

## Prevalence of pediculosis and scabies in preschool nursery children of Afyon, Turkey

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**Abstract:** Scabies and pediculosis are ubiquitous, contagious, and debilitating parasitic dermatoses. The tendency of high prevalence of pediculosis and scabies among school and preschool age children has prompted us to conduct a head louse and scabies prevalence survey among preschool nursery children in our district. A school-based, cross-sectional study was performed, with 1,134 children chosen for evaluation. All cases were evaluated by physical examination and a detailed, structured questionnaire. The infestation was found in 14 (1.2%) of 1,134 children; 9 (0.8%) with pediculosis capitis and 5 (0.4%) with scabies. We found that infestations were more frequent in children with mothers whose education levels were low. This indicates the necessity of an improvement in the economic and socio-cultural status of the community and the promotion of hygiene concepts and practices in order to improve health of preschool age children.

**Key words:** *Pediculus humanus* var. *capitis*, head louse, *Sarcoptes scabiei*, scabies, prevalence, children, Turkey

Infestations with parasites that live on or in the skin, namely ectoparasitoses, are usually considered to be vexing disorders; these disorders do not attract much clinical attention, but can cause significant morbidity. Depending on the socioeconomic setting, these infections may affect a large proportion of a population. Ectoparasitic infestations can be sporadic, endemic, or epidemic. Pediculosis and scabies are ubiquitous (Takano et al., 2004).

Lice are blood-sucking insects which are specific parasites of human beings. *Pediculus humanus* var *capitis* (PC) lives on the head (head lice); *P. humanus* var *corporis* lives in clothing, benefiting from the warmth and feeding on the body (body lice); and *Phthirus*

*pubis* lives on the pubic area. Head lice are the most common type of louse; this is especially true in children within the age range of 3-11 years. Since the 1970s, the prevalence of head lice has increased in many countries (Chosidow, 2000).

Scabies has also been known for over 2,500 years. It is caused by a mite, *Sarcoptes scabiei* var *hominis*, and is an obligate human parasite that burrows tunnels downward into the epidermis (not deeper than the stratum granulosum) (Chosidow, 2000).

The increasing prevalence of active pediculosis and scabies among school and preschool age children prompted us to conduct a head louse and scabies prevalence survey among preschool children in the Afyon district of Turkey. This is the first study from Turkey reporting scabies and pediculosis prevalence in preschool children.

This study was conducted in Afyon, a city located

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Fig. 1. The location of Afyon on the map of Turkey.

in the inner west region of Turkey (Fig. 1) between November 2004 and March 2005. The city has a population of 129,000 and the number of children 4 to 6 years of age enrolled in preschool at the time of the study was 1,288.

A school-based, cross-sectional study was performed. The total number of children assigned to 71 classrooms in 43 preschool nurseries in the city center was 1,288. Of all these subjects, 154 were excluded from the study due to either irregular attendance or incomplete questionnaires. As a result, 1,134 children (88.0% of the study sample) were analyzed in this study. Before examining children, a detailed, structured questionnaire was submitted to the parents, and socio-demographic data and written informed consent were obtained. In the questionnaire, the age, sex, number of siblings, family size, frequency of hair washing (per week), monthly income, social security of the family, and the education levels and occupations of the parents were recorded for each child.

The hair and scalp were examined for PC by hand separation of the hair every 1-2 cm. The presence of either live or dead eggs, or nits, regardless of morphologic features or localization, was considered infestation with PC. The diagnosis of scabies was made by looking at burrows or rashes. The definitive diagnosis was made by microscopic identification of the mites or eggs from skin scrapings.

The examinations were carried out by 2 dermatologists; all examinations were supervised by the principal author in order to minimize individual variations.

In this study 1,134 children between 4 and 6 years of age were evaluated; 607 (53.5%) of the subjects were boys and 527 (46.5%) were girls. The infestation

was found in 14 (1.2%) of 1,134 children; 9 (0.8%) children with pediculosis capitis and 5 (0.4%) children with scabies. There were no significant sex differences in infested cases; 6 (42.9%) of the infested cases were boys and 8 (57.1%) were girls. The analysis of other variables, such as family income, family size, number of siblings, social security of the family, and frequency of hair washing, were not found to be significantly different between infested and noninfested subjects (Table 1).

The education level and occupation of the mother, however, were found to be associated with the rate of infestation. The ratio of infested children, with a mother whose highest level of education was primary school, was significantly higher than children whose mother attended high school or college ( $\chi^2 = 19.12, P < 0.05$ ). In terms of the occupation of the mother, infestation was found to be more frequent among children whose mothers were housewives than children with mothers of other occupations ( $\chi^2 = 21.20, P < 0.05$ ).

Pediculosis has a worldwide distribution, with a variable rate of up to 80%. Its prevalence has increased worldwide since the middle of the 1960s (Kokturk et al., 2003). Furthermore, scabies also continues to be an important parasitic disease that persists throughout the world despite the availability of various acaricides used for its control. Worldwide, an estimated 300 million people are reported to be infested with scabies, which spreads through human contact (Arene et al., 1985; Borgers et al., 2002).

In certain epidemiologic school surveys conducted in different countries, the prevalence of pediculosis has been found to be 15% in France (Combescot, 1990), 33.7% in Australia (Speare and Buettner, 1999), 40% in Taiwan (Fan et al., 1991), 78.6% in Libya (Combescot, 1990), 55% in Israel (Mumcuoglu et al., 1990), and 28.3% in the U.K. (Downs et al., 2000).

Epidemiologic studies have been conducted in our country, and the prevalence of pediculosis have been reported to be 18.6% in Adana, 16.1 and 20.7% in İzmir, 7.3% in Sivas, and 1.8% in Ankara (Ozcan et al., 1996). A study conducted among primary school children in our study region reported the prevalence of scabies to be 9.9% (Cetinkaya et al., 2004). However,

**Table 1.** Characteristics of subjects infested by pediculosis and scabies

Characteristics	Infested subjects	
	No.	Posit. rate (%)
Sex		
Boys (N = 607)	6	0.9
Girls (N = 527)	8	1.5
Total (N = 1,134)	14	1.2
Head lice	9	0.8
Scabies	5	0.4
Number of sibling		
0-3 (N = 858)	11	1.3
4+ (N = 276)	3	1.1
Frequency of hair washing		
Twice a week (N = 537)	5	0.9
Once a week (N = 597)	9	1.5
Family size		
2-5 (N = 726)	8	1.1
5+ (N = 408)	6	1.4
Education of fathers		
Primary school (N = 183)	4	2.1
High school and college (N = 951)	10	0.9
Education of mothers		
Primary school (N = 368)	11	3.0
High school and college (N = 766)	3	0.4
Social security of the family		
Yes (N=1015)	12	1.2
No (N=129)	2	1.6
Family income		
Low (N=325)	6	1.8
Medium (N=440)	4	0.9
High (N=369)	4	1.1
Occupation of mothers		
Health (N=286)	1	0.3
Education (N=229)	3	1.3
Officer (N=332)	1	0.3
Home wife (N=287)	9	3.1
Occupation of fathers		
Health (N=67)	1	1.5
Education (N=138)	2	1.4
Officer (N=79)	1	1.3
Others (N=850)	10	1.2

the pediculosis prevalence in our study (0.8%) was significantly lower than that found in other studies with similar methodologies conducted among primary school children from our region and from other regions of our country.

Almost 50% of general practitioners and dermatologists indicated that they rarely or never reported scabies to the Health Inspector. As a result, the true incidence of scabies in Turkey, as in many other countries, is not known. In studies from our country, the prevalence were reported to be 0.48% in Hatay (Onlen et al., 2004), 0.8-1% in Malatya, and 8.7% in Diyarbakır (Ozcan et al., 1996). Although the prevalence rate found in our study (0.4%) was concordant with some of these results, it showed considerable differences from other studies.

One of the most common factors that causes these results is the high sociocultural and economic status of the parents of children attending preschool nurseries in our country, as in most cases, preschool nurseries required tuition fees (20-200 EUR per month), which limits the number of children admitted. We assume that a second common cause of the low prevalence of infestation is the number of students in each class. A total of 1,288 children in 71 classrooms of 43 preschool nurseries indicates a mean number of 18.14 students per class.

In this study we found that the level of education of the mother was related to the frequency of infestation; significantly higher rates of infestations were observed in children with mothers of lower education levels. This finding is supported by several studies with similar methodologies in primary school children from our country and others. A significant relationship was also found between the occupation of the mother and infestation of the child. These results need to be supported by multi-center, large-scale studies of preschool age groups.

Consequently, based on these initial data from preschool nurseries in Turkey, scabies and pediculosis infestations are present in children, but are not serious. Therefore, it is necessary that the economic and sociocultural status of the community be improved and hygiene concepts and practices be promoted in order to improve the health of preschool age children.

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