Description Of Head Lice (*Pediculus Capitis*) Infection Of Primary School Age Children In Elementary School Negeri 40, Salero District, Central Ternate District, Ternate City, 2022

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Abtract

Head lice are the cause of the ectoparasitic disease pediculosis capitis. Both adults and children in school can have head lice. A public elementary school (SDN) 40 in Salero Village, Ternate City is utilized to illustrate how Pediculus capitis might spread. The purpose of this study is to characterize head lice infections caused by Pediculosis capitis in elementary school-aged children and to identify the risk factors that contribute to the spread of this infestation. This study uses a descriptive, analytical, correlative research design. The children in grades 4, 5, and 6 of SDN 40 comprised the study's population. The process of sampling involved tracking head lice infections according to factors such as age, gender, infection location, itching in the head, hair type, length, and frequency of hair washing r with Pediculus capitis infection (p-value = 0.001 and OR 0.102-0.570); long hair with Pediculus capitis infection (value = 0.000 and OR 101-0.569); hair washing interval with Pediculus capitis infection (p-value = 0.000 and OR 0.019-0.415) and use of combs together with Pediculus capitis infection (p-value = 0.001 and OR 00.141-0.789). Hair type did not have a significant relationship with Pediculus capitis infection with a p-value = 0.852 and OR 0.477-2.505.

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Keywords: *Children, head hygiene, head lice and Pediculus capitis.*

I. INTRODUCTION

Head lice (Tuma), whose Latin name is *Pediculus* sp, are a type of ectoparasitic insect belonging to the Pediculidae family. This ectoparasite is a blood-sucking parasite that does not have wings and is obligate to humans. Three types of tumors can infest humans based on their predilection, namely *Pediculus var. capitis*, *Pediculus corporis*, and Pthyrus pubis. Of these three types of tuma, the type most often found is *Pediculus var. capitis* [1]. Head lice obtain their food source from blood which is sucked 2-6 times a day or approximately every 4-6 hours. These lice really like the head area and behind the ears. Transmission can be through towels, blankets, hats, combs, head-to-head contact, and other personal items. Head lice can attack anyone, but children are twice as likely to be exposed. Children who live in one place and interact with one another have a high risk of exposure [2]. Head lice have a life span of around 30 days and can survive in a free environment for around 1-2 days, while their eggs can survive in a free environment for around 7 days. These head lice cannot fly or jump but they can crawl at a speed of around 23 cm per minute [2]. Etymologically, elementary school is a place for children aged 7-11 years, who gather to gain knowledge, skills, and character to become useful human beings when the child grows up. Conceptually, basic education can be interpreted as explained in Law no. 20 of 2003 concerning the National Education System, namely conscious and planned efforts contained in the objectives of national education and education in elementary schools, namely to create a learning atmosphere and learning activity process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble morals, and skills needed by himself and society in the nation and state.

There there will be interaction between students which is a good source of transmission. [3]. It was further explained that these lice more often attack children aged 5-11 years who often have physical contact. According to Massie et al., (2020), head lice complete their life cycle in their host (host) which he infects[2]. These lice infect the head of their host to suck blood through the scalp and simultaneously inject saliva containing vasodilators and anticoagulation. Symptoms that appear when head lice infect the skin by causing

pruritus, excoriation, and conjunctivitis, which originate from saliva on the head lice, then the reaction to the bite of the head lice depends on the degree of sensitivity of the host to the saliva or anticoagulation injected by the lice into the host's scalp. According to Pringgayuda et al, 2021 explained that *Pediculosis capitis* can be transmitted from one individual to another through direct or indirect contact[4]. Indirect contact can occur through using objects alternately or together [5]. The factors of age, gender, social and economic conditions, personal hygiene, and residential density play a role in the transmission of *Pediculosis capitis* [6].Important factors that help the spread of head lice in children are climatic conditions, geographical environment, health conditions, income, and family density. There are many studies in the world about the prevalence and factors that influence *Pediculus capitis*. Some prevalence of *Pediculus capitis* such as in Asia 15.1% ± 12.8%, Europe 13.3% ± 17.0%, and South America 44.1% ± 28.0%. It is estimated that every year head lice attack 6 million to 12 million children aged between 3-11 years in the United States, meaning that 10% -40% of school-age children have experienced *Pediculus capitis*. Currently in Bangkok 23.32% and in Argentina 42.7%.

The prevalence of Pediculus capitis in developed countries is lower compared to developing countries [7]. Apart from these countries, Indonesia is also a country that is still widely exposed to *Pediculus capitis*. Clinical symptoms due to *Pediculosis capitis* infestation are itching caused by the team's saliva when it sucks blood. As a result, it will cause itching, giving rise to the habit of continuously scratching the scalp. Canyon and Melrose (2006) in Widniyah (2019) explain that sufferers can experience anemia, and will lose 0.008 ml of blood every day or around 20.8 ml/month, which occurs in children who on average have active *Pediculosis capitis.*[8]. Children with good nutritional intake do not show symptoms, so they do not show well. Hardiyanti et al., (2015) in Khasanah in 2022 explains that *Pediculosis capitis* does not pose a significant health risk, but the infection can cause sleep disturbances and difficulty concentrating [9]. *Pediculosis capitis* can cause infected people to frequently scratch their heads, causing a secondary infection that is characterized by the presence of pus or pus. Even if there are severe cases and poor nutrition, sufferers can experience anemia. The diagnosis of *Pediculosis capitis* can be made by finding the egg (nits), nymph, or adult stage [9]. Head lice research in Ternate City has not been widely reported, even though head lice are an important problem for school children, especially those in elementary schools. There are complaints from parents whose children often scratch their scalps, especially girls who often play together, resulting in accidental physical contact. Based on this information, this research was conducted to determine the description of *Pediculosis capitis* head lice infection in elementary school children and the description of head lice infection as well as risk factors related to the transmission of *Pediculosis capitis* infestation in elementary school children at SDN 40 Ternate City.

II. METHODS

Study location

This research was carried out in October 2022 with the research location at SDN 40 Ternate City, Salero Village, Central Ternate District.

Sampling Method

This research is a correlative analytical descriptive study with a cross-sectional design, namely analyzing pediculosis capitis head lice infection and then comparing it with risk factors using a questionnaire. The sample used was all 96 students in grades 4-6. The instruments used in this research were a research permit, questionnaire, and research tools (lice comb, hand scoop, and hair cap). Preparation for the research, namely (1) The researcher prepared 7 enumerators who would help in the research, (2) The researcher and 7 enumerators wore PPE and prepared whatever was needed, (3) Each enumerator was given the task of examining 14-15 children, (4) After that, they give questionnaires to the children to fill in, then the children are checked for lice, (5). Start looking for lice on the children's heads using the lice comb that has been provided, (6) Carry out analysis of the data that has been obtained (7) The characteristic variables of the respondents observed are, student age, gender, combing interval, hair length, hair type, location of itching on the head, and hair washing intervals.

Data Analysis

To determine the characteristics of respondents using the Excel program and to determine the relationship between respondent characteristics and *Pediculosis capitis* infection using SPSS 17.

III. RESULT AND DISCUSSION

Result

a. Respondent Characteristics

An overview of the characteristics of SDN 40 student respondents in grades 4-6 as samples in this study is presented in the following table.

Table 1. Distribution of respondents based on age, gender, location of infection, headache, hair washing interval, hair length, hair type, and shared use of combs

Variables	Category	Frequency	%
Age	9 years	25	26
	10 years	47	49
	11 years	24	25
Amount		96	100
Genderl	Man	50	52
	women	46	48
Amount		96	100
location of infection	Back of head	48	53
	The whole thing	31	29
	Near the ear	19	13
	Other region	7	6
Amount		96	100
Itching in the Head	There is	53	55
	There isn't any	43	45
Amount		96	100
Hair Washing Intervals	≥ 2 times	76	79
	< 2 times	20	21
Amount		96	100
Long hair	Short	55	57
	Currently	18	19
	Long	23	24
Amount		96	100
Hair Type	Straight	60	62
	Wavy	36	38
Amount		96	100
Using Shared Combs	Yes	52	54
	No	44	46
Amount		**96**	**100**

Primary Data Source, 2022

b. Relationship between Observed Variables and *Pediculosis capitis* Infection

The relationship between each research variable for students at SD Negeri 40 grades 4-6 who were respondents is presented in Table 2 below.

Table 2. Analysis of the relationship between the variables age, gender, hair washing interval, hair length, hair type, use of combs together with the incidence of Pediculosis capitis at SDN 40 Ternate City in 2022

Age	*Pediculosis capitis*				Total		OR (Cl 95%)	*P Value*
	Ya		Tidak					
	N	%	N	%	N	%		
9-10	34	65	42	96	76	100	(0.019-0.415) 0.090	0.000
10-11	18	35	2	4	20	100		
Total	52	100	44	100	96	100		
Gender	*Pediculosis capitis*				Total		OR (Cl 95%)	*P Value*
	Positive		Negative					

	N	%	N	%	N	%		
Man	19	37	31	70	49	51	(0.102-0.570) 0.241	0.001
Woman	33	63	13	30	47	49		
Total	52	100	44	100	96	100		
Hair Washing Intervals	*Pediculosis capitis*				Total		OR (Cl 95%)	*P Value*
	Yes		No					
	N	%	N	%	N	%		
≥2 times	34	65	42	96	76	100	(0.019-0.415) 0.090	0.000
< 2 times	18	35	2	4	20	100		
Total	52	100	44	100	96	100		
Long hair	*Pediculosis capitis*				**Total**		**OR (Cl 95%)**	***P Value***
	Yes		No					
	N	%	N	%	N	%		
Short	19	37	30	68	49	51	(0.101-0.569) 0.241	0.000
Currently	10	19	7	16	17	18		
long	23	44	7	16	30	31		
Total	52	100	44	100	96	100		
Hair Type	*Pediculosis capitis*				**Total**		**OR (Cl 95%)**	***P Value***
	Positive		Negative					
	N	%	N	%	N	%		
Straight	33	63	27	61	60	63	(0.477- 2.505) 1.094	0.832
wavy	19	37	17	39	36	37		
Total	52	100	44	100	96	100		
Using a shared comb	*Pediculosis capitis*				Total		**OR (Cl 95%)**	***P Value***
	Negative		Positive					
	N	%	N	%	N	%		
Yes	13	37.1	22	62.9	35	36	(0.141-0.789) 0.333	0.001
No	39	63.9	22	36.1	61	64		
Total	52	100	44	100	96	100		

Sumber. Data primer, 2022

Discussion

This research was conducted on 96 respondents who were students at SDN 40 Kota Ternate in grades 4, 5, and 6. The respondents consisted of 50 male students and 46 female students (Table 1). The research results showed that 52 students were positive for *Pediculosis capitis*, while 44 students were found to be negative, out of a total of 96 student respondents. There are several factors known from the results of this study that are thought to influence the infestation of *Pediculosis capitis* on students' scalps, namely gender, hair length, hair type, hair washing interval, and sharing combs. Respondents in this study were aged 9-11 years. Respondents who tested positive for head lice were 52 students out of 96 respondents or 54%, meaning that there are still many students who do not have head lice. Another research was conducted by Noersyamsidar and Suprihartini (2022) using student respondents aged 11-15, totaling 26 respondents, while 42.3% (11 respondents) were positive and the remaining 15 respondents (3.9%) were not infected with *Pediculosis capitis*. Female respondents had more head lice, namely 33 respondents (63%) compared to male respondents, namely 19 respondents (37%) [10]. These results indicate that women have a greater chance of being infected with *Pediculosis capitis* than men. Women with long hair who do not receive proper attention such as hair washing intervals, hair type, and sharing combs can provide opportunities for the development of head lice. *Pediculosis capitis* is rarely found in boys because the short hair is very easy to clean. The condition of not being infected in boys can also occur in children who live in places where there is little exposure to *Pediculosis capitis.*

The same research results were found in a study in Ethiopia and found that women were infected with *Pediculosis capitis* at a higher rate than men [2]. Respondents with an average interval of washing their hair more than twice a week were 34 students and 18 students less than twice a week. Furthermore, the number of respondents who were positive for Pediculosis were 23 students who had longer hair, 33 students with wavy hair, and 13 students who used combs or accessories together. Lukman et al, (2018) explained in her research that girls are more susceptible to being exposed to head lice. This vulnerability is caused by

their long hair and frequent use of combs or accessories interchangeably. If someone uses accessories interchangeably, the lice eggs can be transferred. Hair thickness also affects head lice. Thicker hair will make it more difficult to remove head lice eggs from the hair. However, if you take good care of it and wash it 2-3 times a week, you can avoid head lice [11] .According to a research report conducted by Hardiyanti et al., 2015 in Noersyamsidar and Suprihartini (2022), the spread and development of *Pediculus capitis* is influenced by various factors, including[10].

a. Age

Children are more often affected by *Pediculosis capitis*, especially children aged 5-11 years because their playing environment is exposed to lice.

b. Gender

Several studies show that girls are more susceptible to *Pediculosis capitis* because they have long hair and often use hair accessories and combs.

c. Using a shared bed or pillow

Adult lice can survive outside the head for 1-2 days, while the eggs themselves can survive up to 7 days. If a person infested with Pediculosis capitis lays their head somewhere, it is likely that there are adult lice or eggs that have fallen in that place.

d. Using combs or shared accessories

Adult lice and nits can stick to the comb. If someone uses a comb at the same time, the lice or eggs can be transferred. The same thing applies to using accessories.

e. Long hair

Long hair is more susceptible to Pediculosis capitis infestation. This condition is because it is more difficult to wash the hair and scalp of long hair than short hair. However, if long hair is well maintained it can prevent head lice.

f. Hair thickness

Thick hair makes it more difficult to remove lice eggs from the hair, and vice versa. However, if you care for thick hair well and wash it 2-3 times a week, you can avoid head lice.

g. Frequency of washing hair

The level of hair cleanliness can be seen from how often he washes his hair. In the United States washing the head is their routine habit. Fewer people are infested with head lice compared to areas and countries where people rarely wash their hair.

h. Economy

Apart from economic problems, low socio-economic levels also influence the presence of Pedoculosis capitis infestation due to the inability to treat the infestation effectively and successfully treat hair with shampoo.

i. Hair shape

Africans or African Negroes are rarely infected with *Pediculosis capitis* because their hair is curly, and it is difficult for adult female lice to lay their eggs.

Rahmita et al., (2019) explained in their research that there are factors that play a role in transmission, namely age, gender, social and economic conditions, personal hygiene, and residential density[6]. Based on the results of a preliminary study by Hermawan et al 2023 with a representative sample of 5 people selected from students in grades I, II and III, 2 people obtained positive results for Pediculus capitis infection[12]. This positive result is caused by the condition of students in the elementary school environment which does not always pay attention to cleanliness and coupled with the number of students being too dense, so that the school becomes a factor that needs to be considered in the incidence of Pediculus capitis infection. Students who care less do not pay attention to personal health and lack knowledge of the causes and symptoms of Pediculus capitis infection are more easily infected[13].Based on the results of statistical analysis, there is a significant relationship between age with p-value = 0.000 and OR (0.019-0.415); gender with Pediculus capitis infection with p-value = 0.001 and OR (0.102-0.570); hair length with p-value =0.000 and OR (101-0.569);, hair washing interval with p-value =0.000 and OR (0.019-0.415) and use of a comb together with value =0.001 and OR (00.141-0.789), on the occurrence of Pediculus capitis

infection (Table 2). Meanwhile, hair type, namely value = 0.852 and OR (0.477- 2.505, is not significantly related to Pediculus capitis infection. The results of this study are in line with research reported by Hermawan et al., 2023 on students at SDN Bandar Lor 1, Kediri City, that age, gender, hair shape, scalp type, and level of knowledge were significantly associated with infection[12].

The results of this research are in line with Maryanti and Lestari's research reported in 2020 and Damayanti in 2018, namely that the female gender dominates the positive rate for infection with Pediculus capitis. This is because women have a habit of interacting more closely and for longer with each other than men[14,15]. Elementary school-age girls tend to have longer hair and always wear hair accessories [16]. Long hair is a better place to live for head lice than in men [17]. The same report was also reported by Lukman et al (2018) that the incidence of *Pediculosis capitis* at the Miftahul Ulum Kalisat Jember Islamic Boarding School was quite high. There is a significant relationship between the risk factors for *Pediculosis capitis*: gender, frequency of washing hair, use of shared combs or hair accessories, use of shared mats or beds, hair length, and hair type on the incidence in students at the Miftahul Ulum Kalisat Jember Islamic Boarding School and type. Gender is the greatest risk factor overall[11].Noersyamsidar and Suprihartini (2022) explained that elementary school children, especially those aged 11-15 years, are more exposed to *Pediculus capitis* because children do not care about their hygiene.[10]. Girls with long hair who rarely wash their hair. Many factors cause *Pediculus capitis* to spread, such as taking turns using a comb, hat, headscarf, mukenah. This makes the spread of head lice very fast, usually in children who have different levels of cleanliness, depending on their parents' understanding.

IV. CONCLUSION

The following are the findings of the research described about the description of Pediculus capitis infection in children at SDN 40:

1) Age-based characteristics of the 96 students in SDN 40, Salero Village, Ternate City; many of them are exposed to ages 9 and 11. Girls were more exposed than boys, with 33 respondents (63%) and 11 respondents (37%), respectively, based on gender. 34 pupils washed their hair more than twice a week, compared to only 18 who did so less than twice a week. There were 33 students with wavy hair, 23 students with longer hair, and 33 students who used combs or other accessories in common with student responses who tested positive for pediculosis were 13 students.

2) The relationship between children at SDN 40 Saalero Village and Pediculus infection is significant between ages, namely value = 0.000 with OR (0.019-0.415); gender, namely value = 0.001 with OR (0.102-0.570); hair length, namely value = 0.000 with OR (101-0.569); Hair washing interval is value = 0.000 with OR (0.019-0.415) and use of a comb with p-value = 0.001 with OR (00.141-0.789), on the occurrence of Pediculus capitis infection. Hair type is p-value = 0.852 with OR (0.477- 2.505 not significantly related to *Pediculus capitis* infection

V. SUGGESTION

Research is still limited to certain schools, it is hoped that in the future research can be carried out in elementary schools in Ternate City, in order to obtain basic data about the spread of Pediculus capitis, especially in Ternate City.

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