





Risk Factors Associated with Head Lice (Pediculosis Capitis) Infestation in Children Aged 6–15 years in Relocation Housing for Tsunami Victims

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Abstract:

Background: Pediculosis capitis, or head lice infestation, is a significant public health concern in Indonesia. It is caused by the human lice species *Pediculus humanus capitis*. Pediculosis capitis primarily affects children and is considered one of the neglected diseases in Indonesia. The incidence rate of pediculosis in Indonesia is still limited. Nevertheless, several studies have demonstrated that the incidence rate of pediculosis in various regions of Indonesia is notably high, particularly among children. These study results require further investigation, as pediculosis frequently indicates poverty, poor health, and inadequate sanitation, which the Sustainable Development Goals (SDGs) seek to alleviate through the inclusion of SDG 1, SDG 3, and SDG 6. This study aimed to assess the risk factors for pediculosis infestation in children aged 6 to 15 and selected a relocation site for the 2018 Sunda Strait Tsunami victims as the study location.

Methodology: This study employed a cross-sectional research design to investigate the risk associated with pediculosis infestation in children aged 6–15 years residing in Kunjir Permanent Settlement (*Huntap* Kunjir), Lampung Province, Indonesia. The data were analyzed using univariate, bivariate, and multivariate methodologies.

Results: The results demonstrated that gender, personal hygiene, hair washing routine, habits of exchanging personal items, hair length, and hair type were statistically significantly related to the incidence of pediculosis (P-value <0.05).

Conclusion: The most significant factor linked to the occurrence of Pediculosis capitis is hair length.

Keywords: Children, Head lice, Personal hygiene, Pediculosis, Relocation, Sanitation.

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1. INTRODUCTION

Pediculosis capitis, or pediculosis as it is commonly known, is a public health problem that occurs worldwide. It is a condition caused by an infection of the scalp and hair caused by the human louse, *Pediculus humanus capitis* [1]. The incidence of pediculosis is closely related to poverty, poor health, and suboptimal sanitation and hygiene, which the Sustainable Development Goals (SDGs) aim to alleviate [2]. This infestation is often overlooked,

particularly in developing countries where other health concerns are accorded greater priority. While pediculosis does not result in mortality, it has been associated with significant morbidity in children globally [3]. The global prevalence of pediculosis is relatively high, with millions of individuals becoming infested with *Pediculus humanus capitis* annually. In the United States, it is estimated that 6–12 million individuals are affected by pediculosis capitis, indicating a prevalence of approximately 10–40% among school-aged children. In developed countries such

as Norway, the prevalence reached 97.3%. In developing countries such as Pakistan and Peru, the prevalence of pediculosis capitis in school-aged children was 87% and 87.6%, respectively [4]. The prevalence of pediculosis capitis in a number of countries is as follows: Türkiye, 9.4%; Iran, 4%; Saudi Arabia, 12%; Jordan, 13.4%; Egypt, 21.6%; Palestine, 32.4%; and Malaysia 35%. Furthermore, the current prevalence in Thailand is 23.32%, and in Argentina, it is 42.7% [5].

The data on cases of pediculosis capitis in Indonesia is not yet comprehensive due to the fact that it is not considered a significant health issue, as it does not result in mortality [5]. A previous study conducted in Yogyakarta City revealed that 71.3% of female students living in dormitories were infested with pediculosis capitis [6]. A separate study revealed that 72.1% of students at a boarding school in Surakarta had been infested with pediculosis capitis, and that figures were similarly high in both Manado City (78.57%) and West Nusa Tenggara Province (67.5%) [7]. It is probable that the aforementioned rates are significantly lower than the actual rates, as many individuals with pediculosis capitis who self-treat do not report to health workers.

In light of the aforementioned elaboration, it can be posited that pediculosis capitis has been endemic in both developed and developing countries, as well as across tropical and subtropical regions [8]. Pediculosis capitis is more prevalent among children within the age group of 3–12 years. The prevalence of pediculosis capitis is high in this age group because of the rapid and easy transmission of the parasite. Furthermore, children require adult assistance in maintaining personal hygiene, and some may be less diligent in practices such as bathing or washing their hair. The likelihood of infestation is heightened by the tendency of children to exhibit active behavior and to frequently touch hair, share personal items, and bathe in proximity to one another, such as in rivers, lakes, or pools [9, 10]. While children over the age of 15 are not considered vulnerable to pediculosis, the possibility of re-infection remains [11]. Moreover, a significantly higher prevalence of pediculosis capitis was observed in female individuals compared to males. This is attributable to gender-related behavioral differences. For example, boys tend to engage in outdoor activities and sports, which often involve brief contact with one another, while girls often play in smaller groups with closer contact [8]. Pediculosis can be transmitted in both direct and indirect ways. Indirect transmission may occur via intermediate media, including blankets, head covers, towels, beds, and hair tools/accessories [11]. The spread of pediculosis capitis is influenced by a number of factors, including the level of knowledge about pediculosis capitis, poor personal hygiene, residential density, and individual characteristics (age, gender, hair length, and hair type) [12]. The clinical manifestations of pediculosis capitis include pruritus, especially on the occipital and temporal regions of the scalp, which can extend to other regions. This may also result in a pungent, foul-smelling odor of the

scalp. If left untreated for an extended period, in rare case, pediculosis may lead to anemia. Children infected with pediculosis capitis often experience sleep disturbances at night due to pruritus and scratching [13].

The Kunjir Permanent Settlement (*Huntap* Kunjir) is a housing settlement established to provide compensation to victims of the 2018 Sunda Strait tsunami. The residents of Huntap Kunjir have been engaged in a process of adaptation to their new conditions in the aftermath of the tsunami, which resulted in the devastation of their homes, livelihoods, and possessions. The process of adapting to a new environment, including the adaptation of sanitation and personal hygiene practices, presents a number of challenges. One such challenge is the spread of pediculosis among children, which is a common occurrence in the context of residential relocation processes for disaster victims [14, 15]. In Kunjir Village, there is a dearth of information regarding the incidence of pediculosis capitis and its risk factors. Furthermore, the children residing in the village remain uninformed about the importance of personal hygiene. A significant proportion of children in the population still rarely wash their hair, resulting in a build-up of dirt and odor. Additionally, many children share personal items such as hair tools, scarves, and hairbands with siblings or friends, further contributing to the potential infestation. The potential risk factors for pediculosis capitis may include age and gender. Control efforts for pediculosis are insufficient due to the lack of prioritization of this health issue [7]. Health outreach and health counseling have been conducted with the objective of increasing knowledge about the prevention of pediculosis [9]. The results of these efforts have not been effective in controlling pediculosis. The use of pesticides has also been employed as a means of reducing the incidence of pediculosis [16]; however, this approach has resulted in unintended consequences, such as the development of resistance [17, 18]. The lack of research on the risk factors for pediculosis has resulted in suboptimal prevention efforts. Without understanding the factors that cause pediculosis, it is challenging to develop effective preventive strategies. This study aims to identify the risk factors for pediculosis capitis among children, with the objective of reducing the risk of transmitting pediculosis capitis through the development of optimal preventive measures.

2. MATERIAL AND METHODS

2.1. Research Design

This study employed a quantitative methodology with a cross-sectional design. It was conducted in Kunjir Permanent Settlement (*Huntap* Kunjir), Kunjir Village, Lampung Province, Indonesia, in 2023. The study population consisted of 30 children aged 6–15. The sampling technique used was total sampling. Huntap Kunjir is a settlement established for the purpose of relocating victims of the 2018 Sunda Strait tsunami.

Table 1. The tested results of Validity and reliability.

No	Question	R Count (RC)	R Table (RT)	Validity Valid if RC>RT	Cronbach alpha (α)	Reliability Reliable if α ≥ 0.6
Personal Hygiene						
1	Do you typically change clothes twice a day?	0.544	0.361	Valid	0,659	Reliable
2	Do you typically shower twice a day?	0.557	0.361	Valid		
3	Do you wash your hair at least twice a week?	0.691	0.361	Valid		
4	Do you usually let your pillows and pillow bolsters air dry in the sun at least once a month?	0.712	0.361	Valid		
5	Do you always use your own comb (rather than borrowing one a friend or relative)?	0.441	0.361	Valid		
6	Do you always let your towel air dry after you use it to wipe your body?	0.523	0.361	Valid		
7	Do you always change your bed sheets at least every two weeks?	0.538	0.361	Valid		
Knowledge						
1	Did you know that head lice are contagious?	0.913	0.361	Valid	0,896	Reliable
2	Do you know how to avoid getting head lice?	0.576	0.361	Valid		
3	Do you know how to treat head lice?	0.935	0.361	Valid		
4	Do you know anyone who has head lice, whether it is a friend, family member, or relative?	0.847	0.361	Valid		
5	-	0.929	0.361	Valid		
Hair Washing Practice						
1	Do you usually wash your hair two or more times a week?	0.926	0.361	Valid	0,883	Reliable
2	Do you always wash your hair with shampoo?	0.434	0.361	Valid		
3	Do you always rub your hair when you wash it?	0.967	0.361	Valid		
4	Do you always rinse your hair with clean water after washing it?	0.952	0.361	Valid		
5	Do you always dry your hair after washing it?	0.916	0.361	Valid		
6	Do you always comb your hair after washing it?	0.628	0.361	Valid		
7	Do you always use your own comb (rather than borrowing one from a friend or family member)?	0.529	0.361	Valid		
The habit of Sharing Personal Items						
1	Have you ever borrowed clothes from friends or family members?	0.768	0.361	Valid	0.836	Reliable
2	Have you ever borrowed a friend's or family member's prayer equipment?	0.652	0.361	Valid		
3	Have you ever borrowed a hair tie from a friend or family member?	0.721	0.361	Valid		
4	Have you ever borrowed a friend's or family member's hat?	0.682	0.361	Valid		
5	Have you ever borrowed a towel from a friend or family member?	0.577	0.361	Valid		
6	Have you ever borrowed a pillow or pillow bolster from friends or family members?	0.567	0.361	Valid		
7	Have you ever borrowed a friend's or family member's comb?	0.625	0.361	Valid		
8	Have you ever borrowed hair tools from friends or family members?	0.674	0.361	Valid		
9	Have you ever borrowed a friend's or family member's hijab?	0.653	0.361	Valid		

2.2. Research Instrument

Data were collected through questionnaires and observation sheets. The questionnaires were subjected to a process of validity and reliability testing. The results of this testing are shown in Table 1. This study has obtained ethical clearance from the Ethics Committee of Ahmad Dahlan University. Prior to conducting meetings with respondents who were minors, permission was obtained from their parents or guardians. The letter of consent was signed by the parents and two witnesses. During the interview, the children were accompanied by their parents or guardians.

2.3. Analysis

The data were analyzed using univariate, chi-square, and multiple logistic regression techniques.

3. RESULTS AND DISCUSSION

3.1. Validity and Reliability Test

A questionnaire is declared valid if the resulting *r* value exceeds the *r*-table and reliable if Cronbach's alpha value for each variable is equal to or greater than 0.6 [19]. The results of the validity and reliability tests for the instruments utilized in the present study are presented in Table 1.

3.2. Univariate Analysis

The majority of respondents were female children between the ages of 6 and 15 years who were afflicted by pediculosis capitis. They demonstrated a lack of personal hygiene, inadequate knowledge, and deficient hair-washing practices, exhibited a proclivity for sharing personal items, and had long and curly hair. The univariate test results are presented in Table 2.

Table 2. Univariate test results.

Variable	Frequency	Percentage (%)
Gender	-	-
Male	12	40
Female	18	60
Age	-	-
6–10 year	15	50
11–15 year	15	50
Being afflicted by <i>pediculosis capitis</i>	-	-
Yes	17	56.7
No	13	43.3
Personal hygiene	-	-
Good	13	43.3
Poor	17	56.7
Knowledge	-	-
Good	14	46.7
Poor	16	53.3
Hair washing practice	-	-
Good	12	40
Poor	18	60
Having the habit of sharing personal items for use	-	-
Yes	18	60
No	12	40
Hair length	-	-
Long	17	56.7
Short	13	43.3
Hair type	-	-
Straight	14	46.7
Curly	16	53.3

Note: Source: Primary data.

Table 3. Bivariate test results.

Variable	<i>Pediculosis capitis</i>				P-Value	Prevalence Ratio (PR) and Confidence Interval (CI)
	Yes		No			
	N	%	N	%		
Gender	-	-	-	-	0.004*	3.375** (1.340-8.502)
Male	3	25	9	75		
Female	14	77.8	4	22.2		
Age	-	-	-	-	0.269	0.625*** (0.265-1.474)
6–10 year	10	66.7	5	33.3		
11–15 year	7	46.7	8	53.5		
Personal hygiene	-	-	-	-	0.012*	2.942** (1.160-7.461)
Good	4	30.8	9	69.2		
Poor	13	76.5	4	23.5		
Knowledge	-	-	-	-	0.153	1.829*** (0.776-4.307)
Good	6	42.9	8	57.1		
Poor	11	68.8	5	31.2		
Hair washing practice	-	-	-	-	0.000*	5.000** (1.726-14.483)
Good	2	16.7	10	83.3		
Poor	15	83.3	3	16.7		
Having the habit of sharing personal items for use	-	-	-	-	0.035*	0.417**** (0.179-0.971)
Yes	13	72.2	5	27.8		
No	4	33.3	8	66.7		

(Table 3) contd....

Variable	Pediculosis capitis				P-Value	Prevalence Ratio (PR) and Confidence Interval (CI)
	Yes		No			
	N	%	N	%		
Hair length	-	-	-	-	0.012*	0.340**** (0.134-0.862)
Long	13	76.5	4	23.5		
Short	4	30.8	9	69.2		
Hair type	-	-	-	-	0.004*	3.810** (1.304-11.133)
Straight	4	28.6	10	71.4		
Curly	13	81.3	3	18.7		

Note: *= significant; ** = risk factor; ***= not identified as either a risk or protective factor; **** = protective factor.

Table 4. Results of multiple logistic regression test.

Variable	B	S.E	Wald	df	Sig.	Exp(B)	95%b.C.I for EXP (B)	
							Lower	Upper
Personal hygiene	-3.201	1.541	4.314	1	0.038	0.041	0.002	0.835
Hair washing practice	-3.935	1.538	1.538	1	0.011	0.20	0.001	0.398
Hair length	3.201	3.201	1.541	1	0.038	24.551	1.198	503.206

3.3. Bivariate Analysis

The bivariate analysis revealed that the variables of gender, personal hygiene, hair washing practices, habits of sharing personal items for use, hair length, and hair type exhibited a statistically significant correlation with the incidence of pediculosis (p-value <0.05). The prevalence ratio (PR) was greater than 1 (PR>1), and the confidence interval (CI) did not exceed 1, indicating that gender, personal hygiene, hair washing practices, and hair type were risk factors for pediculosis. In this context, risk factors are defined as variables that are associated with an increased likelihood of pediculosis capitis. It is notable that age and knowledge were not identified as risk or protective factors, as the CI value exceeded 1. Conversely, the habit of sharing personal items for use and hair length were identified as protective factors, as the prevalence ratio (PR) value was less than 1, and the CI did not exceed 1. In this context, protective factors are defined as variables that can potentially mitigate the negative effects associated with risk factors. The bivariate test results are presented in Table 3.

3.4. Multivariate Analysis

Variables related to Pediculosis capitis with a p-value less than 0.25 were subjected to multivariate analysis using multiple logistic regression analysis. Following the completion of four modelling stages, the variables that met the requisite p-value of less than 0.05 were identified as personal hygiene, hair washing practice, and hair length. The impact of personal hygiene on pediculosis capitis was found to be 0.041 and B -3.201. This indicates that a reduction in personal hygiene can potentially increase the likelihood of pediculosis capitis by 0.04 times more significantly. The variable representing hair-washing practice had an influence of 0.20 and B -3.935, indicating that a less frequent hair-washing practice may potentially increase the likelihood of pediculosis capitis by 0.2 times.

The variable pertaining to hair length demonstrated an effect of 24.551 and B 3.201, indicating that an increase in hair length can elevate the likelihood of pediculosis capitis by 24.551 times. The variable exhibiting the strongest correlation with the incidence of pediculosis capitis was the length of hair. The multivariate test results are presented in Table 4.

4. DISCUSSION

The prevalence of pediculosis capitis in children has been demonstrated to be influenced by gender, personal hygiene, hair washing practice, habits of sharing personal items, hair length, and hair type. These findings are supported by statistical analysis, as demonstrated in the present study. The variable most strongly correlated with the incidence of pediculosis capitis was identified as hair length. Furthermore, a greater number of cases of pediculosis capitis were observed in girls compared to boys, which is likely attributable to differences in the behavior of the two groups. For example, boys tend to engage in outdoor activities that necessitate brief contact, such as sports, whereas girls typically participate in activities that involve smaller groups and closer proximity, facilitating direct contact. Given that a greater proportion of girls have longer hair than boys, it follows that they need more intensive hair care [20]. Hair that is dirty, greasy, infrequently washed, and seldom combed is an optimal environment for breeding *Pediculus humanus capitis* [21]. Additionally, it was observed that girls frequently share hair accessories with their friends during playtime [22]. The findings of the present study are consistent with those of previous research, which showed that women are twice as likely to experience pediculosis capitis as men. The prevalence of pediculosis capitis in Asadabad, Iran, was 3.2% in girls and 0.5% in boys [23]. Another significant relationship between gender and the incidence rate of pediculosis capitis was found in West Praya, Central Lombok, Indonesia (p-value < 0.05) [24].

Additionally, a significant difference in the prevalence of pediculosis among students based on gender was observed in South West Iran (p value < 0.05) [22].

An individual's responsiveness and reasoning abilities are subject to the influence of age. Age is frequently a predisposing factor that contributes to the initiation of an individual's actions. However, the results presented in Table 2 showed that age was not a significant predictor of pediculosis capitis, with a p -value of 0.269. A total of ten children aged between six and ten years old, representing 66.7% of the total sample size, experienced pediculosis capitis. A total of five children within the 6–10 age group, representing 33.3% of the total sample, did not experience pediculosis capitis. Concurrently, seven children in the 11-to-15-year-old age group, representing 46.7% of the total sample, experienced pediculosis capitis. Of the children aged 11–15 years, eight (53.3%) did not have pediculosis capitis. In general, age has been identified as a significant factor influencing an individual's health behavior [25]. As individuals age, they accumulate a wealth of experience, knowledge, expertise, and wisdom, which collectively shape their decision-making processes. This phenomenon also manifests in children as they mature, influencing their personal hygiene habits. Additionally, as individuals age, their activities tend to evolve, reducing the likelihood of contracting conditions like pediculosis [26].

A correlation was identified between personal hygiene and the incidence of pediculosis capitis in Huntap Kunjir (p -value of 0.012). A total of four children, representing 30.8% of the total size of the sample, exhibited good personal hygiene yet still contracted pediculosis capitis. Nine children, representing a percentage of 69.2%, demonstrated good personal hygiene and did not experience any cases of pediculosis capitis. Additionally, 13 children (76.5%) exhibited poor personal hygiene and experienced pediculosis capitis. Meanwhile, four children with poor personal hygiene did not experience pediculosis capitis, representing a rate of 23.5%. The high incidence of pediculosis capitis can be attributed to poor personal hygiene practices. A correlation exists between lower levels of personal hygiene and higher rates of pediculosis capitis [26]. The personal hygiene habits of children may be influenced by the practices they observe in their parents. For instance, failure to shower twice a day, to wash hair at least twice a week, and to maintain sanitary living conditions can facilitate the spread of pediculosis. The conditions of overcrowded housing, a lack of adequate sanitation facilities, and poor hygiene practices are frequently observed in disaster victim relocation sites and have the potential to elevate the risk of transmitting pediculosis [27]. Wearing a head covering on wet hair can result in prolonged moisture retention, which provides an optimal environment for the proliferation of *Pediculus humanus capitis* [26].

It can be argued that knowledge is an essential factor in influencing attitudes and behaviors. However, it should be noted that knowledge is not the sole determining factor. In addition to knowledge, life experience and a range of economic, social, and cultural factors also exert

an influence on attitudes and behavior [28, 29]. As anticipated, the results of previous studies indicated that knowledge was not a significant factor in the incidence of pediculosis capitis in Huntap Kunjir, as other variables exerted a substantial influence on the incidence of pediculosis [30, 31]. Washing the hair is an effective method of maintaining personal hygiene and preventing the occurrence of disease. The incidence of pediculosis is closely related to hair-washing practices because *Pediculus humanus capitis* is a parasite that lives and reproduces in the hair of the head. The lack of regular washing and cleaning of hair allows for the accumulation of dirt, moisture, and odor, which in turn provides an ideal environment for head lice to thrive [32]. Hair washing serves to remove dirt and other impurities from the scalp. The benefits of hair washing include a positive feeling, a feeling of freshness, enhanced cleanliness, a well-groomed and well-maintained appearance, improved scalp blood circulation, and the removal of lice and dandruff [33]. This finding is consistent with the results of previous research, which have demonstrated a correlation between the practice of hair washing and the incidence of pediculosis capitis. It has been demonstrated that regular hair washing can serve as an effective method for reducing the risk of pediculosis capitis [34]. It is crucial to use shampoo during the hair washing process, as the absence of shampooing may result in incomplete removal of dirt from the hair. The optimal method for hair washing entails scrubbing the hair with shampoo and then rinsing it with clean water. Furthermore, it is imperative to use clean water for bathing and shampooing to prevent the proliferation and reproduction of head lice on a clean scalp. Promoting the enjoyment of hair washing in children can foster regular and enthusiastic participation in this practice [35].

Moreover, children frequently engage in play and often share personal items, such as combs, hair ornaments and accessories, for use. The results of the present study indicate that the practice of exchanging personal items was associated with an increased prevalence of pediculosis capitis in Kunjir Village. The practice of exchanging personal items among children has been identified as a potential risk factor for pediculosis or head lice infestation. This is because head lice can be transmitted indirectly through contact with objects that have been contaminated with adult lice, nymphs, or eggs and then are shared [36, 37]. Hair plays a vital role in human social life and is a significant aspect of human attractiveness. It is, therefore, imperative to maintain optimal hair hygiene to prevent the development of a breeding ground for *Pediculus humanus capitis* [38]. The results of the study indicated a correlation between hair length and the incidence of pediculosis capitis. Long hair necessitates more intensive care in comparison to its shorter counterparts. Furthermore, long hair is more susceptible to dirt and requires more intensive cleansing. In this regard, head lice have a proclivity for infesting long, thick, and dirty hair. Those with long hair may be inclined to be less diligent in their hair-washing routines, given the perceived greater difficulty and time commitment associated with cleaning long hair. Parents of children with long hair must be committed to their children's hair hygiene to prevent head lice infestation

[33, 10, 39]. It is important to note that children with curly hair are at an increased risk of developing pediculosis capitis. A study showed a correlation between hair type and the incidence of pediculosis capitis, with curly hair being identified as a preferred habitat for *Pediculus humanus capitis* due to its capacity to provide ample concealment and difficult combing [40].

The results indicated that long hair was the most influential of the six variables associated with pediculosis capitis [41]. Individuals with long hair are more susceptible to head lice infestations. The majority of women who contracted pediculosis capitis had hair that was shoulder-length or below [42]. This is because it is more difficult to maintain the hygiene of the hair and scalp when the hair is long in comparison to when it is short [42, 43]. Additionally, the scalp tends to be warmer and moist when the hair is long, which is conducive for the survival of *Pediculus humanus capitis*. Conversely, short hair is less conducive to the survival of *Pediculus humanus capitis* as it provides the opposite conditions [40]. It can be stated, therefore, that long hair represents the optimal habitat for *Pediculus humanus capitis*, facilitating its survival and reproduction. In contrast, short hair is easier to maintain and comb than long hair. Consequently, if the hair is infested with *Pediculus humanus capitis*, the infestation will be detected more expediently.

Based on the results of this study, several recommendations are proposed for implementation at the study location, namely Huntap Kunjir. Preventive measures can be undertaken through the routine examination of pediculosis in children and the provision of personal hygiene counseling to parents and children. Furthermore, as curative measures, the government, through health facilities, can provide lice treatments for children diagnosed with pediculosis. Future research may investigate the potential efficacy of natural ingredients for head lice treatment as a means of enhancing head lice control.

CONCLUSION

The present study has identified a number of factors associated with the incidence of pediculosis capitis. These include gender, personal hygiene, washing practices, habits of sharing personal items for use, hair length, and hair type. Specifically, gender, personal hygiene, hair washing practices, and hair type have been identified as risk factors for pediculosis. Conversely, age and knowledge are not identified as either risk or protective factors. The habit of sharing personal items and hair type are identified as protective factors. The variable most strongly associated with the incidence of pediculosis capitis is hair length.

AUTHOR'S CONTRIBUTIONS

T.W.S. and K.I.: study was conceptualized and designed; S.S.: initial manuscript was prepared by author.

LIST OF ABBREVIATIONS

CI	=	Confidence Interval
PR	=	Prevalence Ratio

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was granted ethical clearance by the Ahmad Dahlan University, Indonesia Ethics Committee (reference number 012211177).

HUMAN AND ANIMAL RIGHTS

All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

The letter of consent was duly signed by the parents of the participants and two witnesses.

STANDARDS OF REPORTING

The reporting was conducted in accordance with the STROBE guidelines.

AVAILABILITY OF DATA AND MATERIALS

The data and materials are available upon request to the corresponding author [T.S.].

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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