

Epidemiological Study of Head Louse (*Pediculus humanus capitis*) Infestation Among Primary School Students in Rural Areas of Sirjan County, South of Iran

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ABSTRACT

Background: The head louse (*Pediculus humanus capitis*), is an obligate ectoparasite that is found on the hair and scalp and transmitted mainly through physical contact. In the most part of the world, pediculosis is a major public health concern, where head lice infestation is a common problem in school-age children.

Objectives: Present study is the first study about head lice infestation in the rural areas of Sirjan county in Iran. Considering the fact that primary school students are more prone to head lice infestation, this study was conducted in the all primary schools of the rural areas of Sirjan. This study was conducted to determine the head lice infestation rate and some risk factors in primary school students.

Materials and Methods: The data from Iran's National Census was used for sampling. All primary school students Between 2009 to 2010 from rural areas of the Sirjan County were selected and asked about the presence of lice (in any form). For the data analysis, chi-square test (SPSS software, version 11.5) was used and *P* value less than 0.05 was considered significant.

Results: A total number of 20 out of 1772 (1.12%) examined students were found to be infested by lice. Although the infestation rate was higher in girls, the difference of infestation rate between genders was not statistically significant (*P* > 0.05). The rate of head lice infestation was significantly (*P* < 0.05) correlated to their hair-washing behavior. Parents' literacy level also was significantly related to the head lice infestation rate (*P* < 0.05).

Conclusions: Pediculosis is a major health problem in many parts of the world including both developed and under-developed countries. According to our findings, it seems that in populated families in which parents have lower literacy level, in families without a bathroom at home, the infestation rate was higher. Therefore, employing health workers to educate such families as well as teachers is a good method to prevent pediculosis.

► **Implication for health policy/practice/research/medical education:**

To providing a clue for health workers who are responsible for controlling Pediculosis.

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1. Background

The head louse *Pediculus humanus capitis*, is an obligate ectoparasite which is found on the hair and scalp and transmitted mainly through physical contact (1, 2). Head louse blood feeding behavior leads to anemia, while the scratch sites can lead to secondary infection (2). It seems that head louse is not vector of any disease but it causes irritation, annoyance and sleeplessness apart from psychological and social distress (3). Head louse is a major health problem in many parts of the world and so pediculosis is common in both developed and under-developed countries (2, 4, 5). Several studies have been performed on the epidemiology of head louse (*Pediculus humanus capitis*) infestation and its related risk factors in Iran; in these studies some factors have suggested to be related to the head lice infestation rate, including: sex, age group, race, type of hair and so on (5). In recent years resistance to insecticides has contributed to the increase of head lice prevalence (6). In some epidemiological studies performed on school children in other countries, the prevalence of head lice has been found to be 13% in Australia (7), 35% in Brazil (8), 5.8% in Korea (9) and 52% in Ukraine (10).

2. Objectives

This present study is the first study about head lice infestation in the rural areas of Sirjan county in Kerman Province, southern part of Iran. Considering the fact that primary school student are more prone to head lice infestation, this study was conducted in all primary schools of rural areas of Sirjan county. The primary goal of this study was to determine the head lice infestation rate and related risk factors in primary school students enrolled in the study.

3. Material and Methods

3.1. Study Area

Sirjan ($29^{\circ}27'5''N$ $55^{\circ}40'5''E$) (Figure 1) is a city in the Kerman province, south of Iran. According to Iran's National Census in 2006, its population is 167,014, scattered in 40,605 families. Located at an altitude of 1730 m above the sea level, it is situated in a depression between the southern Zagros Mountains to the west and the Kuh-e Bidkhan massif to the east. It is well known for its pistachios and "geleem" rugs (11).

3.2. Data Collection and Analysis

The Method of Sampling was data extracted from National census. All Primary School Students enrolled from 2009 to 2010 belonging to the rural areas of the Sirjan County were selected and examined for the presence of egg, nymph or adult lice. A team including health workers of the study area, school health nurses and a medical entomologist (skilled in the detection of head lice) examined the hair and scalps of the studied students for lice

screening.

Visual inspection is the best way for confirming louse infection and collecting the eggs, nymphs and adult lice. Searching was carried out for about 3–5 minutes. The process was continued after combing the hair of students with suspected infection with a fine-toothed comb for about 7 minutes over a white paper. Any stage of the lice which were observed in combing process were fixed by a tape piece on the paper. Removed lice were observed and collected by sell tapes. Students whose hair had at least one of the developing stages of parasite including only nits located $\frac{1}{4}$ inch from the scalp were considered positive. After examining each student, the related personal data was collected by a standard questionnaire that was prepared to record information about sex, school grade, family size, parent's literacy level etc. For the data analysis, chi-square test (SPSS software, version 11.5) was used and P value less than 0.05 was considered significant.

4. Results

In this study a total number of 1772 primary school students (846 females and 926 males) from all primary schools were examined and twenty students were found to be infested with at least one stage of lice life cycle (Table 1). The overall infestation rate was calculated to be 1.12% for the studied sample (0.64% for boys and 1.65% for girls). Although the infestation rate was higher in girls, the difference was not statistically significant ($P > 0.05$). Hair size was not significantly related to the infestation rate ($P > 0.05$). Hair washing had highly significant relation with infestation rate ($P < 0.05$), so infestation rate

Table 1. Head Lice Infestation Rate by Sex Among Primary School Students of Sirjan County, Kerman Province, Iran

	No. of Examined	No. of Infested	Percentage
Male	926	6	0.64%
Female	846	14	1.65%
Total	1772	20	1.12%



Figure 1. Study Area in Sirjan County, Kerman Province, Iran

was higher among the students who did not have bathroom or sanitary water in their home. Head lice infestation rate was significantly related to the parents' literacy level ($P < 0.05$); the values were 4.4% for the students with uneducated parents, and 0.6% for students whose parents' literacy level was up to diploma; while the students whose parents' literacy level was higher than diploma had no infestation. Another factor that was analyzed in this study was family size. There was a highly significant positive association between family size and infestation rate ($P < 0.05$). Additionally, the rate of head lice infestation was significantly higher in higher grade students ($P < 0.05$).

5. Discussion

In the present study, it was shown that 1.12% of students were infested by lice. Other studies have reported different infestation rates from other parts of Iran; for example from 1% in Fars to 28.5% in Ardebil (12). In most of these studies the rate of head lice infestation in girls was more than boys (5, 12-18). Although in our study the difference between infestation rate in girls and boys was not significant, our findings also show that the infestation rate in girls was higher than boys. It seems that the difference in behavior patterns between boys and girls might have affected transmission rates and susceptibility to head lice infestation (5, 13). We found that there was statistically a significant association between the prevalence of head lice and school grade. Our finding was similar to that of Salemi et al conducted among the girls in primary schools of Iranshahr (3); on the contrary Shayeghi et al. and Edalatkhan et al. reported that the infestation rate is higher among the first grade students (5, 19). We found that *Pediculus capititis* infestation rate correlated with the family size, lower parents literacy level and lack of sanitary water or a bathroom at home. These finding were similar to that of other studies (5, 14, 18, 20, 21). Although, one study has reported no correlation between the infestation rate and factors such as school grade, family size and the frequency of hair washing (5). Cultural barriers is a limitation of these types of studies, for example some students might be infested but don't let others know it because he or she is shy. In conclusion, according to our findings, it seems that the infestation rate was higher in crowded families, families with low literacy level parents, and in families without a bathroom at home; therefore coaching the families by their village health workers can prevent pediculosis in these students.

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