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RESEARCH ARTICLE

Prevalence of Pediculosis Capitis and its Risk Factors in Elementary School Students

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Abstract

Background: Pediculosis capitis or head-lice infestation is a health problem, especially in children in developing countries. Transmission of pediculosis capitis is also fast, causing a high-incidence in an area. This study was conducted to determine the prevalence of pediculosis capitis and the relationship between risk factors for its infestation. Methods: This is a descriptive study with a cross-sectional design. The data was collected from elementary school students in Tenganan village, Bali, Indonesia in September 2018. The sampling technique was a voluntary sampling method with a sample of 141 elementary school students. Data analysis was carried out with the SPSS with univariate and bivariate analysis. Results: The prevalence of pediculosis capitis in elementary school children in Tenganan Village is 69.5%. Factors related to pediculosis capitis infestation are sex (PR=2.235, p <0.001), long-hair (PR=2.015, p <0,001), shared hair-accessories (PR=1.450, p=0.004), and lived with people infected with head lice (PR=1.692, p <0.001). Conclusion: The prevalence of pediculosis capitis in elementary school children in Tenganan Village is 69.5% with gender as the most influential risk factor for infestation.

Keywords: *Pediculosis capitis, Prevalence, Risk factors.*

Introduction

Head lice or *Pediculus humanus capitis* is one of the obligate ectoparasites that infect the human scalp. They carry out their life-cycle in the human body by sucking the blood of its host. Head lice infection can cause *pediculosis capitis* [1].Pediculosis capitis can affect all age groups, sexes, races, and occupations. *Pediculosis capitis* is still a health problem throughout the world, especially in children in developing countries. *Pediculosis capitis* was most common in elementary school children [2].

Pediculosis capitis has now spread to all socioeconomic groups, especially in areas that are densely populated. *Pediculosis capitis* does not cause high mortality and morbidity. So this disease is often ignored or considered mild compared to other diseases. However, infestations caused by *Pediculus humanus capitis* on children's scalp can interfere with concentration and discomfort due to the itching caused.

Transmission of pediculosis capitis is very fast so that it can cause a high incidence in an area [3].

One common risk factor for pediculosis capitis is the lack of hair hygiene. Risk factors include the frequency of washing hair, shared use of hair accessories, shared sleeping utensils, and living together with those who suffer from pediculosis capitis [4].In Selangor (Malaysia), 15.3% of children aged 7-15 years suffer from pediculosis capitis [5].In Bangkok (Thailand), 23.3% of children aged 5-12 years suffer from pediculosis capitis [6].In Sabang (Indonesia), 27.1% of children suffered from pediculosis capitis[4].Given the impact caused by pediculosis capitis in elementary school children, it is important to study the prevalence and risk factors. This study aims to analyze the prevalence and risk factors associated with pediculosis capitis.

Methods

This is a descriptive study with cross-sectional study design. The study was carried out at two elementary schools in Tenganan village, Bali, Indonesia, in September 2018.

We used a non- probability sampling using the voluntary sampling method. All parents or legal guardians of the subjects provided written informed consent to be included in this study. The physical and clinical examination of hair and scalp visually with a single-use comb. The subject was considered positive for head live if we found at least one adult lice, nymphs, or nits. The subject will be classified negative otherwise. We then carried out an interview about the risk factors for pediculosis capitis using a validated questionnaire. All data were analyzed using the Statistical Package for the Social Sciences (SPSS) software version 22. We used univariate analysis, bivariate analysis, and the chi-square test for this study. Prevalence ratio (PR) analysis was carried out to determine the risk factors that influence pediculosis capitis infestation with 95% confidence intervals (CI). A p-value of <0.05 was considered significant.

Results

There were 141 subjects who participated in this study, with 98 (69.5%) were infected with pediculosis capitis, and 43 (30.5%) were not, where positive subjects were found more in females (69.3%), as displayed in Table 1. We found that sex, long hair, and the habits of using shared hair-accessories serve as risk factors in pediculosis capitis transmission. Table 2 shows each risk factor that we evaluated in this study.

Table 1: Characteristics of the subjects

Characteristics	***Pediculosis capitis***	
	Positive (N=98)	Negative (N=43)
Sex, n (%)		
Female	68 (69,3)	3 (70,4)
Male	30 (30,7)	40 (29,6)
Age (years), median (min-max)	9 (6-13)	10 (6-13)
Body weight (kg), median (min-max)	29 (18-41)	31 (17-42)

Table 2: Risk factors for head lice infection in the study subjects

Risk factors	***Pediculosis capitis***				
	Yes (N=98)	No (N=43)	p	PR	CI95%
Sex					
Female	68 (69.3)	3 (70.4)	<0.001	2.235	1.698-2.942
Male	30 (30.7)	40 (29.6)			
Long-haired					
Yes	58 (98.3)	1 (1.7)	<0.001	2.015	1.610-2.522
No	40 (48.8)	42 (51.2)			
Infrequent hair washing					
Yes	55 (71.4)	22 (28.6)	0.586	1.063	0.852-1.327
No	43 (67.2)	21 (32.8)			
Education level (mother)					
Elementary school Junior high or higher Education level (father)	63 (75.0) 35 (61.4)	21 (25.0) 22 (38.6)	0.125	1.160	0.961-1.553
Elementary school	48 (73.8)	17 (26.2)	0.394	1.122	0.903-1.395
Junior high or higher	50 (65.8)	26 (34.2)			
Shared hair accessories					
Yes	76 (74.5)	22 (22.4)	0.004	1.450	1.176-1.954
No	23 (53.5)	20 (46.5)			

Discussion

In this study, we found that females experiencing *Pediculosis capitis* infestation more than the males' counterparts. Gulgun *et al* [7].Found that women were 41 times more likely to experience *Pediculosis capitis* infestation compared with men. Rampal *et al* [8].Also stated that the prevalence of *Pediculosis capitis* was higher in women compared to men. Close contact is more often present among women compared to men.

Direct or indirect contact is a way of transmitting head lice [6].This may also be related to long hairs in female students in our subjects.

Hair is a good place to live and breed for head lice. In our study, students with long hair experienced *Pediculosis capitis* infestation twice as likely compared to short hair. Nindia *et al* [4].Reported 9.9% of respondents with long hair infected with pediculosis capitis. A study reported that 16 people (100%) of respondents with long hair infected with pediculosis capitis [10].Head lice are easier to hide and lay eggs in long-haired persons. Long hair is more moist and dark so it becomes a good place to breed.

Having long hair is more difficult to clean compared to short hair so it becomes one of the good predisposing factors for breeding if personal hygiene is relatively poor [11, 12].Regular hairwashing showed no relationship to *Pediculosis capitis* infestation. A study found that routine hair washing experienced higher pediculosis capitis compared with those who rarely wash their hair [13].Munusamy *et al* [14]. Did not find an association between hairs washing with the incidence of *Pediculosis capitis* [14].

This may be caused by the level of hygiene of a person is not a major predisposing factor for transmission of head lice. We did not find any relationship between the parent's levels of education to the *Pediculosis capitis* infestation. Similar results were also reported by other studies [15, 16].We also found that the habit of sharing hair accessories among children results in higher *Pediculosis capitis* infestation.

This result was supported by Khamaiseh *et al* [17].Who found a significant relationship between the use of accessories together with the incidence of *Pediculosis capitis* [17].It is thought that accessories such as hairpins, combs, and caps may transmit *Pediculosis capitis*. The transmission will only take place if there is intense direct head contact between the patient and other people.

Sleeping with patients with pediculosis capitis is one of the habits that can facilitate the transmission of head lice infestation with the record that sleeping equipment is used simultaneously, such as sleeping on the same mattress or bed linen and sleeping using the same head pillow [18].A small number of head lice moves from one head to another through bed sheets are vulnerable due to a bedsheet environment that is less supportive of head lice.

This result in minimal chances of successful transmission despite sleeping together [14, 18].There is several limitations to this study: the limited number of risk factors involved, the use of cross-sectional design, and the small number of subjects. Further studies that overcome these limitations are needed to gain a better understanding of head lice infection.

Conclusion

The prevalence of *Pediculosis capitis* in elementary school children in Tenganan village is 69.5%. Risk factors for *Pediculosis capitis* infestation include sex, long hair, and shared hair-accessories.

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