



## **Head lice infestation among local and displaced secondary school girls and its effect on some haematological parameters in Kirkuk city.**

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### **Abstract**

**Background:** Head lice infestation is one of the most important health problems throughout of the world. The species which cause pediculosis in humanus beings is *Pediculus humanus capities*.

**Objectives:** The aim of the current study is to estimate the distribution of head lice among local and displaced secondary school girls to assess haemoglobin and packed cell volume in Kirkuk city.

**Methods:** The hair of all students was examined by researchers and blood samples were drawn from each student for determination of haemoglobin concentration and PCV percentage.

A questionnaire form was filled for each student including personal and family information. The student t-test was used to show significant difference of PCV and Hb between lice infested and non infested students.

**Results:** The overall rate of head lice infestation among secondary students girls was 34.7% (displaced 42.7% and local 26.7%). The highest rate of infestation was among 16-18 years and lowest was among 13-15 years. The highest rate in displaced students was among middle educated status, while in local students among low educated status. The PCV and Hb values in infested girls were lower than non- infested ones.

**Key words:** Head lice infestation, PCV, Hb, displaced and local secondary girls students, Kirkuk.

اصابة قمل الراس لدى الطالبات في المدارس الثانوية المحلية والنازحة وتأثيرها  
على بعض القياسات الدموية في مدينة كركوك



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### الخلاصة

**المقدمة:** الاصابة بقمل الرأس واحد من اهم المشاكل الصحية في العالم ، النوع الذي يصيب الانسان هو *Pediculus humanus capities*

**الهدف:** الغرض من الدراسة هو تقدير انتشار قمل الراس وتأثيره على حجم كريات الدم الحمر وتركيز الهيموغلوبين في المدارس المحلية والنازحين لطالبات المرحلة الاعدادية في مدينة كركوك.

**طريقة العمل:** تم فحص شعر طالبات المرحلة الاعدادية من قبل الباحثين واخذ عينات الدم لتقدير تركيز الهيموغلوبين وحجم كريات الدم الحمر المتراسة، تم ملئ ورقة الاستبيان لكل طالبة وتضمنت المعلومات الشخصية والعائلية .

تم اجراء t-test لملاحظة الفرق المعنوي بين تركيز الهيموغلوبين وحجم كريات الدم الحمر المتراسة بين التحليل الاحصائي

الطالبات المصابات وغير المصابات بقمل الرأس.

**النتائج:** المجموع الكلي للاصابة بقمل الرأس في اغلب المدارس الثانوية للنازحين و٢٦,٧ لغير النازحين) للبنات هو ٣٤,٧% (٤٢,٧)

اعلى معدل للاصابة سجلت للطالبات اللاتي تتراوح اعمارهم بين ١٦-١٨ سنة والاقل اصابة بين الطالبات اعمارهم تتراوح بين ١٣-١٥ سنة ، الاعلى معدل كانت في مدارس النازحين ذات مستوى تعليمي متوسط ، بينما في المدارس المحلية كانت في مرحلة الدراسية الواطئة ومعدل حجم كريات الدم المتراسة وتركيز الهيموغلوبين في الطالبات المصابة هو الاقل من غير المصابات.

الكلمات الدالة: الاصابة بقمل الرأس، حجم كريات الدم المتراسة، الهيموغلوبين، طالبات المدارس النازحين وغير النازحين، كركوك.

## Introduction

Pediculosis is infestation of the body with lice. The human head louse is found wherever personal or general hygiene is at low level [1] . The clinical signs of head



lice infestation includes itching and inflammation of the scalp and neck sighting of lice and detection of eggs attached to hair shafts [2] .

In Baghdad [3 ] examined 540 child (240 boys and 300 girls) from 8 public elementary schools their age were ranged from 6-12 years for infestation of head lice (*Pediculus capitis*). She found the overall rate of pediculosis among school children irrespective of their sex was 13.5%. The rate of infestation among girls (17.33%) was higher than boys (8.75%), she also found highest rate of infestation among the age group 8-10 years > (18.7%).

Omidi, *et al.*;2013 [4 ] in Hamadan in Iran carried on across sectional study to determine the prevalence of pediculosis among 10841 secondary school students in Hamadan, Iran, they found the prevalence of pediculosis was 1.05%(1.27%) among students in urban area , where as 0.05% among the rural area students. About 2.3% belonged to female students and 0.11% among the male students in high socioeconomic area in Izmir, Turkey [5]. They examined 5347 students of a secondary and 3 elementary schools, whose socioeconomic and cultural status are relatively high, they found in 225 students (4.2%) eggs and/or adults were detected, 181(4.14%) out of 4365 elementary school students and 44(4.48%) out of 9825 secondary school students were infected with *Pediculus capitis*, studies in Kirkuk city regarding head lice infestation were taken so this study was conducted to determine the rate of head lice among local and displaced secondary students.

## **Material and Methods**

A study was carried out in Kirkuk city on displaced and local secondary school girls, during period from 1 st March 2016 to 28 th of February 2016, to determine the distribution of *Pediculus humuns capitis*.



A total of 4 secondary school (2 displaced and 2 local) were visited once a week during the period of the study.

A total of 300 students were chosen (150 displaced students and 150 local students). The internal displaced students originated from different cities and villages from (Anbar, Mosul, Salahaddin, Diyala, Fallujah and other areas which severely affected by conflicts and crisis in Iraq), poor hygienic condition, while the local students living in normal good level of sanitation, high income and good level of hygiene.

The packed cell volume (PCV) value was estimated by haematocrite using microcentrifuge technique and haemoglobin concentration was estimated using Sahli's method [6] .

Statistical method: The student t-test was used to show the significant difference between infested and non infested students in both displaced and local students [7] .

### **Results:-**

The overall rate of head lice among students enrolled the study was (34.7%). The rate of infestation among displaced school girls was (42.66%), which was higher than local school girls (26.66%). According to the age groups, the highest rate among displaced students was (22%), their age group 16-18 years and the lowest was among 13-15 years old (20.66%), table(1). While among the local students the highest rate was (23.33%) among the age group 16-18 years and the lowest among 13-15 years old (3.33%) as indicated in table 2.

**Table (1) Frequency of head lice among displaced secondary school girls in Kirkuk city.**

Age group year	No.positive	% positive	No.Negative	% Negative	Total	
					No.	%
(13-15)	31	20.66	62	41.33	93	62
(16-18)	33	22	24	16	57	38
Total	64	42.66	86	57.33	150	100



\*Total number examined =150 students

**Table (2) Frequency of head lice among local secondary school girls of different age.**

Age group year	No.positive	% positive	No.Negative	% Negative	Total	
					No.	%
(13-15)	5	3.33	11	7.33	16	10.7
(16-18)	35	23.33	99	66	134	89.3
Total	40	26.66	110	73.33	150	100

\*Total number examined =150 students

Table (3) (4) show the relationship between educational status of parents and the rate of head lice infestation of displaced and local students. In displaced students the highest rate of infestation was among middle educational status (25.33%), followed by low educational status (9.33%),and the lowest was among high educational status, (8.0%) respectively , while among local students the highest was among low educational status (13.33%) followed by middle (8.0%) and the lowest among high educational status (5.33%) as indicated in table (4) .

**Table (3) Distribution of head lice among displaced secondary school girls of different educational level**

Educational level	Lice (+)		Lice(-)		Total	
	No.	%	No.	%	No.	%
High	12	8.0	12	8.0	24	16
Middle	38	25.33	52	34.66	90	60
Low	14	9.33	22	14.66	36	24
Total	64	42.66	86	57.33	150	100



\*Total number examined =150 students

**Table (4) Distribution of head lice among local secondary school girls of different educational level**

Educational level	Lice (+)		Lice(-)		Total	
	No.	%	No.	%	No.	%
High	8	5.33	7	4.66	15	10
Middle	12	8.0	47	31.33	59	39.3
Low	20	13.33	56	37.33	76	50.7
Total	40	26.66	110	73.33	150	100

\*Total number examined =150 students

Table (5) shows the effect of head lice infestation on PCV value and hemoglobin concentration among displaced students, it is shown that the mean value of PCV among infested (39.8%) was lower than control non- infested students (40.2%) while the hemoglobin concentration among infested students (12.9 gm/dl) was lower than non infested ones (13.1 gm/dl).

**Table (5) The PCV and Hb values among displaced secondary students.**

Lice	NO.	%	PCV %(Mean± SD)	Hb (Mean± SD)
Positive(+)	64	42.66	39.8±3.5	12.9±1.2 mg/dl
Negative(-)	86	57.33	40.2±2.78	13.1±0.93 mg/dl
P value			0.478	0.478 mg/dl

Table (6) shows the effect of head lice infestation on PCV value and hemoglobin concentration among local students, it is shown that the mean value of PCV among infested (37.3%) was lower than control non- infested students (38.9%) while the



hemoglobin concentration among infested students (12.2gm/dl) was lower than non infested ones (12.6gm/dl).

**Table (6) The PCV and Hb values among local girl's secondary students.**

Lice	NO.	%	PCV(Mean± SD)	Hb(Mean± SD)
Positive(+)	40	26.7	37.3±2.79	12.2±0.93
Negative (-)	110	73.3	38.9±3.3	12.6±1.1
P value			0.020	0.020

## Discussion

The overall rate of head lice infestation among both displaced and local secondary school girls in Kirkuk city was high (34.7%). The rate of infestation among displaced students (42.7%) was higher than local students (26.7%).

The higher rate of head lice infestation among displaced students than local ones, reflect to homeless, nutritional status, low general or personal hygiene, low socioeconomic status among internal displaced students as displaced students were from different cities and villages were living under poor hygienic condition with lack of sanitary municipality water supply and unhygienic conditions.

The high infestation rate among secondary students is more higher than reported in Hamadan, Iran [4] , they found the frequency of head lice was 1.05% [8] who carried on Nationwide survey in Iran found that the rate of infestation among 11-17 years girls (29.8%)and more than 17 years was 6.3% and higher than in Turkey [5] .

In Egypt [9 ] recorded the prevalence rate in secondary school girls (13.9%) which was lower than primary (17.02%) and preparatory school girls (33.1%).

The decrease in infestation rate in secondary school girls , may be attributed to better personal hygiene and health care practice by older age school students and increase students knowledge [10] .This finding is in agreement with other studies [11] . The high frequency of lice infestation in Kirkuk city might be due to warm climate,



socioeconomic status, sample size, period of study, lack of treatment and resistance to treatment [12] .

In Iraq, although several studies were done on the prevalence of head lice among primary schools, little work has been performed in secondary schools. Investigating various studies in Iraq, it has revealed various results.

In Baghdad, 14.3% [13] ; Kirkuk 6.5%[14] ; Diyala,23.3%[15] ; Erbil 14.8%[16 ] and Erbil in 2013-2014,13.8% [17] .

The variation in the infestation rate may be due to period of study, diagnostic techniques eradication method and knowledge about head lice and perception of pediculosis as a health problem in addition to socioeconomic state and hygiene [18] .

It is concluded that the frequency of head lice is common among local and displaced secondary school girls. Infestation rate was higher among displaced than local students. The head lice infestation did not lead to anemia in both groups of secondary school girls.

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