

Knowledge of Girl Students about Oxyuriasis in Middle Schools of Kashan, Central Iran

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Abstract

Background and Aim: Due to the high prevalence and worldwide distribution of *Enterobius vermicularis* and its readily transmission among children, parents' knowledge and health education have an important role in restriction and infection control. This study was performed to evaluate the girl students' knowledge about transmission, symptoms, and prevention of oxyuriasis in 2012–2013 in Kashan, Central Iran. **Materials and Methods:** In this cross-sectional study, a total of 500 students in three levels of middle schools were studied. To evaluate the students' knowledge level of oxyuriasis, the standardized questionnaire was distributed and completed. Data were analyzed using statistical software SPSS. **Results:** Among three levels of students of middle schools, 67.6% of students had average awareness (information), 17.4% had weak information, and 15% had high information. In the assessment of the level of awareness in the first-level students, 23.41% of the students had weak information, 66.4% had average information, and 10.12% had high information. In the second-level students, 12.57% had weak information, 73.14% had average information, and 14.28% had high information. In the third-level middle-school students, 16.76% of students had weak knowledge, 62.87% had average knowledge, and 20.35% had high knowledge. **Conclusion:** The result of this study shows that knowledge of middle-school students about this infection is good but not sufficient, and it is necessary for teachers and health officers in schools to increase hygienic knowledge of the students and to train about this infection to decrease the damage of personal and social problems.

Keywords: Awareness, Iran, Kashan, students, oxyuriasis

INTRODUCTION

Enterobius vermicularis, also called Oxyure, pinworm, and anal worm, is a parasite from nematode worm which lives in human colon. Due to simple transmission of Oxyure and near contact of human, this worm has a worldwide distribution and is more prevalent than other parasitic worms.^[1] *Enterobius* adult worms live in the cecum and at the end of the large intestine of the human. Adult worms migrate out the anus and will die after egg shedding and the eggs become larva in body temperature immediately. They are infective at this stage. The worm's life is short as 1–2 months.^[2] Autoinfection through anal itching and infected hands is the main fecal-oral transmission way. Autoinfection increases infection prevalence and long residence time of infection among children. Other modes of transmission include touching infected objects, inhalation of dust containing parasite eggs, and rarely reverse infection from the anus (retroinfection).^[3] The symptoms of oxyuriasis include anorexia, weight loss, irritability, toothache, abdominal

pain, nausea, and vomiting.^[3,4] It has been demonstrated that *E. vermicularis* may enter the urinary and vaginal tracts in female children and lead to vulvovaginitis.^[3,5]

Due to the laying of this parasite around the anus and outside the digestive tract, eggs are found during stool testing in 5% of infected people. Using the Scotch tape method, the infection can be well detected. The Scotch tape shows the highest percentage of positive results and the highest number of eggs. One-time swab test can detect approximately 50% of infections and two tests detect 90% of infections.^[4,5]

The minimum infection rate is found in children <2 years old and the infection rate is at a maximum between the ages of the primary

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school, while that decreases in the adult population. The global prevalence of infection in children is estimated at 4%–24%.^[4]

About 208.8 million people worldwide are infected with this worm, of which 18 million people are in Canada and the United States. This assessment shows an infection rate of 3%–80% in different groups. The rate of infection in an Eskimo village was 66%, in tropical Brazil was 60%, and in Washington was 12%–41%.^[2,5]

In a study in Isfahan, 398 children aged 2–7 years were tested in several nursing cares, of which 81% were infected with this parasite and the egg was observed in the nail test of 11% of children.^[2,4,6] In a study in Tabriz in which children of ten nursery schools were tested, the average prevalence infection was 70% and the maximum was 83%.^[4]

The best way to treat the disease is respecting personal hygiene by cutting nails and frequently washing hands, especially after using toilets or before eating.^[3-5] Enterobiasis has been reported in all parts of Iran. The severity of pollution is higher in the northern, western, and cold regions. Kashan, with a population of nearly 400,000 people and about 2100 hectares, is extensive and has a warm and dry climate. Based on the prevalence of Oxyur disease in Kashan and all parts of the country, the purpose of this study is to evaluate the awareness about this disease in the middle-school girl students in Kashan, in order to reduce the cost of treatment.

MATERIALS AND METHODS

This descriptive study was carried out in 2012–2013. By assuming that 50% of girls had adequate knowledge about oxyuriasis, with a 5% significance level and a 95% confidence interval, the sample size was estimated to be 500 girl students. First, the list of middle schools was received from the four districts, and sample schools were selected randomly from regions 1, 2, 3, and 4. From each school in each branch, a class was selected and all students in that class were questioned. After obtaining the license for selected schools, we were referred to schools and after justification of the research, the questionnaire was provided to students and asked to fill the questionnaires carefully. The type of questionnaire was a face-to-face self-responded open-ended questionnaire.

The prepared questionnaire consisted of 22 questions, including six questions related to general information, six questions about pathogens, three questions about transmission of the disease, one of them about the knowledge of symptoms, five questions about knowledge about treatment, and six questions on knowledge about prevention. The data extracted from the questionnaire were analyzed using SPSS 16 software (SPSS Inc., Chicago, IL, USA) and descriptive statistic parameters.

RESULTS

Totally among the 500 girl students in the first to third grade in the middle schools in Kashan, the students' knowledge was moderate and it was in the range of 62%–73%.

From 158 students in the first grade, 37 (23.41%) had low knowledge (0–10 correct answers), 105 (66.45%) had moderate awareness (between 15 and 10 correct answers), and 16 (12.12%) had high knowledge (between 20 and 15 correct answers) [Table 1].

From 175 students in the second grade, 22 (12.57%) had low knowledge, 128 (73.14%) had moderate knowledge, and 25 (14.28%) had a high knowledge. Of the 167 third-grade students, 28 (16.76%) had low knowledge, 105 (62.8%) had moderate knowledge, and 34 (20.35%) had a high knowledge.

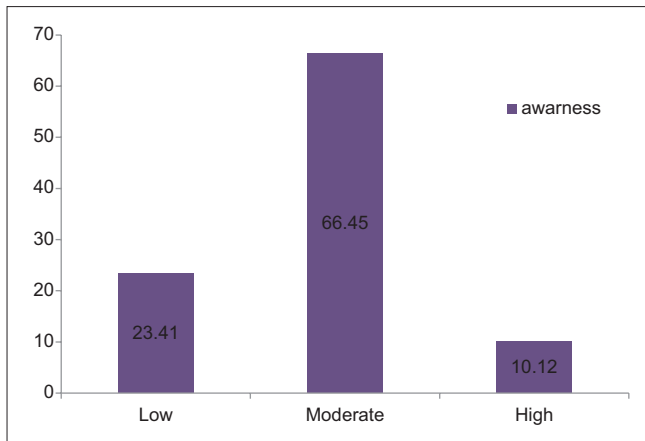
The lowest level of knowledge is related to the living place of the pathogen and consists of 10%–20% correct answers. The question with the most correct answer was the question about the kind of oxyuriasis for which approximately 85%–95% of students were responding correctly [Graphs 1-3].

DISCUSSION

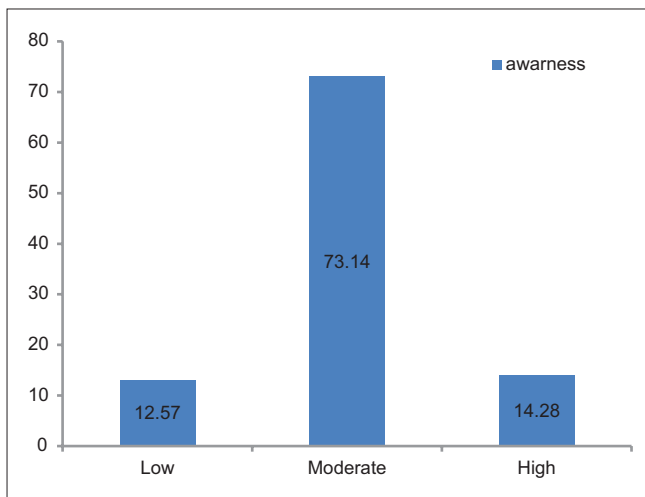
The intestinal parasitic diseases have a worldwide distribution. The prevalence of parasitic infection in human populations is closely related to the level of individual health and also the favorable conditions for the growth and propagation of these parasites in the environment.^[6] Due to the importance of recognizing the type of parasite and its awareness in each area and for its dissemination reasons, it is necessary to study the awareness of oxyuriasis in each region. In this study, the knowledge about oxyuriasis in the middle-school girl students of the Kashan was moderate (62.8%–73%). High prevalence of oxyuriasis in the world is due to lack of awareness of the disease, and the prevalence of disease decreases with the increasing awareness of people.^[7] Some studies on oxyuriasis in different parts of the world are mainly related to the prevalence of this parasite, and studies about awareness and its attitude are limited. For example, in a study among children admitted to South Korean kindergartens in 2012, the prevalence of oxyuriasis was 10.7%. In this study, the most important risk factors for these children were the lack of awareness and noncompliance with individual hygiene.^[8] In another study, the prevalence of oxyuriasis among primary school students aged 6–10 years in Thailand was 38.8%. In this study, although not directly mentioned for the role of awareness and individual's knowledge, the improvement of the socioeconomic status of the family, which contributes to the increase of awareness, has been considered as a factor for control and reduction of this parasite.^[9]

Different studies in Iran also indicate that *E. vermicularis* infection is prevalent among children. In Iran, the prevalence of oxyuriasis in children has been reported from 1.2% to 66.1% in different regions.^[10-12] In a systematic study in 2017, the average prevalence of infection among children in Iran was estimated to be 17.2%.^[11] In this study, the weakness for public health status is considered to be effective.

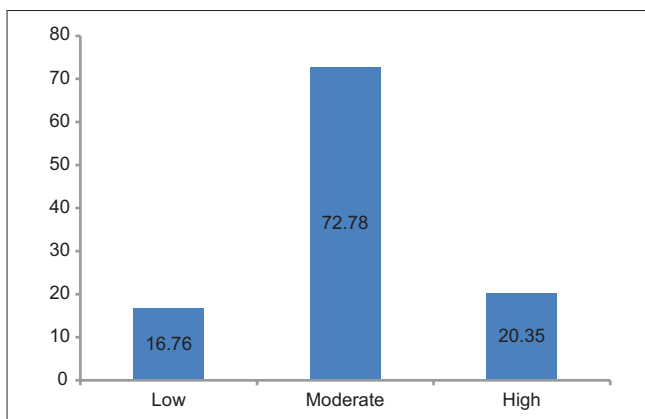
A study conducted on children under 10 years' age group in rural areas of Kashan showed that 31.3% of these



Graph 1: Distribution of Knowledge Level of First grade in middle school Students in the City of Kashan



Graph 2: Distribution of Knowledge level of second grade among middle School Students in Kashan City



Graph 3: Distribution of Knowledge Level of third grade in middle school Students in the City of Kashan

children were infected. In this study, the association of contamination with the climate of the place of residence was investigated.^[13]

Table 1: Knowledge of girl students about oxyuriasis in middle school, Kashan 2012

Awareness	Grade			Total, n (%)
	First, n (%)	Second, n (%)	Third, n (%)	
Low	37 (23.41)	22 (12.57)	28 (16.76)	87 (17.4)
Moderate	105 (66.45)	128 (73.14)	105 (62.87)	338 (67.6)
High	16 (10.12)	25 (14.28)	34 (20.35)	75 (15)
Total	158 (100)	175 (100)	167 (100)	500 (100)

The results of this study among middle-school students of Kashan showed that awareness of the disease is moderate. Regarding the high prevalence of oxyuriasis and other parasitic infections in the world and Iran, it is recommended that students' knowledge about the disease be improved. It seems that the reasons for the moderate awareness of the students of Kashan about oxyuriasis are that the courses taught are same in all the schools that can be attributed to the poor education of health educators for students in the prevention of parasitic diseases and also the weakness for the medical and health contents of the courses.

CONCLUSION

The results of this study showed that there is not much difference between the educational grades in the knowledge of oxyuriasis, and also the level of students' knowledge in different schools is the same. According to the other studies on oxyuriasis and its prevalence in different cities of Iran, it can be suggested that education courses regarding parasitic diseases be developed in textbooks. A higher prevalence of infection to *Enterobius* has been reported in kindergartens. The presence of health-care trainers and the training of preschoolers with the help of film and animations or wall posters can be a good way to focus on children and reduce infection. It is also suggested that a health instructor be deployed in all schools, and if possible, courses should be conducted on the way of transmission, control, and recognition of diseases.

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Conflicts of interest

There are no conflicts of interest.

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