



CLINICAL AND EPIDEMIOLOGICAL STUDY OF PEDICULOSIS, *PEDICULUS HUMANUS CAPITIC* (HEAD LICE INFESTATION) IN PRIMARY SCHOOL PUPILS, SAVOJBOLAGH COUNTY, ALBORZ PROVINCE, IRAN

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ABSTRACT

Background: The aim of the study was to determine the prevalence of Pediculosis (Head Lice Infestation) and the factors affecting the rate of infestation in primary schools pupils of Savojbolagh County, Alborz province north Iran. **Methods:** In this study, data were collected from the health examinations of 12,782 female and male primary school students in 2013 of Savojbolagh county, Alborz province. And the other hand, collected information about personal health (hair washing, use of comb and length of hair) and general information (sex, school grade, parent's job, parent's education). Results were analyzed by SPSS software. **Results:** The prevalence of head louse infestation was 1.86%. In the urban areas head louse infestation was 1.63% and in rural areas was 2.15%. About 2.54% belonged to female pupils and 0.29% was pertained to the male pupils. There was significant relation between hair washing, use of comb, length of hair and head lice infestation ($P < 0.05$) and there is no significant correlation between school grades, parent's job and head lice infestation ($P > 0.05$). **Conclusion:** The head louse infestation is an important health problem in primary schools in Savojbolagh county. Therefore, there is a need for educational campaigns about danger of infection and regular mass screening at primary school.

KEYWORDS: Pediculosis – Head Lice - Savojbolagh –Iran.

INTRODUCTION

Pediculosis (Head Lice Infestation) is a worldwide public health concern that affects mostly primary school- aged children. People get head lice from direct hair to hair contact with another person who has head lice. This can happen when people play, cuddle, or work closely together.^[1-4]

Adult louse can live up to 30 days on a person's head and once mature, can lay up to 10 eggs per day. To live, adult louse need to feed on blood several times daily. Head louse rarely survives beyond 36 hours away from the host without a blood meal.^[5]

Lice infestations have been prevalent among humans for many centuries and it has been revealed that lice infestations are associated with lack of hygiene and

poverty in human societies.^[6] Hyper infestation with head louse can lead to iron deficiency anemia in school children.^[7]

Schools, especially primary schools, are places which have the main role for starting an epidemic of pediculosis.^[8]

The highest incidence is seen in children aged five to twelve years; however, the incidence in the 24 – 36 year-old group is increasing due to their exposure to infested children. Pediculosis is more common in younger girls and those in crowded families.^[9,10]

Although most infestations are asymptomatic, pediculosis capitis may result in considerable discomfort, parental anxiety, embarrassment to the child,

unnecessary absence from school and work and also has adverse effects on the schoolchildren’s academic performance by negatively affecting concentration.^[11,12,13]

The patients show not only physical symptoms but also psychological distress occurred and this could be more important point in head louse infestation especially in children.^[14] Most studies in pediculosis involved children of preschool and school. In this study, we assessed the prevalence of pediculosis capitis among the primary school pupils, Savojbolagh County, Alborz Province, Iran.

MATERIALS AND METHODS

Savojbolagh county is located in west of Alborz Province, 25 km far from Karaj and 65 km far from Tehran. It is with hot and dry climate in summer and prone to tropical diseases prevalence including vector born diseases (Figure 1).

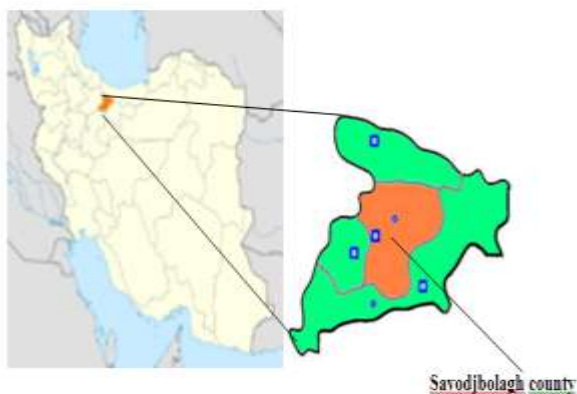


Figure 1. Map of the study area (Alborz province - Savodjbolagh county).

This study has been carried out in two phases between September - December 2013. For the diagnosis of head lice, the entire head was examined carefully after parting the hair; special attention was paid to the nape of the neck and behind the ears. A child was considered infested if living lice, eggs either live or dead or nits were detected. Collected lice and hair with nits/eggs, which were cut from the infested child’s hair, were preserved in 70% ethyl alcohol and later brought to the laboratory for more detailed examination under a light microscope.

The chi-square test (SPSS software, version 16) was used to compare categorical variables. For all statistical analyses, a significance level of $P < 0.05$ was adopted. Also we asked some questions about personal health and general information (school grade, parent's education, parent's job, sex, hair washing, use of comb in day and length of hair). Obtained data were deposited in to the SPSS data sheets and based on study questions were analyzed using proper statistical tests and parameters. Infested children were treated with permethrin shampoo and re-examined one week later for relapse of head lice infestation.

RESULTS

The study was conducted during September–December 2013. Finally 12782 pupils (3847 boys and 8935 girls) were included and examined in this study. Among this students 238 pupils (1.86%) were found to be infested with *pediculus humanus capitis*. Girls have a significantly greater infestation with 2.54% in comparison to the boys infestation 0.29% ($P < 0.05$). Also there is no significant correlation between region and head lice infestation ($P > 0.05$) (Table 1).

Table 1: Prevalence of head lice infestation by sex and region.

Subject	No. of Examination	No. of Infestation	Prevalence(%)
Male	3847	11	0.29% ($P < 0.05$)
Female	8935	227	2.54%
Urban	7849	132	1.68% ($P > 0.05$)
Rural	4933	106	2.15%
Total	12782	238	1.86%

Revealed that some of them such as hair washing, use of comb and length of hair could effect on head louse infestation significantly ($P < 0.05$). Table 2 represents the details properly.

Table 2: Prevalence of head lice infestation by personal health ($P < 0.05$).

Variable	No. of Examination	No. of Infestation	Prevalence(%)
<u>Hair washing</u>			
Once a week or less	3707	133	3.59%
Twice a week	6902	86	1.25%
Three a week or more	2137	19	0.87%
<u>Use of comb in day</u>			
One a day or less	1789	92	5.1%

Twice a day	8053	129	1.6%
Three a day or more	2940	17	0.58%
<u>Length of hair</u>			
Short	1406	23	1.6%
Medium	3068	75	2.4%
Long	8308	140	1.69%

General variables such as school grade (Table 3) and parent's job (Table 4) they have did not show significant correlation with head louse infestation ($P>0.05$), but parent's education level was effect on head louse infestation ($P<0.05$)(Table 5).

Table 3: Prevalence of head lice infestation by school grade ($P>0.05$).

Subject	No. of Examination	No. of Infestation	Prevalence(%)
School grade			($P>0.05$)
Grade 1	2762	47	1.70%
Grade 2	2744	50	1.82%
Grade 3	2701	52	1.93%
Grade 4	2477	48	1.94%
Grade 5	2098	41	1.95%
Total	12782	238	1.86%

Table 4: Prevalence of head lice infestation by parent's job.

Variable	No. of parents/No. of infested	Percent(%)	P- value
<u>Mother Job</u>			
Housewife	124/238	52%	$P>0.05$
Works outside	96/238	40%	
Deceased	18/238	8%	
Total	238/238	100%	
<u>Father Job</u>			
Official employee	82/238	34%	$P>0.05$
Worker	104/238	44%	
Deceased	52/238	22%	
Total	238/238	100%	

Table 5: Prevalence of head lice infestation by parent's education.

Variable	No. of parents/No. of infested	Percent(%)	P- value
<u>Mother education</u>			
Under high school	190/238	79.8%	$P<0.05$
High school	35/238	14.7%	
University Degree	13/238	5.5%	
Total	238/238	100%	
<u>Father education</u>			
Under high school	175/238	73.5%	$P<0.05$
High school	45/238	19%	
University Degree	18/238	7.5%	
Total	238/238	100%	

DISCUSSION

A total of 12782 primary school students were screened for the presence of head lice and, in 238 of them (1.86%) head lice were detected. In Iran the prevalence of head louse infestation has been reported frequently from several parts of the country. In recent studies the

prevalence ranged was different, 27.1% in Iranshahr, Sistan and Baluchistan Province^[15], 4.8% in Khajeh City in east Azerbaijan Province^[16], 1.05% in Hamadan^[17], 4.7% in Sanandaj. Kurdistan province^[18] and 4% in Urmia, Wast Azarbaijan Province, Iran.^[19]

Other studies conducted around the world revealed different prevalence. Studies done in recent years demonstrate that the prevalence has been 0.7% in Germany^[20], 4.1% in South Korea^[21], 29.7% in Argentina^[22], 33% in Australia^[23], 35% in Brazil^[24] and 48.7% in France.^[25]

In the present study, girls were significantly more infested than boys. An infestation rate of 2.54% in girls and 0.29% in boys ($P < 0.05$). In Sivas, Turkey infestation was 13.7% of the girls and 1.1% of the boys examined.^[26] In the case of gender; rate of pediculosis was 2.383% among the girl students; whereas the boy group was infested by 0.11% of pediculosis in Hamadan, west of Iran ($P < 0.001$).^[17] In Urmia, west Azerbaijan, Iran, reported girls have a significantly greater infestation with 5.5% in comparison to the boys infestation 1.8 ($P < 0.05$).^[19] This phenomenon could be explained by the fact that girls have longer hair, which facilitates the transmission of lice from head to head and they are more sociable, frequently touching other girls' hair. In addition, in long hair, nits remain attached as the hair grows and accordingly, these signs of previous infestations, which had been treated successfully, remain for months, while a short hair-cut in boys, removes the nits.

In our study there is no significant correlation between region and head lice infestation ($P > 0.05$), but the prevalence was 1.279% among the urban students while the students of rural schools assumed 0.05% of the prevalence in Hamadan, west of Iran.^[17]

In this study, students age or school grade was not significant correlation with head louse infestation.

The prevalence of head lice infestation was significantly according to school grade ($P < 0.05$) and the most frequent group was first grade (13.54%).^[16] Analysis of probable relationship between class grade and infestation load revealed no significant difference between different grades and head louse infestation load in Urmia, West Azerbaijan, Iran ($P = 0.443$).^[19]

In this study, results showed significant relationship between infestation and hair length in both groups ($P < 0.05$). In Sivas, Turkey reported significant relationship between infestation and hair length.^[26] In Iran, some studies reported There is significant relationship between infestation and hair length.^[19,26,27]

There was a significant statistical relationship between head louse infestation and number of hair washing a week and use of comb in day ($P < 0.05$). The results of studies in other areas showed significant relationship between infestation and number of hair washing a week. In Ravansar^[27], but there was no significant statistical relationship between head louse infestation and number of hair washing a week in Sivas, Turkey^[26], Urmia and Sanandaj in Iran^[18,19] Bathing carefully and with longer

hairs could be difficult for children as well as inspection for infestation by parents and health officers.

In this study there was a significant statistical relationship between head louse infestation and parent's education ($P < 0.05$). Results in Sanandaj, Iran showed that there was a significant decrease in children's infestation with increasing father's education ($P > 0.05$) but there was significant difference and infestation in mother's education ($P < 0.05$).^[18] The most of study, there was significant statistical relationship between head louse infestation and parent's education ($P < 0.05$). In Khajeh city in east Azerbaijan Province and Hamadan of Iran, there was significant statistical relationship between head louse infestation and parent's education.^[16,17]

Head louse infestation is not a significant health problem in primary school pupils in Savojbolagh county, but health providers must improve health education programs especially in the both rural and urban areas and among girls. Girls were more often infested with head lice than boys were and children who were previously infested with lice, as well as children from families where there had been previous infestations, had a greater chance of being re-infested.

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