

ORIGINAL ARTICLE

The Association Between Individual Characteristics, Personal Hygiene, and Environmental Sanitation to Pediculosis Capitis in Students of Mentokok Elementary School, West Praya, Central Lombok

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ABSTRACT

Introduction: Pediculosis capitis is an infestation of the skin and head hair caused by *Pediculus humanus var. capitis*. This disease occurs among children, especially those aged 3-11 years or elementary school-age children. Several factors which can promote the spread of pediculosis capitis infestation are socio-economic factors, knowledge level, poor personal hygiene, residential density, and individual characteristics (age and sex). This study aimed to determine the association between individual characteristics, personal hygiene, and environmental sanitation to pediculosis capitis in students of Mentokok Elementary School, West Praya, Central Lombok. **Methods:** This research was analytical observational study with cross-sectional approach using purposive sampling technique with sample of 46 students. Bivariate analysis with Chi-square test was used for data analysis. If the p-value ≤ 0.05 then H_0 was rejected, suggesting a significant relationship between variables. Meanwhile, if p-value > 0.05 then H_a was rejected, suggesting no significant relationship between variables. In this study data were collected by direct examination of the respondents' hair, questionnaire sheet and observation form. **Results:** From 46 samples, 30 (65.2%) were infected with pediculosis capitis, while 16 (34.8%) were pediculosis capitis-negative. Statistical results with the Chi-square test showed a significant association between age and pediculosis capitis with $p=0.038$ ($p < 0.05$). There was significant association between sex and pediculosis capitis with $p=0.000$ ($p < 0.05$). There was a significant association between personal hygiene and pediculosis capitis with $p=0.021$ ($p < 0.05$) and significant association between residential density and pediculosis capitis with $p=0.023$ ($p < 0.05$). **Conclusion:** There was a significant association between individual characteristics, personal hygiene and environmental sanitation to pediculosis capitis in students of Mentokok Elementary School, West Praya, Central Lombok.

Keywords: Pediculosis Capitis, Individual Characteristics, Personal Hygiene, Environmental Sanitation

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INTRODUCTION

Pediculosis capitis is an infestation of the skin and head hair caused by *Pediculus humanus var. capitis* (1). This disease occurs among children, especially those aged 3-11 years (2). Pediculosis capitis can be found worldwide at all age, but it is mostly found in children and adolescence. The highest incidence is at age of 3-12 years or elementary school-age children (1). This disease has become a problem in

both developing and developed countries such as the United States. Pediculosis capitis infests 6 to 12 million people annually (2). Based on gender, women are twice at risk compared to men (3). Some of the factors that contribute to the spread of pediculosis capitis are socio-economic factors, level of knowledge, poor personal hygiene, residential density, and individual characteristics (age and sex) (4). Individual characteristic such as age has a major role in the incidence of pediculosis capitis, in accordance with research by Rassami and Soonwera in 2012 in Bangkok, Thailand, which showed that the ratio of *Pediculus humanus var capitis* infestations in school children ranged from 12.26% -29.76%, and 26.07% in the 12-year-old age group (5). Gender based grouping

shows that the percentage of pediculosis capitis found in female was more than that in male. Although pediculosis capitis can infect both gender, female is twice susceptible to this condition than male because the majority of women have long hair which is hard to be cleaned. This condition enables *Pediculus humanus var. capitis* to live. Moreover, girl students often exchange hair accessories (6). In addition, pediculosis capitis increases in a dense living area or housing. The density can lead to many health issues due to bad air circulation and the lack of oxygen. It is easier for infectious diseases such as pediculosis capitis to spread (7). Lastly, poor personal hygiene for example rarely washing the hair also contribute to pediculosis capitis (8).

From the presurvey that has been done by the author, many students from Mentokok Elementary School, are infected by *Pediculus humanus var. capitis* because of several reasons. Firstly, the internal factors such as gender, age, the length of hair. Secondly, the external factors such as unfrequent hair washing, exchange hair accessories and hair comb, and unhealthy environmental sanitation.

The purpose of this study is to determine association between individual characteristics, personal hygiene, and environmental sanitation to pediculosis capitis in students of Mentokok Elementary School, West Praya, Central Lombok.

MATERIALS AND METHODS

This research used analytic observational research design with cross sectional approach method. This research conducted on March untill April 2018 at Mentokok Elementary School, West Praya, Central Lombok. The number of sample of this research was 46 respondents. The sample was chosen using purposive sampling technique based on inclusion and exclusion criteria. Inclusion criteria in this study were the students grade I to III students of Mentokok Elementary School, aged six to nine years old, received information about this research and signed informed consent paper. Meanwhile, if the students were not in grade I to III, aged below six or above nine years old, did not receive information about this research and did not sign informed concern paper belong to exclusion criteria. This research got ethical clearance permission from ethics commission of "Human Resources Development and Empowerment Agency for Health Polytechnic Health Ministry of Health, Mataram" number LB.01.03/1/551.2/2018.

The number of students infected by pediculosis capitis were obtained by directly checking on respondents hair. Personal hygiene data were collected from multiple choices questionnaire filled by the respondents. The respondents were categorised as

having good personal hygiene if they answered more than or equal to 70 % of the questions correctly, otherwise, they were categorised as having poor personal hygiene (9). For the last data, the environment sanitation, observation sheet were used to collect the information about the house area, and the number of people lived in the house. When the house area was more than or equal to 8 m²/person then it categorised as not dense, however if the area was less than 8 m²/person than it is dense (10). The data collected in this reasearch were analysed using univariate and bivariate methods and then searched the statistical test using chi square test. . If the p-value ≤ 0.05 then H_0 was rejected, suggesting a significant relationship between variables. Meanwhile, if p-value > 0.05 then H_a was rejected, suggesting no significant relationship between variables.

RESULTS

According to Table I which shows the results of research conducted on grade I, II and III Mentokok elementary school students, there were 30 students (65.2%) who were positive and 16 students who were negative (34.8%) for pediculosis capitis.

Table I : Pediculosis Capitis Infestation of Mentokok Elementary School, West Praya, Central Lombok

Pediculosis Capitis	Number (n)	Percentage (%)
Positive	30	65,2%
Negative	16	34,8%
Total	46	100%

Table II shows that from 46 respondents aged 6-7 years, 19 people (41.3%) were positive and 5 people (10.9%) were negative for pediculosis capitis. Meanwhile, among respondents aged 8-9 year, 11 respondents (23.9%) were positive and 11 (23.9%) were negative for pediculosis capitis. Among male respondents 4 people (8.7%) were positive and 13 people (28.3%) were negative for pediculosis capitis. Among Female respondents 26 people (56.5%) were positive and 3 (6.5%) were negative for pediculosis capitis. Table II also be shows that among respondents with good personal hygiene, 4 people (8.7%) were positive and 7 people (15.2%) were negative for pediculosis capitis. Meanwhile, among respondents with poor personal hygiene, 26 (56.5%) were positive and 9 (19.6%) were negative for pediculosis capitis. Among respondents who had dense residence, 16 people (34.8%) were positive and 3 people (6.5%) were negative for pediculosis capitis. Among respondents who had a sparse residence, 14 (30.4%) were positive and 13 people (28.3%) were negative for pediculosis capitis.

Table II: Pediculosis Capitis Infestation of Mentokok Elementary School, West Praya, Central Lombok Based on Research Variable

Variable	Incidence of Pediculosis capitis			
	Positive		Negative	
	Number (n)	Percentage (%)	Number (n)	Percentage (%)
Age				
6-7 year	19	41,3%	5	10,9%
8-9 year	11	23,9%	11	23,9%
Sex				
Male	4	8,7%	13	28,3%
Female	26	56,5%	3	6,5 %
Personal Hygiene				
Good	4	8,7 %	7	15,2%
Poor	26	56,5%	9	19,6%
Residential density				
Dense	16	34,8%	3	6,5%
Sparse	14	30,4%	13	28,3%

According to Table III which shows results of statistical analysis using the Chi-square test, there was a significant association between age and the incidence of pediculosis capitis with p-value of 0.038 ($p < 0.05$) and there was a significant association between gender and the incidence of pediculosis capitis with a p-value of 0.000 ($p < 0,05$). In addition, there was a significant association between personal hygiene and the incidence of pediculosis capitis with a p-value of 0.021 ($p < 0.05$) and there was a significant association between residential density and the incidence of pediculosis capitis with p-value of 0.023 ($p < 0.05$). Results of statistical analysis showed that H_a was accepted and H_0 was rejected, suggesting that there was a significant association in each variable.

Table III : Results of Chisquare test

Variable	P Value
Individual Characteristic	
Age	0.038
Sex	0.000
Personal Hygiene	0.021
Residential Density	0.023

DISCUSSION

Based on the results of this involving 46 respondents, it was found that there was a significant association between age and the incidence of

pediculosis. In the results of this study, the majority of people with pediculosis capitis were aged 6-7 years. This is in line with research by Caunahan (2004) which states that the most prevalence occurs at <7 years old (11). This happens because the Pediculosis infestation depends on the level of awareness of the respondent to keep it clean (11). This also occurs because age is closely related to the experience and information obtained by a person so that age is related to how well a person perceives, experiences, and thought patterns. Age-related behavior is thought to be the cause of pediculosis (12).

Then there was a significant association between gender and the incidence of pediculosis capitis in students of Mentokok Elementary School. This is due to the difference in hair length between men and women so that the possibility of *Pediculus humanus var. capitis* can live and reproduce in long hair (13). This study is also in line with the results of Nurlatifah's (2017) study that there is a significant association between gender and the incidence of pediculosis capitis (13). Based on the observations of researchers, female students of Mentokok Elementary School prefer to let their hair loose without being tied. The habit of girls is also to have more frequent contact, enjoy playing and sleeping together with friends or relatives. This may provide a transmission route for pediculosis capitis infestation. Meanwhile, boys made contact while playing less often than girls. This study is also in line with the results of the study (Zulinda et al 2010) that the percentage of incidence of pediculosis capitis was found more in women (77.1%) than men (8.2%) (1).

There is a significant association between personal hygiene and the incidence of pediculosis capitis in students of Mentokok Elementary School. This is because students of Mentokok Elementary School still have bad personal hygiene habits. This can be seen from the results of the questionnaire which showed that there were several behaviors of students of Mentokok Elementary School students who rarely wash their hair, the habit of exchanging objects or accessories, sleeping together, and a lack of awareness of the importance of personal hygiene so that pediculosis infestation has increased. This is in line with the research of (Anifah et al. 2018) that there is a significant association between personal hygiene and the incidence of pediculosis capitis (14). Personal Hygiene management is very important, especially for children, including the ability to look after themselves and maintain physical health. Children need to be trained to be able to take care of themselves and keep them clean. Maintaining personal hygiene directly or indirectly is one of the best ways to prevent pediculosis (14).

Based on the results of chi square test, there was a significant association between residential density and the incidence of pediculosis capitis in students of Mentokok Elementary School. This was in accordance with the theory by Kamiabi (2005) that residential density is one of the causal factors for pediculosis capitis (4). Based on the observations of authors, many houses where students of Mentokok Elementary School lived did not meet standard requirement of environmental sanitation. This was indicated by the measurement of the area surrounding their house which showed many dense settlement ($<8 \text{ m}^2/\text{person}$). In addition, the distance among houses of students of Mentokok Elementary School is extremely close, leading to an assumption that the residential density causes an increase in room temperature which increases humidity and facilitates the spread of pediculosis capitis. Occupant density of a house will increase the room temperature due to the release of body heat which will increase humidity due to water vapor (15). The greater number of residents in the house will lead to the faster pollution process of the indoor air, both gas and microbial pollution (15). Lack of knowledge and high costs for building a healthy house can lead to overcrowding, in addition to cultural factors in the Mentokok community that one house is usually occupied by more than 2 family heads (KK).

In addition, from the results of the house area measurement of all 46 respondents' houses by authors, there were 19 (41.3%) houses which did not meet the requirements because the results showed that the house area was merely $8 \text{ m}^2/\text{person}$. Based on the Decree of Health Ministry of Republic Indonesia No. 829 / Menkes / SK / VII / 1999 about the proper size of house, minimum bedroom area is $8 \text{ m}^2/\text{person}$ (10). This residential density causes an increase in room temperature, thus facilitating the transmission of pediculosis capitis. In addition, the number of residents in a dense house will also result in decreased O_2 levels in the room followed by an increase in room CO_2 . The impact of an increase in indoor CO_2 is a decrease in indoor air quality which allows microorganisms to rapidly multiply. Therefore, house with small size and dense number of occupants will increase the likelihood of disease transmission through droplets and direct contact (15).

CONCLUSION

Based on the results of this study, it can be concluded that there was an association between individual characteristics, personal hygiene and environmental sanitation to the incidence of capitis pediculosis in students of Mentokok Elementary School, West Praya, Central Lombok.

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