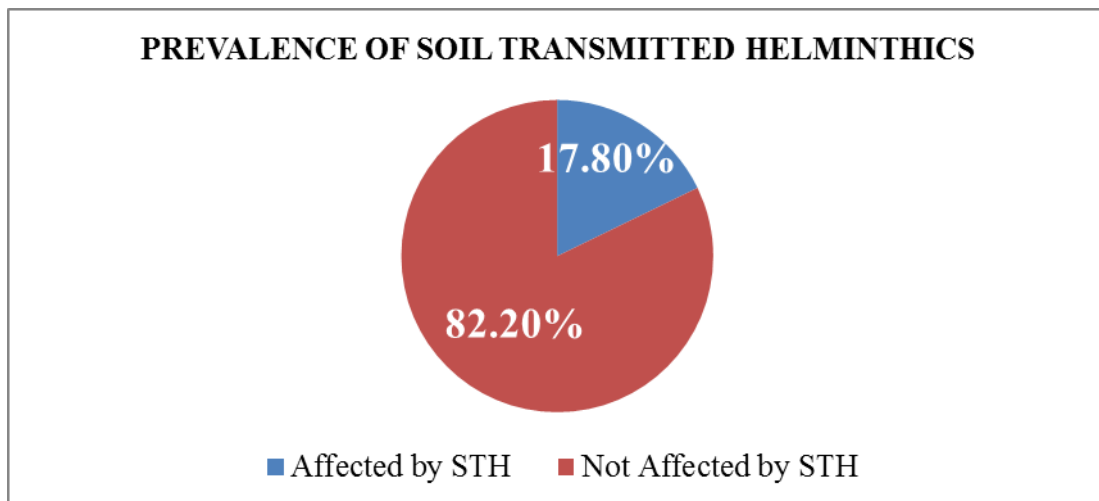


Figure 2: Prevalence of soil-transmitted helminthics

Knowledge of deworming:

Among 1026 respondents, most (73.39%) of paramedical professionals had good knowledge about deworming and STH, the highest among different groups of respondents, and 53.06%

of school students had only good knowledge about deworming and STH, the lowest among different groups of respondents (Figure 3).

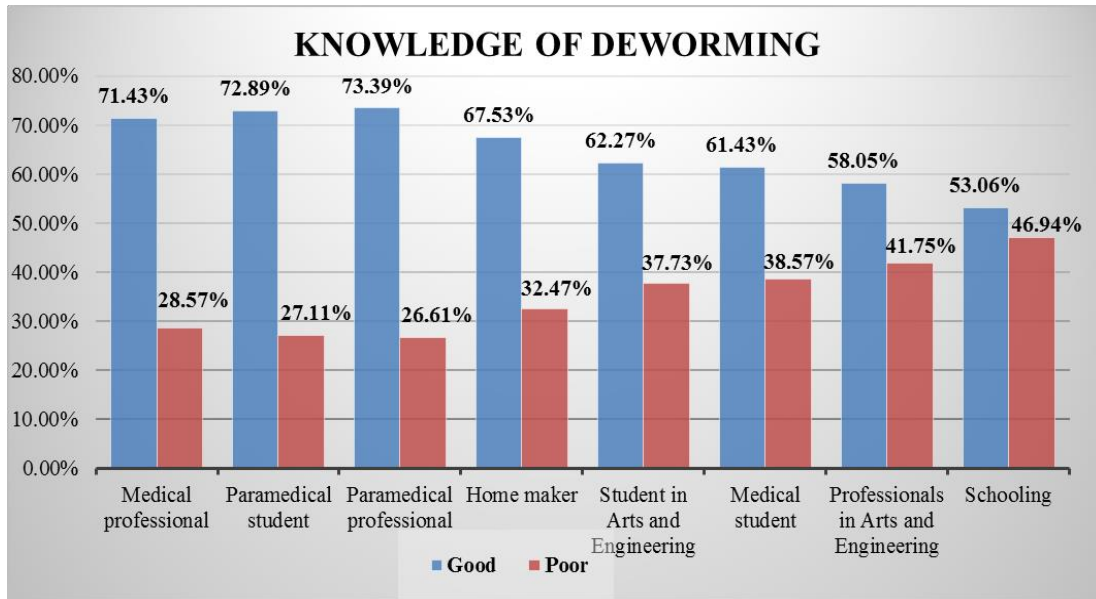


Figure 3: Knowledge of deworming based on their educational qualification

The attitude of deworming:

Among 1026 respondents, most (50.98%) of paramedical professionals had a favorable attitude about deworming and STH, the highest among different groups of respondents, and 28.57% of medical professionals had only favorable attitude about deworming and STH, the lowest among different groups of respondents (Figure 4).

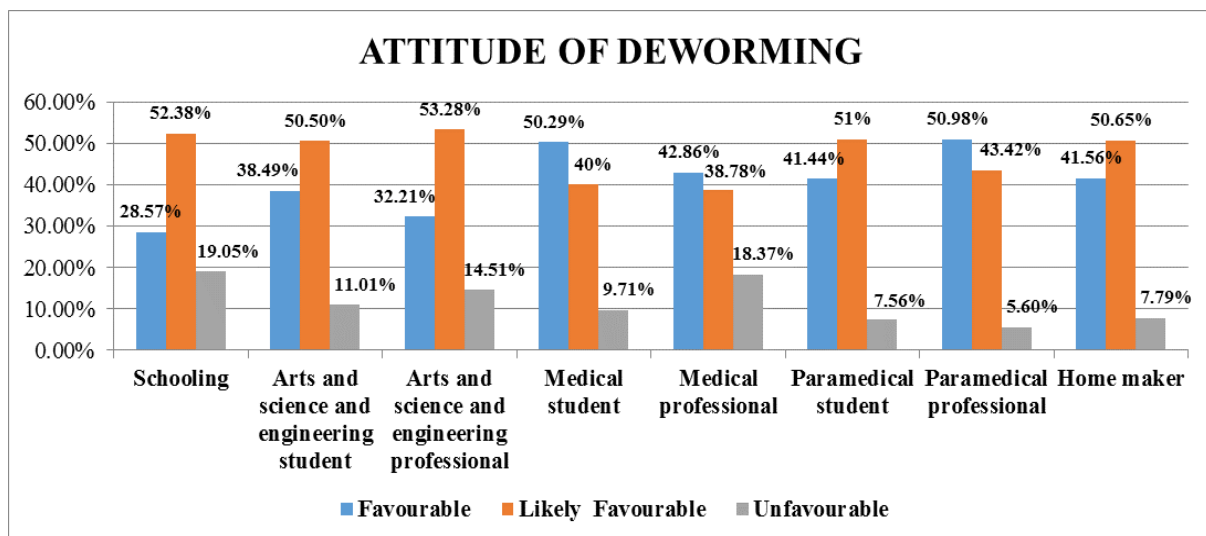


Figure 4: Attitude of deworming based on their educational qualification

The practice of deworming:

Most paramedical professionals conduct proper deworming and STH practices. Improper practices were found among the populations of schooling (20.9%), and homemakers (25.45%) (Figure 5).

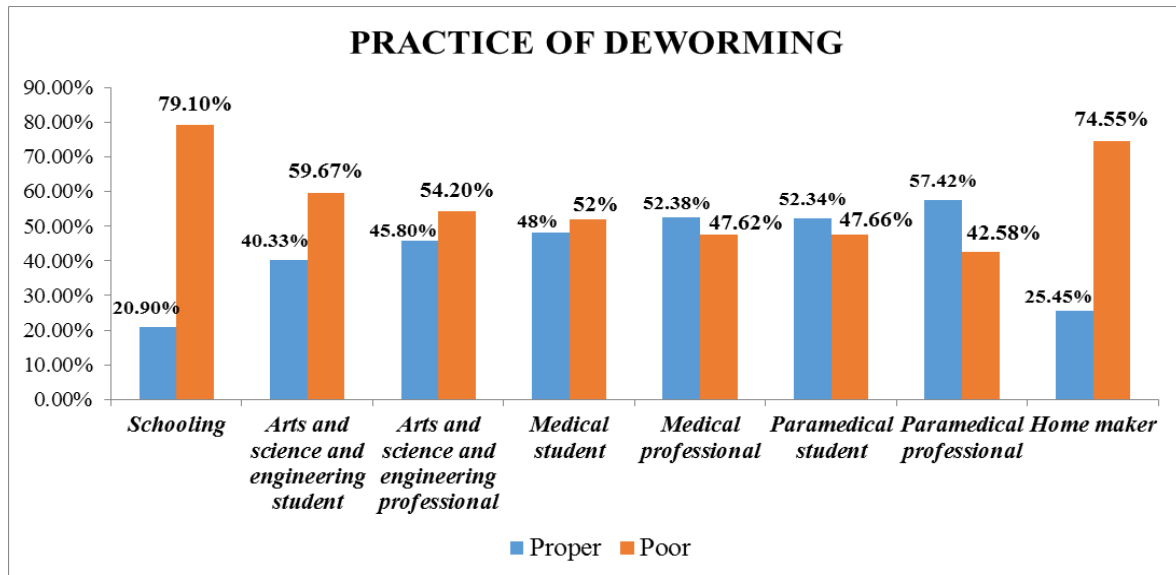


Figure 5: Practice of deworming based on their educational qualification

Discussion:

The overall response obtained among the population was categorized based on their educational qualification. The level of knowledge is good among paramedical professionals but poor among school students. The level of attitude is mostly favorable among paramedical professionals. While paramedical students and paramedical professionals adhere to proper practice, school students and homemakers don't have proper practice.

Another study associated with deworming conducted in Tamil Nadu about the practice of deworming concluded that regular deworming practice to their children is poor among mothers of fewer than five children staying in rural areas¹⁰. A study conducted by jagadeesan et al to evaluate the knowledge and attitude about worm infestation and to assess the deworming practices employed among the caregivers of children aged between 5 – 12 years demonstrated that 67% were found to have the knowledge, and 33% lacked in knowledge about worm infestation, 88% were aware that it would cause manifestations, 68% did not practice any prophylactic measures¹¹.

A study conducted by prathaban et al demonstrated that 19% had adequate knowledge and 31% of mothers were good practices of prevention of worm infestation. That study concludes that Demographic variables have an influence on the knowledge and practices of mother regarding worm infestation among the school-age children¹⁴.

A study conducted by Tripura et al., demonstrated that Majority of respondents in the present study washed their hands and also for their children before eating and after defecation¹². Another study conducted by suraksha et al finds out that there is a significant impact on knowledge, attitude and practice of deworming after educational intervention among medical students and healthcare professionals¹⁶.

In another study conducted by Kassaw MW et al., knowledge, attitude, and practice on prevention and control of intestinal parasites in Ethiopia's Sekota town was significantly low among mothers¹⁷.

Non-Availability of basic infrastructure, unhygienic environment, and consumption of improperly cooked contaminated food and contaminated water may contribute to the high prevalence of intestinal parasites as suggested by Fernandez et al. (2002) in rural children living in and around Chennai¹³.

Another study conducted by aruldas et al., concluded that educational and socioeconomic backgrounds and experience in health programs should be considered while designing community drug distributor (CDD) training. Along with community-wide mass drug administration (cMDA) delivery for STH, as CDD do share community myths and misconceptions around STH, they should be proactively addressed during the CDD training to strengthen competency in counseling¹⁵.

CONCLUSION:

The Knowledge on STH and the importance of the deworming process are significantly low among school students and homemakers, so awareness and practice of deworming should be created among people from the schooling itself through health education and medical camps. STH's control approach of mass deworming programs and health education to the parents about the importance of regular deworming practices through pamphlets (**Annexure-2**) and social media and by placing the banner in general public places.

ACKNOWLEDGEMENT:

None to disclose

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Annexure 1:

Knowledge

1) Soil transmitted helminths (STH) Caused by

- A. Intestinal worms
- B. Earth worm

2) Deworming refers to

- A. Process of killing the internal parasite
- B. Process of killing earth worm

3) Mode of transmission happens in STH

- A. Droplet of infected person
- B. Contaminated water and food

4) Sign and symptoms of STH is

- A. Hungry, overweight, constipation
- B. Loss of appetite, vomiting, diarrhoea

5) Which age group gets more affected by STH?

- A. Above 20 years of age
- B. Below 20 years of age

6) National deworming day is being observed on

- A. Feb - 10
- B. Feb - 15

7) Complication of STH is

- A. Anemia, malaria
- B. Pneumonia

Attitude

1) is a periodic check-up necessary to know worm status?

- A. Strongly agree
- B. Agree
- C. Disagree

2) Raw food consumption can cause a worm infestation

- A. strongly agree
- B. Agree
- C. Disagree

3) Abdominal pain is one of the symptoms of worm infection

- A. Strongly agree
- B. Agree

C. Disagree

4) STH is a preventable & curable disease

- A. Strongly agree
- B. Agree
- C. Disagree

5) Improper hygiene is the main reason for STH

- A. Strongly agree
- B. Agree
- C. Disagree

6) Soap and hand wash can help to prevent the transmission of STH?

- A. Strongly agree
- B. Agree
- C. Disagree

7) Health education / awareness regarding deworming can help to reduce the prevalence of STH?

- A. Strongly agree
- B. Agree
- C. Disagree

Practice

1. How to prevent the spread of worm?

- A. Wash hand and keep hygiene
- B. Wear the mask
- C. Social distancing

2. Have you ever carried out deworming by using (Deworming medicine medicines? in this year?

- A. Yes, I carried out this year
- B. No, I didn't carried out till now
- C. Yes, I carried out. But not in this year

3. What are the dosage forms available in antihelmenthic drug?

- A. Tablet and capsule
- B. Syrup and injection
- C. Don't know

4. Why did you undergo deworming?

- A. Symptoms experienced like lack of appetite, vomiting and diarrhoea
- B. Preventive measure
- C. Treatment measure

5. Do you eat unwashed fruits and vegetables?

- A. Often
- B. Sometimes
- C. Not at all

6. How you come to know about deworming?

- A. Self education
- B. Health care professional
- C. Others

7. What kind of water do you drink regularly?

- A. Tap water
- B. Boiled or purified water
- C. Both

Prevalence

1. Have you ever affected by STH?

- A. Yes
- B. No
- C. Don't know

Annexure 2:

Deworming awareness leaflet

- According to 2021, as per WHO, in India, 339 million children are at high risk of Soil transmitted helminthics infection, and they require preventive chemotherapy for STH.
- These worms live in human intestines and consume nutrients meant for the human body. They are transmitted by eggs present in human feces, which contaminate soil in areas where sanitation is poor
- *Ascaris lumbricoides* (Roundworm), *Necator americanus* (Hookworm), *Ancylostoma duodenale* (Hookworm) and *Trichuris trichura* (Whipworm) are among the soil-transmitted helminths (STH) that can mostly infect people.
- Anemia, malnutrition, poor mental and physical & cognitive development are all consequences of STH infections.
- High risk groups of STHs infection include children, adolescent, Pregnant women and other occupational groups like farmers etc.,



Roundworm



Hookworm



Whipworm



Pinworm

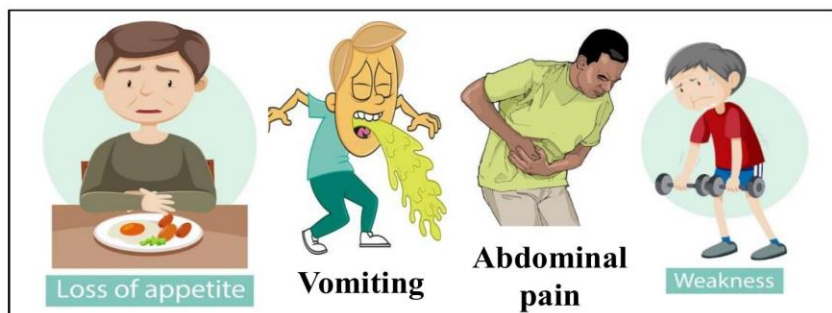
Transmission of STHs:

- Poor sanitation and hygiene conditions
- Contact with infected soil
- Playing barefoot outside
- Defecating in the open place
- Drinking contaminated water
- Improperly washing hands before eating food
- Improperly washing hands after using the toilet
- Eating fruits and vegetables without washing
- Eating contaminated food



Symptoms of STHs:

- Abdominal pain
- Vomiting
- Diarrhoea
- Loss of appetite
- Body weakness
- Rectal collapse



<u>Complication of STHs:</u>	<u>Prevention of STHs:</u>
<ul style="list-style-type: none">➤ Anaemia➤ increase malabsorption of nutrient➤ Impaired growth➤ Impaired development➤ Poor nutrients	<ul style="list-style-type: none">➤ Washing hands with soap properly before eating➤ Always use toilet for defecation➤ Eat only wash fruits and vegetables➤ Drink clean water➤ Wear slippers

Treatment for worm infection (Deworming):

- National Deworming Day will be observed on 10th February every year
- Deworming primarily targets health status, nutritional status, educational access and quality of life.
- Albendazole should be given to all children aged 1 to 19 at age-appropriate dosages because it will help to kill whipworm, Roundworm & Hookworm
- The recommended dosage for children between the ages of 2 and 19 is 1 tablet (400 mg) and for children between the ages of 1 and 2 is half tablet (200 mg).
- Millions of individuals throughout the world have received treatment for soil-transmitted helminthics with albendazole, a medication that is safe for both children and adults.



Benefits of treatment:

- Decreased anemia
- Improved nutrition
- Increased growth and weight gain
- Improved cognition and mental and physical development
- Increased resistance to other infections
- Helps improve concentration

“Thank you for participating in this survey with your own consent”

“This leaflet was prepared by SSM College of Pharmacy staff and students to create awareness about deworming among the general public”