

Knowledge, Attitude and Practices of Intestinal Helminths and Protozoa Infection Among Parents of School Children In Peripheral School and Urban School Area in Kuantan, Pahang, Malaysia

Malezya Kuantan, Pahang Bölgesi Taşra ve Merkez Okul Çocukları Ebeveynlerinin Bağırsak Helmintleri ve Protozoon Enfeksiyonlarında Bilgi, Tutum ve Uygulamaları

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Özet

Bağırsak helmintleri ve bağırsak protozoon enfeksiyonları, bugün dünyadaki gençler ve yetişkinler arasındaki hastalıkların önde gelen nedenlerinden biridir. *Ascaris lumbricoides* (A. lumbricoides) ve *Trichuris trichiura* (T. trichiura), özellikle çocuklar arasında enfekte olan en yaygın bağırsak helmintleridir. *Entamoeba histolytica*, *Giardia lamblia*, *Cryptosporidium parvum* ve *Blastocystis hominis* gibi insanlar üzerinde etkili olan çeşitli bağırsak protozoonları enfekte kişinin dışkılarından bulaşmaktadır. Bu kesitsel araştırma Kuantan, Pahang, Malezya'da yapılmıştır. Bu anket Kuantan, Pahang, Malezya'da kentsel ve kırsal bölgelerdeki okul çocuklarının ebeveynlerinden toplanmıştır. Çalışmaya katılan okul çağı çocukları ebeveyni olan 136 kişi kentsel ve çevresel ilköğretim okullarından rastgele seçilmiştir. Kentsel ilkököl (UPS)'yi "Sekolah Kebangsaan U" ya da "Sekolah Kebangsaan U" dan 68 kişi, kentsel alanlardaki okul çocuklarının ebeveynlerini temsil etmektedir; kırsal ilkököl (PPS)'yi "Sekolah Kebangsaan P" ya da "Sekolah Kebangsaan P" dan gelen 68 kişi, okul çocuklarının ebeveynlerini temsil etmektedir. Bağırsak helmintleri ve protozoon enfeksiyonlarında her iki ebeveyn grubu arasında bilgi, tutum ve uygulamaları üzerinde anlamlı bir fark gözlenmemiştir. Düşük gelirli ve yüksek gelirli ebeveynler arasında bilgi, tutum ve uygulama açısından anlamlı fark bulunmamıştır. Bağırsak helmintleri ve protozoon enfeksiyonları hakkında halkın Bağırsak parazitleri ve hijyen davranışlarıyla ilgili bilinçlendirilmesi gereklidir.

Anahtar Kelimeler: bağırsak helmintleri, bağırsak protozoonları, bilgi, tutumlar, uygulamalar, kırsal okul, kentsel okul

Abstract

Intestinal helminths and intestinal protozoa infections are one of the leading causes of diseases among young people and adults in the world today. *Ascaris lumbricoides* (A. lumbricoides) and *Trichuris trichiura* (T. trichiura) are the most common intestinal helminths infected people especially among children. Various types of intestinal protozoa are affecting people, such as *Entamoeba histolytica*, *Giardia lamblia*, *Cryptosporidium parvum* and *Blastocystis hominis* which then pass out through faeces of the infected person. A cross-sectional study was conducted in Kuantan, Pahang, Malaysia. The survey was collected from parents of school children in urban and peripheral area in Kuantan, Pahang, Malaysia. A total of 136 parents of school children were selected randomly from the primary schools at urban and peripheral for the study. Sixty-eight respondents from the urban primary school or UPS or "Sekolah Kebangsaan U" represent the parents of school children in urban area and sixty-eight respondents from the primary school or PPS or "Sekolah Kebangsaan P" represent the parents of school children in peripheral area. No significant difference was observed on knowledge, attitudes and practices of intestinal helminths and protozoa infection among parents from both areas. There was no significant difference in terms knowledge, attitudes and practices between parents from low income and high income. Awareness to the public regarding the intestinal parasites and good hygiene behavior were needed to expose the public about the intestinal helminth and protozoa infections.

Keywords: intestinal helminths, intestinal protozoa, knowledge, attitudes, practices, rural school, urban school



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Introduction

Intestinal parasitic infections have a global distribution and give rise to the burden of infectious diseases around the world^{2,3}. Currently, intestinal parasitic infection had been classified among the most prevalent neglected tropical diseases (NTD). NTD persist exclusively in the poorest population often in remote areas, rural areas, urban slums or in conflict zones⁶. Low socio-economic status, overcrowded areas, poor environmental sanitation, inappropriate garbage disposal, lack access to safe water and unhygienic personal habits are among the factors which contribute to the increase number of prevalence in intestinal parasitic infection^{2,4,8}. Intestinal helminths are a public health concern in Malaysia, especially in rural and aboriginal communities^{1,11}. Efforts made to control intestinal parasitic infections are minimal compared to other health activities⁷. The study on this infection is crucial and beneficial to provide the latest data and information for actions by government and for appropriate control measures to be determined and undertaken. Until now, there is no national policy in Malaysia for the prevention and control of these infections.

The aim of this research is to evaluate and compare the knowledge, awareness and practices (KAP) of intestinal protozoa and helminthes among parents from the urban primary school (UPS) and peripheral primary school (PPS) in Kuantan, Pahang. In specific, the objectives are to evaluate and compare the socio-demographic status with personal hygiene behavior regarding on intestinal protozoa infections and to find out the perceptions about the transmission of the intestinal helminthes and intestinal protozoa infection.

Materials and Methods

Ethical consideration

The ethical clearance for human study was obtained from the IIUM Research Ethic Committee (IREC), International Islamic University Malaysia.

Sample Collection

Data were collected from January 2015 to March 2015 among parents of primary school children from urban and peripheral areas in Kuantan. A total of 136 parents of school children were selected randomly from the urban and peripheral areas for the study.

A number of 68 respondents from UPS represents the parents of school children in urban area and 68 respondents from PPS represents the parents of school children in peripheral area. Sex, home address, educational level and average family income were asked in the surveys fall under the demographic information. Possible risk factors for both potential infections were obtained by a multiple answer and open-ended questionnaires.

Questionnaire

The survey was based on a structured questionnaire to collect information on the KAP of the participants towards intestinal protozoa infections and helminth infections. Demographic, socioeconomic and environmental information and hygiene behaviors of the respondents were recorded. Questions on the attitude were given to evaluate the prevailing attitudes, beliefs and misconceptions that the participants may have about intestinal protozoa and helminths infections. Interviewed respondent was done to increase the sample size. Several questions were designed in a yes/no format while some with multiple choice questions. Four questions are open-ended, which require participants to state what they know about the intestinal helminths, listing the name of helminths and name of the herbal medicine that they use for the treatment of the infections.

Statistical Analysis

Statistical Package for Social Sciences for windows SPSS (version 12) was used to analyze the statistic of epidemiological data received. For descriptive data, percentage and frequency were used to assess KAP data of protozoa and helminth results then presented in qualitative variables. Independent-test was used to compare the means between two groups on the same continuous, independent variable. The KAP of intestinal helminthes and protozoa among parents in group of average income and two difference areas were compared. A p-value of ≤ 0.05 was considered statistically significant.

Results

Based on Table 1, descriptive knowledge about intestinal parasites among parents from UPS and PPS were reported. The first question asked was "Is feces are the source of infection of the intestinal helminths?". Analysis indicated that among 136 parents, 47.8%⁶⁵

Variables	Area		Total
	Urban Primary School/ UPS Frequency (%) (n=68)	Peripheral Primary School/ PPS Frequency (%) (n=68)	
Feces as a source of infection			
Yes	36 (52.9%)	29 (42.6%)	65 (47.8%)
No	9 (13.2%)	5 (7.4%)	14 (10.3%)
Do not know	23 (33.8%)	34 (50.0%)	57 (41.9%)
Heard about intestinal helminths or protozoa			
Yes	46 (67.6%)	39 (57.4%)	85 (62.5%)
No	22 (32.4%)	29 (42.6%)	51 (37.5%)
Have you ever been infected?			
Yes	10 (14.7%)	8 (11.8%)	18 (13.2%)
No	45 (66.2%)	50 (73.5%)	95 (69.9%)
Do not know	13 (19.1%)	10 (14.7%)	23 (16.9%)
Perception towards intestinal helminths and protozoa			
I think worms and protozoa are harmless	5 (7.4%)	7 (10.3%)	12 (8.8%)
I think worms and protozoa are harmful to health	50 (73.5%)	48 (70.6%)	98 (72.1%)
I do not know	13 (19.1%)	13 (19.1%)	26 (19.1%)

responded that feces were the source of infection of the intestinal helminthes while 10.3%¹⁴ answered that feces were not the source of infection and 41.9%⁵⁷ responded that they do not know whether feces were the source of infection or not. Besides, this study found that 62.5%⁸⁵ of the participants had heard about at least one of the intestinal helminths or intestinal protozoa whereas 37.5%⁵¹ has never heard about intestinal helminths or intestinal protozoa. With regard to question on perception towards intestinal helminths and protozoa, 72.1%⁹⁸ of respondents gave answer "worms and protozoa are harmful to health", 19.1%²⁶ "worms and protozoa are harmless" and 8.8%¹² "do not know the answer". Moreover, the surveys also questioned whether the participant has ever experienced being infected with intestinal parasites. The result has shown that only 13.2%¹⁸ of the participant had experienced the infection of intestinal parasite while 69.9%⁹⁵ have never been infected and 16.9%²³ were not sure whether they had been infected or not.

Table 2 shows an attitude and practices towards general hygiene and intestinal parasitic infections. With regards to question on

practices of hand washing, majority of the respondents 93.4%¹²⁷ always observe washing hands of their children before eating while 57.6%⁷⁷ parents always ensure their children were using soap when washing hands and washing hands after defecation. Besides, 94.9%¹²⁹ of the participants always certify that their children and family members' practice washing their hands each time after defecation. There were still a small percentage of the respondents 5.1%⁷ who practice poor hygiene in their daily activities. Furthermore, 86.8%¹¹⁸ always ensure their children cut their nails periodically and 13.2%¹⁹ did it sometime. The survey also recorded that 86%¹¹⁷ of children always wears shoes when playing outside their house while 14%¹⁹ sometimes wear shoes outside their houses. Moreover, 92.6%¹²⁶ of the respondents reported that their children takes bath more than seven times a week and 7.4%¹⁰ of their children takes bath seven times a week. The analysis has shown that majority of the children defecate in pit latrine toilet 74.3%¹⁰¹ and 25.7%³⁵ defecate in pour flush toilet. Other than that, 37.5%⁵¹ children consume 4 or more times per week, 34.6%⁴⁷ consume fruits or vegetables 2-3 times per week, 11.8%¹⁶ eat at least 1 time per week and 16.2%²² children did not eat fruits or vegetables du-

Table 2: Attitude and practices regarding intestinal helminthes and intestinal protozoa among the respondents from UPS and PPS

Variables	Area		Total
	Urban Primary School/ UPS Frequency (%) (n=68)	Peripheral Primary School/ PPS Frequency (%) (n=68)	
Washing hands before eating			
Sometimes	3 (4.4%)	6 (8.8%)	9 (6.6%)
Always	65 (95.6%)	62 (91.2%)	127 (93.4%)
Using soap when washing hands			
Sometimes	27 (39.7%)	32 (47.1%)	59 (43.4%)
Always	41 (60.3%)	36 (52.9%)	77 (57.6)
Washing hands after defecation			
Sometimes	4 (5.9%)	3 (4.4%)	7 (5.1%)
Always	64 (94.1%)	65 (95.6%)	129 (94.9%)
Cutting nails periodically			
Sometimes	8 (11.8%)	10 (14.7%)	18 (13.2%)
Always	60 (88.2%)	58 (85.3%)	118 (86.8%)
Wearing shoes when outside			
Sometimes	3 (4.4%)	16 (23.5%)	19 (14.0%)
Always	65 (95.6%)	52 (76.5%)	117 (86.0%)
Taking bath a week			
7 times a week	2 (2.9%)	8 (11.8%)	10 (7.4%)
More than 7 times a week	66 (97.1%)	60 (88.2%)	126 (92.6%)
Where to Defecate			
Pit latrine	65 (95.6%)	36 (52.9%)	101 (74.3%)
Pour flush toilet	3 (4.4%)	32 (47.1%)	35 (25.7%)
Eating fruits or vegetables			
They did not eat fruits or vegetables during the past 7 days	14 (20.6%)	8 (11.8%)	22 (16.2%)
1 time per week	5 (7.4%)	11 (16.2%)	16 (11.8%)
2-3 times per week	25 (36.8%)	22 (32.4%)	47 (34.6%)
4 or more times per week	24 (35.3%)	27 (39.7%)	51 (37.5%)
Washing fruits or vegetables before eating			
Sometimes	2 (2.9%)	5 (7.4%)	7 (5.1%)
Always	66 (97.1%)	63 (92.6%)	129 (94.9%)
Boiling water before drinking			
Sometimes	4 (5.9%)	5 (7.4%)	9 (6.6%)
Always	64 (94.1%)	63 (92.6%)	127 (93.4%)
Disposing household waste			
Burning in open fields	6(8.8%)	26(38.2%)	32(23.5%)
Collecting by municipal	62(91.2%)	42(61.8%)	104(76.5%)

Table 3: Comparing knowledge, attitudes and practices scores between different areas using Independent t-test

Variable	Urban Primary School/ UPS n=68 Mean (sd)	Peripheral Primary School/ PPSn=68 Mean (sd)	Mean difference (95%CI)	t-statistics (df)	p-value
Knowledge, attitudes and practices of intestinal helminths and protozoa	11.897 (2.5342)	12.147 (2.4934)	-0.2500 (-1.103, 0.603)	-0.580 (136)	0.563

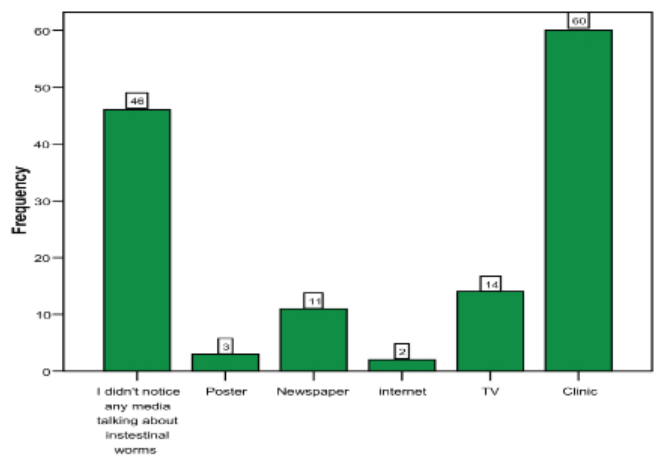
Table 4: Comparing the knowledge, attitudes and practices scores income level using Independent t-test

Variable	Urban Primary School/ UPS n=68 Mean (sd)	Peripheral Primary School/ PPSn=68 Mean (sd)	Mean difference (95%CI)	t-statistics (df)	p-value
Knowledge, attitudes and practices of intestinal helminths and protozoa	11.897 (2.5342)	11.44 (2.532)	-0.721 (-0.342, 1.784)	-1.341 (136)	0.182

ring the past 7 days. Analysis indicated that majority of the parents 94.9%¹²⁹ always wash the fruits or vegetables before consumption while only 5.1%⁷ wash the fruits or vegetables before eating. Moreover, majority of the respondents 93.4%¹²⁷ always boil water before drinking and minority 6.6%⁹ sometimes boil water before drinking.

Refer to table 3 shows the independent t-test of KAP of intestinal helminths and protozoa among parents in different areas. The p-value is more than 0.05 which is 0.563. There is no significant difference in terms of KAP between UPS parents and PPS parents. Table 4 shows the independent t-test of KAP of intestinal helminths and protozoa among parents in different average income. The p-value (0.182) is more than 0.05. Therefore, there is no significant difference in terms of KAP between low income parents and high-income parents.

Referring to the second objective of the study, open questions were created to ask the respondents about their perception toward the intestinal helminthes and protozoa infections. According to Figure 1, 60 of the participants got the information from clinics. Other sources of information including 14 parents got the information from television, 11 parents got the information from newspaper, 3 parents got the information from poster and 2 parents got the information from internet readings. Unfortunately, 46 of the respondents never notice any source of information about intestinal helminthes and intestinal protozoa in media.

**Figure 1: Source of Information of intestinal helminths and intestinal protozoa**

Discussion

Majority of respondents 47.8%⁶⁵ responded that feces were the source of infection of the intestinal helminths. In contrast to earlier study by Tripura et al. (2013), the result showed low percentage (19.6%) answered human faeces as source of intestinal parasitic infection. Other than that, more respondents gave answers that worms and protozoa are harmful to health than worms and protozoa are harmless and do not know. The result is consistent with other study conducted in India which revealed high number of respondents, 58.1%⁶⁸ considered worms to be harmful than harmless⁹. However, in this study, more respondents from PPS which is peripheral area do not know that faeces are source of infection (50%) and never heard about intestinal parasitic infection

(42.6%). This shows many respondents who actually has lack of knowledge on the source of infection of the intestinal helminths which can lead to poor awareness of hygiene in their activities. The result also indicates that people especially in peripheral area in Kuantan were still not exposed to the public health issue on the intestinal parasites.

Besides, the surveys also questioned whether the participant has ever experienced being infected with intestinal parasites. Only small number of the participants had experienced the infection of intestinal parasite. The result may be due to the respondents did not know the real sign or symptoms of the intestinal helminthes and protozoa infection. Some of the participants also confuse whether the symptoms that they had were because of the infections or other illnesses that were more likely share the same symptoms like intestinal parasites infections.

The study revealed that 6.6%⁹ and 5.1%⁷ of respondents sometimes wash hand before eating and after defecation respectively. This may be due to negative influence by factors such as laziness, the rush to play with friends, or even the lack of hand washing facilities close to the latrines¹⁰. Besides, there is still more respondents from peripheral area than urban area that sometimes wash fruits before eating and sometimes boil water before drinking. This poor knowledge and practices towards avoiding the sources of intestinal parasitic infections among the participants in this study could be due to general ignorance and lack of proper information through well-coordinated health awareness programmes in the area.

There is no significant difference in terms of KAP between parents from PPS and parents from UPS and no significant difference in terms of KAP between low income parents and high-income parents. Attitudes and practices of both areas were similar towards general hygiene such as hands hygiene practices, waste disposal, wearing shoes when playing outdoor, times taking bath in a week, periodically cutting finger nails and boiling water before drinking. They are found to have same knowledge on their perception toward intestinal helminths and protozoa. The KAP evaluation on difference socio-demographic status which is average income gives

a reading of no significantly difference between the income groups. The income does not give any guarantee on the knowledge, attitudes and practices toward the intestinal helminths and intestinal protozoa infection.

The result has shown that majority of respondents got the information about the intestinal parasitic infection from clinics. The result is inconsistent with other study in Tanzania on parasitic disease, schistosomiasis that revealed most of respondents got the information from school (34.5%)⁵.

The results of the study are useful to promote proper management of hygiene. The findings of this study are important in the socio-economic research which will help in the making of strategies and models for sustainable development. More studies are needed to improve the quality of life of the human population. The possible risk factors of the infection in urban and peripheral areas in Kuantan must be determined to prevent infections.

There were still limitations in the study. There were schools that do not give permission to do a survey and majority of the parents were reluctant to cooperate in this study. This cause small number of samples collected in the study. Besides, majority of the respondents unwilling to answer the open-ended question part thus lead to incomplete evaluation aspects.

Conclusion

The study found that there is no significant difference about KAP of intestinal protozoa and helminths among parents from urban and peripheral areas and also there is no significant different about KAP of intestinal protozoa and helminths among parents of low salary income and high salary income. The perceptions from the parents on the intestinal helminthes and protozoa are the possible risk factors of the infection. From the study findings obtained, it is crucial for all communities to understand and be aware of these infections. Primary prevention is better than cure. Good hygiene practices can lead to a healthy life for the communities.

Conflict of Interest Statement

We declare that we have no conflict of interest.

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