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Full length research paper

Epidemiological study of Pediculosis Capitis among primary and middle school children in Asadabad, Iran

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The head louse, Pediculus humanus capitis is a worldwide community health concern. In our city, no studies about pediculosis infestation levels have been conducted in recent years. The aim of this work was to investigate the prevalence of head lice in primary and middle school children in Asadabad, Iran.This was a descriptive cross-sectional study conducted in primary and middle school children in Asadabad, during the academic year of 2013- 2014. Data were collected at baseline via questionnaire, checklist, and head examination. A total of the 600 students were examined (412 girls and 188 boys), 14 showed pediculosis and the total prevalence rate was 2.3%.The infestation was equal in public schools and private schools. Rate of pediculosis was higher in primary schools (4.0%) than middle schools (0.7%). The age of the students ranged from 6 to 14 years. The total number of infected group was N=14 with mean age 8.93±2.43 years and in uninfected group was N=586 with mean age 10.98±2.82 years were enrolled in the study (P<0.01).This study showed that different significant between curly hair (5.5%) and straight hair (1.9%) and also family size when compared with pediculosis capitis (P=0.05). When the relation of pediculosis and socioeconomic classes was analyzed as sharing common comb, shares a room with other people, frequent bathing, father's and mother's profession and also father's and mother's education, Chi–square test did not show a statistically significant relationship between the head lice contamination and socioeconomic factors (P>0.05).It is necessary to find the risk factors of the infection in order to understand how to control or decrease infection in students, considering the important role of health education in reduction of head lice infections.

Keywords: Ectoparasites, Pediculosis, Head lice, Prevalence, Epidemiology, Asadabad, Iran

INTRODUCTION

The head louse,Pediculus humanus capitis (De Geer, 1778 - Anoplura: Pediculidae) is a worldwide community health concern (Lee, 2010).Head lice infests an emerging social problem and is found in all parts of the world and in every race, socioeconomic status, family background, or personal habit (Fathy, 2007;Frankowski, 2010).Head lice is usually detected by three different manifestations such as: itching and inflammation of the scalp and neck, sighting of lice, and detection of eggs attached to hair shafts (Guenther, 2010; Meinking, 2004). The head louse is a kind of blood-sucking insect which can cause pruritus (which is the most common symptom), excoriation, conjunctivitis, and secondary bacterial infestations (Fan, 2004). Lice infestation is dated and seen from 25 million years ago in primates (Reed, 2007). Fertilized eggs of sucking lice are called as nits and are firmly cemented to the hair shaft. Subsequently, eggs develop through three nymph instars before reaching to adulthood (Busvine, 1966; Ferris,1951). The highest percentage of this incidence is seen in children aged five to twelve years; however, this incidence in the 24 – 36 year-old group is increasing due to their exposure to infested children. Pediculosis is more common in young girls and those in crowded families especially because of using similar hair products (Clore, 2000). Schools, especially primary schools, are places which have the main role for starting the prevalence of contagious disease and

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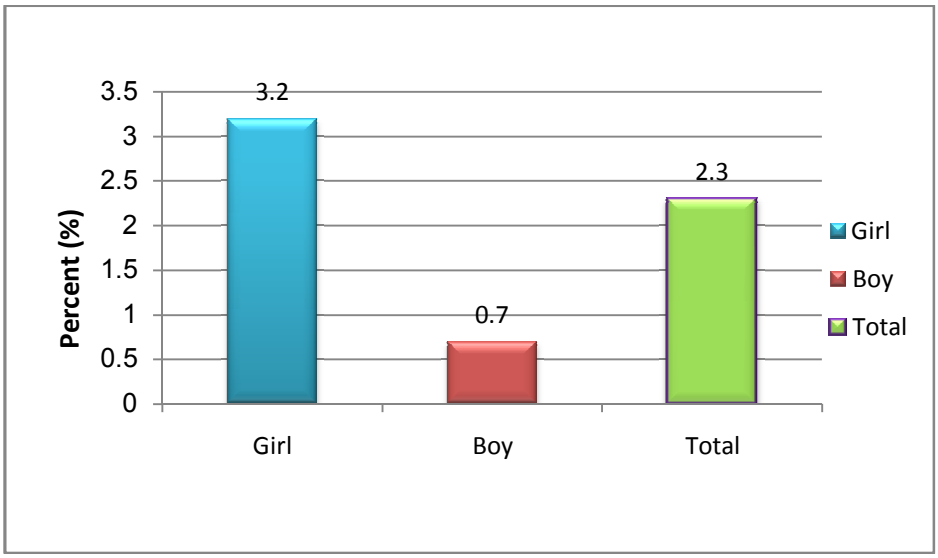

Figure 1. Pediculosis prevalence among different genders

infestations such as the epidemic of pediculosis (Khokhar, 2002). Almost all, human head lice infestations and transmissions occurs by direct host-to-host contact (Takano, 2005). Asadabad city is located at 34° 37′ -34° 50′ N, 47° 51′ -47° 90′ E, in Hamadan province, West of Iran, with 104,566 inhabitants (2005). Many studies have conducted in Iran comparing the social status and rate of pediculosis in different cities. In our city, no studies about pediculosis infestation levels have been conducted in recent years. The aim of this work was to investigate the prevalence of head lice in primary and middle school children in Asadabad, Iran. In addition, the influence of different risk factors for pediculosis infestation, such as gender, hair characteristics, and socioeconomic class, were studied in relation to the prevalence of this ectoparasite.

MATERIAL and METHODS

This was a descriptive cross-sectional study conducted in primary and middle school children in Asadabad, during the academic year of 2013- 2014.Data were collected at baseline via questionnaire, checklist, and head examination. The sample size was determined by considering an expected prevalence (P) of 50 % with a 95% confidence, by using the formula n=z2×p (1-p)/d2 in which z=1.96 and d=0.04 which resulted in 600(188 boys and 412 girls) children (Abedsaeeidi, 2002). In the second stage, the schools were selected according to their geographical distribution to cover the whole district and they represent public and private schools (16 primary and middle schools were randomly selected among male and female and students were systematic selected in schools in Asadabad).In order to evaluate the influence of these different risk factors for pediculosis prevalence, an epidemiological survey was designed to record information about gender, type of school, hygiene teacher, job and education of parents, qualified private bedroom, sharing a bed and blanket, frequent bathing, combing hair type, hair characteristics and family members. Our criteria for the diagnosis of Pediculosis were the presence of at least one living adult, nymph, or viable nit (Pollack, 2000).

Statistical analysis

The Chi square test for homogeneity of proportions was used to compare the prevalence between some variables. Confidence intervals (CI) of 95 % for prevalence were determined. Results were presented as mean ± standard deviation (SD) for quantitative variables. The statistical analysis was conducted with statistical software SPSS 20.

RESULTS

A total of the 600students were examined (412 girls and 188 boys), 14 showed pediculosis and the total prevalence rate was 2.3%.Pediculosis was more frequent in girls (13 out of 412, 3.2%) than in boys (1 out of 188, 0.5 %) ($P<0.05$) (Figure1).The infestation was equal in public schools (2.3 %, N=514) and private schools (2.3 %, N=84) ($P>0.05$, Figure 2).Rate of pediculosis was higher in primary schools (4.0%, N=303) than middle schools (0.7%, N=297) ($P<0.01$, Figure 3).The age of the students ranged from 6 to 14 years. The total number of infected group was N=14 with mean age 8.93±2.43years and in uninfected group was N=586 with mean age 10.98±2.82 years were enrolled in the study as shown in Table 1 ($P<0.01$). The prevalence of head lice infestation was affected by

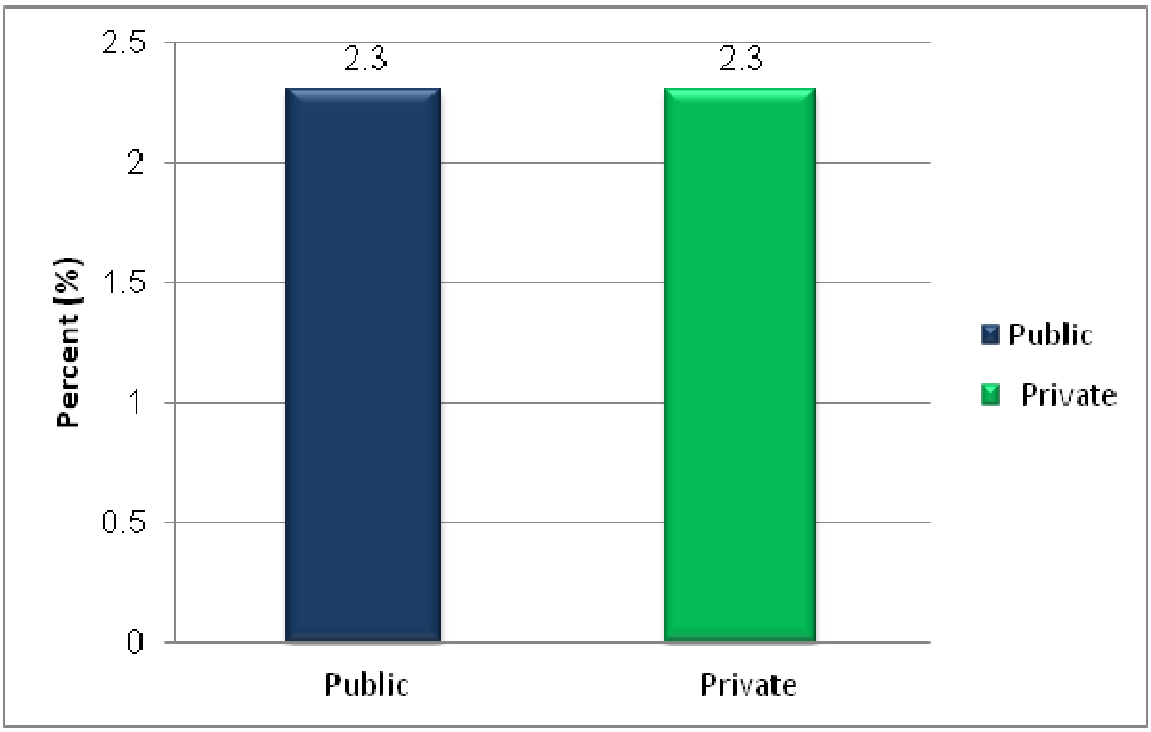

Figure 2. Pediculosis prevalence among Public and Private school

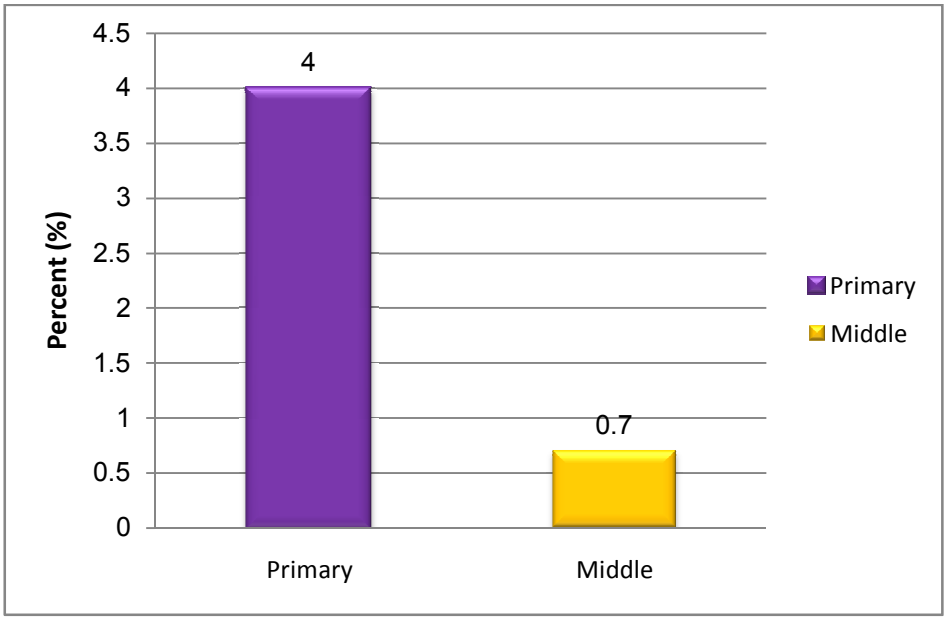

Figure 3. Pediculosis prevalence among Primary and Middle school

Table 1: Comparison between mean age of infected and uninfected school children in Asadabad, Iran, 2013-2014

	N	M±SD	T	P-Value
Infected	14	8.93±2.43	2.690	0.007
Uninfected	586	10.98±2.82		

Table 2: Head louse infestation in school pupils according to some socio-economic factors in Asadabad, Iran, 2013-2014

Characteristics	Values	Infected N (%)	Uninfected N(%)	Total N(%)	P-Value
Having hygiene teacher	Yes	9 (1.8)	502 (98.2)	511 (85.2)	0.043*
	No	5 (5.6)	84 (94.4)	89 (14.8)	
No. of family members	≤3	10 (1.8)	543 (98.2)	553 (92.2)	0.003*
	>3	4 (8.5)	43 (91.5)	47 (7.8)	
Sharing common comb	Yes	5 (3.5)	137 (96.5)	142 (23.7)	0.283
	No	9 (2.0)	449 (98.0)	458 (76.3)	
Shares a room with other people	Yes	6 (1.9)	318 (98.1)	324 (54.0)	0.397
	No	8 (2.9)	268 (97.1)	276 (46.0)	
Frequent bathing	Once a week	3 (2.0)	145 (98.0)	148 (24.7)	0.776
	> Once a week	11 (2.4)	441 (97.6)	452 (75.3)	
Father's profession	Unemployed	2 (3.3)	59 (96.7)	61 (10.2)	0.229
	Businessmen	7 (1.7)	414 (98.3)	421 (70.2)	
	Government	5 (4.2)	113 (95.8)	118 (19.6)	
Mother's profession	Housewife	13 (2.4)	521 (97.6)	534 (98.0)	0.691
	Businessmen	0 (0)	29 (100)	29 (4.8)	
	Government	1 (2.7)	36 (97.3)	37 (6.2)	
Father's education	Illiterate	3 (7.0)	40 (93.0)	43 (7.2)	0.054
	Initial education	7 (1.6)	435 (98.4)	442 (73.7)	
	University education	4 (3.5)	111 (96.5)	115 (19.2)	
Mother's education	Illiterate	2 (2.4)	82 (97.6)	84 (14.0)	0.917
	Initial education	11 (2.4)	442 (97.6)	453 (75.5)	
	University education	1 (1.6)	62 (98.4)	63 (10.5)	
Hair shape	Straight	10 (1.9)	517 (98.1)	527 (78.8)	0.023*
	Curly	4 (5.5)	69 (94.5)	73 (12.2)	

social-economics as regards 8.5% of affected cases had family size comprising more than three persons and 5.6% of students with head lice infestation had no hygiene teacher in the school, while in the infected students that have hygiene teacher prevalence of pediculosis was only 1.8% and there were significant differences between pediculosis and in social and cultural variables (P<0.05).This study showed significant difference between curly hair (5.5%) and straight hair (1.9%) when compared with pediculosis capitis (P=0.023, Table 2). When the relation of pediculosis and socioeconomic classes was analyzed as sharing common comb, shares a room with other people, frequent bathing, father's and mother's profession and also father's and mother's education, Chi–square test did not show a statistically significant relationship between the head lice contamination and socioeconomic factors (P>0.05) (Table 2).

DISCUSSION

Head lice infestation is one of the major public health problems with a world-wide distribution (Shayeghi, 2010). This lack of data on the epidemiology of head lice could hamper and disrupt the strategy for pediculosis control in our city. The prevalence of head lice in children found in this study was 2.3% including 3.2% girls and 0.5% boys. The results of this study are consistent with other studies carried out in Iran where the rate of contamination was reported to be 4.5% in Gilan, including 5.7% girls and 3.3% boys(Pour Baba R, 2005); 4.8% in Khaje, including 6.66% girls and 2% boys (Shayeghi, 2010); in Aran and Bidgol where the amount of head lice contamination in the girls and boys students of primary schools was 0.42% and 0.05%, respectively (Doroodgar, 2011)and 2.2% in Babol, including 3.48% girls and 0.96% boys (Zabihi, 2005). In the Hamadan city, the general prevalence was 6.85% (girls: 13.5%; boys: 0.7%) and the number of girls who had been contaminated was more than that of boys (Nazari, 2007).

The studies carried out abroad also support the finding of this study. According to those studies, this rate reached 9.1% in Turkey, including 16.4% girls and 2.1% boys (Oguzkaya, 2006); 16.59% in India, including 20.42% girls and 13.86% boys (Khokhar, 2002) and 13.3% in Yemen, including 18.9% girls and 8.6% boys (Al-Maktari, 2008). As it can be seen, in all of the above mentioned studies, the rate of

contamination was higher in girls than boys. Children aged 10-11 years were most frequently infested with pediculosis, which could be explained because of their age and their head to head contact (Downs, 1999; AL-Shawa, 2008).Head lice infestation was observed to be a common condition among primary school children and, as has also been documented by others (Hunter, 2003; Frankowski, 2010).The number infestation was equal in public and private schools in Asadabad (2.3 %) and this finding was disagreement with other study results (Lesshafft, 2013; El-Bashir, 2002). This study also showed that the prevalence rate was modified by hair type. Dissimilar results were informed by Borges and Mendes (Borges and Mendes, 2002).Many authors conceive that head lice prevalence can be associated with socioeconomic factors (Nazari, 2007; Hunter, 2003).Head lice infestations are more prevalent in poor socioeconomic status, and family size, age, level of education and personal hygiene are important factors affecting its epidemiology (Gazmuri et al., 2014). Results show that screening and treatment for head lice among children need to be done continuously in order to decrease the infestation rates (Muhammad Zayed et al. 2010; Catala et al., 2004). In our study, no significant effect was found of the socioeconomic factors on head lice contamination such as sharing common comb, shares a room with other people, frequent bathing, father's and mother's profession and also father's and mother's education.

CONCLOSSION

Socioeconomic status is a major factor influencing the occurrence of pediculosis capitis among school children in both sexes. Improving standards of living and personal hygiene might significantly reduce pediculosis capitis in school children in Asadabad. Therefore, it is necessary to find the risk factors of the infection in order to understand how to control or decrease infection in students, considering the important role of health education in reduction of head lice infections.

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