



Prevalence of Head Pediculosis Among Refugees In Sulaimani Governorate/ Kurdistan- Iraq

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ABSTRACT

The head louse (*Pediculus humanus capitis*) is one of the common obligate ectoparasites blood-sucking, wingless, belonging to the order Phthiraptera, sub-order Anoplura which are specific parasites of a human being with the medical importance worldwide. This study carried out to estimate the prevalence of head pediculosis and its associated factors among refugees in Sulaimani province. Total of 11798 peoples participated in this study including 5056 male and 6742 female from five refuges campus in Sulaimani province, the direct inspection visually followed to detect head lice infestation (pediculosis). The overall prevalence in the current study was 1.12%, the infestation was significantly higher among female (1.78 %) than the male (0.24 %). The age significantly had an effect on the pediculosis; the higher rate of pediculosis was among children (1-5 years) than the other age groups although Pediculosis was significantly higher among low-level educational peoples (preparatory and primary). The family size, hair washing duration, length of hair and type of hair have the direct effect of the head louse infestation, while the significant association between scalp disease (Dandruff) and infestation rate of head lice was not observed. From this study, we conclude the prevalence of head lice has directly related to age, personal hygiene, and hair type, and the refugee's camps in Sulaimani province (Kurdistan-Iraq) need more health care and health awareness.

Keywords: pediculosis, infestation, refugees, head louse.

نسبة الانتشار لقمل الرأس بين اللاجئين في محافظة السليمانية/ كردستان – العراق

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الخلاصة

قمل الرأس (*Pediculus humanus capitis*) هو احد الطفيليات الخارجية الشائعة، من نوع الممتصة الدم، بدون اجنحة وتعود إلى رتبة Phthiraptera ورتبية (تحت الرتبة) Anoplura وهي طفيليات خاصة بالانسان ولها اهمية طبية في جميع أنحاء العالم. اجريت هذه الدراسة لتقدير مدى انتشار قمل الرأس والعوامل المرتبطة به بين اللاجئين في محافظة السليمانية. وشارك في هذه الدراسة 11798 شخص، بواقع 5056 ذكر و 6742 انثى من خمسة اماكن للاجئين في محافظة السليمانية، وتمت المعاينة المباشرة بالعين الجردة للكشف عن إصابة قمل الرأس (القمل). كان الانتشار العام في الدراسة الحالية 1.12 %، وكان معدل الإصابة أعلى بكثير بين الإناث (1.78 %) من الذكور (0.24 %) وكانت الفروقات معنوية كما وجد ان للعمر تأثير كبير على القمل وبلغ اعلى معدل من الاصابة بين الأطفال (1-5 سنوات) من الفئات العمرية الأخرى وايضا

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نسبة الإصابة كانت أعلى بشكل ملحوظ بين الأشخاص منخفضي المستوى العلمي (الروضة والابتدائية). عدد افراد الأسرة ومدة غسل الشعر وطول الشعر ونوع الشعر له تأثير مباشر على الإصابة بقمل الرأس، في حين لم يلاحظ ارتباط ملحوظ ومعنوي مرض فروة الرأس ومعدل الإصابة بالقمل، نستخلص من هذه الدراسة إلى ان انتشار قمل الرأس يرتبط مباشرة بالعمر والنظافة الشخصية ونوع الشعر، كما أن مخيمات اللاجئين في محافظة السليمانية (كردستان - العراق) تحتاج إلى المزيد من الرعاية والرعي الصحي.

INTRODUCTION

The insects are the largest class of Animalia kingdom. About 80% of the known animals species in the world belongs to insects [1]. The human head lice, *Pediculus humanus capitis* are blood-sucking, wingless and obligate ectoparasites, belonging to the order: Phthiraptera, which are specific parasites of a human being [2], their life cycle consists of three stages, egg, nymph, and adult. The lifespan of adult louse is up to 30 days on a person's head, it can lay up to 10 eggs per day, the adult louse takes a blood meal several times daily and sometimes it can survive for 36 hours without a blood meal, they are not evidenced to be the vector of any disease but they cause annoyance, irritation, and sleepiness[3]. The infestation is a regular community health concern which affects millions of children around the world, it may be completely asymptomatic, or cause intense scalp itchiness, dermatitis, secondary bacterial infection, allergic reaction, pruritus, excoriation, lymphadenopathy, and conjunctivitis have been frequently seen more among infested children. The pruritus, which occurs due to sensitization to both louse salivary and fecal antigens, may be so intense that secondary bacterial infection may occur [4]. People get head lice from direct hair contact with another infected person. The transmission will happen when people play, cuddle, or work closely together and among family member from children to another member [5].

The highest prevalence is recorded among children aged five to twelve years; however, the prevalence among the aged 24–36 years old group is high due to their exposure to infested children, the high infestation among this groups due to poor hygiene, socioeconomic status and lack of medical treatment[6].

In the United States of America, pediculosis capitis yearly affects about six to twelve million individuals [7]. Pediculosis infestation rate was 3.7% among children living in Ilorin, Nigeria and girls had a higher infestation rate (5.6%) than boys [8], also in eastern Taiwan and in Korea, the prevalence was 12.9% and 5.8% respectively [9]. Epidemiological studies conducted in various schools and nurseries in different Arabic countries and Iraqi neighboring countries have demonstrated various results, the prevalence rate of infestation in Turkey was 9.4%, in Iran 4% and 14%, in Iraq [10- 13].

MATERIALS AND METHODS

The study was carried out among five refugees in Sulaimani, Kurdistan, northeast of Iraq located on the longitude (44.50- 46.16) east and latitude (35.04 - 36.30) north. The sampling and data collection, with collaborating with world vision organization (WVO) team in a different district of Sulaimani governorate including; Dukan center, PiraMagrun, Chamchamal, Halabja Taza and Baynjan, they include 1007, 1050, 1834, 1300 and 300 families, respectively. The refugees were visited regularly 3 days a week from November 2016 to February 2017. During short interview each participant was inspected for head lice infestation by direct visual examination, the entire head carefully investigated especially the nape of the neck and behind the ears, hair had at least one of developing stage of *pediculosis capitis*, including nits residues, was considered infested. After the head inspection, and according to a questionnaire, the: age, gender, school grade, family size, the frequency of hair washing, length of hair, hair type, sharing a common comb, sharing common cloth or bed and duration of infestation were asked, finally after inspection anti-lice shampoo was described to who were infested and advised to control the disease. Data statistically analyzed by SPSS (version21).

RESULTS

Out of 11798 peoples (5056 male and 6742 female) were examined by visual inspection for head lice (*P. humanus capitis*). About 132 peoples (1.12%) was found infested with *P. humanus capitis*, the infestation rate was significantly ($p < 0.01$) higher among female than male (Table-1).

Table 1-Prevalence of pediculosis among refugees in Sulaimani according to the gender:

Gender	No. of examined	No. of non- infested	No. of infested	Prevalence of pediculosis
Male	5056	5044	12	0.24 %
Female	6742	6622	120	1.78 %
Total	11798	11666	132	1.12 %

P value= 0.01

Table-2 Shows the number and percentage rate of pediculosis among age groups. The infestation rates among age groups (1-5 years) was significantly higher (1.44%) than the infestation among other age groups followed by (6-10 years), (11-15years) and older than 20 years, that record (1.24 %), (1.18 %) and (0.8%) respectively while lower rate of pediculosis was found in the age group (16-20years).

Table 2-Prevalence of pediculosis among refugees according to their age groups

Age (years)	No.of examined	No. of non-infested	No. of infested	Prevalence of pediculosis
1 – 5	1878	1851	27	1.44 %
6 – 10	3963	3914	49	1.24 %
11 – 15	1286	1258	28	1.18 %
16 – 20	2317	2308	9	0.39 %
>20	2354	2335	19	0.8 %
Total	11798	11666	132	1.12 %

P value= 0.01

Refugee's educational level also has da irect association with personal hygiene and on pediculosis, the infestation rate among people who have preparatory and primary level was (3%) and (1.11%) respectively, while the pediculosis rate among those have secondary, university graduate and illiterate was lower Table-3.

Table 3-Prevalence of pediculosis among refugees and associated factors in Sulaimani Province

Characteristic (Factors)	No. Examined	No. of non-infested	No. of Infested	Prevalence of pediculosis	P-value
Educational level	Preparatory	2112	2047	65	3%
	Primary	4501	4451	50	1.11%
	Secondary	2265	2255	10	0.44%
	university	610	609	1	0.16%

		graduate					
Family size	Illiterate	2310	2304	6	0.26%		
	1-2 Persons	2113	2120	7	0.33 %		
	3-4 Persons	2327	2346	19	0.81 %	0.00001	
	5-6 Persons	3972	4021	49	1.23 %	4	
	>6 prson	3254	3311	57	1.75 %		
The frequency of hair washing	Once a week	6063	5980	83	1.37 %		
	Twice a week	4622	4579	43	0.93 %	0.01	
	Three or more a week	1113	1107	6	0.54 %		
Length of hair	Short	4423	4370	53	1.2 %		
	Medium	4052	3993	59	1.45 %	0.00245	
	Long	3323	3303	20	0.6 %	5	
Hair type	Straight hair	4211	4142	69	1.63 %		
	Wavy hair	5240	5200	40	0.76 %	0.00213	
	Curly (spring)	2347	2324	23	0.98 %		
Sharing common comb	Yes	7347	7231	116	1.58 %	0.00000	
	No	4451	4435	16	0.36 %	1	
common cloth or bed	Yes	7105	6992	113	1.58 %	0	
	No	4693	4674	19	0.4 %	.00001	
Scalp disease	Yes	1022	1007	15	1.47 %	0.26720	
	No	10776	10659	117	1.08 %	8	

The results of the current study revealed that family size of refugees has a significant effect on the pediculosis ($p < 0.01$). The infestation rate among people who have family size more than 6 persons was higher (1.75 %) than those who have smaller family size. Prevalence of pediculosis among refugees according to their frequency of hair washing shows that highest rate (1.37 %) of infestation was among those refugees who are washing their hair once a week which significantly differ from the other group ($p \leq 0.01$), Table-3.

Length of hair is also important as medium hair length reports significantly ($p < 0.01$) higher prevalence rate (1.45 %) of pediculosis followed by short and long hair length that have (1.2%) and (0.6 %) prevalence rate respectively, while hair types were also affected by pediculosis occur as the highest rate (1.63%) recorded among refugees that have straight hair which is significantly higher than pediculosis among the other hair type groups. According to sharing tools, the higher rate (1.58%) of infestation was noticed among those who are sharing common comb, bed or clothes, while the relation between scalp disease and pediculosis was not found Table-3.

DISCUSSION

Pediculosis is one of the common public health issues in the world, it can be defined as the presence of at least one living adult, nymph or viable nit. Head lice are one of the most important

human obligate ectoparasites which infest human, with prevalence varying across countries from less than 1% to more than 50% [14].

The current study is carried out among refugees due to poor sanitation and low service among most of the total prevalence of pediculosis among refugees in Sulaiman/Kurdistan-Iraq was (1.12%), this finding is lower than some studies conducted among refugees, among refugee children in China, Fan *et al* [15] recorded 14.2%. This higher infestation rate may be due to the variation of the age most studies targeting schoolchildren. Among European schoolchildren, the infestation rate was 3.3% in France [16], while in England it was 2.03% [17] and in Poland, 1.59% was recorded [18]. The high rate of pediculosis (54.1%) was recorded in Egypt among schoolchildren [19], in the same study in Iran, the infestation rate was 6.85% [20], while in Palestine the rate reaches 14.1% [21], and in a recent study in Iraq the high infestation rates were recorded by [13], all these results were higher in comparison with pediculosis among refugees recorded in the current study due to socioeconomic, cultural and environmental and climate factors and also the most studies of pediculosis in Iraq were carried out among primary school children which are the critical age for the personal hygiene.

In Iraq-Kurdistan Region, a study performed among primary schools children in Kirkuk province; the infestation rate of pediculosis was 6.5% [22]. Some researcher indicated that the prevalence of head lice in Erbil city reached 13.8 to 19.7 % [23, 21]. The cause of this variation in the prevalence of head lice infestation may be due to several factors including the head-to-head contacts, diagnostic techniques, eradication methods, pesticide resistance, knowledge regarding head lice and perception of pediculosis as a health problem [13]. Some factors also provide a good environment to increase the prevalence of parasitic infection and head pediculosis as poor hygiene and socioeconomic status, season, lack of good medical treatment and the low-quality anti-lice shampoo which are commercially used with no good quality this due to uncontrol of the pediculosis [24, 21].

In the current study, the infestation rate among female was significantly higher than in male, which was consistent with many other studies [17, 23]. Also, this finding supported by [11] in Iran, this may be attributed to the behavioral variations between the two genders. Boys have a tendency only in brief contacts during sports or rough activities and generally girl having long hair as compared to boys.

The age was significantly related to the prevalence of head lice, in the current study aged 1-5 years constituting the highest infestation rate (1.44%) followed by 6-10 years, this result agreed with [21] in Erbil-Kurdistan region, the variation of the rate of infestation among age groups may be due to personal hygiene practices, including the regular combing and washing of the hair, and also the activities. The high infestation rate among children may be due to more activities and probably they depended on one themselves for personal hygiene practices, while the lower rate of infestation was found among (21 years and older) because they have more health education and they occasionally depend on themselves [21].

In the present study, the significant correlation between infestation rate and refugee's educational level was observed, this finding agreed with [25], while dissimilar to the [26], they found non significant correlation between head louse infestation and education level, these controversial results could be explained by the level of infrastructure or logistic facilities as clear through the various location of studies. In the case of refugees, most of the crowded families were living together in resident place and they are using same things. Some studies found low or no significant correlation between lice infestation and the size of the family in contrast to this result [27, 9]. This study also shows the frequency of hair washing affected lice infestation significantly. This is compatible to [28] in Ravansar west of Iran, they found a significant relationship between infestation and hair washing frequency. In opposite to those of Urmia and Sanandaj in Iran [11] they did not find a correlation between infestation and hair washing frequency. Most refugees taking a bath and washing hair one time weekly, especially in winter because of state and place of living, this attribute the highest rate of infestation among them, and that could be related to these controversies. The hair characters (color, length, type, and kind) and their effect on the rate of infestation of pediculosis are highly controversial also [25]. Also, some studies which reported that hair length did not appear to be an independent risk factor [29]. However, other studies found that long-haired girls were more infested with lice [25, 27]. The findings can be attributed to the fact that most of the refugees because of their method of life have no long hair and most of them the hair characters are similar.

Concerning hair type in this study, it was found that the highest rate of infestation among those with straight hair and that have been reported previously in Iraq [25] as they found that the highest rate was among those with black and straight hairs (14.35% and 17.3% respectively) in both genders. Despite this dissimilar study done by [30] found the rate of infestation of a head louse is higher among children with dark and wavy hair, this may be due to the fact that some hair type is not common among Iraqi population such as curly (spring) hair type and straight hair type increase rate of infestation because during brushing or hair washing lice and their stages especially viable nit fall down more easily than the other types of hair and this facilitates the rate of infestation and re-infestation. In the current study, no obvious related was found between scalp disease and pediculosis infestation.

CONCLUSION

The finding of this work concluded that pediculosis is a public health concern among the refugees, also a low prevalence rate was recorded 1.125%, may be related to regular health education programs that following up by relief organizations for refugees and providing with anti-lice shampoo to protect and reduce of pediculosis. The correlation between age, hair types, gender, education, and pediculosis were significantly observed, while the scalp disease has no related to pediculosis. The more and better long strategical plan of healthcare needed to reduce and eradicate head lice infestation among refugees.

ACKNOWLEDGMENT

This study was supported by World Vision Organization (WVO); hereby the authors deeply have to thank all administrators' staff and physicians members of (WVO) for their collaboration.

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