WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 7.523
Volume 6, Issue 8, 1206-1214. Research Article ISSN 2277–7105

AN EPIDEMIOLOGICAL SURVEY ON INTESTINAL PARASITIC INFESTATION AMONG URBAN AND RURAL POPULATION OF MEERUT (U.P.)

Praveen Kumar* and Rajesh Praveen

*Department of Zoology, N.R.E.C. College, Khurja, (Bulandshahr).

Article Received on
25 May 2017,

Revised on 14 June 2017,
Accepted on 05 July 2017

DOI: 10.20959/wjpr20178-8961

***Corresponding Author**
Dr. Praveen Kumar
Department of Zoology,
N.R.E.C. College, Khurja,
(Bulandshahr).

ABSTRACT

In order to investigate the epidemiological investigation of human intestinal parasitic infestation in rural and urban population of Meerut District. Parasitic infestation of gastrointestinal tract is a major cause of morbidity and mortality. Despite the existence of effective parasitic infestations remain a major public health problem. In rural and urban communities, continuing infection is often reinforced by dietary habits. The intestinal parasitism is common in developing countries. Their distribution is mainly associated with poor personal hygiene, environmental sanitation and socio – economic conditions. This study present a survey of the prevalence of intestinal parasitic infection. A stool examination was performed on 223, randomly selected persons from rural and urban populations of Meerut District. The present study was carried out from 2009 to 2011. The collected stool specimens were examined microscopically for the presence eggs, cysts and trophozoits of intestinal parasites, using simple smear in saline method. Epidemiological data were analyzed using Chi –Squared test. The prevalence of intestinal parasites was significantly higher (χ^2 = 25.95, df = 2, P = 5.99 at 0.05 level) in low age group, (χ^2 = 31.1, df = 2, P = 5.99 at 0.05 level) in low income group, (χ^2 = 6.23, df = 1, P = 0.46 at 0.05 level) in rural population and (χ^2 = 1.58, df = 1, P = 0.46 at 0.05 level) in males as compared to females. The present study indicates that a nationwide parasite control project is necessary to reduce the possibility of morbidity and mortality due to parasitic diseases in the country.

KEYWORDS: Intestinal Parasites, Prevalence, Poverty, Epidemiology.

INTRODUCTION

Human intestinal parasites occur throughout the world but it is in the west tropics and sub-tropics where they are found in their greatest numbers. A basic requirement for the continued survival of these organisms is an inadequate and unhygienic method of disposal of faecal material. The intestinal parasitic infections caused by intestinal parasites are among the most prevalent infections in human in developing countries. Intestinal parasitic infections such as amoebiasis, ascariasis, hookworm infection and trichiuriasis are among the ten most common infections in the world [WHO, 1987]. Human intestinal parasites can be present in any disease, in any person, at any age. People with intestinal parasitic infections are usually under nourished and weak, infected with viral, fungal, or bacteria, and have various types of chemical and metal poisoning. Intestinal parasites cause a significant morbidity and mortality in endemic countries. These infections are the most prevalent in tropical and sub – tropical regions of the developing world where adequate water, sanitation facilities and poor economic conditions are lacking. [Savioli 2004, Cappello, M 2004, Sah and Bhattarai S 2013 and Nxasana et al, 2013]. The worldwide prevalence of intestinal parasites is estimated in more than 3.5 billion with around 4.5 million clinical cases. [Okey, et al 2004]. It is observed that about 60 – 80 percent population of certain areas of West Bengal, Uttar Pradesh, Bihar, Orissa, Punjab, East Coast of Tamil Nadu and Andhra Pradesh is infected with parasites [Dutta, 1962]. Intestinal parasitoses are common both in general population and in people residing in institutions in tropical and sub – tropical regions. [Grandle et al, 2011 and Melo et al, 2010] The conditions required for transmission and aqusion of intestinal parasitism are favored in institutions where large number grouped together for a long period of time and poor sanitary conditions prevail. This is evidenced by studies on the prevalence of intestinal parasites in school, day care centers and institutions. [Souza et al 2010, Iichukwu et al, 2000, Okey, et al 2004, Heidari et al 2003, Lee et al 2000, Gatti et al 2000, Rivero- Rodinguer et al 2000]. Local conditions such as, quality of domestic and village infrastructure, economic, occupation and social factors such as, education influence the risk of infections, diseases transmission and associated morbidity and mortality. [Wang et al 2009, Yakuba et al 2003] The objective of this study was to perform an epidemiological survey to determine the prevalence of intestinal parasitic infections in the populations of Meerut District.

MATERIAL AND METHODS

The present study was conducted on human intestinal parasitic patients and few healthy subjects as control. In this study, a survey was carried out for human parasitic diseases, from

rural and urban populations of Meerut District for two years from 2009 to 2011. For this study, an interview technique was performed to collect the information of subjects regarding their age, sex and family background. For the present study, a total of 223, samples of stool for both rural and urban populations were collected for microscopic investigations in laboratory. The Simple Smear in Saline method [WHO 1991] was used to determine the stool samples. The persons having any cyst/ova/trophozoit/whole parasite were treated as parasitic positive patients. During the Demographic study of persons, the age group, sex, socio-economic and literacy status were included in this study. The Chi –Squared tests were performed to the test for an association between all possible pairs of parasitic infections and between the genders of each age group. The calculated χ^2 value was more than P – value (at 0.05 level).

RESULTS AND DISCUSSION

Overall 223, stool samples were examined by Simple Smear in Saline method on the population of Meerut District. The age combination shows that 52 (23.31%) persons were in 0-15 age group and 91 (40.80%) in 15-35 age group while, 80 (35.87%) were above the age of 35 years. The sex based distribution shows that out of 223 samples, the 120 (53.81%) were collected from males and 103 (46.18%) from female. According to socio-economic status 71 (50.70%) to low (5001 to 15000), 112 (17.85%) to medium (15001 to 25000) and 40 (12.5%) persons to high (<25000) income group. The literacy status shows that 103 (33.98%) were belongs to illiteracy, 85 (37.93%) to high school, 20 (15.0%) to intermediate and 15 (6.66%) to graduate and above. In these 223 samples, 61 were found parasitic positive patient in which 54.1% positive parasitic patients were from 0 -15, 27.9% from 15-35 and 18.0% from the age above 35. Further, sex wise distribution shows that 60.7% positive parasitic patients were male and 39.3% females. Their economic status shows that 59.02%, 32.79%, and 8.20% positive parasitic patients were in low, medium and high income group respectively, while the literacy status shown that 57.38% positive parasitic patients were illiterate, 36.07% at high school level and 4.92% at intermediate, while the 1.63% positive parasitic patients were at graduate or above level. The results of present study shows that the gastrointestinal parasitic infection was found statistically more significant higher (χ^2 = 25.95, df = 2, P = 5.99 at 0.05 level) in low age group, (χ^2 = 31.1, df = 2, P = 5.99 at 0.05 level) in low income group, (χ^2 = 6.23, df = 1, P = 0.46 at 0.05 level) in rural population and (χ^2 = 1.58, df = 1, P = 0.46 at 0.05 level) in males as compared to females. In the univariate analysis, no statistically significant association were observed between educational levels. Our findings are the

consonance with socio-economic indicators [Iichukwu, et. al. 2010 and Lee, et. al. 2000]. The unsanitary conditions and low age group increased the risk factors for developing intestinal parasitic infections. [Adamu, et al. 2006, Gatt, et. al. 2000 and Heidan, et. al. 2003] In other study revealed that the prevalence of intestinal parasites was high in low age group as compared to other age group. [Aschalaw, et. al. 2013, Kumar et. al. 2013 and Kumar et. al. 2015)] In the continuation of this study, another study also revealed that the high prevalence of intestinal helminthes shown in the low socio – economic group. [Bhandari, et. al. 1985].

Table 1: Prevalence analysis for positive patients according to residence gender.

Characteristic Gender	Total Number	Positive (+)	Negative (-)	Prevalence (%)
Urban	98	19	79	31.15
Rural	125	42	83	68.85

*χ^2 = 6.23, df = 1, P = 0.46 at 0.05 level

Table 2: Prevalence analysis for positive patients according to age group.

Characteristic Age Group	Total Number	Positive (+)	Negative (-)	Prevalence (%)
0 – 15	52	33	19	54.1
15 – 35	91	17	74	27.9
Above 35 Years	80	11	69	18.0

*χ^2 = 25.95, df = 2, P = 11.345 at 0.05 level

Table 3: Prevalence analysis for positive patients according to gender.

Characteristic Gender	Total Number	Positive (+)	Negative (-)	Prevalence (%)
Male	120	37	83	60.7
Female	103	24	79	39.3

*χ^2 = 1.58, df = 1, P = 0.46 at 0.05 level

Table 4: Prevalence analysis for positive patients according to age economic status.

Characteristic Economic Status	Total Number	Positive (+)	Negative (-)	Prevalence (%)
Low Income (5001 to 15000) group	71	36	66	59.02
Medium Income (15001 to 25000) group	112	20	61	32.79
High Income (<25000) group	40	05	35	8.20

*χ^2 = 33.64, df = 3, P = 11.34 at o.01 level

Table 5: Prevalence analysis for positive patients according to education status.

Characteristic Education Level	Total Number	Positive (+)	Negative (-)	Prevalence (%)
Illiterate	103	35	68	57.38
High School level	85	22	63	36.07
Intermediate	20	03	17	4.92
Graduate & Above	15	01	14	1.63

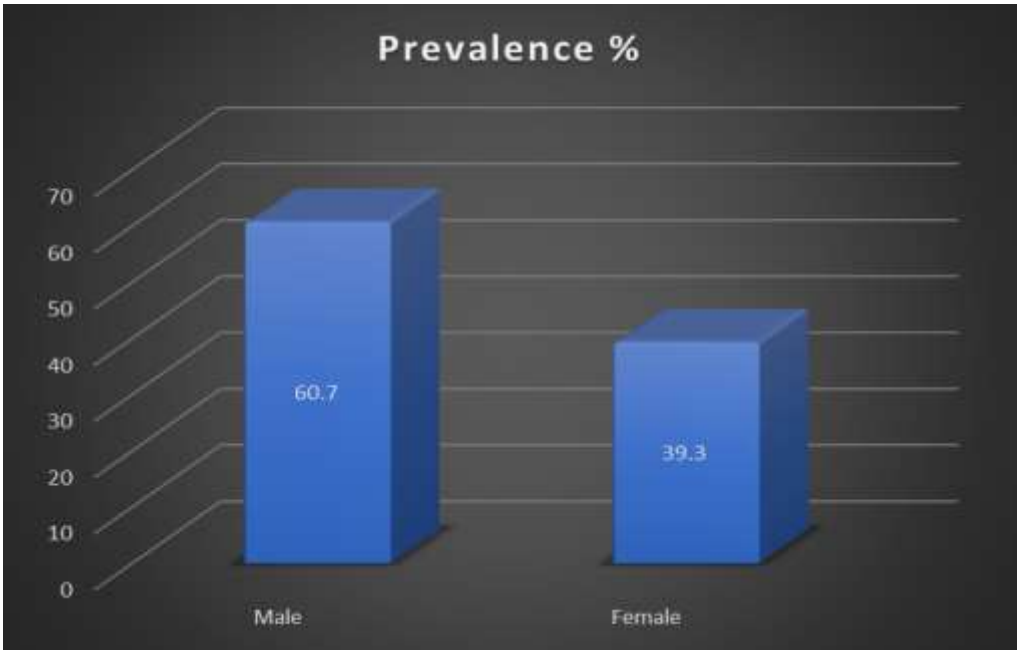

Fig 1: Prevalence of gastrointestinal parasitic infection according to residence.

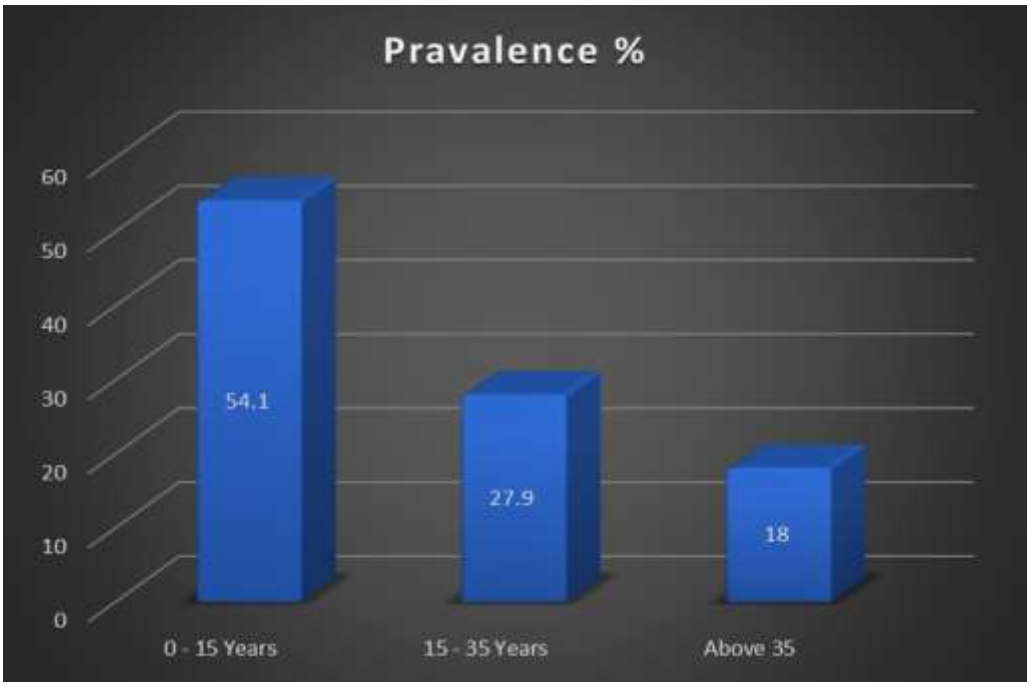

Fig:- 2- Prevalence of gastrointestinal parasitic infection according to age group.

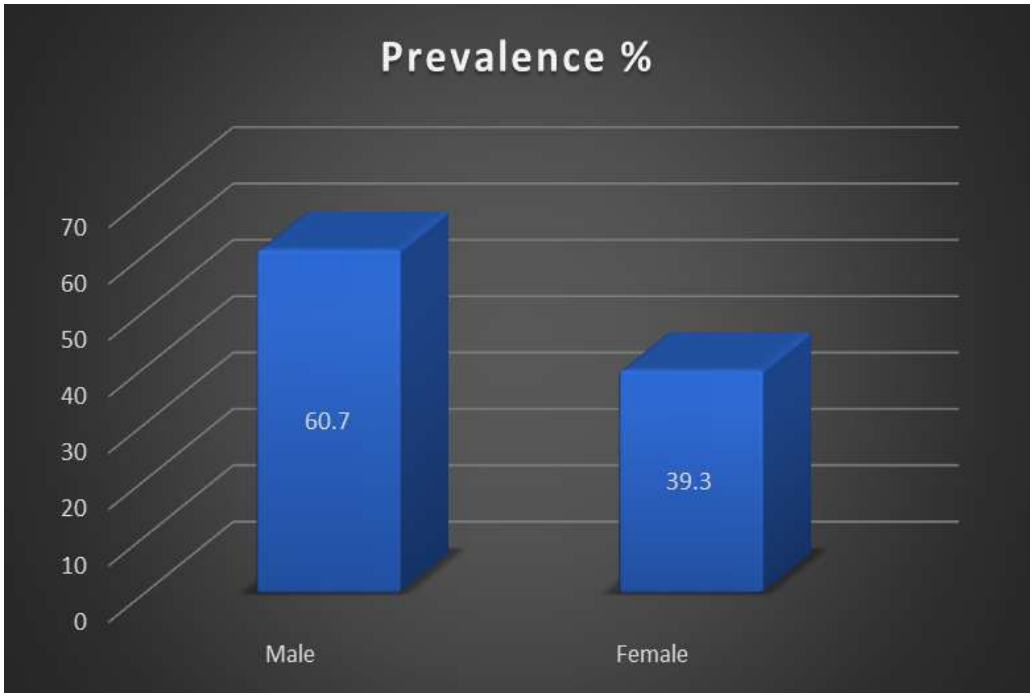

Fig 3: Prevalence of gastrointestinal parasitic infection according to gender.

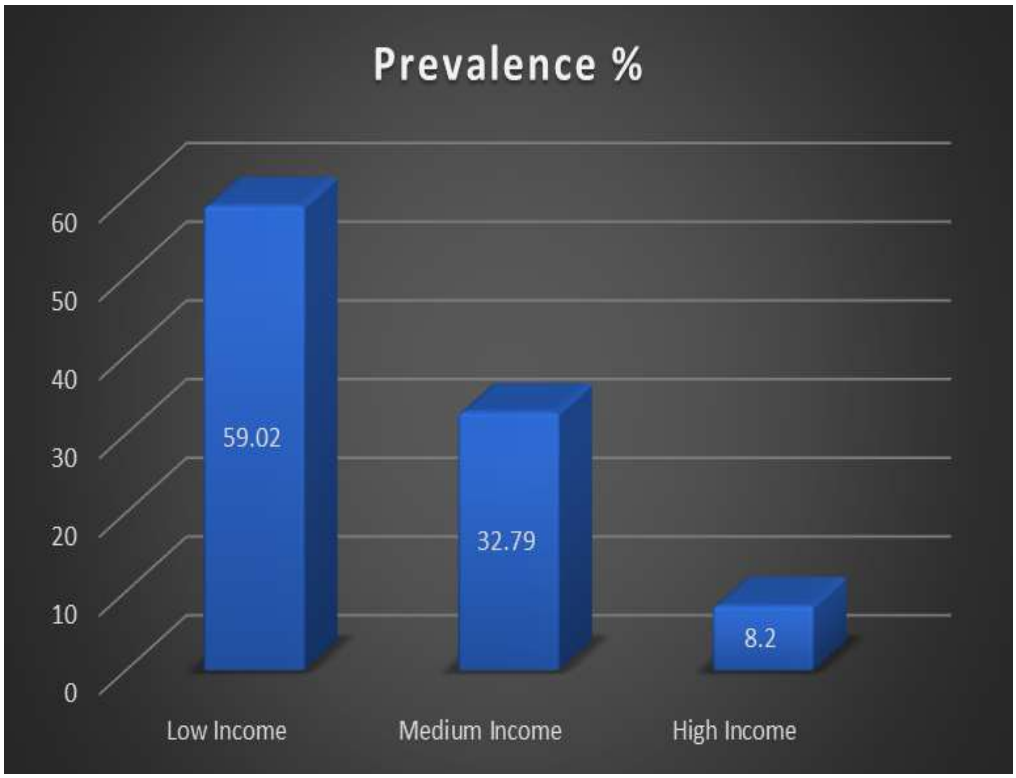

Fig:- 4 - Prevalence of gastrointestinal parasitic infection according to economic status.

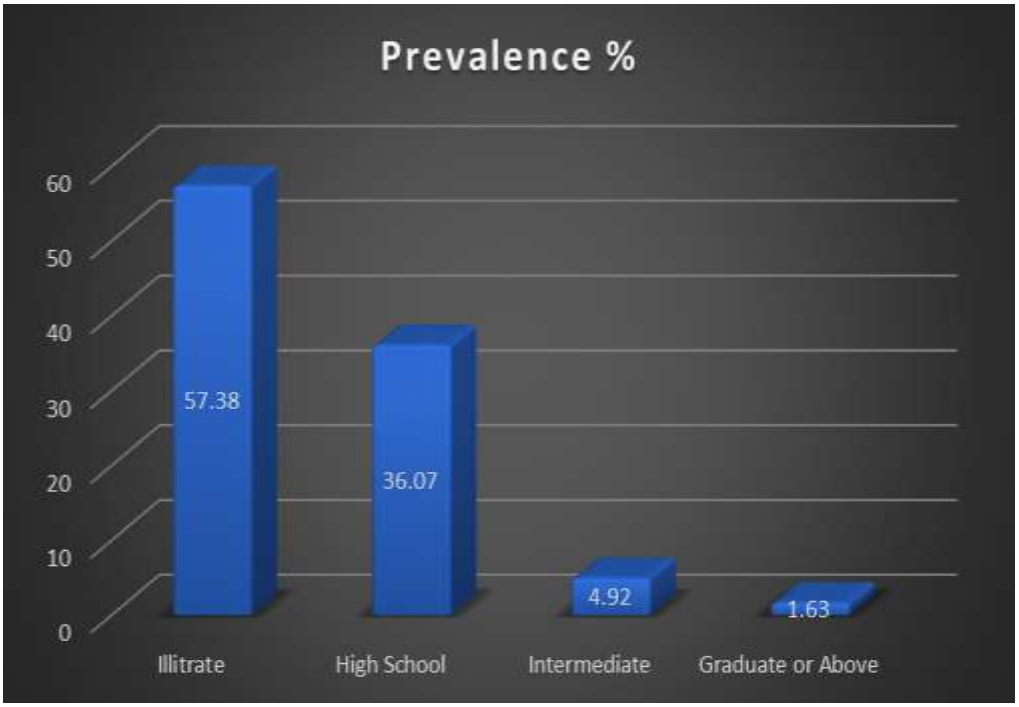

Fig 5: Prevalence of gastrointestinal parasitic infection according to education status.

CONCLUSION

In conclusion, the prevalence of gastrointestinal parasitic diseases appears to be high due to poverty, low literacy status, standards of livings, social norms and customs. The present study indicates that a nationwide parasite control project is necessary to reduce the possibility of morbidity and mortality due to parasitic diseases in the country.

REFERENCES

1. Adamu, H., Endeshaw, T., Teka, T., Kifle, A. and Petros, B. (2006) The Prevalence of intestinal parasites in pediatric diarrheal and non-diarrheal patients in Addis Ababa Hospitals with special emphasis on opportunistic parasitic infections and with insight into the demographic and socio-economic factors. *Ethiopial J of Health Development*, 20: 39–46.
2. Aschalaw, G., Belay, A., Bethel, N., Betreason, S., Atnad, Y., Meseret, A., Megista, E. and Baye, G. (2013) Prevalence of intestinal parasitic infections and risk factors among school children at the University of Gondar community school, Northwest Ehiopia: a cross-sectional study. *BMC Public Health*, 13: 304.
3. Bhandari, B., Gupta, G.P. and Mondowara, S.L. (1985) Prevalence of intestinal parasites in Udipur. *Ind. Jour. Ped*, 52: 299.

4. Dutta, P.R. (1962) Rural Health Surveys in India, *P.H. Centers CHEB, DGHS, New Delhi.*
5. Gatt, S., Lopes, R., Cevini, C., Ijoba, B., Bruno, A., Bemuzz, A.M., De Lio, P. and Monco, A (2000) Intestinal parasitic infections in an institution for the mantally ratarted. *Ann. Torp. Med. Parasitol*, 94: 453–460.
6. Grande, R., Ranzi, M.L., Restelli, A., Maraschin, A., Perego, L. and Torresani, E (2011) Intestinal parasitosis prevalence in outpatients and inpatients of Ca Granda IRCCS Foundations – Ospedale Maggiore Policlinico of Milan data comparison between 1984 – 1985 and 2007 – 2009. *Infez. Med*, 19: 28–38.
7. Heidan, A. and Rokni, M.B. (2003) Prevalence of intestinal parasites amond children in day care centers in Damghan, Iran. *Iranian J. Publ. Health*, 32: 31–34.
8. Hall, A., Kassa, T., Demissie, T., Degefie, T. and Lee, S. (2008) National Sruvey of the health and nutrition of school children in Ethiopia. *Trop Med. Int. Health*, 13: 1518–26.
9. Iichukwu, G.C., Iichukwu, C.G., Ozumba, A.N., Ojinnaka, N.C., Ibe, B.C. and Onwasigwe, C.N. (2010) Some behavoural risk refactors for intestinal helminthiasis in nursery and primary school children in Enugu south eastern, Nigeria. Niger J. Clin. Paract, 13: 288–293.
10. Kumar Praveen., Rajesh Praveen and Lata Sneh (2013) An Epidemiological Profile of human gastrointestinal parasites in Meerut District. *Bulletin of Environment, Pharmacology and Life Sciences (BEPLS)*, 3(1): 228–231.
11. Kumar Praveen and Rajesh Praveen (2015) Prevalence of Intestinal Parasitic Infections in Meerut District. International Archive of Applied Sciences and Technology IAAST; Vol 6 (2) June 2015: 40 – 43.
12. Lee, J., Park, G.M., Lee, D.H., Park, S.J. and Yong, T.S (2000) Intestinal parasitic infections at an institution for the handicapped in Korea. *Korean J. Parasitol*, 38: 179–181.
13. Leykun, J. (2001) Soil transmitted helminthic infections and S, Monsoni in school children form Chilga District, Nortwest Ehiopia, *Ehiop. J. Health Science*, 13: 79-87.
14. Mengistu, A. Grebre-Selassie, S. and Kassa, T. (2007) Prevalence of Intestinal Parasitic Infections among Urban dwellers in South West Ethiopia. *Ethiopian Journal of Health Development*, 21: 12–17.
15. Noyer, C.M. and Brandt, L.T. (1999) Parasitic Infection of the gastrointestinal tract. *Curn – Gastro Interol. Rep*, 1(4): 282–291.

16. Okyay, P., Ertug, S., Gultakin, B., Onen, O. and Beser, E. (2004) Intestinal parasites prevalence and related factors in school children, a western city sample, Turkey. *BMC. Public Health*, 4: 64.
17. Rao, D.C.V. and Puri, R.K. (1973) Morbidity patterns is seen in urban pediatrics centre, Pondichery. *Ind. Tour. Com. Dis*, 5: 2.
18. Udani, R.N. and Patel. R.B. (1983) Impact of Knowledge of Anaganwadi workers on slum community. *Ind. Tour. Ped*. 50: 157.
19. Wang, L.D., Guo, J.G., Wu, X.H., Chen, H.G., Wang, T.P., Zhu, S.P., Zhang, Z.H., Steinmann, P., Yang, G.J. and Wang, S.P. (2009) Chin's new strategy to block Schistosoma japonicum transmission: experiences and impact beyond Schistosomiasis. *Top Med Int. Health*, 13: 1475–1483.
20. WHO (1987) Prevention and control of intestinal parasitic infections, Geneva. Technical Report Series, 749.
21. WHO (1991) Basic Laboratory Methods in Medical Parasitology, Geneva, Switzerland, 32.
22. WHO (2002) The prevalence and control of schistomosiasis and soil-transmitted helminthiasis, Geneva, *World Health Organization.*
23. Yakuba, N., Musa, G. and Yakubu, S.E. (2003) Seasonal Changes in the distribution and infection rate of Schistosoma intermediate hosts in River Kubanni and its Tributaries. *Bio Res Com*, 13: 207 – 214.