

*Original Article*

**Prevalence of Pediculosis and Associated Risk Factors in the Girls primary School in Azadshahr City, Golestan Province, 2012-2013**

\*Farzad Motevalli Haghi<sup>1</sup> Maryam Golchin<sup>2</sup> Maryam Yousefi<sup>2</sup> Mahbobeh Hosseini<sup>3</sup> Behzad Parsi<sup>4</sup>

1- Department of Medical Entomology, School of Health, Health Sciences Research Center, Mazandaran University of Medical Sciences, Sari, Iran

2- Department of Environmental Health, School of Health, Mazandaran University of Medical Sciences, Sari, Iran

3- Department of Biostatistics, School of Health, Mazandaran University of Medical Sciences, Sari, Iran

4- Department of Physiology and Pharmacology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

\*haghi77@yahoo.com

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**Abstract**

**Background and purpose:** Pediculosis (*Pediculus capitis*) is a worldwide public health concern that affects mostly on primary school-aged children. This descriptive study was performed to determine the prevalence of pediculosis and some risk factors among girls primary school in Azadshahr city, Golestan province, Iran.

**Materials and Methods:** A total of 1510 girls were selected from primary schools of Azadshahr from first to sixth grade. Data were collected from the selected schools by one trained nursing inspector. A questionnaire was filled for each school child prior to hair examination, then examination was carried out to detect head lice as well as eggs/nits. Data were analyzed using SPSS for Windows 16.0 and the chi-square test. Statistical significance was considered at the level of ( $P < 0.05$ ).

**Results:** Of 1510 primary school girls under investigation, 55 were infected with pediculosis with the average infection of 3.60%. The results showed significant variations in head lice infestation, and factors such as sharing instruments, personal health, parents educations, bathing facilities, hair length, family size, father profession, hair shape, health care employer ( $P < 0.05$ ); while there was no significant variation in lice infestation when, frequency of mothers profession and hair shape ( $P > 0.05$ ).

**Conclusion:** Increasing awareness and training of teachers and parents, as well as improving standards of personal health can significantly reduce the prevalence of pediculosis.

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**Key words:** *Pediculosis Capities*, Girl's Primary School, Epidemiology, Azadshahr City

## 1. Introduction

Pediculosis is one of the human parasitic diseases presented as head, body and genital louse. This disease despite improvement of hygienic condition and progress of medical sciences is one of health problem worldwide and with high transmission potential (1). Head louse is observed less or more worldwide. This type of parasitic infestation occurs in 6-12 million of the people annually (2).

Epidemiologic studies of pediculosis from France, Korea, Australia, Spain, Taiwan, and England indicated the prevalence of 15.0% (3), 37.2% (4), 33.7% (5), 39.3% (6), 4.0% (7), and 28.3% (8) respectively.

Worldwide studies indicate different prevalence rates of this disease from lower than 10% to higher than 40% among school children (9). Various studies in Iran indicated pediculosis prevalence higher in the rural areas than the urban areas.

Infestation to louse in Joyabad of Khomain City (Iran) (10). was reported 11.9%. A study by Eivazi on the head louse among the primary girl students of East Eslam Abad Township indicated the prevalence rate of 24.8% (11).

The protein present in the saliva of the louse enters into the body by the bite of louse. It causes fatigue and sensitivity. The frequent bite may cause acute allergy such as, itching. If the faces of the louse inhaled causes symptom similar to the hay fever. The second infection may occur by crushing of the bite site, which leads to the skin swelling, impetigo and the other similar conditions that results in depression, mental problem, insomnia, and education problem (12).

The main effective way in effect against the disease is using the shampoo containing pesticides, such as, lindan and permethrin, public education where the prevalence rate is high and also improvement of the hygienic condition (13,14).

Humidity and dense population provides proper condition for multiplication of the

louse. Since contamination to the louse is a good indication of personal and public unhygienic condition; therefore, determination of infection and the prevalence could be a proper health index of the society. The epidemiologic study could determine the contamination condition and its relationship with the environmental circumstances. This study was designed and performed in order to determine the pediculosis prevalence rate and the effective factors in the elementary school-aged students in the Azadshahr city in 2012-2013. The data can be used to control the problem in primary schools across Iran.

## 2. Materials and Methods

This cross-sectional descriptive study was conducted in the elementary school students of the Azadshahr city, which situated in border line of Golestan and north Razavi provinces with 50,374 population. A total of 1510 girl students of the urban areas were selected.

In a classroom, all students were checked for the presence of nit, louse by the researcher. In case of observing the louse or nit, the students were considered infected and selected as cause group. A questionnaire was filled by the student or the school administrators. The data were on the age, family size, the parent's education level, etc. In each class, the infested students compared with non-infested students (sham group) were selected randomly as a control group and filled the questionnaire. The recorded data were coded and analyzed statistically using the  $\chi^2$  test.

## 3. Results

From the total number of 1510 elementary school students, 55 students (3.6%) were infested with pediculosis. In studying the relation between the infestation and father's profession, the highest rate of infection was noticed in the subjects whose father was

jobless (35%) and the lowest rate of infection in the subjects whose father was government employed (31%). The difference was significant ( $P < 0.05$ ) (Table 1). Insignificant difference was observed for the head pediculosis among students with different educational grades ( $P < 0.05$ ) (Table 1).

In schools with health staff and without health staff, significant difference was observed from the viewpoint of louse infection ( $P < 0.05$ ) in a way that the rates of pediculosis prevalence in the school without and with health staff were 73% and 27%, respectively. The rates of infection in the students using shared instrument and non-

shared instrument were 29% and 71%, respectively (Table 2). There is a significant difference between two variables of head pediculosis and using shared instrument ( $P < 0.05$ ). The rate of infestation related with the personal hygiene were 27% compared with 73%, showing significant difference ( $P < 0.05$ ). The rate of pediculosis prevalence among students having and not having a bathroom at house showed statistically significant difference ( $P < 0.05$ ). Furthermore, insignificant difference was observed between the two variables of head pediculosis and their personal hygiene ( $P < 0.05$ ) (Table 2).

**Table 1.** The relation between the pediculosis and the other variables of the questionnaire such as, age, educational level, father's job, father's education, family size in the elementary students of the Azadshahr city, Golestan province

The population variable	Infected		Non-infected		(P-value)
	Number	%	Number	%	
Age (year)					
7	15	27	272	16	
8	9	16	255	17	
9	13	24	226	17	
10	10	18	235	16	(0.0300) 12.30
11	3	6	226	17	
12	5	9	241	17	
Total	55	100	1455	100	
Educational level					
1 <sup>st</sup>	15	27	272	16	
2 <sup>nd</sup>	9	16	255	17	
3 <sup>rd</sup>	13	24	226	17	
4 <sup>th</sup>	10	18	235	16	(0.0400) 6.10
5 <sup>th</sup>	3	6	226	17	
6 <sup>th</sup>	5	9	241	17	
Total	55	100	1455	100	
Father's job					
Jobless	19	35	480	33	
Business	19	34	454	31	
Government employed	17	31	521	36	(0.0400) 6.10
Total	55	100	1455	100	
Father's education					
Illiterate	14	25	277	19	
High school	18	33	550	38	
High secondary school and higher	23	42	628	43	(0.0300) 7.04
Total	55	100	1455	100	
Family size					
2	2	3	180	12	
3	1	2	225	15	
4	25	45	335	23	
5	18	33	174	12	(0.0001) 22.15
6	4	7	261	18	
7 and more	5	10	280	20	
Total	55	100	1455	100	

**Table 2.** The relation between the pediculosis and the other variables of the questionnaire such as, the health staff, mother's level of education, sleeping in the common room, place for bath, hair shape, personal hygiene, shared instrument in the elementary students of the Azadshahr city, Golestan province

The population variable	Infected		Non-infected		(P-value)
	Number	%	Number	%	
The health staff					
Does not have	29	53	594	41	(0.0140) 5.99
Has	26	47	861	59	
Total	55	100	1455	100	
Mother's level of education					
Illiterate	23	42	569	39	(0.7760) 70.50
High school	12	22	334	23	
High secondary school and higher	20	36	562	38	
Total	55	100	1455	100	
Sleeping in common room					
Yes	37	67	962	66	(0.0001) 5.99
No	13	23	493	34	
Total	55	100	1455	100	
Place for bath					
House	41	74	1178	81	(0.0900) 2.70
Public bath	14	26	277	19	
Total	55	100	1455	100	
Hair shape					
Smooth	48	87	1116	76	(0.0100) 6.50
Curly	7	13	339	24	
Total	55	100	1455	100	
Personal hygiene					
Yes	15	27	830	57	(0.0001) 37.08
No	40	73	625	43	
Total	55	100	1455	100	
Shared instrument					
Yes	16	29	857	59	(0.0001) 37.50
No	39	71	598	41	
Total	55	100	1455	100	

#### 4. Discussion

Despite the improvement of the hygienic level of the society, head louse infection still remained health concern in the poor and the developing countries.

Studies indicate the presence of head louse from different regions of Iran and the WHO statistical data recognize Iran as infected areas of the world (15).

In the present study, the prevalence of pediculosis among the elementary school students was found 3.6%. This low rate of infection could be due to the proper surveillance of the health staff from the schools and the prompt treatment. Similar

studies from different elementary schools of Iran reveal the presence of head louse as follows: Khoramabad 6.2% (16), Sari 1.9% (17), Kashan 5.24% (18), Yasoj 21.8% (19), Amlash 9.2% (14), Sanandaj 19.7% (20), Hamadan 13.5% (21), Hamadan 0.66% (22), and Hamadan 6.74% (23). In the present study, head louse infestation prevalence indifferent age groups had insignificant difference.

Considering to the  $\chi^2$  test, insignificant difference was observed between pediculosis prevalence and the age of the students, which corresponds with the data given by Dehghani et al.(18) and Sultana et al.(24) The present

study indicated the significant relationship between pediculosis and education level of the students' father.

High educated fathers helps to increase the knowledge of family and providing proper way to solve health problem, which agrees with the data has given by Rafiey et al.(25) and Kokturk et al.(26) The data have shown significant relationship between lack of personal hygiene and infestation with head louse.

High prevalence of pediculosis in the city could be due shared use of hair comb, head cover, pillow, towel, and bed. Furthermore, the unhygienic environment and health education deficit are the other effective factors. The report given by Rafinejad et al. (14), Zabihi et al. (27), Motalebi and Minoueian Haghghi (28), and Hodjati et al.(29) agree with our findings.

Majority of the students under study had bathroom at their house, so makes the hygiene more, because increase of taking bath reduces the infection, which agrees with the data given by Rafinejad et al.(14) and Rafiey et al.(25) Considering the results of variable tests, significant relation was observed between the schools with and without the health staffs.

Similar studies performed by Donnelly et al.(30), Rafiey et al.(25), Zabihi et al.(27), and Dehghani et al.(18) indicated that presence of health expert in the schools plays important role in prevention of pediculosis in the school students. In the present study, significant relationship was not observed between the hair condition and head louse infection, corresponds with the report of Soultana et al.(24) but disagree with the data of Rafinejad et al.(14) The variables have played an important role in the prevalence of pediculosis, having health staff at schools, hygienic behaviors and health education, to control pediculosis.

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### **References**

1. Aydemir EH, Unal G, Kutlar M, Onsun N. Pediculosis capitis in Istanbul. *International Journal of Dermatology* 1993; 32(1): 30-2.
2. Monsen KA, Keller LO. A population-based approach to pediculosis management. *Public Health Nurs* 2002; 19(3): 201-8.
3. Combescot C. [Current epidemiology of pediculosis capitis]. *Bull Acad Natl Med* 1990; 174(2): 231-6.
4. Huh S, Pai KS, Lee SJ, Kim KJ, Kim NH. Prevalence of head louse infestation in primary school children in Kangwon-do, Korea. *Korean J Parasitol* 1993; 31(1): 67-9.
5. Speare R, Buettner PG. Head lice in pupils of a primary school in Australia and implications for control. *Int J Dermatol* 1999; 38(4): 285-90.
6. Magra Saenz de BG, Goiria Ormazabal JI, Lopez M, I, Perez RC, Bonet RT, Caturra LJ. [Pediculosis capitis: epidemiologic study of 23,624 schoolchildren in Bilbao]. *Rev Sanid Hig Publica (Madr)* 1989; 63(1-2): 49-62.
7. Fan PC, Chao D, Lee KM, Chan CH, Liu HY. Chemotherapy of head louse (*Pediculus humanus capitis*) infestation gamma benzene hexachloride (gamma-BHC) among school children in Szu-Hu District, Yunlin County, Central West Taiwan. *Zhonghua Yi Xue Za Zhi (Taipei)* 1991; 48(1): 13-9.
8. Downs AM, Stafford KA, Stewart GH, Coles GC. Factors that may be influencing the prevalence of head lice in British school children. *Pediatr Dermatol* 2000; 17(1): 72-4.
9. Koch T, Brown M, Selim P, Isam C. Towards the eradication of head lice: literature review and research agenda. *J Clin Nurs* 2001; 10(3): 364-71.
10. Atayi B, Sadri GH. Survey of pediculosis in Joy Abad region. *Proceedings of the 8<sup>th</sup> International Congress on Infectious Diseases*; 1999 Jun 26-30; Tehran, Iran.



11. Eivazi A. The prevalence survey head lice infestation in among school children Arak Area in West Eslam Abad country, Medical entomology and vector control [Thesis]. Tehran, Iran: School of Medicin, Tarbiyat Modarres University 2005. [In Persian]
12. Pirouzi P, Pirouzi MA. The Canadian encyclopedia of dermatology [Thesis]. Ottawa, Canada: Library and Archives Canada 2003.
13. Schenone H, Wiedmaier G, Contreras L. [Treatment of pediculosis capitis in children with permethrin 1% shampoo or lotion]. *Bol Chil Parasitol* 1994; 49(3-4): 49-52.
14. Rafinejad J, Nourollahi A, Biglarian A, Javadian E, Kazemnejad A, Doosti S. The comparison of the effect of permethrin shampoo and lindane lotion on the treatment of head lice (*Pediculus Humanus Capitis*) in the primary school pupils. *J Mazandaran Univ Med Sci* 2011; 21(83): 35-41. [In Persian]
15. Gholchaye MJ, Ahmadi M. Survey pediculoscaphitis in 3-7 children in kindergarten in Rasht. *J Guilan Univ Med Sci* 2012; 11(41): 21-5. [In Persian]
16. Taheriyani M. A survey of head lice among primary school children, in Khoramabad in 1998-99. *J Ilam Univ Med Sci* 1999; 1(3): 31-4. [In Persian]
17. Motavali F, Sharif M, Sedaghat MM, Gholami SH. The prevalence survey head lice infection among primary school children in sari province in 1997-98. *J Mazandaran Univ Med Sci* 1999; 9(24): 44-8. [In Persian]
18. Dehghani R, Dorodgar A, Almasi H, Asadi MA, Sayyah M. The prevalence survey head lice infection among primary school girl children in Kashan city in 1998. *Daneshvar Med* 1999; 7(26): 63-6. [In Persian]
19. Sharaki GHH, Koroush A, Usufi A, Fararoie M. The prevalence survey head lice infestation among primary school children, in Yasauj city in autumn 1999. *Armaghane-danesh* 2002; 6(1-2): 22-33. [In Persian]
20. Davari B, Yaghmayi R. The factors that may be influencing the prevalence of head lice in primary school children Sanandaj city [Online]. [cited 2000]; Available from: URL: <http://irlistner.com/article/345113>
21. Zahirnia A, Taherkhani H, Bathaai S. A comparative study on the effectiveness of three different shampoos in treatment of head lice (*pediculus capitis*) in primery school-children in Hamadan province, Iran 2000-2001. *J Mazandaran Univ Med Sci* 2005; 15(49): 16-24. [In Persian]
22. Moradi A, Zahirnia A, Alipour A, Eskandari Z. The prevalence of pediculosis capitis in primary school students in Bahar, Hamadan province, Iran. *J Res Health Sci* 2009; 9(1): 45-9. [In Persian]
23. Moradi A.R, Bathaai S.J, Shojaeian M, Neshani A, Rahimi M, Mostafavi E. Outbreak of pediculosis capitis in students of Bahar in Hamadan province. *Dermatology and Cosmetic* 2012; 3(1): 26-32.
24. Soutana V, Euthumia P, Antonios M, Angeliki RS. Prevalence of pediculosis capitis among schoolchildren in Greece and risk factors: a questionnaire survey. *Pediatr Dermatol* 2009; 26(6): 701-5.
25. Rafiey A, Kasiri H, Mohammadi Z, Haghighizadeh MH. The factors that may be influencing the prevalence of head lice in primary school girl children Ahvaz city. *Iran J Infect Dis Trop Med* 2009; 14(45): 41-5. [In Persian]
26. Kokturk A, Baz K, Bugdayci R, Sasmaz T, Tursen U, Kaya TI, et al. The prevalence of pediculosis capitis in schoolchildren in Mersin, Turkey. *Int J Dermatol* 2003; 42(9): 694-8.
27. Zabihi A, Jafarian Amiri S, Rezvani S, Bijani A. A study on prevalence of pediculosis in the primary school students of Babol, 2003-2004. *J Babol Univ Med Sci* 2005; 7(4): 88-93. [In Persian]
28. Motalebi M, Minoueiian Haghighi MH. The survey of pediculosis prevalence on Gonabad primary school students. *Ofogh-e-Danesh* 2000; 6(1): 80-7. [In Persian]
29. Hodjati MH, Mousavi N, Mousavi M. Head lice infestation in school children of a low socioeconomy area of Tabriz city, Iran. *African Journal of Biotechnology* 2008; 7(13): 2292-4. [In Persian]
30. Donnelly E, Lipkin J, Clore ER, Altschuler DZ. Pediculosis prevention and control strategies of community health and school nurses: a descriptive study. *J Community Health Nurs* 1991; 8(2): 85-95.