

Assessing How Worm Infestation Deteriorates the Quality of Nutrition among Children Aged 5 to 12 Years: A Study in Kanpur City

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ABSTRACT

Worm infestation is one the main problems of child development, the intestinal infection causes stomach ache which becomes a common complain of the children. The reason behind this complaint is intestinal parasites such as worms. A child is deprived off the nutrients because the worms living in the intestine feed on these. Common complaints of this problems grinding of teeth, anal itching, bed wetting, abdominal pain, nausea and vomiting. Educating the parents and children regarding hygiene and deworming medicines can cure this problem.

Keywords: Infestation, Good hygiene, Deworming, Symptoms.

INTRODOCTION

Worm infestation remains one of the main problems of child development. This is especially a greater health hazard in developing countries. Worm infestation is common in children all over the world. Impure water, low socio-economic state, poor sanitation coupled with low literacy rates of parents particularly the mothers are the main causes of this prevalent malady. Worm infestation is one of the major causes of childhood malnutrition, anemia, stunted physical and mental growth, psycho-social problems and this along with repeated gastrointestinal and upper respiratory tract infection contributes to high morbidity in children and remains a major cause of high infant and child mortality in our country.

Worms may be of many shapes and sizes, from microscopic 'pinofview' to 'tape-worms that are several feet long. Most of these worms live in the intestinal tract.

Infection of humans by worms, or worm infestation is a worldwide public health problem. It is estimated to affect over 200 million people in India. Children are most susceptible to worm infestation. This could lead to malnutrition, iron-deficiency anemia and impaired physical growth. It could also affect the learning ability of a child. Good hygiene and timely deworming can eradicate worm infestations and help children lead a healthy and active life.

Following is a brief note on the most common types of worms that are found in humans, with the symptoms and effects.

Types of parasite worms:

Type of Worm	Length or Growth	Symptoms of Worm/ Effect
Round worm Common, approximately 1000 million people are infected worldwide. 	Up to 15 inch long, 200 000 eggs a day	Pain in upper abdominal, asthma, eye pain, insomnia, rashes. Can cause blockages in the intestinal tract, loss of appetite, appendicitis, abscesses in the liver, etc.
Hook worm 	Up to 1/2 inch long	They feed on patient's blood. The symptoms include abdominal pain, loss of appetite, craving to eat soil, iron and protein deficiency, dry skin and hair, skin irritations, delayed puberty, mental dullness, etc. In acute cases it can cause cardiac failure and death.
Pin worm or Threadworm (Enterobius vermicularis) Most common worm. Common in children, about 500 million are infecte worldwide.	Up to 1/2 inch long. They lay about 15 000 eggs per day at outer of	The symptoms of pinworms include itching and irritation of the anus or vagina, digestive disorders, insomnia, irritation or nervousness. The worms come out of the anal opening to lay eggs at night. The eggs can pass to others through air or by contact with

	anus.	infected food. The eggs are not affected by disinfectants. It passes from person to person. The eggs can be passed by direct contact, or through sharing of food, toys, etc.
Whip worm several hundred are million infected worldwide. 	1 to 2 inches long	The symptoms of whipworms are bloody stools, pain in the lower abdomen, weight loss, nausea, and anemia.
Tapeworm 	Up to 35 feet long. they lay million eggs per day	There are usually no symptoms of tapeworm. They are detected in the stool sample. The infected person may have dizziness, vomiting, hunger or loss of appetite or weight loss.

ANALYSIS

[On The Basis Of Specific Information]

1. Distribution of data according to age group:-

CLASS INTERVAL	FREQUENCY	PERCENTAGE
5yrs.-6yrs.	05	$(5/20) \times 100 = 25\%$
7yrs.-8yrs.	06	$(6/22) \times 100 = 30\%$
9yrs.-10yrs.	03	$(3/20) \times 100 = 15\%$
11yrs.-12yrs.	06	$(6/20) \times 100 = 30\%$

2. Distribution of data according to sex:-

SEX	FREQUENCY	PERCENTAGE
Male	11	$(11/20) \times 100 = 55\%$
Female	09	$(09/20) \times 100 = 45\%$

3. Distribution of data according to religion:-

RELIGION	FREQUENCY	PERCENTAGE
Hindu	08	$(08/20) \times 100 = 40\%$
Muslim	09	$(09/20) \times 100 = 45\%$
Sikh	03	$(03/20) \times 100 = 15\%$

4. Distribution of data according to socioeconomic status:-

SOCIOECONOMIC STATUS	FREQUENCY	PERCENTAGE
Poor	09	$(09/20) \times 100 = 45\%$
Middle Class	10	$(10/20) \times 100 = 50\%$
High Income Group	01	$(01/20) \times 100 = 05\%$

5. Distribution of data according to place of living:-

PLACE OF LIVING	FREQUENCY	PERCENTAGE
Rural	07	$(07/20) \times 100 = 35\%$
Urban	13	$(13/20) \times 100 = 65\%$

(1) What were the main complaints from which your child was suffering from?

(A) Constipation & pain in abdomen (B) Nausea & vomiting (C) Excessive & frequent appetite (D) Grinding of teeth (E) Dribbling of saliva (F) Anal itching (G) Anemia & physical weakness although eating well (H) Bed wetting (I) Eye problem (e.g. impaired vision, etc.) (J) Skin rashes, blisters or any other skin problem (K) Persistent coughing.

OPTION	FREQUENCY	PERCENTAG
A	08	$(08/20) \times 100 = 40\%$
B	08	$(08/20) \times 100 = 40\%$
C	05	$(05/20) \times 100 = 25\%$
D	10	$(10/20) \times 100 = 50\%$
E	03	$(03/20) \times 100 = 15\%$
F	07	$(07/20) \times 100 = 35\%$
G	09	$(09/20) \times 100 = 45\%$
H	07	$(07/20) \times 100 = 35\%$
I	02	$(02/20) \times 100 = 10\%$
J	04	$(04/20) \times 100 = 20\%$
K	03	$(03/20) \times 100 = 15\%$

(2) How did you come to know that your child is suffering from worm infestation?

- (A) Worms came out in the stool (B) Worms came out while vomiting. (C) Worms came out while coughing
(D) By my experiences according to the child's complaints.

OPTION	FREQUENCY	PERCENTAG
A	12	$(12/20) \times 100 = 60\%$
B	03	$(03/20) \times 100 = 15\%$
C	02	$(02/20) \times 100 = 10\%$
D	04	$(04/20) \times 100 = 20\%$

(3) i-Did you consult any doctor and go for confirmatory- test ?

- (A) Yes (B) No

OPTION	FREQUENCY	PERCENTAG
A	19	$(19/20) \times 100 = 95\%$
B	01	$(03/20) \times 100 = 05\%$

ii-If yes then what was the result?

- (A) Roundworm (B) Hookworm (C) Pinworm/threadworm (D) Whipworm (E) Tapeworm (F) Positive but don't know which type (G) Negative

OPTION	FREQUENCY	PERCENTAG
A	10	$(10/19) \times 100 = 52.63\%$
B	01	$(01/19) \times 100 = 5.26\%$
C	07	$(07/19) \times 100 = 36.84\%$
D	00	$(00/20) \times 100 = 00\%$
E	02	$(02/20) \times 100 = 10.53\%$
F	01	$(01/19) \times 100 = 05.26\%$
G	00	$(00/19) \times 100 = 00\%$

(4) From how much time the child is suffering from these complaints?

- (A) A few days. (B) A few weeks. (C) A few months. (D) From more than 1 year.

OPTION	FREQUENCY	PERCENTAG
A	00	$(00/20) \times 100 = 00\%$
B	02	$(02/20) \times 100 = 10\%$
C	12	$(12/20) \times 100 = 60\%$
D	06	$(06/20) \times 100 = 30\%$

(5) Do you and your family members practice proper hygienic habits?

- (A) YES (B) NO

OPTION	FREQUENCY	PERCENTAG
A	17	$(17/20) \times 100 = 85\%$
B	03	$(03/20) \times 100 = 15\%$

(6) I-Do you teach your children habits of proper cleanliness & hygiene ?

(A) YES (B) NO

OPTION	FREQUENCY	PERCENTAG
A	17	$(17/20) \times 100 = 85\%$
B	03	$(03/20) \times 100 = 15\%$

II-If yes then do they follow those habits?

(A) YES (B) NO

OPTION	FREQUENCY	PERCENTAG
A	07	$(07/17) \times 100 = 41.18\%$
B	10	$(10/17) \times 100 = 58.82\%$

(7) Does your child regularly eats food/drinks from places or vendors where the food is kept open & in unhygienic conditions?

(A) YES (B) NO

OPTION	FREQUENCY	PERCENTAG
A	14	$(14/20) \times 100 = 70\%$
B	06	$(06/20) \times 100 = 30\%$

(8) From where do you get your drinking water?

(A) Underground source via hand pump/tube well/well. (B) Government water supply. (C) Surface water source like pond/lake/river.

OPTION	FREQUENCY	PERCENTAG
A	12	$(12/20) \times 100 = 50\%$
B	08	$(08/20) \times 100 = 40\%$
C	00	$(00/20) \times 100 = 00\%$

(9) Do you use your drinking water after purifying or boiling it?

(A) YES (B) NO

OPTION	FREQUENCY	PERCENTAG
A	09	$(09/20) \times 100 = 45\%$
B	11	$(11/20) \times 100 = 55\%$

(10) Does your child eats things like mud/baked clay of pots/silica/chalk etc.

(A) YES (B) NO

OPTION	FREQUENCY	PERCENTAG
A	05	$(05/20) \times 100 = 25\%$
B	15	$(15/20) \times 100 = 75\%$

(11) What are the defecation habits of your child?

(A) More than twice a day (B) Twice a day (C) Once a day (D) Once in two or more days.

OPTION	FREQUENCY	PERCENTAG
A	00	$(00/20) \times 100 = 00\%$
B	07	$(07/20) \times 100 = 35\%$
C	09	$(09/20) \times 100 = 45\%$
D	04	$(04/20) \times 100 = 20\%$

(12) Type of stool?

(A) Soft (B) Hard (C) Loose

OPTION	FREQUENCY	PERCENTAG
A	09	$(09/20) \times 100 = 45\%$
B	08	$(08/20) \times 100 = 40\%$
C	03	$(03/20) \times 100 = 15\%$

(13) Does your child complaints of itching in nose &/or picks his/her nose constantly?

(A) YES (B) NO

OPTION	FREQUENCY	PERCENTAG
A	10	$(10/20) \times 100 = 50\%$
B	10	$(10/20) \times 100 = 50\%$

(14) I-Does your child looks physically weaker than other children of his/her age group?

(A) YES (B) NO

OPTION	FREQUENCY	PERCENTAG
A	15	$(15/20) \times 100 = 75\%$
B	05	$(05/20) \times 100 = 25\%$

ii-If yes then what could be the possible reason?

(A) Worm infestation (B) Improper eating habits/diet (C) Due to any exhausting disease (D) By birth.

OPTION	FREQUENCY	PERCENTAG
A	15	$(15/15) \times 100 = 100\%$
B	04	$(04/15) \times 100 = 26.67\%$
C	00	$(00/15) \times 100 = 00\%$
D	00	$(00/15) \times 100 = 00\%$

(15) i-What about his/her progress in reaching the milestones of growth?

(A) On timely basis (B) Slightly late (C) Very late.

OPTION	FREQUENCY	PERCENTAG
A	14	$(14/20) \times 100 = 70\%$
B	06	$(06/20) \times 100 = 30\%$
C	00	$(00/20) \times 100 = 00\%$

(16) i-Is your child's concentration level low?

(A) Yes (B) No

OPTION	FREQUENCY	PERCENTAG
A	10	$(10/20) \times 100 = 50\%$
B	00	$(10/20) \times 100 = 50\%$

ii-If yes then what's the reason ?

(A) Due to worm infestation (B) Due to poor diet/eating habits

(C) Due to any exhausting disease (D) By birth.

OPTION	FREQUENCY	PERCENTAG
A	10	$(10/20) \times 100 = 50\%$
B	04	$(04/20) \times 100 = 40\%$
C	00	$(00/20) \times 100 = 00\%$
D	00	$(00/20) \times 100 = 00\%$

(17) i-Due you see any kind of change in your child's behavior after worm infestation?

(A) YES (B) NO

OPTION	FREQUENCY	PERCENTAG
A	19	$(19/20) \times 100 = 95\%$
B	01	$(10/20) \times 100 = 05\%$

ii-If yes then what?

(A) Gets irritated/angry easily (B) Anxiety/restlessness (C) Nervousness or gets easily frightened (D) Lack of interest in any kind of physical or mental labor (E) Sleepy (F) Efficiency has gone down.

OPTION	FREQUENCY	PERCENTAG
A	10	$(10/19) \times 100 = 52.63\%$
B	03	$(03/19) \times 100 = 15.78\%$
C	02	$(02/19) \times 100 = 10.53\%$
D	07	$(07/19) \times 100 = 89.47\%$
E	02	$(02/19) \times 100 = 10.53\%$
F	06	$(06/19) \times 100 = 31.58\%$

(18) What is the daily diet that you give to your child?

(A) Proper balanced diet inclusive of fresh fruits, green vegetables, etc. at proper time (B) Diet containing milk, cereals and sometimes fruits but no vegetables (C) Milk & cerelac only (D) Milk only (E) Whatever child likes to eat (F) Not able to provide a better nutrition.

OPTION	FREQUENCY	PERCENTAG
A	07	$(07/20) \times 100 = 35\%$
B	05	$(05/20) \times 100 = 25\%$
C	00	$(00/20) \times 100 = 00\%$
D	00	$(00/20) \times 100 = 00\%$
E	03	$(03/20) \times 100 = 15\%$
F	05	$(05/20) \times 100 = 25\%$

(19) Do you regularly consult your doctor for deworming of your child?

(A) YES (B) NO

OPTION	FREQUENCY	PERCENTAG
A	10	$(10/20) \times 100 = 50\%$
B	10	$(10/20) \times 100 = 50\%$

(20) What do you do to prevent worm infestation or to deworm your child?

(A) Use allopathic medicines (B) Use ayurvedic/herbal medicines (C) Use homoeopathic medicines (D) Use home-remedies (E) Do nothing about that.

OPTION	FREQUENCY	PERCENTAG
A	10	$(10/20) \times 100 = 50\%$
B	05	$(05/20) \times 100 = 25\%$
C	08	$(08/20) \times 100 = 40\%$
D	05	$(05/20) \times 100 = 25\%$
E	02	$(02/20) \times 100 = 10\%$

CAUSES:

(a) Contaminated food/drinks; dirty hands; no or improper personal hygiene (b) Being bare footed in case of hookworms (c) Faulty living.

SIGNS & SYMPTOMS OF WORMS IN CHILDREN:

(a) Constipation (b) Gas & stomach bloating (c) Increased appetite and desire for sweets specially (d) Food allergies (e) Grinding of teeth (f) Dark circles around eyes (g) Bed wetting & restlessness at night (h) Itchy feeling in & around anus and inflammation of the vagina in girls and women in case of threadworms (i) Headaches, sensitiveness to light & twitchy eye lids (j) Gums, rectum or nose bleeds (k) Extreme skin rashes with blisters specially on the inside of lower lip (l) Anemia due to blood loss & impaired nutrition (m) Weakness, tiredness, etc (n) Depression, irritation & lack of concentration etc (o) Foul breath (p) Itching in nose.

COMPLICATIONS:

(1) Diarrhoea, foul breath, dark circles around eyes (2) Inflammation of intestine & lungs with nausea, vomiting & coughing (3) Anemia & other nutritional disorders (4) Constipation & loss of weight (5) Physical & mental growth retardation.

TREATMENT:

The most commonly used medicines for deworming by doctors are :

1) Mebendazole 100 mg twice daily for 3 days.

2) Albendazole 400 mg once at bed time for 2 - 3 days.

3) Pyrantel pamoate (10 mg/kg/day) one single dose only. Medicines for deworming are also available in other modes of treatment like ayurveda, homoeopathy, etc. Many people also use home based therapies like coconut, garlic, pomegranate, castor oil, papaya, etc.

OBJECTIVES

- 1) To know about the frequency of children affected with worms in different age groups from 12 years of age.
- 2) To find the percentage prevalence of conditions due to nutritional impairment in children affected with worms.
- 3) To know about the affect of socio-economic status on the prevalence of impaired nutrition in children affected with worms.
- 4) To know about the knowledge and approach of treatment among people towards worm infestation.
- 5) To impart knowledge to the parents regarding worm infestation.

RESULTS AND DISCUSSION

[ON THE BASIS OF SPECIFIC INFORMATION]

1) The most common complaint which was reported was grinding of teeth (50 %) , the 2nd common complaints were of anal itching & bed wetting (45% each), the 3rd common complaints were of constipation & pain in abdomen and nausea & vomiting (40% each). While the least common complaints were of anemia & physical weakness and eye problems (10% each), the reason behind it may be anemia and eye problems are basically seen either in very chronic & severe cases or in children belonging to poor families where proper nutrition is not available.

2) Most of the people came to know that their child was suffering from worm infestation when the worms came out in the stool of their child (60%), while the rarest condition was when worm came out from the mouth of their child while coughing (10%). Coughing may occur when during its lifecycle the worm passes through the larynx => pharynx => oesophagus. Although worm coming out while coughing is not so common.

3) (i) It was an amazing fact that most of the people consulted the doctor and went for the confirmatory test (95%), the reason behind this may be that the study was conducted in the district hospital.

(ii) The maximum number of cases were found to be of round worms (52.63%) while the second highest number of cases were of pin worms/ thread worms (36.84%) . While, there was not even a single case of whip worm infestation.

4) In most of the cases the children were suffering from their presenting complaints from a few months (60%), while only 30% cases were such where children were suffering from more than 1 year.

5) Although most of the people used to practice proper hygienic habits (85%) but still their children were getting worm infestation which shows that the modern life style, the food habits as well as increasing pollution is also responsible for this.

6) (i) Nearly every one teaches their children habits of proper cleanliness and hygiene. This is basically due to the reason that most of the samples collected were from urban areas.

(ii) But as it was expected children were not strictly following those habits. The parents or the other elder people were not able to make their children follow good hygienic habits either due to lack of time or due to excessive love and affection towards the children.

7) One of the major causes of worm infestation even after following proper hygienic habits is eating foods in the market. Children who were taken as samples, most of them (70%) regularly eat food/drinks from places or vendors where the food is kept open or in unhygienic conditions.

8) The commonest source of drinking water supply is the underground water (60%), while the remaining people used the government supply (40%). This result shows that even the govt. supply water is not hygienic even after chlorination.

9) More than half of the people (55 %) used their drinking water without purifying or boiling. This shows that most of them are either not bothered about it or don't have proper knowledge about the importance of it.

10) Most of the children were reported to eat things like mud/baked clay of pots/silica/chalk etc.

11) The defecation habits in most children (45%) was found to be once a day which does not clearly indicate that they were constipated or not but in some children (20%) they reported of defecation habit of once in two or more days which shows a severe constipation. This is due to the partial blocking of the GIT due to heavy worm infestation.

12) Stool was found to be soft in maximum cases (45%) only and only few cases were there in which stool was loose (15%).

13) Itching in the nose and nose picking is generally common in worm infestation. The reason behind this is when during its life cycle the worm passes through the larynx => pharynx it causes an allergic reaction which causes coughing and also if the worm reaches the nose it causes nasal itching.

14) (i) It was the opinion of most of the parents (75%) that their child looked physically weaker than the other children of his/her age. The reason behind it may be that even after proper nutritious diet the child does not get the actual amount of nutrition he/she requires to grow as a great part of it being taken up by the worms.

(ii) The above discussion can be proved easily by this result that all the parents thought that the reason behind it was WORM INFESTATION.

15) Only some parents (30%) reported that their child reached its milestone slightly late. This result although does not confirm that the slow progress was actually due to the worm infestation.

16) (i) Half of the parents reported that their child was suffering from low concentration level problem.

(ii) The reason was found to be worm infestation as all of them said yes for this reason and only 40% of them said about diet or eating habits. None of the child was suffering from any exhausting disease or by birth.

17) (i) Except one case all reported of changes in the child's behavior after worm infestation.

(ii) The most common behavioral change that was seen was lack in interest in any kind of physical or mental labor (89.47%). The 2nd most common change was getting irritated or

easily (52.63%) . The least common changes to be found were nervousness or gets easily frightened and sleepy (10.53% each).

18) The daily diet provided to the children by the parents in 35% cases was proper balanced diet inclusive of fresh fruits, green vegetables, etc. at proper time, while 25% cases were those where the child was provided either with diet containing milk, cereals and sometimes fruits but no vegetables or whatever the child likes.

19) Only half of the parents used to consult their doctor regularly for deworming of their child and for a checkup whether the child is not suffering any condition due to worm infestation. 20) Half of the people told that they used allopathic medicines for regular deworming of their child, while 2nd highest number was of those who used homoeopathic medicines due to its no side effect. Remaining people except two of them either used ayurvedic remedies or homemade remedies.

CONCLUSION

Stomach ache is the common complain of children due to intestinal infection, which is mostly caused by intestinal parasites such as worm. A child is deprived off the nutrients as worms tend to live intestine as feed on these.

Worm are of various types, the most common are tapeworm, roundworm, pinworms as threadworm and hook worm.

The most common symptoms o worm infections are weight loss, bed wetting, irritability, blood in stools. The causes of worm infections are direct contact with an infected surface such as soil containing eggs or germs at a playground or touching pets infected food or water unhygienic conditions, and inadequate hand washing.

Tapeworm infection symptoms most commonly seen are Jaundice, Nausea, Vomiting, eating too frequently & sometimes malnutrition. Common symptoms of Roundworm infection are Diarrhea dry cough and fever. In Pinworm infection itching around the arms, trouble sleeping due to itching painful urination are common symptoms.

Most worm infection can be easily treated. Antiworm or deworming medicines are available, for an effective recovery good hygienic practices must be adopted.

Intestinal worms are generally found in children who are exposed more to the contaminated environment and have direct contact with direct soil or water. Children who play barefoot in these causes have more risk of getting infected by these worms. Contaminated food or Junk food can also be a source of spread of these worms.

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