

# Faisal Muchsin

## Overview of Risk Factors For the Incidence of Pediculosis Capitis in Children

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trn:oid:::1:3309089741

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## OVERVIEW OF RISK FACTORS FOR THE INCIDENCE OF PEDICULOSIS CAPITIS IN CHILDREN

Marliana Nurprilinda<sup>1\*</sup>, Eva Silvia F Sitanggang<sup>2</sup>, Mulyadi Djojoputro<sup>3</sup>, Dartri Cahyawari<sup>4</sup>

<sup>1</sup>Department of Anatomical Pathology, Faculty of Medicine, Universitas Kristen Indonesia, Jl. Mayor Jendral Sutoyo No.2, Cawang, Kramat Jati, Jakarta 13630, Indonesia

<sup>2</sup>Undergraduate Program, Faculty of Medicine, Universitas Kristen Indonesia, Jl. Mayor Jendral Sutoyo No.2, Cawang, Kramat Jati, Jakarta 13630, Indonesia

<sup>3</sup>Department of Pharmacology and Therapy, Faculty of Medicine, Universitas Kristen Indonesia, Jl. Mayor Jendral Sutoyo No.2, Cawang, Kramat Jati, Jakarta 13630, Indonesia

<sup>4</sup>Dermatology, Venereology, and Aesthetic Department, Kemang Medical Care Mother and Children Hospital, Jl. Ampera Raya No.34, Ragunan, Ps. Minggu, Jakarta Selatan, Jakarta 12540, Indonesia

\*[marliana.gaol@uki.ac.id](mailto:marliana.gaol@uki.ac.id)

### ABSTRACT

Pediculosis capitis (head lice) is a global health issue, particularly among school-aged children, caused by *Pediculus humanus capitis*. This condition can be transmitted both directly or indirectly via fomites. Symptoms commonly associated with Pediculosis capitis include itching of the scalp, sleep disturbances, and discomfort. Several factors generally influence the prevalence, including age, gender, frequency of hair washing, hair type, level of knowledge, personal hygiene, living conditions, and shared use of bedding or pillows. Research purposes to identify the risk factors associated with Pediculosis capitis among students at SDN Cawang 04 and SDN Cawang 12 in East Jakarta. This research is an analytical study with a cross-sectional approach. The research method employed is quantitative, utilizing questionnaires as research instruments and visual inspection to diagnose infestation, which is confirmed if eggs, nymphs, or adult lice are found in the hair. The sample was selected through random sampling from students in grades 3,4, and 5, with a total of 180 respondents determined using the Slovin formula. Data collection in this study used primary data collected through head lice or nit examinations and questionnaires. The research instruments used were a questionnaire regarding sociodemographic characteristics and questions to determine the number and risk factors for head lice. Data were analyzed using univariate analysis in SPSS. The results show that out of 180 respondents, 100 people (55.6%) were positive for Pediculosis capitis, with a higher infestation rate among female students (76, 42.2%) compared to male students (24, 13.3%). Based on respondent characteristics, the most common age was 9 years old, namely 39 people (21.6%), and grade IV, 37 people (20.5%). Dominant risk factors include age, gender, having long hair, a family size of more than four members, and parents' highest education level being high school. This study indicates that the incidence of Pediculosis capitis remains relatively high.

Keywords: elementary school children; head lice; hygiene

### How to cite (in APA style)

Nurprilinda, M., Sitanggang, E. S. F., Djojoputro, M., & Cahyawari, D. (2025). Overview of Risk Factors for the Incidence of Pediculosis Capitis in Children. *Indonesian Journal of Global Health Research*, 7(4), 1113-1122. <https://doi.org/10.37287/ijghr.v7i4.6907>.

## INTRODUCTION

Pediculosis capitis is a contagious health problem that is commonly found throughout the world, both in developing and developed countries, often occurring in the age group of six to twelve years (Cahyarini et al., 2021; Hardiyanti et al., 2015; Suweta et al., 2021). Pediculosis capitis (head lice) is caused by an infestation of the blood-sucking ectoparasites of the host's scalp, which are 1-3 mm long, flattened dorso-ventrally arthropods. This parasite is black, segmented, has a pair of eyes, a pair of short antennae, and three pairs of clawed feet to grip hair, as well as a piercing tool on the head (Cahyarini et al., 2021; Massie et al., 2020). Head lice do not have wings so they cannot fly and jump, transmission requires close head-to-head contact (Clark, 2022; Madke & Khopkar, 2012; Rumampuk, 2014). Pediculosis capitis can only live on the scalp and hair of humans (Hapsari, 2021). Its life cycle begins with eggs, nymphs, and adult head lice (Feldmeier, 2012). This parasite reproduces through the process

of laying eggs and attaching its eggs to the hair, especially near the hair roots in the retroauricular and occipital parts of the scalp. Symptoms caused by head lice are itching of the scalp due to an allergic reaction to saliva containing vasodilators and anticoagulants, along with excretions from this parasite which also enter when the parasite is sucking blood (Leung et al., 2022; RIDWAN, 2022). Other symptoms are sleep disturbances, discomfort due to being isolated from other children to the point of feeling ashamed in the child, and anemia, which will make the child lethargic, sleepy, which will reduce concentration at school and have a detrimental effect on the child's academics (Bohari et al., 2025; Leung et al., 2022).

There are two ways of Pediculosis capitis transmission, namely direct and indirect contact. Direct contact is the most common transmission through head-to-head contact with a person who has been infested with Pediculosis capitis. This condition is generally more common in children, especially those of school age (Adham et al., 2020; Y. Hermawan & Al-Faritsy, 2025; Syarbaini & YULFI, 2021). Another way is indirect contact through fomites or contaminated objects, such as using hair accessories, headscarves, towels, combs, hats, pillows and mattresses that are used together with someone who is infested with Pediculosis capitis (Bragg & Wills, 2023). The prevalence of Pediculosis capitis according to data from the Centers for Disease. Control and Prevention (CDC), each year, between six million to twelve million cases of head lice infestation are recorded in children aged three to eleven years in the United States (Shakya et al., 2018). In Japan, an estimated 1.5 million people are infected each year (Kasai et al., 2009). This incident can affect all age groups and both genders, especially in children, where girls are two to four times more often infested with Pediculosis capitis than boys.

Pediculosis capitis infestation is generally influenced by several factors, including age, gender, frequency of hair washing, hair length and type, poor personal hygiene, housing density, and the habit of sharing beds or pillows (Ary, 2019; Lukman et al., 2018). Research conducted by Hermawan showed that Pediculosis capitis is often found in children aged between six and ten years, with the highest average at the age of eight years. This is due to several supporting factors for Pediculosis capitis infestation, namely, a lack of personal hygiene and insufficient knowledge about preventing Pediculosis capitis (Setiyani et al., 2021). In addition, the high incidence rate in school-age children is caused by frequent head-to-head contact. Those over five years of age often already perform bathing and shampooing activities themselves, but still pay less attention to aspects of good personal hygiene.

Meanwhile, research conducted on elementary school children in Langowan Timur sub-district based on the age of the child showed the highest percentage in children aged 7 to 12 year (Massie et al., 2020). This is because children at this age are children who often have close physical contact. Their activities are more with their peers such as learning to share personal items (headscarves, hair clips, hats, combs, pillows), sleeping together during sleepovers, and playing together in small groups so that transmission is easier to occur (Nurudeen & Toyin, 2020). Based on the data above, the number of infestation incidents and supporting factors for the occurrence of Pediculosis capitis in several areas were obtained. The general objective of this study was to identify risk factors for Pediculosis capitis in children at SDN Cawang 04 and SDN Cawang 12, East Jakarta.

## METHOD

This study employs an analytical approach with a cross-sectional design. The method employed is a quantitative approach, utilizing a questionnaire as a research instrument and visual examination. It is considered positive for Pediculosis capitis if eggs, nymphs, or adult lice are found, to determine the prevalence and describe risk factors for the occurrence of Pediculosis capitis. The research was conducted at SDN Cawang 04 and SDN Cawang 12, which are located in East Jakarta City, in July 2024. The population in this study was students in grades 3, 4, and 5 who attended SDN Cawang 04 and SDN Cawang 12 in East Jakarta City.

Sampling was conducted using the Random Sampling technique, which involves selecting a small portion of the population of all students in grades 3, 4, and 5 who are chosen randomly. The sample size of this study was determined using the Slovin formula to calculate the minimum number of a known population. It is known that the number of students in grades 3, 4, and 5 is 180 people who have met the inclusion and exclusion criteria. Data collection in this study utilized primary data, which involved examining head lice or lice eggs and completing a questionnaire. The questionnaire will be distributed and completed directly by students in grades 3, 4, and 5 who meet the inclusion criteria, after receiving an explanation and stating their willingness to participate. Data processing using univariate analysis was conducted with a descriptive approach, namely by presenting a frequency distribution table of the research variables (age, gender, sociodemographic characteristics, hair characteristics, and personal hygiene). So that in this study, the distribution table can provide information about the description of risk factors for the incidence of *Pediculosis capitis* in children of SDN Cawang 04 and SDN Cawang 12, East Jakarta City

## RESULT

### Respondent Characteristics

The characteristics of respondents in this study are based on gender, age, and class level. The study involved 180 respondents, with the distribution of their characteristics shown in Table 1.

Table 1.  
Frequency Distribution Overview of Respondent Characteristics

Characteristis	f	%
Gender		
Laki-Laki	79	43.9
Perempuan	101	56.1
Age (year)		
8	22	12.2
9	61	33.9
10	55	30.6
11	35	19.4
12	7	3.9
Class		
III	59	32.8
IV	61	33.9
V	60	33.3

Table 1, the total number of respondents in this study was 180 people, consisting of 101 (56.1%) women and 79 (43.9%) men. Based on age, it can be seen that the majority of respondents were 9 years old, namely 61 (33.9%) people, 10 years old as many as 55 (30.6%) people, 11 years old as many as 35 (19.4%) people, 8 years old as many as 22 (12.2%) people, 12 years old as many as 7 (3.9%) people. Based on class, class III had as many as 59 (32.8%) participants, class IV had as many as 61 (33.9%) participants, and class V had as many as 60 (33.3%) participants.

### Sociodemographic Characteristics of Respondents

The sociodemographic characteristics of this study include the number of siblings, number of family members, mother's last education, father's last education, in addition to finding out whether respondents have ART (Household Assistants) and pets or not, which can be seen in Table 2

Table 2.  
Overview of Frequency Distribution of Sociodemographic Characteristics

Characteristis	f	%
Number of Siblings		
None	13	7.2
1-2 people	89	49.4
3-4 people	53	29.4
> 4 people	25	13.9
Number of Family Members		
≤ 4 people	89	49.4
> 4 people	91	50.6
Mother's Education		
≤ Junior High School	33	20.0
Senior High School	89	51.7
≥ Academy/S-1	58	28.3
Father's Education		
≤ Junior High School	26	14.4
Senior High School	85	48.3
≥ Academy/S-1	69	37.2
Have a Household Assistant		
Yes	27	15
No	153	85
Having Pets		
Yes	86	47.8
No	94	52.2

### Prevalence of Pediculosis capitis Based on Respondent Characteristics

Table 3.  
Frequency Distribution of Pediculosis Capitis Incidents Based on Respondent's Gender

Gender	<i>Pediculosis capitis</i>		Total
	Positive	Negative	
	f (%)	f (%)	
Male	24 (30.4)	55 (69.6)	79 (100)
Female	76 (75.2)	25 (24.8)	101 (100)

Table 4.  
Frequency Distribution of Pediculosis Capitis Incidence Based on Respondents' Age

Age	<i>Pediculosis capitis</i>		Total
	Positive	Negative	
	f (%)	f (%)	
8 year	14 (63.6)	8 (36.4)	22 (100)
9 year	39 (63.9)	22 (36.1)	61 (100)
10 year	26 (47.3)	29 (52.7)	55 (100)
11 year	20 (57.1)	15 (42.9)	35 (100)
12 year	1 (14.3)	6 (85.7)	7 (100)

Table 5.  
Frequency Distribution of Pediculosis Capitis Incidents Based on Respondents' Class Level

Class	<i>Pediculosis capitis</i>		Total
	Positive	Negative	
	f (%)	f (%)	
III	35 (59.3)	24 (40.7)	59 (100)
IV	37 (60.7)	24 (39.3)	61 (100)
V	28 (46.7)	32 (53.3)	60 (100)



## Prevalence of Pediculosis capitis Based on Respondents' Sociodemographic Characteristics

Table 6.

Distribution of Pediculosis capitis Based on Respondents' Sociodemographic Characteristics

Characteristics	<i>Pediculosis capitis</i>		Total
	Positive	Negative	
	f (%)	f (%)	
Number of Siblings			
None	6 (46.2)	7 (53.8)	13 (100)
1-2 people	46 (51.7)	43 (48.3)	89 (100)
3-4 people	35 (66.0)	18 (34.0)	53 (100)
> 4 people	13 (52.0)	12 (48.0)	25 (100)
Number of Family			
≤ 4 people	48 (53.9)	41 (46.1)	89 (100)
> 4 people	52 (57.1)	39 (42.9)	91 (100)
Mother's Education			
≤ Junior High School	22 (61.1)	14 (38.9)	36 (100)
Senior High School	52 (55.9)	41 (44.1)	93 (100)
≥ Academy/S-1	26 (51.0)	25 (49.0)	51 (100)
Father's Education			
≤ Junior High School	15 (57.7)	11 (42.3)	26 (100)
Senior High School	45 (51.7)	42 (48.3)	87 (100)
≥ Academy/S-1	40 (59.7)	27 (40.3)	67 (100)
Have a Household Assistant			
Yes	14 (51.9)	13 (48.1)	27 (100)
No	86 (56.2)	67 (43.8)	153 (100)
Having Pets			
Yes	45 (52.3)	41 (47.7)	86 (100)
No	55 (58.5)	39 (41.5)	94 (100)

Table 7.

Distribution of Pediculosis capitis Based on Risk Factors

Risk Factor	<i>Pediculosis capitis</i>		Total
	Positive	Negative	
	N (%)	N (%)	
Hair Washing Frequency			
1-2 times a week	22 (75.9%)	7 (24.1%)	29 (100%)
≥ 3 times a week	78 (51.7%)	73 (48.3%)	151 (100%)
Hair Type			
Straight	50 (54.3%)	42 (45.7%)	92 (100%)
Curly	50 (56.8%)	38 (43.2%)	88 (100%)
Hair Length			
Short (above shoulder)	45 (51.7%)	42 (48.3%)	87 (100%)
Length (above shoulder)	55 (59.1%)	38 (40.9%)	93 (100%)
Personal Hygiene			
Good	93 (54.1%)	79 (45.9%)	172 (100%)
Bad	7 (87.5%)	1 (12.5%)	8 (100%)

## DISCUSSION

### Description of Frequency Distribution of Pediculosis capitis Incidents Based on Respondent Characteristics

In this study, 100 respondents were infested with Pediculosis capitis, consisting of 24 (30.4%) male and 76 (75.2%) female. Pediculosis capitis incidents can occur in all genders. In Table

3.3, girls are more infested with head lice than boys. This can be caused by differences in behavior between girls and boys where girls often have close head contact either directly or indirectly such as using shared combs and often exchanging hair accessories (headscarves, clips, hair ties and headbands) (R. A. Hermawan et al., 2023; Sidar & Suprihartini, 2022; Tumiwa et al., 2023) This study is in accordance with research conducted by Noersyamsidar, which suggests that the female gender dominates the incidence of Pediculosis capitis infestation, with a percentage of women (66.7%) compared to men (33.3%) (Sidar & Suprihartini, 2022). Research by Hermawan et al. and Nurdiani also stated that the prevalence of Pediculosis capitis in women is higher than in men ( R. A. Hermawan et al., 2023; Nurdiani, 2020).

Table 4 shows that the highest incidence of Pediculosis capitis infestation occurred at the age of 9 years as many as 39 respondents and the lowest incidence occurred at the age of 12 years as many as 1 respondent. It was also found that the highest incidence based on class level occurred in grade IV students as many as 37 respondents and the lowest incidence occurred in grade V as many as 28 respondents. This study is in line with research conducted by Tappeh et al (Tappeh et al., 2012), which showed that infestation in the age group of 7 to 9 years was higher than other age groups. This can happen because older ages are expected and able to act hygienically in using their personal equipment properly (Tappeh et al., 2012) The results of the study conducted by Nurdiani at the Sirojan Mustaqim Islamic Boarding School and residents of RW 03, Pondok Ranggon Village also showed that the age of six to nine years was 40% most infested with Pediculosis capitis (Nurdiani, 2020). According to Cahyarini et al (Cahyarini et al., 2021), the high prevalence in school-age children is caused by head-to-head contact that often occurs when children play and study together in small groups.

### **Description of Pediculosis capitis Distribution Based on Sociodemographic Characteristics**

Based on the sociodemographic data in Table 6, the prevalence of Pediculosis capitis is higher in respondents who have one to two siblings, namely 46 out of 100 infested respondents. This study is not in line with that conducted at SD No. 6 Darmasaba, Abiansemai District, Badung Regency, which found that the majority of students infested with Pediculosis capitis have more than two siblings (Suweta et al., 2021). This can occur because the total number of respondents is not the same, where respondents who have one to two siblings have a total of 89 people compared to respondents who have three to four siblings, only 53 people. Based on the number of family members, more than four people were found to be 52 out of 100 respondents who were infested compared to those with four or less family members. This study is in accordance with the study of Suweta et al (Suweta et al., 2021), respondents who have five or more family members tend to be higher. Having many siblings and family members living together causes a higher infestation rate, especially with low economic and parental education levels, allowing children to sleep together, making it easier for head lice to be transmitted (Cahyarini et al., 2021).

Table 6 shows the incidence of Pediculosis capitis from 100 respondents who were infested, the highest occurred in students whose mother's last education was high school, namely 52 people out of 93 respondents, compared to 22 people out of 36 respondents whose mother's education was not up to or up to junior high school and 26 people out of 51 respondents whose mother's education was a bachelor's degree. Then, from 100 respondents who were infested, the highest occurred in respondents whose father's last education was high school, namely 45 people out of 87 respondents, compared to 40 people out of 67 respondents whose father's education was a bachelor's degree and 15 people out of 26 respondents whose father's education was not up to or up to junior high school. This shows that having parents with high or low education can still be infested with Pediculosis capitis. According to a study in Iran, parental education has no relationship with the incidence of Pediculosis capitis, head lice

attacks are not only limited to low strata and education (Tappah et al., 2012). The level of parental education can be assumed as a representation of their socioeconomic level, so the work of parents, especially fathers with high workloads, has less attention to Pediculosis capitis infestation in their children.

From the results of Table 6, it is known that the highest Pediculosis capitis infestation occurred in respondents who did not have household help, namely 86 people out of a total of 153 respondents, compared to those who had household help, there were 14 people infested out of a total of 27 respondents. This can happen because almost all respondents did not have household help, so the incidence rate in respondents who did not have household help was higher. In Table 6, the highest incidence of Pediculosis capitis infestation occurred in respondents who did not have pets, namely 55 people out of a total of 94 respondents, compared to those who had pets, there were 45 people infested out of a total of 86 respondents who had pets. This can happen because almost all respondents did not have pets, so the incidence rate in respondents who did not have pets was higher.

### **Description of Frequency Distribution of Pediculosis capitis Incidents Based on Risk Factors**

Based on the results of Table 7, Pediculosis capitis incidents occurred more in children who washed their hair three to four times a week, obtained 78 respondents compared to those who washed their hair one to two times a week, obtained 22 respondents. According to Anik (FEBRIANA, 2022), washing hair should be done three times a week so that the scalp and hair remain clean, because if you wash your hair too rarely it can make your hair damp and dirty due to oil or sebum released by the oil glands. According to Suweta et al. (Suweta et al., 2021), there is no significant relationship between the frequency of washing hair and the incidence of Pediculosis capitis. This study is supported by research conducted by Anik (FEBRIANA, 2022) that there is no relationship between the frequency of washing hair and the incidence of head lice. This proves that Pediculosis capitis transmission can still occur in people with frequent hair washing frequencies and can still cause itching caused by Pediculosis capitis infestation (Suweta et al., 2021).

Positive cases of Pediculosis capitis were also found equally in curly-haired respondents, namely 50 people out of a total of 88 respondents and those with straight hair were 50 people out of 92 respondents. This happened because there was a difference in the total number of respondents with curly and straight hair, so in this study the incidence of Pediculosis capitis can occur in both curly and straight hair. According to Hardiyanti et al., (Hardiyanti et al., 2015), curly or frizzy hair is rarely infected with head lice because adult female mites have difficulty laying eggs on the hair. In respondents with long hair, 55 people were infested with Pediculosis capitis compared to 45 people with short hair. In line with research conducted in Jatinangor which showed that the highest percentage occurred in respondents with long hair (76.9%) (Karimah et al., 2016).

The results of this study also showed that students with poor personal hygiene were more infested with Pediculosis capitis, namely 87.5%. Personal hygiene is a person's effort to maintain their cleanliness and health to achieve a sense of security and comfort. Research at the PPAI An-Nahdliyah Islamic Boarding School, Malang Regency in 2019 showed that there was a relationship between personal hygiene and the presence of Pediculosis capitis (Hapsari, 2021). These results are supported by research conducted by Anik in Cawang Village in 2022, there was a significant relationship between personal hygiene and Pediculosis capitis (FEBRIANA, 2022; Nurdiani, 2020) Lack of awareness in maintaining personal hygiene such as maintaining clean hair and personal equipment such as combs, towels and accessories used can increase the occurrence of Pediculosis capitis

## CONCLUSION

Pediculosis capitis is an ectoparasitic infection that is common in school-age children and can cause itching, sleep disturbances, anemia, difficulty concentrating, and psychological problems such as shame, low self-esteem, and social isolation that impact academic achievement. Research at SDN Cawang 04 and SDN Cawang 12 East Jakarta in 2024 with 180 respondents showed: 1) Prevalence: A total of 100 students (55.6%) were infested, dominated by girls (76 people/75.2%). The highest age was 9 years (39 people), and the highest class was grade 4 (37 people); 2) Sociodemographic Characteristics: The highest infestation was found in children with 1–2 siblings (46 people), family members >4 people (52), mothers with high school education (52), fathers with high school education (45), no household help (86), and no pets (55); 3) Key Risk Factors: Age, gender, hair length, and personal hygiene are the most influential factors in the incidence of Pediculosis capitis. This study highlights the importance of health education and personal hygiene to prevent the spread of head lice in the school environment.

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