

Prevalence of Head Lice in Jeddah City, Saudi Arabia According to Crowding Criteria

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Abstract: One of the cosmopolitan parasites recorded all over the world is the Head Lice, *Pediculus humanus capitis*, it parasitizes the human being with highly prevalent in children. The habit feeding of Head lice is sucking blood from human and it is about every 4 to 6 hours each day which causing severe irritation and inflammation. Crowding is the factor effect on the prevalence of *Pediculus humanus capitis* between hosts, this record is related to the crowding factor increased the head lice prevalence among school girl students attending the elementary schools in Jeddah city. Study was conducted by filling the questionnaires for the head lice infected students in the public and private schools under study according to their information in the schools records. The *Pediculus humanus capitis* infested students were mainly lived in apartments have at least three rooms. The student's siblings was five or more, most of them sharing their sister in bed and having prior infested people in the student's family.

INTRODUCTION

The infestation by head lice does not have accurate reports so the announcement of infestation in the countries is required, about five million infected person between 6 and 12 years old were mentioned yearly (Gratz, 1997; Scanni and Bonifazi, 2008). In several developed countries, head lice increased within the last two decades even though the improved sanitary condition and the achieved pediculosis management (Burgess, 2004; Kim et al., 2004). In Abha city, Saudi Arabia, the most frequent types of infestation skin diseases were pediculosis capitis gave a prevalence of infestation as 9.6% (Bahamdan, et al., 1996).

The head lice prevalence in a population of Saudi Arabian Children was 12% and the distribution of infestation among males and females was broadly similar (Boyle, 1987). Home crowding is considered as the highest factor enabling infestation transmission (Gbakima and Lebbie, 1992). Girls had a higher infestation rate than boys where they had low socio-economic status, other correlation factors were the overcrowding, hair length, family size, age and the special sanitation (Ebomoyi, 1994).

In general, population in Lima, Peru, the head lice prevalence was significantly correlated with age, gender, number of family members, quality of

house building material and existence of pets in home (Lesshafft et al., 2013). In Gaza Governorate, the prevalence of pediculosis capitis in children was 71.8% when the students live in houses with three to four rooms (AL-Shawa, 2008). El-Mehamdy (1995) stated that in a survey of 2928 elementary school girls living in Jeddah, 9.7% of them had pediculosis capitis infestation and the highest rates were correlated with the studying level and long hair, the attack severity was found to be associated with crowding and mother education. The latest study in Al-Khobar city stated that in female schoolchildren the head lice prevalence was 5.2% and the student's family live in a flat (Al-Saeed et al., 2006).

The aim of this work was to determine head lice prevalence among elementary schools girl students in Jeddah, one of the biggest cities in Saudi Arabia and the crowding Criteria that influence the intensity of head lice infestation.

MATERIALS AND METHODS

The positive detection by visual eyes of head lice infestation was depended on the presence of at least one of the developing stages of *Pediculus humanus capitis*, including also nit residues. Five degrees of parasitism were considered during the student's inspection for head lice infestation (Catala et al., 2005), these five categories classified as (0) which

there no developmental stage of head lice and student considered free, (0+) if there one sign of infestation such as active lice (adult or nymph) and nits or its residue so student considered infested with pediculosis, (1) if there few nits and no mobile lice and student considered as have low infested pediculosis, (2) if there more than 10 nits behind student ears in less than one cm from scalp with little mobile lice, she considered with medium infestation signs, (3) if there more than five mobile lice and their nits spread all over student hair so she considered have high pediculosis infestation.

All students' information, regarding their demographic characteristics was recorded as well as their families characteristics were also recorded in the questionnaire which was filled by the student information that she known, or by that information recorded in the school official records. All information regarding the student hair characteristics such as size, type, color, density ...etc was mentioned in the questionnaire.

The computer Statistical Package for Social Science (SPSS) was used for analyzing the date of questionnaires. To estimate the frequency of head lice infestation between elementary school girls in Jeddah city and to compare between factors that affect the intensity of pediculosis infestation, Chi-square test and statistical correlation were done.

RESULTS

In a year and eight months starting from September 2012 to May 2013, head lice prevalence and infestation intensity were estimated in the elementary girl students in Jeddah city. Total number of examined students was 5150 from some

public and private schools (Table 1). The infested students were 580 and the prevalence was 11.26%, those students who filled the questionnaire were 547 and the intensity of infestation was light (29.1%), mild (34%) and heavy (36.4%).

The first factor of crowding criteria was the student's home type (Table 2, Figure 1A). Out of 547 students, 333 of them were lived in apartments giving the percentage of 60.9%. The intensity of pediculosis infestation and student's home type are independent (P= 0.098). With increasing in room's number (Table 2, Figure 1B), there was a decreasing in infested student's number, that 299 students lived in houses with three rooms giving a percentage as (54.7%). There is a significant correlation between pediculosis intensity and student home's rooms number (P= 0.006). The correlation coefficient is weakly related (r = 0.061).

The effect of increasing the brothers number, the pediculosis infestation was obvious (Table 2, Figure 1C). There was an increasing in students infested proportion (48.8%) if the student has five or more brothers. There is a significant association between head lice intensity and student's siblings (P= 0.008) and the pediculosis infestation almost increases when the number of student's brothers increases (r = 0.153). The high occurrence percentage (84.5%) was recorded in students sleep with their sister (Table 2, Figure 1D), so the relationship between pediculosis intensity and student's sharing bed was not significant related, P-value was (0.780). The presence of other infested members in the family played a role in the pediculosis prevalence (Table 2, Figure 1E), the high percentage (71.3%) of students who had infested members in their families and the correlation is highly significant (P= 0.00).

Table 1: Prevalence and infestation intensity of *Pediculus humanus capitis* in elementary school girl students in Jeddah city, Saudi Arabia

Total girl students in public and private schools		5150
Infested girl students		580
Prevalence percentage%		11.26
Students filled the questionnaire		547
Intensity of infection		
Number of students examined	Degree of infestation intensity	Percentage %
160	Light	29.1
187	Mild	34
200	Heavy	36.4

Table 2: Prevalence and infestation intensity of *Pediculus humanus capitis* in primary school girl students in Jeddah city according to crowding criteria

Crowding criteria	No. of students	Prevalence (%)	Intensity of infestation					
			Light	%	Mild	%	Heavy	%
Home type								
Popular	157	28.5	41	26.1	48	30.6	68	43.3
Apartment	333	60.9	127	38.1	96	28.8	110	33
Villa	57	10.4	19	33.3	16	28.1	22	38.6
Room number								
Two	142	26	47	33.1	40	28.2	55	38.7
Three	299	54.7	119	39.8	82	27.4	98	32.8
Four or more	106	19.4	21	19.8	38	35.8	47	44.3
Student's siblings								
One or none	31	5.7	13	41.9	6	19.4	12	38.7
Two	58	10.6	28	48.3	17	29.3	13	22.4
Three	104	19	44	42.3	34	32.7	26	25
Four	87	15.9	27	31	23	26.4	37	42.5
Five or more	267	48.8	75	28.1	80	30	112	41.9
Student's sharing bed								
Alone	20	3.7	10	50	4	20	6	30
Mother	60	11	20	33.3	16	26.7	24	40
Sister	462	84.5	156	33.8	138	29.9	168	36.4
Others	5	0.9	1	20	2	40	2	40
Prior infected people								
Yes	390	71.3	94	24.1	116	29.7	180	46.2
No	157	28.7	93	59.2	44	28	20	12.7

DISCUSSION

Head lice are still a community health problem all over the world, this prevalence of pediculosis in Saudi Arabia as 11.26% was similar with that of Boyle, (1987) who recorded 12% in Jeddah city in 300-child population from birth to ten years old, but it was higher than 7.9% and 9.6% which recorded in 2928 of primary schoolgirls in Jeddah and in 647 of young pupils in Abha respectively (EL-Mehmady, 1995, Bahamdan, et al., 1996), as well as it was extremely higher than 5.2% that documented in female schoolchildren in Al-Khobar city (Al-Saeed, et al., 2006).

The pediculosis intensity increased when the student's family live in an apartment being as 60.9%, which resemble that documented by Al-Saeed et al. (2006) and Lesshafft et al. (2013), both studies reported that living in a flat or houses made from adobe or wood may played a positive role in spreading head lice. The house size in Jeddah city was associated with the heavy infestation of head lice, it was 54.7% when the house composed from three rooms, this result like that recorded in Gaza governorate by Al-Shawa (2008), she got 71.8% as pediculosis incidence when the children live in houses with three to four rooms.

Peak of head lice intensity (48.8%) was found when the student's siblings were five or more,

which is convenient with many results recorded in different cities (Gbakina and Lebbie, 1992; Ebomoyi, 1994; El-Mehmady, 1995; Al-Saeed et al., 2006; Al-Shawa, 2008 and Lesshafft et al., 2013). Student's sharing bed, a habit with close relation to the family size has great influence on the head lice intensity that co-sleepers (84.5%) are liable of infestation in extremely effect than single sleepers (3.7%), which is compatible with the results documented by Gbakina and Lebbie (1992).

It was found that 71.3% of schoolgirls in the elementary schools in Jeddah city had other family members who had been infested with *pediculus humanus capitis*, this was compatible with that recorded by Al-Shawa (2008) in Gaza governorate.

In conclusion, the increase in head lice infestation among the elementary school students may be due to the large size of family and to the small area of home which makes the family members very close to each other. Also, the crowding affects on the pediculosis intensity when there are limited room's number in a student's home, and this may be due to the shortage of the student's father income. The student's siblings, the student's sharing bed or the presence of infested person in family might play a role in increasing the chance of getting head lice infestation back again.

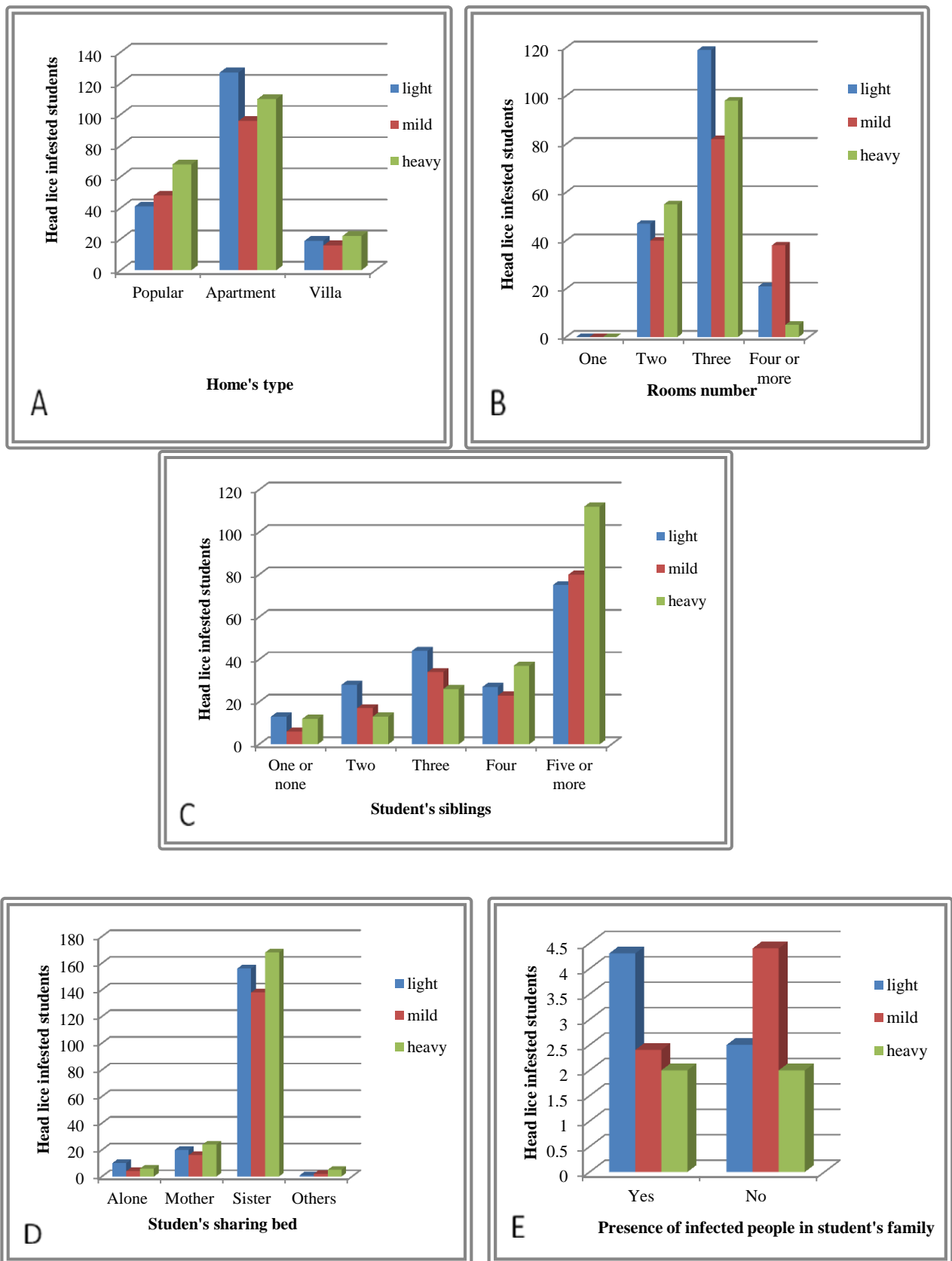


Figure 1: Infestation intensity of *Pediculus humanus capitis* in the elementary school girls in Jeddah city according to crowding criteria (A: home's type, B: room number, C: student's siblings, D: student's sharing bed, E: presence of infected people in student's family)

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