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**Review Article**

# Study of Prevalence and Risk Factors of Pediculosis among Primary School Students in Babylon Province

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**Abstract**: ***Background:*** Pediculosis considered permanent illness that infesting hair of man which caused by ectoparasite known as *Pediculus humans capitis*. ***Objectives****:* The present study was reported to estimate the incidence in Babylon and to clarify the main risk factors which related with spread of pediculosis among primary school students. ***Methods:*** This study was conducted during the period from October, 2023- Jun 2024 in Babylon province. From several primary school students aged (6-13 years),750 students (male and female) were examined for the presence of *P. capitis.* ***Results****:* The overall infestation rate with pediculosis among primary school students was (10%) (75/750) and was raised significantly in females (14.2 %) than in males (5.47 %). The highest infestation was (12.05%) among (10 -13) age group and lowest (7.7 %) in (6- 9) age group and there was a significant variation between two age groups p-value< 0.05. The results reveal to significant relationship between pediculosis infestation with some risk factors like as level of parent's education, residency, economic status and crowded in the classrooms while the rate of infestation related with hair longevity of girl reported no significant change p-value>0.05. ***Conclusion:*** Present study showed high prevalent rate of pediculosis among students in primary school. The results revealed that rural areas, long hair, uneducated parent, economic status and overcrowding classroom were the risk factors for the increase of pediculosis infestation within primary school students.

**Keywords:** Pediculus humans capitis, Primary School, students, prevalence, Pediculosis.

## INTRODUCTION

Pediculosis or head louse infestation is considered epidemic disease and one of the most common parasitic infestations of man in developing countries and cause great social, economic and health problems for poor communities, especially among primary school children ages but any age group can get the infestation. The causative agents of disease is *Pediculus humans capitis* as ectoparasite which live on head of infected humans and known as head louse, it cosmopolitan in distribution and high prevalent in winter season [1], It is a small wingless flatted insect about two to four millimeters in length and has three pairs of long legs which helped the parasite to move easily on head of patient it resides mainly near the nape of neck and behind ears . the parasite transmitted from one person to another by direct contact through head to head or by indirect way via contaminated towels such as combs, hair ribbon, brushes, coats and bed .the parasite complete has life cycle in single host and three morphologic forms or stags , the adult female produce oval , 0.8 mm in length , yellow to white in color eggs or nits ,the female can put about eight eggs per day on the surface of patient skin where the temperature is suitable for eggs . the eggs hatches in eight days to give nymph stage which requires three molts and eight days to reach mature adult male and female [2]. *Pediculus humans capitis* cause Pediculosis as permanent parasitic illness in humans which responsible for many clinical manifestation on infected person , the most common symptoms is pruritic or itching because allergic reaction response due to bite of parasite and that lead to excoriation and this condition followed by secondary bacterial infection, the disease usually companied by regional lymphadenopathy and irritability with disturbance of sleeping especially in young children [3], sores on skin of patient at the site of infestation (head)caused by scraping of affected area. the heaviest lesion is typical occurs in the retroarticular scalp. Diagnosis of Pediculosis is usually made by identification of mature parasite and observed its motion rapidly on hair of patient, they may be difficult to find on light. using of fine-toothed louse comb can facilitate demonstrated of parasite [4]. Head lice and

eggs may be visible by the naked eye. using of a magnifying lens also necessary to revels movement of lice or detection nymph form inside a viable nit. Eggs are may confused with the particles that found on hair like as hair droplet of spray, dandruff and dirt particles. The clinical manifestation of Pediculosis is very useful and aid in diagnosis of head lice such as regional lymphadenopathy or enlargement of lymph nodes near the area of infestation also the pruritus and itching of head patient considered remarkable clinical symptoms of disease. The age group of individuals is important in diagnosis because the pediculosis is very common and high prevalent in primary school children. The treatment of choice cream rinses or shampoo containing pyrethrins, ivermectin or benzyl alcohol are useful for treating of persons with head lice. Medical Products that contain permethrin, pyrethrins, malathion are available over the counter but this medication having lindane or malathion are available just through Physician Prescription [5].

**Study Design and Samples**

Present study was conducted in several primary school in Babylon. The aims of study to assess the prevalence and some risk factors which related with pediculosis transmission in primary school student. from October 2023- Jun 2024. A total of 750 students were register in current study, Sample populations were including students from various primary schools from city center and some districts in Babil Governorate, Iraq. The students were classified as grouped according to their sex and age as first stage of study, then the clinical examination of student's hair were examined during a period about five min for each student to observe and detect any form of parasite *P. capitis*. the examination initially done by visual observation to full hair especially the area around the ears, scalp and neck and inspected carefully by using of special louse comb and handled amplifying lens for easily remove of parasite without any pulling of students hair, and then the parasite was placed in a petri dish. A student was considered as the positive case if indicate one of developing stage of ***P. capitis*** like as mature, eggs or immature nymph stages. Also the questionnaire form was sent to the parents to get family and student information's. After the end of exam all study results were computed and statistic analyzed done by using of statistical tests.

**Statistical Analysis**

Each data in present research were anatomize by employ SPSS software and Chi-square testing. The statistical considerable value was at $P < 0.05$.

# RESULTS

The data in table (1) report that the prevalence rate of pediculosis was significantly higher among females (14.2 %) compared with male (5.47 %).

**Table 1: Pediculosis (%) by gender**

| Gender | No. of exam | % | No. of infested | % | P- value |
|---|---|---|---|---|---|
| Males | 365 | 48.66 | 20 | 5.479 | |
| Females | 385 | 51.33 | 55 | 14.285 | |
| **Total** | **750** | | **75** | | **< 0.05** |

Table (2): The data illustrate the incidence of pediculosis among primary schoolchildren according to the age group. The high infestation rate showed in (10- 13) years old compared with students among (6 - 9) years old was (7.77).

**Table 2: Pediculosis (%) by age group**

| Age groups | No. of exam | % | No. of infested | % | p- value |
|---|---|---|---|---|---|
| 6-9 | 360 | 48 | 28 | 7.777 | |
| 10- 13 | 390 | 52 | 47 | 12.051 | |
| **Total** | **750** | | | | **<0.05** |

The data of current study observed that the students inhabit rural regions has higher rate of incidence with pediculosis (12.151%) than the students inhabit urban regions (7.605 %) as in table (3).

**Table 3: Pediculosis (%) according to the residency**

| Residency | No. of exam | % | No. of infested | % | p- value |
|---|---|---|---|---|---|
| Rural area | 395 | 52.66 | 48 | 12.151 | |
| Urban area | 355 | 47.33 | 27 | 7.605 | |
| **Total** | **750** | | | | **<0.05** |

The high rate of infestation with a significant P- value < 0.001 was appear with non-educated parents and exhibit a potential effect in pediculosis frequencies within primary school students as in table (4).

**Table 4: Pediculosis (%) according to the education levels of students' parents**

| Education level of students' parents | No. of exam | % | No. of infested | % | p- value |
|---|---|---|---|---|---|
| Educated | 400 | 53.33 | 30 | 7.5 | |
| None educated | 350 | 46.66 | 45 | 12.8 | |
| **Total** | **750** | | | | **< 0.05** |

Table (5): Explain the relationship between the pediculosis infestation within primary school students and the family economic status of children. Concerning the family economic status, the high rate of infestation appear in students among family with low income [65.33 %] compared with students within family having high income [34.66%]. The P value according to this factor was significant.

**Table 5: Pediculosis (%) according to the economic status of students' family**

| Economic status | No. of exam | % | No. of infested | % | p- value |
|---|---|---|---|---|---|
| Low economic status | 455 | 60.33 | 49 | 65.33 | |
| High economic status | 295 | 39.33 | 26 | 34.66 | |
| **Total** | **750** | | | | **< 0.05** |

The crowded of the classrooms, the highest rate was noticed among students in crowded classrooms (more than two student per table) was (%) compared to non -crowded classrooms two students per table) was (%) our study indicate to significant relationship between them as in Table (6).

**Table 6: Pediculosis (%) with crowded of students within classrooms**

| Classrooms crowded | No. of exam | % | No. of infested | % | p- value |
|---|---|---|---|---|---|
| more than 2 students /table | 410 | 45.33 | 51 | 12.439 | |
| 2 students /table | 340 | 54.66 | 24 | 7.058 | |
| **Total** | **750** | | | | **< 0.001** |

High infestation rate was notice within students with long hair (14.7 %) compared with students having short hair (13.71%). Statistical analysis appears no significant variation of infestation rate between them as a result in Table (7).

**Table 7: Pediculosis (%) in relation to hair length of female students**

| Hair longevity (female only) | No. of exam | % | No. of infested | % | p- value |
|---|---|---|---|---|---|
| Students with short hair | 175 | 45.45 | 24 | 13.714 | |
| Students with long hair | 210 | 54.54 | 31 | 14.7 | |
| **Total** | **385** | | | | **>0.05** |

# DISCUSSION

Pediculosis is cosmopolitan but very high prevalent in developing countries because of many factors, like as low socioeconomic status, low level of education of child mother and father, poor personal hygiene, bad sanitary disposal. In addition to bad conditions in primary school around the world particularly in developing countries all these factors are make the Pediculosis is the most prevalent [1,2]. Results in this study found that the prevalence rate of pediculosis was [10 %] in primary school students in Babylon. Significantly less than the average incidence indicates twenty-five percentage of pediculosis infestation worldwide, the results was harmonization with data of several studies conducted in Nigeria about prevalence of pediculosis in primary school children [6], study In Turkey the prevalence of pediculosis reach 9.4 percentage in seven hundred and eatery five Turkish students [7]. One Study found high rate of infestation [81.5%] within children in primary school [8].

The recent study reports significant raise of pediculosis among females [14.28 %] when compared with males [ 5.47%]. This finding may be due to many factors such as closer contact between girls more than in males, inadequate hygiene practices, and sharing toys or articles are considered the more risk factors for transmitted pediculosis among girl in primary school. Similar study of [9] reported that the incidence of pediculosis occupies third within all skin infection in primary school among females in Amman. The prevalence rate of pediculosis in female is consistent with the data reported by Riabi which caried out during [2012] in Khorasan [10]. Other study that conducted during 2014 by Morowati [11] achieved the similar results in their data. Many researches in Iraq indicate a raise of pediculosis infestation within girls compared to that in boys, and it is believed that the difference in infestation between them do not depending on physiological basis, but may be related with nature of hair, like as long hair, wavy or thick hair is a characteristic feature of girls and this facilitate the maintain and spread of the infestation [12].

The infestation rate in students where live in rural areas reach (12.15%) had higher prevalence rate than those live in urban areas (7.605). The data of current study observed that students inhabit rural regions more easily infested with pediculosis than students live in urban regions, this finding, may be related with more personal hygiene of students in urban areas, good socioeconomic status level of families, better education of parents in addition the urban primary school have supervisor or health teacher. This finding was harmonization with result of one study which caried in Iran [13] who reported incidence rate of pediculosis 12.4 and 6.5 percentage in rural and urban areas respectively.

According to education status of parents, the present study report that the infestation reach (12.8 %) among students have history of low level of education parents while the students have history of high level of education parent was [7.5 %]. Our study found there was a significant relevance between the pediculosis and students parents' education level. This is in agreement with results of a number of previous studies [10,11]. Findings of present study also agree with results of other studies done in Turkey [14 ], Tunisia [15] and study conducted in Saudi Arabia [16] these studies observed that the incidence of pediculosis within students with educated parents were lower than that those with uneducated parents and appears that literacy was principle risk factor in transmission of pediculosis. In this study found correlation between the pediculosis and the parent's career of children in primary school and most of students who had parents with low level of education were infected.

Concerning the family economic status of students, the high infestation rate reported in students among family with low income [65.33 %] compared with students within family having high income [34.66%]. The P- value according to this factor was significant [Table 5]. One study [14] indicated that the monthly family income is considered the influential and principal factor in spread of pediculosis and they found a proportional relationship between the increase in infestation rate and decrease in monthly family income among the tested group students. Other study [13] found the infestation rate was high among the group of students within low family income compared with students within high family income, although there was no significant deference between them. It seems that the factors of poverty and low family income are closely related to overcrowding in housing, poor hygiene, and a lack of knowledge about transmission of parasite [6]. Many studies reveal to a family's income level is usually linked to their economic status, families with higher monthly income generally entertain a good quality of life, pretty education and access to medical care resources, which means that the chance of family members getting diseases are lower than families with simple livelihood [4,5, 16].

In present study we indicate higher incidence of pediculosis within older age [12.05 %] than young age was [7.77 %] as in [Table 6]. This finding may because of principal role of parents in cleaning body of small ages. In the other hand the older age independent in care and cleaning on their parents also closer relationships with friends, social activities and paucity of health education about spread or risk of pediculosis, these factors may increase the chance of infestation within older ages group. Similar study disagrees with results of current study; it has reported that the infestation within young age especially six to seven ages more than in older age students in spite of it affect any age groups of students but it commonly occurs in the small age group [17]. Other study appears that the students between 6 to 12 years are commonly in high risk for pediculosis [18]. A similar study conducted in Jordan reported a high infestation rate in more than nine years age [19], whereas a study by [20] appears that risk of disease elevated by fifteen percentage for every year of age. while the study of [21] in Iran, found that no statistical changes of infestation through the ages of primary school children.

Statistical analysis of present study indicates a significant ($P < 0.05$) relationship between pediculosis infestation and crowded students in the classrooms; there were significant difference in number of infected students whose inhabit crowded classroom compared with students inhabit non crowed classroom. This results may be due to the fact that more than two student site in same table increase the rate of spread and crawled of parasite from head to head because of close physical contact, also the Primary school students commonly do not have awareness of good personal hygiene in crowded classrooms, in addition the close physical contacts during play, all these factors make students more susceptible to infection than others pediculosis infestation spread and increase when found of individuals in dense population and facilitate transmitted of parasite to other members in the same site. A similar study explains that the prevalence of pediculosis was increase within children whose sitting in crowded classroom [22]. Study of [23] explain that the heavy crowded classroom is important factor that affects to the transmission of pediculosis among pupils.

High rate of infestation was observed among female students with long hair [14.7%] while the rate was lower among students with short hair [13.7%]. The data of current study appears that the pediculosis infestation was more common within students with long hair. However, in the statistical analysis, we observed no significant variation between two study groups. Overall, the small difference between the pediculosis infestation and the length of hair is consistent with many previous studies, contradicting the common belief cutting hair reduce the spread or lower of pediculosis infestation within girls in primary school and hair length has weak effect on transmission of head louse [24 ,25].

## CONCLUSION

Pediculosis still a big health problem for primary school children in Iraqi countries. This research indicates a high incidence of pediculosis in schoolchildren, a default of parent's awareness about pediculosis infestation and its risk also poor personal hygiene, crowded are considered important factor accompanied with the prevalence of pediculosis. the study suggests make massive examination and early detection of the disease among the primary school students and treated the infested cases early may be effective way to decrease the transmission of the disease and eliminated of parasite. we hope to increase awareness of students concerning the risk and effect of parasitic diseases and followed a good lifestyle to decrease or prevent such health problems.

## REFERENCES


1. Zahirnia A, Aminpoor MA, Nasirian H. Impact and trend of factors affecting the prevalence of head lice (*Pediculus capitis*) infestation in primary school students. Chulalongkorn Med J. 2021;65(4):359–68.
2. Bekri G, Shaghaghi A. Prevalence of *Pediculus humanus capitis* and associated risk factors among elementary school-aged girls in Paveh, West Iran. J Infect Dev Ctries. 2022;16(9):1506–11.
3. Haama AA. Epidemiology and molecular aspect of *pediculosis* among primary school children in Sulaimani Province Kurdistan-Iraq. Kurdistan JAppl Res. 2020:1–9.
4. Abd RG. Study of the prevalence of head lice infestation among school students and its effect on some blood tests, and a statement of the effect of five types of treatment on eliminating lice in Salah Al-Din Governorate. J Adv Educ Sci. 2023;3(2):69–74.
5. B. E. Álvarez-Fernández, M. A. Valero, B. Nogueda-Torres, and M. M. Morales-Suárez-Varela, "Embryonic Development of Pediculus humanus capitis: Morphological Update and Proposal of New External Markers for the Differentiation Between Early, Medium, and Late Eggs," Acta Parasitologica, pp. 1–10, 2023.
6. Ebomoyi EW. Pediculosis capitis among urban school children in Ilorin, Nigeria. Journal of the National Medical Associa tion, 1994, 86(11):861–4.
7. Ozden O, Timur I, Acma HE, Simsekli D, Gulerman B, Kurt O. Assessment of the prevalence of Head Lice Infestation and Parents' attitudes towards its management: a School-based Epidemiological Study in Istanbul, Turkiye. Turkiye Parazitol Derg. 2023;47(2):112–6.
8. Nasirian H, Ahmadi SAY. *Pediculus capitis* (Anoplura: Pediculidae) infestation in preschool and primary school students and the community: a global-scale evidence review. Int J Trop Insect Sci. (2024);44:441–536. 10.1007/s42690-023-01129-w. [Google Scholar]
9. Shakkoury WA, Abu-Wandy E. Prevalence of skin disorders among male school children in Amman, Jordan. Eastern Mediterranean health journal, 1999, 5(5): 955–9.
10. Riabi HR, Atarodi AR. Epidemiological and clinical study of infested cases with Pediculus capitis and P. Corporis in Khorasan-e-Razavi. Iranian Journal of Parasitology. 2012;7(1):85-91.
11. Morowati Sharifabad M A, Ebrahim Zadeh M, Fazeli F, Dehghani A, Neshati T . Study of Pediculus capitis prevalence in primary school children and its preventive behaviors determinants based on Health Belief Model in Their Mothers in Hashtgerd, 2012. 2014; 14(6):200-209. [Persian
12. A. E. C. Cardoso, A. E. O. Cardoso, C. Talhari, and M. Santos, "Update on Parasitic Dermatoses," Anais Brasileiros de Dermatologia, vol. 95, pp. 1–14, 2020.
13. Nejati, J.; A. Keyhani; A. T. Kareshk; H. Mahmoudvand; A. Saghafpour; M. Khorminasab; R. Tavakoli Oliaee; S. M. Mosavi. Prevalence and Risk Factors of Pediculosis in Primary School Children in South West of Iran. Iran J Public Health, 2018. Vol. 47, No.12: 1923-1929.
14. Motovali-Emami M, Baz K, Bugdayci R, et al. (2003). The prevalence of Pediculosis capitis in school children in Mersin, Turkey. Int J Dermatol, 42 (9): 694–8. [DOI] [PubMed] [Google Scholar]
15. Farjallah D, Belgacem S, Remadi L, Chaabane-Banaoues R, Trimech F, Fredj SB, et al. Prevalence of pediculosis among primary school children in Tunisia. East Mediterr Health J. 2024;30:561–9. 10.26719/2024.30.8.561. [DOI] [PubMed] [Google Scholar]
16. AL-Megrin Wafa A.I. (2015). Assessment of the Prevalence of Pediculosis capitis among Primary School Girls in Riyadh, Saudi Arabia. Res J Environ Sci, 9 (4): 193–9. [Google Scholar]
17. Epidemiological aspects of Pediculosis capitis and treatment evaluation in primary-school children in Iran. Motovali-Emami M, Aflatoonian MR, Fekri A, Yazdi M. Pak J Biol Sci. 2008;11:260–264. [Abstract] [Google Scholar]
18. Khokhar A. A study of pediculosis capitis among primary school children in Delhi. Indian J Med Sci. 2002 Sep;56(9):449-52.
19. Soultana V, Euthumia P, Antonios M, Angeliki RS. Prevalence of pe diculosis capitis among schoolchildren in Greece and risk factors: a questionnaire survey. Pediatr Dermatol. 2009 Nov-Dec;26(6):701-5.
20. Mohammed, AL., 2012. Head lice infestation in schoolchildren and related factors in Mafraq governorate,Jordan. Int J Dermatol, 51(2): 168-72

21. Ziaoddini A, Riahi R, Heidari-Beni M, Ziaoddini H, Zamani S. National and provincial prevalence of *Pediculus humanus capitis* among urban students in Iran from 2014 to 2018. J Res Health Sci. 2019;19:e00459. [PMC free article] [PubMed] [Google Scholar]
22. Mahmood S. Head pediculosis among in Baghdad Ar ea elementary school children. Iraqi Journal of Science. 2010;51(1):49-55
23. AlBashtawy M, Hasna F. Pediculosis capitis among primary-school children in Mafraq GovernorateJordan. East Mediterr. Health J. 2012;18:43-8.
24. Nasirian H. Monitoring the impact, trends, and impact levels of factors affecting *Pediculus capitis* infestation in primary school students: an illustrate scale evidence review. J Public Health. 2024; 32:1479–557. 10.1007/s10389-023-01863-y. [Google Scholar]
25. Dagne H, Biya AA, Tirfie A, Yallew WW, Dagnew B. Prevalence of pediculosis capitis and associated factors among schoolchildren in Woreta town, northwest Ethiopia. BMC Res Notes. 2019; 12:1–6.