

## Original Article

# Epidemiology of Head Lice Infestation in Primary School Pupils, in Khajeh City, East Azerbaijan Province, Iran

M Shayeghi<sup>1</sup>, \*A Paksa<sup>1</sup>, Y Salim abadi<sup>1</sup>, A Sanei dehkoordi<sup>1</sup>, A Ahmadi<sup>2</sup>, M Eshaghi<sup>1</sup>, S Bazrafkan<sup>1</sup>

<sup>1</sup>Department of Medical Entomology and Vector Control, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

<sup>2</sup>Departement of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

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## Abstract

**Background:** *Pediculus capitis* (Anoplura: Pediculidae) or head louse is an obligate ectoparasite transmitted mainly through physical contact. This study was conducted to survey the prevalence of head lice infestation rate and some risk factors in Primary School pupils, in Khajeh City East Azerbaijan Province, Iran

**Methods:** We selected 20 primary schools of Khajeh City during 2008 and 2009. Totally 500 pupils including 200 boys and 300 girls from all grade 1-5 were selected by multistage, systematic random sampling in rural areas of Khajeh City and were examined for lice. In addition, a standard questionnaire recorded information about demographic features of each pupil. Results were analyzed by SPSS software.

**Results:** The total prevalence of head lice infestation in this study was 4.8%. and the prevalence rate was significantly higher in girls (6.66%) than in boys (2%). Epidemiological factors such as: sex, school grade, family size, parent's education, type of house, hair washing (per week), number of using comb per day, were evaluated and results showed significant difference in head lice infestation and sex, school grade, family size, father education, and type of house ( $P < 0.05$ ).

**Conclusion:** Pediculosis is a public health problem in many parts of the world, and due to the higher prevalence of pediculosis in crowded families, family by lower levels of father's education and socioeconomic status in our study and rural area, it is necessary to give health education for families to prevent of pediculosis in this area.

**Keywords:** Head louse, *Pediculus capitis*, Epidemiology, Iran

## Introduction

*Pediculus capitis* (De Geer, 1778) (Anoplura: Pediculidae) or head louse is an obligate ectoparasite transmitted mainly through physical contact (Linardi et al. 1988). Because of head louse feeding of blood it leads to anemia and in the scratch sites can lead to secondary infection (Slonka et al. 1976). Head louse is one of the health problems in many parts of the world (Ewasechko 1981, Kwaku-Kpikpi 1982). Head louse prevalence in school-age children is more common for

example, 27% of urban primary schools in Iranshahr area (Southeast of Iran) were found infested (Alempour Salemi et al. 2003). Hodjati et al studied the head lice infestation in school children of Tabriz City and the infestation rate was 3.64% (Hodjati et al. 2008). The prevalence of head lice was 1% in Fars (Davaranpanah et al. 2009), and 1.3% in Bahar (Moradi et al. 2009).

Some factors are effective for the head lice prevalence, that related to the host such

\*Corresponding author: Mr Azim Paksa,  
Email: a.paksa@yahoo.com

as: sex, age group, race, type of hair and in recently years resistance to insecticides have contributed to the increase of head lice prevalence (Nazari et al. 2006).

This study was conducted to survey the prevalence of head lice infestation rate and some risk factors in primary school pupils, in Khajeh City, East Azerbaijan Province, Iran.

## Materials and Methods

This Primary school-based, cross-sectional study was conducted at 20 primary schools of Khajeh City (Haris township, East Azerbaijan Province, Iran) during 2008 and 2009. Totally 500 pupils including 200 boys and 300 girls from all grade 1-5 were selected by multistage, systematic random sampling in rural areas of the Khajeh City then were examined for the presence of one of life stages of lice, including eggs and nymph or adult.

A team including health workers of study area, school health nurses and a medical entomologist, skilled in the detection of head lice examined the pupils' hair and scalps for lice. Screening was carried by visual inspection of the head and scalp under the light of a reading lamp about 3-5 min. Pupils suspected of having lice were subjected to comb with a fine-toothed comb for about 7 minutes over a white paper of 60×75 cm size. The removed lice were observed, collected by sellotape. Pupils, whose hair had at least one of the developing stages of parasite including only nits located ¼ inch from the scalp were considered positive (Alempour Salemi et al. 2003).

Also we used a standard questionnaire to record information about sex, school grade, family size, parent's education, type of house (muddy, woody, brick built), hair washing (per week), availability to safe water and number of lice recovered.

The chi-square test (SPSS software, version 11.5) was used to compare categori-

cal variables. For all statistical analyses, a significance level of  $P < 0.05$  was adopted.

## Results

The total prevalence of head lice infestation was 4.8%. The difference between lice prevalence was significant regarding the gender, which was higher in girls (6.66%) than in boys (2%) ( $P < 0.05$ ) (Table 1). Table 2 shows the prevalence of head lice infestation in primary school pupils, which was stratified by social factors. The prevalence of head lice infestation by frequency of hair washing was 8.66%, and 3.7%, for once in two week, once a week respectively and twice or more a week had not any lice. The difference between twice or more of hair washing in a week and infestation rate was highly significant ( $P < 0.05$ ) in comparison to once in two week and once in a week. All of the head lice infestations were in family, which had more than 3 members. The prevalence of head lice infestation was significantly according to school grade ( $P < 0.05$ ). The most frequent group was first grade (13.54%) (Table 2). The prevalence of head lice in relation to type of house was statistically significant ( $P < 0.005$ ) and in muddy house was 10.1 %, woody house 5.73 and the pupils who lived in brick built homes had not any infestation (Table 2).

The results of this survey showed that infestation rate in the pupils who did not use of comb were 6.81%, once use in day 5.94%, and twice use were 2.85%. There was no statistical difference found between the number use of comb and infestation rate. The prevalence of head lice infestation by parents' literacy is presented in Table 3. This results show that there was a negative correlation between father's education and infestation rate ( $P < 0.05$ ). There was not any significant difference between mother's education and infestation.

**Table 1.** Prevalence of the head lice infestation in primary School pupils by sex in Khajeh, Iran

Sex	No. of Examination	No. of infestations	Prevalence (%)
Male	200	4	2
Female	300	20	6.66
Total	500	24	4.8

**Table 2.** Prevalence of the head lice infestation in primary school pupils by social factors in Khajeh, Iran

Characteristics	No. of Examination	No. of infestations	Prevalence (%)
Frequency of hair washing			
Once two week	150	13	8.66
Once a week	297	11	3.7
twice or more a week	36	0	0
Family size			
≤3	20	0	0
>3	480	24	5
Type of House			
Muddy	99	10	10.1
Woody	244	14	5.73
Brick built	157	0	0
School grade			
I	96	13	13.54
II	113	5	4.42
III	105	3	2.85
IV	87	2	2.29
V	99	1	1.01
Number use of comb in day			
Not use	88	6	6.81
Once a day	202	12	5.94
Twice a day	210	6	2.85

**Table 3.** Prevalence of the head lice infestation in primary school pupils according to parents' literacy in Khajeh, Iran

Characteristics	No. of Examination	No. of infestations	Prevalence (%)
Father's education			
Uneducated	65	8	12.3
Primary	313	14	4.47
guidance school	115	2	1.73
High school and upper	7	0	0
Mother's education			
Uneducated	364	22	6.04
Primary	104	2	1.92
guidance school	31	0	0
High school and upper	1	0	0

## Discussion

The total prevalence of head lice infestation among primary school pupils was 4.8%. The prevalence rate from different parts of Iran, mostly in primary school pupils reported lower 1% in Fars (Davarpanah et al. 2009), 1.3% in Hamedan (Moradi et al. 2009), 3.64% in Tabriz (Hodjati et al. 2008), 3.8% in Kerman (Kamiabi et al. 2005), 27% in Iranshahr (Alempour Salemi et al. 2003) and 28.5% in Ardabil (Edalatkhah et al. 2005). Also infestation rate among school pupils in some parts of the world was 33% in Australia (Speare et al. 1991), 35% in Brazil (Borges et al. 2002), 48.7% in France (Courtaide et al. 1993) and 49.7% in Ghana (Kwaku 1982). Almost in all this studies in Iran and other parts of the world, the prevalence of head lice infestation in female pupils was more than the prevalence of the infestation in male pupils. Difference in behavior patterns between boys and girls might have affected transmission rates and susceptibility to head lice infestation (Moradi et al. 2009). We found that *P. capitis* was more prevalent in crowded families, muddy house, family by lower levels of father's education and socioeconomic status, little frequency of hair washing in a week which are all associated with pediculosis (Akisu et al. 2003, Balcioglu et al. 2007) are more frequent in rural regions. Because this study was conducted in rural parts of Khajeh City, these results were expected. We also surveyed the prevalence of head lice infestation by school grade and found that the prevalence in first grade was significantly frequent ( $P < 0.05$ ). Edalatkhah et al in Ardabil reported that infestation rate in younger group was more than older group, and this was similar to our study (Edalatkhah et al. 2005).

In conclusion, it seems that it is necessary to render health education for families in order to prevent pediculosis in the field. In addition, health professionals should be re-

sponsible for treatment and prevention of louse infestation.

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## References

- Akisu C, Sari B, Aksoy U, Ozkoc S (2003) Investigation of *Pediculus capitis* among school children in Narlidere Couny, Izmir and comparison of the current and previous results. *Acta Parasitol Turc.* 27: 45–48.
- Alempour Salemi J, Shayeghi N, Zeraati H, Akbarzadeh K, Basseri H, Ebrahimi B, Rafinejad J (2003) Some Aspects of Head Lice Infestation in Iranshahr Area (Southeast of Iran). *Iranian J Publ Health.* 32(3): 60–63.
- Balcioglu IC, Kurt O, Limoncu ME, Dinc G, Gumus M, Kilimcioglu AA, Kayran E, Ozbilgin A (2007) Rural life, lower socioeconomic status and parasitic infection. *Parasitol Int.* 56(2): 129–33.
- Borges R, Mendes J (2002) Epidemiological aspects of head lice in children attending day care centres, urban and rural schools in uberlandia, central Brazil. *Mem Inst Oswaldo Cruz, Rio de Janeiro.* 97(2): 189–192.
- Courtaide C, Labrieze C, Fontan I, Taieb A, Maleville J (1993) Pediculosis capitis: a questioner survey in 4 schools of the Bordeaux Academy 1990-1991. *Ann Dermatol Venereol.* 120: 363–368.
- Davarpanah MA, Mehrabani D, Khademolhosseini F, Mokhtari A, Bakhtiari H, Neirami R (2009) The prevalence of *Pediculus capitis* among School Chil-

- dren in Fars Province, Southern Iran. Iranian J Parasitol. 4(2): 48–53.
- Edalatkhah H, Arshi S, Sadeghi H, Sepehran V (2005) Prevalence of *Pediculus capitis* in school children in Ardebil province (in Persian). J. Ardebil Univ. Med. Sci. 6: 36–45.
- Ewasechko CA (1981) Prevalence of head lice (*Pediculus humanus capitis*) among children in a Rural, Central Alberta School. Can J Public Health. 72: 249–252.
- Hodjati MH, Mousavi N, Mousavi M (2008) Head lice infestation in school children of a low socioeconomy area of Tabriz city, Iran. African Journal of Biotechnology. 13: 2292–2294.
- Kamiabi F, Nakhaei FH (200) Prevalence of *Pediculosis capitis* and determination of risk factors in primary-school children in Kerman. East Mediterr Health J. 11: 988–992.
- Kwaku-Kpikpi JE (1982) The incidence of the head louse (*Pediculus humanus capitis*) among pupils of two schools in Accra. Trans R Soc Trop Med Hyg. 76: 378–381.
- Linardi PM, Botelho JR, Maria M (1988). Crendices e falsos conceitos que dificultam ações profiláticas contra o piolho e a pediculose “capitis”. J Pediatría. 64: 248–255.
- Moradi AR, Zahirnia AH, Alipour AM, Eskandari Z (2009) The Prevalence of Pediculosis capitis in Primary School Students in Bahar, Hamadan Province, Iran. J Res Health Sci. 9(1): 45–49.
- Nazari M, Fakoorziba MR, Shobeiri F (2006) *Pediculus capitis* infestation according to sex and social factors in Hamedan, Iran. South East Asian J Trop Med Pub Health. 37(3): 95–98.
- Slonka GF, Mc Kinley TW, Mc Croan JE, Sinclair SP, Schultz MG, Hicks F, Hill N (1976). Epidemiology of an outbreak of head lice in Georgia. Am J Trop Med Hyg. 25(5): 739–743.
- Speare R, Buettner PG (1999) Head lice in pupils of a primary school in Australia and implications for control. Int J Dermatol. 38: 285–290.