

# Frequency of Parasitic Infestation in Children of Rural Population of Peshawar

*by* Rubina , Nazli

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## Frequency of Parasitic Infestation in Children of Rural Population of Peshawar

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**Dr. Tasleem Akhtar** M. Phil, Ph D, Ex-Scientific Research Officer, PMRC Research Centre,  
Khyber Medical College Peshawar

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**Jamila Haider**, PhD scholar, Center of Biotechnology & Microbiology, University of Peshawar

5

**Dr. Nabila Sher Mohammad** Assistant Professor Biochemistry, Khyber Girls Medical College  
Peshawar

4

**Dr Rubina Nazli**, MBBS, PhD, Professor of Biochemistry, Institute of Basic Medical Sciences,  
Khyber Medical University, Peshawar

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**Dr. Sadia Fatima** MBBS, PhD Assistant Professor of Biochemistry, Institute of Basic Medical  
Sciences, Khyber Medical University, Peshawar

### Address of corresponding Author:

**Dr Rubina Nazli**

Professor Biochemistry

4

Khyber Medical University

Peshawar, Pakistan.

Ph No: 03215773696

E-mail: [drrubinanazli.ibms@kmu.edu.pk](mailto:drrubinanazli.ibms@kmu.edu.pk)

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[rubinanazli44@gmail.com](mailto:rubinanazli44@gmail.com)

## ABSTRACT

Worm infestation is a major public health problem in children of developing countries because of poor socioeconomic conditions, low literacy rate of parents and lack of good hygienic living. It constitutes an important limitation on growth and development. This cross sectional study was carried out to find out the actual prevalence of parasitic infections in a community village Budhni of Peshawar. A sample of 288 children aged <5 years were randomly selected. Fresh stool sample were examined microscopically. Information was also collected on the age, gender, feeding and hygiene habits of the mothers and children. Microscopic study revealed *Giardia lamblia*, *Hymenolepis nana*, *Ascaris lumbricoides* and *Trichuris trichiura* & *E. histolytica* in the stools of children. Multiple infections were also seen in 19% children.

Key Words: Worm infestation, children < 5 years, rural Peshawar

### 3 INTRODUCTION

3 Worm infestation remains one of the main problems of child development. It is one of the major causes of childhood malnutrition, anaemia, 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.<sup>1</sup>

Intestinal parasite infestations are more frequent in 14 children of school age, and they have a tendency to occur more in this age group. 3 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.<sup>1</sup> Its rate varies from country to country and even different among same country.<sup>2</sup> 7 It is estimated that about 3.5 billion people are affected, and about 450 million are ill due to these infections, the bulk being children.<sup>3</sup>

11 In other estimation about one quarter of the world's population is infected and about 80% of all deaths annually are due to infectious and parasitic diseases in developing countries.<sup>4</sup>

6 The reason behind the high prevalence of these infestations is closely correlated to poverty poor environmental hygiene and impoverished health services.<sup>5</sup>

1 The effect of intestinal pathogenic parasites HIPP is significant on the health of the community.<sup>6,7,8,9</sup> Few studies was done about the prevalence of HIPP in Pakistan<sup>10,11,12</sup> but mostly of on hospitalized children or school based.<sup>13, 14, 15, 16, 17</sup>

1 Due to absence of specific denominator and results it did not reveal the true prevalence of burden of disease due to parasitic infections in the community and health resources, in cooperation 1 by direct impact through health services utilization and the Disability Associated Life Lost Years (DALYS). These studies also indicated that majority of intestinal parasitic

infections were asymptomatic<sup>16, 17</sup> and they did not consult laboratory that is why the true prevalence could not be reported. The large number of subject are the carriers and are serious threat for epidemics but the true prevalence cannot be reported.

## **SUBJECT AND METHODS**

This cross-sectional comparative study was conducted on children less than five years in village Budhni. This village is established by PMRC in 1984 as a model community for its research studies. It is about 30 KM away from Peshawar and has an estimated population of 10, 147 and total houses 1549. For research purpose the whole village is divided into 9 geographical blocks and each house is marked with a specific number. Family Folder of each family is maintained and updated regularly. The population of children under five is approximately 871 in this village.

A sample of 288 children both male and female were randomly selected and included in the study. The nature and procedure of the study was explained to the parents and informed consent taken. The mother/ proxy of child were interviewed by a trained health care worker according to pre-designed questionnaire. The demographic variables age, gender, education/socioeconomic status of the parents, source of drinking water and sanitary condition of the household were recorded. Feeding practices of child whether breast feeding or bottle feeding and use of soother were also recorded. Weight and height/length of child were measured according to standard methods. Children of both gender either symptomatic or asymptomatic and presently not taking treatment for diarrhea and dysentery were included in the study.

A plastic vial with a spoon and sterile tight-fitting lid was given to the mother of child for collection of stool specimen during house to house visit. The mother was instructed to avoid stool contamination with urine. Each container was marked with waterproof ink with an

identification number. Fresh stool samples were delivered to lab immediately for microscopy and other examinations.

To achieve reliable results a mini lab was established in the Community Research Centre in village Budhni equipped with basic requirement. All stool specimens were examined fresh with microscopy being done first for intestinal parasites. Different risk factors associated with intestinal parasites were also calculated at a significance level of  $P < 0.05$ .

## RESULTS

Socio demographic and socioeconomic characteristic of study population is shown in table-1.

A total of 288 children were included in the study; out of which 175(61%) were males and 113(39%) females. The mean age was  $33.8 \pm 16.1$  months, mean height  $83.1 \pm 18.3$ cms and mean weight was  $12.3 \pm 8.9$  Kg. Mean family income of 45% families ranged between Rs: 7,000-10,000 with a mean family size of  $4.6 \pm 2.2$  members per family. About 112(39%) parents were illiterate. Hand washing before feeding/weaning was practiced by 206(71.5%) mothers and 130(45%) children. Soother was used by 70(24%) children. Only 91(31.6%) children were breast fed. Main source of drinking water was hand pump in 211(73%) and flush latrine was present in 184(64%) houses.

Table-2 shows intestinal parasites identified on stool microscopy. An overall prevalence of parasitosis was 41% (117). The most common parasite was *Giardia lamblia* found in 56(19.4%) stool specimens. Among nematodes, *Hymenolepis nana* was seen in 18(6.3%) and *Ascaris lumbricoides* (round worm) in 6(2.1%) cases, more than one parasite was seen in 19% children (table-3).

Distribution of parasites on microscopy according to age and gender is shown in table-4. Infestation increased with age of the child up to 36 months. Most cases were infected between the age group of 25-36 months.

Factors related to worm infestation are shown in table-5. Female children were somehow more infected 43(38%) as compared to male children 55(31.4%). Worm infestation increased with the family size and maximum 11(42.3%) number of infected children belonged to families having > 7 family members. It was observed that higher parental education was associated with lower frequency of worm infestation and worm infestation was highest in children whose parents were illiterate. No much difference in frequency of worm infestation was seen in mother/child hand washing practice before feeding/weaning or use of soother by the child. Hand pumps were the major source of drinking water in this community; almost 77(36.5%) children were infected with the parasites using water from this source. Worm infestation was more (60%) in children using water from a well as compared to those using it from the community tap (24.3%). A significant ( $P<0.02$ ) number of non breast fed children 76(38.6%) were infected with parasites as compared to those who were breast fed 22(24.2%). Toilet facility showed a direct relation to parasitic infection and 12(46.2%) children were found infected when latrine facility was not available in the house hold and they used open fields for squatting. Although these risk factors were affecting the frequency of intestinal parasites to certain extent but none except breast feeding could attain the level of significance.

## **DISCUSSION**

In the present study, parasites were present in 40.6% samples; this is similar to many studies where the prevalence ranges from 30% to 80%. Poor living conditions could be the cause of high prevalence along with using of unsafe water, poor sanitary conditions and improper disposal of

1 waste. These factors were reported by other authors as well along with a climatic difference and temperature and humidity.<sup>8</sup>

The parasitic infestation was more common in females while this difference was non significant in other studies.<sup>17</sup> Controversies exist in studies regarding gender and parasitic infestation.<sup>18</sup>

Parasitic infestation was mostly seen between 25-36 months (53.9%). A study from Karachi showed 2-5 years as the most common age group as in this age the child starts walking and playing with soil.<sup>18</sup> WHO has recommended that every child between 2 to 5 years should be given single dose of antihelminthic drug (prophylactic dose) every 6 monthly (Integrated Management of Childhood Illness).<sup>19</sup>

10 In this study the most common parasite was Giardia Lamblia (19.4%), followed by Entamoeba Histolytica, a protozoan and Hymenolepis nana, a helminthes. Similar results were reported from Karachi Hook worm was not observed in our study and in other studies.<sup>18</sup> Similarly pin worm (enterobius vermicularis) which is common in this part of the world was not found in this study. Different combinations of helminthes and protozoa are reported in other studies.<sup>18</sup>

1 Ratio of protozoal (78.6%) to helminthic (21.4%) infection in present study was 3.7:1, which is similar to 3.5:1 reported from Karachi.<sup>7</sup> 1 Poor living conditions, use of unsafe water supply, 1 improper disposal of waste and poor sanitary conditions along with a climatic difference and temperature and humidity are said to be the risk factors. IMCI Integrated Management of Childhood Illness.<sup>7, 8, 9.</sup>

## CONCLUSION

1 It is concluded that there is a high prevalence of parasitic infestation in the community. Single as well multiple infestations were found. Therefore, 1 an intervention strategy including health education program should be designed and implemented to control parasitic infections.



**Table-1: Demographic and socioeconomic characteristics of study population.**

<b>Characteristics</b>	<b>Number</b>	<b>Percentage</b>
Sample size	288	-
Gender		
Male	175	60.8
Female	113	39.2
Age (months)		
Mean $\pm$ SD	(33.88 $\pm$ 16.13)	-
Height (cm)		
Mean $\pm$ SD	(83.12 $\pm$ 18.37)	-
Weight (Kg)		
Mean $\pm$ SD	(12.39 $\pm$ 8.98)	-
Family Size		
Mean $\pm$ SD	(4.63 $\pm$ 2.22)	-
Parents Education		
Illiterate	112	38.9
Literate	176	61.1
Monthly income (Rs)		
< 7000	52	18.0
7000-10000	129	44.8
> 10000	107	37.2
Hand washing (mother)		
Yes	206	71.5
No	82	28.5

Hand washing (Child)		
Yes	130	45.1
No	158	54.9
Use of soother		
Yes	70	75.7
No	218	24.3
Feeding practices		
Breast feeding	91	31.6
Bottle feeding	36	12.5
Mix feeding	24	8.4
Self/weaned	137	47.5
Source of drinking water		
Community Tape	37	12.8
Hand pump	211	73.3
Bore well	35	12.2
Well with cover	5	1.7
Latrine facility		
Open field squatting	26	9.0
Pit or borehole privy	14	4.9
Pour flush latrine linked with street drain	184	63.9
Septic tank	37	12.8
Surface privy	27	9.4

**Table-2: Type of parasites present in the study population on microscopic examination**

Type of parasite	N	%
Giardia lamblia	56	19.4
Hymenolepis nana	18	6.3
Trichuris trichiura	01	0.3
Entamoeba histolytica	36	12.5
Ascaris lumbricoides	06	2.1
<b>Total</b>	<b>117</b>	<b>40.6</b>

**Table-3: Different types of parasite found in combination on microscopic examination of stool specimen.**

Type	Frequency	Percentage
Giardia lamblia & Hymenolepis nana	9	47.3
12 Giardia lamblia & Ascaris lumbricoides	1	5.3
Giardia lamblia & Entamoeba histolytica	6	31.6
Entamoeba histolytica & Hymenolepis nana	2	10.5
Ascaris lumbricoides & Hymenolepis nana	1	5.3
<b>Total</b>	<b>19</b>	<b>100</b>

**Table-4: Distribution of parasites positive children on microscopic examination of stool specimens according to age and gender.**

Age (months)	Parasite positive					
	Male		Female		Total	
	N	(%)	N	(%)	N	(%)
0-12	05	17.9	01	4.8	6	12.2
13-24	12	19.4	09	42.9	21	25.3
25-36	16	48.5	18	60	34	53.9
37-48	11	40.7	05	26.3	16	34.8
49-60	11	44.0	10	47.6	21	44.7
<b>Total</b>	<b>55</b>	<b>31.4</b>	<b>43</b>	<b>38.0</b>	<b>98</b>	<b>34.0</b>

**Table-5: Different causative factors associated with the presence of parasites in the stool of children.**

Factors	Total (N)	Parasite Positive		P value
		N	%	
Gender				
Male	175	55	31.4	0.3
Female	113	43	38.0	
Family size				
< 4	140	41	29.3	-
5-7	122	46	37.7	0.18
> 7	26	11	42.3	0.27
Parents education				
Illiterate	112	44	39.3	-
Secondary	107	35	32.7	0.38
Higher Secondary	17	5	29.4	-
Graduation & higher	52	14	26.9	0.17
Family Income (Rs)				
< 7000	116	37	31.9	-
7000-10000	43	12	27.9	0.77
>10000	129	49	37.9	0.39
Washing hands (mother)				
Yes	206	68	33	0.7
No	82	30	36.6	-
Washing hands (Child)				
Yes	130	48	36.9	-
No	158	43	27.2	-
Use of soother				
Yes	70	22	31.4	0.70
No	218	76	34.9	-
Source of drinking water				
Community tape	37	9	24.3	-
Hand pump	211	77	36.5	0.21
Tube well	35	9	25.7	0.83
Well (house)	5	3	60	0.25
Mode of feeding				
Bottle feeding	36	10	27.8	-
Breast feeding	91	22	24.2	0.84
Mix feeding	24	6	25	0.95
Self/weaned	137	60	43.8	0.85
Breast feeding vs Non breast feeding	91 197	22 76	24.2 38.6	0.02
Latrine facility				
Open field squatting	26	12	46.2	-
Pit or borehole privy	14	2	12.3	0.09

Pour flush latrine	184	63	34.2	0.33
Septic tank	37	14	17.8	0.68
Surface privy	27	7	25.9	-
Open field vs Home toilet	26 262	12 86	46.2 32.8	0.24

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