

The Relationship Between Personal Hygiene Knowledge and the Incidence of *Pediculosis capitis* Among Female Students at the Islamic Boarding School X in Pati

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Abstract

Background: Personal hygiene is a key factor in preventing infectious diseases such as *Pediculosis capitis*, which commonly occurs in Islamic boarding schools due to close social interactions and shared facilities. **Objective:** This study aimed to determine the relationship between knowledge of personal hygiene and the incidence of *Pediculosis capitis* among female students at X Pati Islamic Boarding School. **Methods:** A quantitative analytical survey with a cross-sectional design was conducted on 84 female students using total sampling, with data collected via questionnaires and analyzed using the chi-square test ($\alpha = 0.05$). **Results:** The study revealed that 63.1% of students had experienced *Pediculosis capitis* within the past year, and 53.6% exhibited poor knowledge of personal hygiene. Statistical analysis showed a significant relationship between knowledge of personal hygiene and the incidence of *Pediculosis capitis* ($p = 0.001$). Students with poor hygiene knowledge were more than twice as likely to be infested compared to those with good hygiene knowledge. The main contributing factor identified was the habit of sharing bedding and personal items with infected peers. **Conclusion:** Poor knowledge of personal hygiene significantly increases the risk of *Pediculosis capitis*, emphasizing the need for targeted health education and improved hygiene practices in Islamic boarding schools.

Keywords: Knowledge; Personal hygiene; *Pediculosis capitis*.

Introduction

When someone talks about *personal hygiene*, they will be talking about the things they do for themselves to keep their body and mind healthy. In Greek, "Personal" means "character" and "hygiene" means "fitness," as said by Tarwoto and Wartonah. Maintaining the physical and mental health of oneself and others requires good attention to *Personal hygiene*. This includes the vaginal area, scalp, eyes, nose, ears, nails, skin, and arms and legs are all part of it. Therefore, maintaining *personal hygiene* is important to prevent the transmission of infections, skin diseases and germs. In order to avoid diseases, it is necessary

to maintain good personal hygiene, including washing hands, nails, genitals, and feet. One of the main factors in the spread of infection is the lack of personal hygiene practiced by individuals.

Globally, about 19% of deaths from infectious diseases can be attributed to unhygienic behavior¹. Children who do not maintain good *personal hygiene* are more likely to be affected by diseases related to health and sanitation, such as viral infections such as diarrhea, Acute Respiratory Infections (ARI), Dengue Hemorrhagic Fever (DHF)². Sanitation is very significant and must be considered. Therefore, *personal hygiene* is one of the most

important steps that must be taken to prevent the spread of infections and skin disorders, as well as the entry of bacteria. *Personal hygiene* is an effort to maintain thorough personal hygiene to prevent disease³. A key component that makes it easier for infections to enter the limbs is poor *Personal hygiene*⁴.

Knowledge can change a person's situation and attitude for the better and be more positive. A person's knowledge can also be influenced by several factors such as education⁵. So a lack of access to education can hinder knowledge of one's personal hygiene⁶. In addition, low socioeconomic status experiences barriers in access to adequate health services and health education⁷. Low socioeconomic position, poor *personal hygiene*, residential density, inadequate health facilities and poor education make one of the risk factors for increasing cases of *Pediculosis capitis*⁸. Strong understanding is closely related to individual behavior, if you want to have good knowledge, it must be accompanied by appropriate behavior⁹. Cleanliness of public facilities and access to clean water greatly affect *personal hygiene* in boarding schools¹⁰. This is one of the factors that often does not meet the standards¹¹.

Ectoparasitic infection known as *Pediculosis capitis* is common worldwide. The incidence of lice infections has increased at some point in the 1970s, with estimates ranging from 0% in developed countries to 78.6% in other countries¹². Infection with *Pediculus humanus var. Capitis* led to the spread of *Pediculosis capitis* worldwide¹³. Parasitic *Pediculosis capitis* affects many humans¹⁴. *Pediculosis humanus var. capitis*, like other blood-sucking insects, sucks human blood by biting the scalp. *Pediculosis capitis* requires a diet of human blood every 4-5 hours a day. The parasite's saliva is aggressive, leading to an expansion of symptoms and signs that include pruritus and eczematous changes¹⁵.

The ectoparasite *Pediculosis capitis*, often

called head lice, is the cause of *Pediculus capitis*. The skeleton of this arthropod is oval and dorsoventrally flattened may be 1-3 mm long with 3 sets of legs. This louse has a grayish hue. The head is characterized by a piercing-sucking mouthpart, antennae, and 2 eyes. The simplest way for head lice to pass from 1 host to another is through close personal contact between the heads of infected people¹⁶. Lice infections can also cause anemia and iron deficiency¹⁷. The low severity of *Pediculosis capitis* is often overlooked, particularly in developing countries. This will lead to adverse effects, such as anemia.

Anemia is one of the many signs and symptoms that can develop in people suffering from *Pediculosis capitis*. Head lice are usually harmless, but their presence throughout the body can be painful. Head lice also cause itchy, scaly, reddened skin, swollen eyes, or even fever¹⁸.

Pediculosis capitis can also distract child while studying leading to poor learning performance and feelings of embarrassment, fear, and pain¹⁶. In addition to causing sleep problems, itching, pain, and secondary bacterial infections such as impetigo and acute glomerulonephritis, *Pediculosis capitis* can also result in lymphadenopathy¹⁹. Persistent pruritus of the scalp, caused by parasites, can be very annoying²⁰. Itching is a common sign of lice. Itchy skin may be caused by too much scratching²¹. Scalp ringworm and other similar problems can also become much worse at the same time as this inflammation allows germs to more easily enter the scalp and cause serious infections²². This condition is often experienced by children aged 3 to 12 years old, reducing the quality of human life. A person over the age of 15 can still experience *Pediculosis capitis*, although it is not as common as in younger people (under 15 years old). The prevalence of *Pediculosis capitis* in girls is higher than boys²³.

The initial survey of some santriwati did not understand about *Personal hygiene* knowledge and almost all santriwati had suffered from *Pediculosis capitis* in the last 1 year. Female students often suffer from *Pediculosis capitis* due to their long hair and regular use of hijab. Santris in dormitories are more likely to sleep in a closed room with their heads touching each other, which can also lead to the rapid spread of *Pediculosis capitis*. The pesantren management promised to transfer sick santris to the nearest hospital outside the pesantren if they are sick.

However, there are still no teaching materials that can increase adolescent health attention and prevention²⁴. *Pediculosis capitis* prevention efforts need to prioritize the delivery of information. The data can be obtained directly or indirectly²⁵. Based on research conducted at Pondok Pesantren X in West Jakarta, it was found that *Pediculosis capitis* was strongly influenced by the level of *personal hygiene* of female students due to hair contact between one child and another²⁶.

Pediculosis capitis is a health problem that often occurs in environments with high levels of social interaction, such as Islamic boarding schools. The high prevalence of *Pediculosis capitis* among female students indicates that there is still a gap in the understanding and application of *Personal hygiene*. This study is important because there is still a lack of studies that specifically highlight the relationship between the level of knowledge of *Personal hygiene* and the incidence of *Pediculosis capitis* in the pesantren environment. In addition, previous studies have focused more on environmental hygiene and sanitation factors without exploring the role of individual knowledge in disease prevention. Thus, this study offers a new perspective on how santriwati's level of understanding of *Personal hygiene* can contribute to the risk of *Pediculosis capitis* infection.

Based on the background that has been described, this study aims to answer several main questions: (1) To what extent is the level of knowledge of *personal hygiene* of santriwati in Pondok Pesantren X?, (2) Is there a significant relationship between the level of knowledge of *personal hygiene* and the incidence of *pediculosis capitis* among santriwati?, (3) What factors contribute to the relationship between knowledge of *personal hygiene* and the incidence of *pediculosis capitis* among santriwati?

Based on the description that has been conveyed in the background above, the researcher will examine "The relationship between *personal hygiene* knowledge and the incidence of *Pediculosis capitis* in female students of Pondok Pesantren X" to be studied.

Materials and Methods

Research Design

This research employed a quantitative analytic survey method with a cross-sectional design. The study was conducted at Pesantren X over a period of one month. This design was chosen to analyze the relationship between knowledge of *personal hygiene* and the incidence of *Pediculosis capitis* in female students within a specific timeframe.

Population and Sample

The study population included all female students (*santri putri*) at Pesantren X. A total of 84 respondents were selected using the total sampling technique. Inclusion criteria consisted of: (1) students who had lived at Pesantren X for at least one year, and (2) students who provided informed consent to participate. Exclusion criteria included students who were absent during the study or unwilling to participate. The sample was considered representative of the overall student population, providing adequate coverage for statistical analysis.

Data Collection Techniques

Primary data were collected through a structured questionnaire distributed via Google Forms. The questionnaire contained 32 dichotomous (yes/no) items, which assessed the incidence of *Pediculosis capitis* and knowledge of personal hygiene. Secondary data, such as student demographic profiles, were obtained from school records. Before use, the questionnaire underwent validity and reliability testing involving 35 female students from another Islamic boarding school in Pati Regency.

Data Analysis Techniques

Data were analyzed in two stages. Univariate analysis was performed to describe respondents' characteristics, including age and class level. Bivariate analysis was conducted to examine the relationship between knowledge of personal hygiene and the incidence of *Pediculosis capitis*, using the Chi-square test with a significance level of 0.05.

Ethical Considerations

This study adhered to ethical principles by ensuring respect for participants' rights, dignity, and confidentiality. Prior to data collection, all participants were informed about the research objectives, procedures, benefits, and potential risks. Written informed consent was obtained from each respondent. Participation was voluntary, and respondents retained the right to withdraw at any time without consequence. Confidentiality of data was strictly maintained, and results were used solely for research purposes. Ethical approval for this study was obtained from the Health Research Ethics Committee, Faculty of Medicine, Muhammadiyah University of Surakarta with approval number 5434/B.1/KEPK-FKUMS/XII/2024.

Results

The purpose of this study was to determine whether there is a correlation between the prevalence of *pediculosis capitis* in female students at Pondok Pesantren X using their level of *personal hygiene* focus. To achieve this goal, 84 female students were selected as the research sample and then given a direct survey. Here is some information about the people who filled out the survey for this study:

Table 1. Univariat Analysis

No	Name	F	%
1.	Age		
	13	26	31.1
	14	28	33.3
	15	30	35.7
	Total	84	100
2.	Knowledge		
	Less	45	53.6
	Good	39	46.4
	Total	84	100
3.	Incidence of <i>Pediculosis capitis</i>		
	Negative	31	36.9
	Positive	53	63.1
	Total	84	100

Based on Table 1, the majority data showed that 63.1% of respondents had experienced *Pediculosis capitis* in the last 1 year, while 53.6% of respondents had insufficient knowledge about *Pediculosis capitis*. The age of the majority of respondents was 15 years old (35.7%). This study focused on a group of female students in an Islamic Boarding School who have risk factors for the incidence of *Pediculosis capitis*, as evidenced by the fact that all respondents were female. The study findings showed that the respondents' level of knowledge about *Pediculosis capitis* varied.

The table 2 informs that knowledge of *personal hygiene* is associated with a lower risk of developing *pediculosis capitis*. *Pediculosis capitis* had been experienced by respondents (82.1%) in the past 365 days, and most respondents (63.1%) had strong knowledge about the problem. Among the female students

at Pondok Pesantren X, there was a significant correlation between knowledge of *personal hygiene* and the incidence of *pediculosis capitis*, as evidenced through the *chi-square* test assessment with a P value of $0.001 < 0.05$. It is clear that the lack of personal hygiene of these female students has played a role in the incidence of *Pediculosis capitis* that occurred in the past 1 year.

Table 2. Distribution of the Relationship between *Personal Hygiene Knowledge* and the Incidence of *Pediculosis Capitis*

Knowl edge	Incidence of <i>Pediculosis capitis</i>				Total		<i>p-value</i>
	Positive		Negative		N	%	
	N	%	N	%			
Less	21	46.7	24	53.3	45	100	0.001
Good	32	82.1	7	17.9	39	100	
Total	53.0	63.1	31.0	36.9	84	100	

Discussion

The frequency distribution of respondents showed the age, knowledge level and incidence of scalp pediculosis. Regarding age, the majority of respondents (33.3%) were 14 years old, followed by those aged 15 (35.7%) and 13 (31.1%). As for knowledge about pediculosis, 53.6% of respondents had inadequate knowledge, while 46.4% had good knowledge.

Personal hygiene is an effort to maintain individual hygiene and health so that one's physical and psychological health is good²⁷. Finally, regarding the occurrence of *Pediculosis capitis*, 63.1% of respondents tested positive for having experienced *Pediculosis capitis* in the past 1 year, compared to 36.9% negative.

The prevalence of *Pediculosis capitis* in Indonesia itself has been identified through several studies that have been conducted previously. In a previous study at Fadlun Minallah Islamic Boarding School in Bantul Yogyakarta, the prevalence rate was 93.9%, while at Darul Mujahadah Islamic Boarding

School in Semarang, the lice infection rate was 96%²⁸. A study conducted by Merarry²⁹ showed the prevalence rate of *Pediculosis capitis* in 4 orphanages in Palangkaraya city was 52.6%. There were 5.7% cases of *Pediculosis capitis* reported in elementary school children in West Sumatra in 2023³⁰, while in the city of Surakarta the cases of *Pediculosis capitis* found were 38%³¹.

The high incidence of *Pediculosis capitis* was associated with *personal hygiene* variables as well as the impact of season, age, socioeconomic position, hair length, housing, and parental education³². Based on the result of the study, the age distribution that most experienced *Pediculosis capitis* was 14 years old, and the age distribution with good knowledge was at the age of 15 years. These data indicate a significant prevalence of scalp pediculosis among the study population, and a significant proportion of respondents with inadequate knowledge of the disease.

A more in-depth statistical analysis, such as the *Chi-two square* test, could be conducted to determine if there is a significant association between age, knowledge level and the occurrence of scalp pediculosis. In addition, such analysis could explore potential risk factors related to the prevalence of the disease. The study could also test the effectiveness of educational interventions to increase knowledge about scalp pediculosis and reduce its prevalence. Finally, it would be relevant to study the correlation between knowledge level and disease prevalence. For more robust findings, it would be possible to obtain more conclusive results.

Based on the interviews with the 3 santri, these findings support the idea that a lack of knowledge about personal hygiene, particularly with regard to hair and environmental hygiene, may increase the likelihood of *Pediculosis capitis*. Direct contact with sick people or the use of contaminated personal items, including

combs, headscarves, pillows and towels, can spread the disease known as *Pediculosis capitis*.

Low levels of knowledge about personal hygiene may also result in less than ideal hygiene habits, such as sharing personal equipment, not washing hair frequently, and not knowing how to stop the spread of head lice. Furthermore, the high prevalence of *Pediculosis capitis* can also be attributed to the environmental conditions of boarding schools, which usually have high levels of social interaction and inadequate hygienic facilities. Living in a dormitory with many female students increases the possibility of direct physical contact and sharing of personal items, which makes *Pediculosis capitis* easier to spread from person to person.

The findings of this study further emphasize the importance of health education for schoolgirls' personal hygiene and prevention of *Pediculosis capitis*. Regular health education programs, access to hygienic facilities, and observation of schoolgirls' hygiene practices are examples of intervention activities that can be implemented. The high prevalence of *Pediculosis capitis* in Pesantren X is closely related to the low level of personal hygiene awareness. Therefore, preventive measures and teaching are needed to improve schoolgirls' understanding of the importance of maintaining personal hygiene, particularly with regard to hair care and avoiding behaviors that increase the risk of head lice infection.

The relationship between *personal hygiene* knowledge and the incidence of *pediculosis capitis*. The statistical test results state that the *p-value* is 0.001, thus, there is a significant relationship between *personal hygiene* knowledge and the incidence of *pediculosis capitis* in female students. The results of this study are due to the majority of santriwati have poor *personal hygiene*, and from the results of the research on *Pediculosis capitis* cases, many

santriwati have experienced *Pediculosis capitis* because santriwati sleep together with people who suffer from *Pediculosis capitis*. Other findings that are not in line with this study are¹⁸ Kurniasari, which obtained a *p-value* of 0.708 > 0.05, this states that there is no significant relationship between *Personal hygiene* and *Pediculosis capitis*.

This is in line with the incident from Rosdiana³³ which demonstrated female students at Binaul Ummah Islamic Boarding School, Bantul. This *p-value* is less than 0.05, which states that there is a statistically significant relationship between *Personal hygiene* knowledge and the incidence of *Pediculosis capitis*. More specifically, there was a significant difference between the group with poor personal hygiene knowledge and the group with good knowledge. In the group with poor knowledge, the percentage of *Pediculosis capitis* incidence (46.7%) was relatively high compared to the group with good knowledge (82.1%). This fact is a correlation factor between *Pediculosis capitis* and the loss of education on *Personal hygiene* practices. In the assessment, the superiority rate changed to a 17.9% decrease among people who had strong attention to *Personal hygiene*.

This is emphasized by the results of research conducted by Sari³⁴, which was conducted at Binaul Ummah Islamic Boarding School, Bantul, Yogyakarta stated that the results of bivariate analysis using the chi square test based on the *p value* <0.05, namely 0.034, so it can be concluded that there is a relationship between the level of knowledge and the incidence of *Pediculosis capitis* in female students of Binaul Ummah Islamic Boarding School. The results of the research conducted by researchers when the data collection process is based on the fact that santriwati at Binaul Ummah Islamic Boarding School already understand about *Pediculosis capitis* handling actions, but they still make a

habit of exchanging personal items with other santriwati such as exchanging headscarves, mukena, combs, and using bedding or pillows with other santriwati, this has been a habit since long among santriwati, while this behavior can develop the risk of indirect transmission of *Pediculosis capitis* between santriwati.

Furthermore, this study is also in line with Sulistyanningtyas³⁵ that there is a relationship between *personal hygiene* and the incidence of *pediculosis capitis* in students at the Al Yaqin Rembang Islamic Boarding School which is indicated by the results of a p-value of 0.0000 <0.05. In addition, research from Setyani³⁶ which obtained the results of *Chi-square* analysis conducted in 2021 showed a P-value of 0.033 (0.05) which indicates that there is a relationship between *personal hygiene* and the incidence of *pediculosis capitis* at the Rohmatul Qur'an Islamic Boarding School, Mejobo District, Kudus Regency.

This finding supports the hypothesis that good *personal hygiene* knowledge is negatively correlated with the incidence of *pediculosis capitis*. It is important to note that despite the significant association, further research is needed to assess other factors that may contribute to the incidence of *Pediculosis capitis*. Further analysis also needs to be done to determine the strength of the association and its implications in public health interventions for the prevention of *Pediculosis capitis*. In conclusion, these results highlight the importance of public health education on *personal hygiene* to reduce the incidence of *Pediculosis capitis*.

Knowledge of *Pediculosis capitis* and being aware of the disorder is an important factor in reducing its incidence, as shown through the results of the study. Nuns who are knowledgeable and aware of the problem are much more reluctant to engage in things that aggravate it. To encourage constructive behavior change, health education in pesantren

needs to be improved. Educating santri through various initiatives such as regular counseling, hygiene instructions, and informative posters will help them become more knowledgeable. Having sufficient knowledge allows them to identify the early signs of *pediculosis capitis* and immediately implement the necessary treatment or prevention strategies.

Practical skills to maintain environmental and personal hygiene should be prioritized over knowledge. For example, the correct process of washing hair, using the right hair care products, and checking for head lice regularly. In addition to helping the community, such activities also break the chain of transmission in the boarding school environment. An often overlooked but important component of personal hygiene for maintaining general health is the condition of the hair and scalp. Proper hair care practices, such as washing hair regularly, choosing the right hair care products, and checking for lice regularly, can be beneficial in preventing and treating *Pediculosis capitis*.

Health education is one of the processes to help create a policy based on understanding in order to promote and determine skills when maintaining health that cannot be known only by improving individual knowledge, attitudes and behaviors (practices), but also can improve and improve environmental conditions in order to encourage full health awareness³⁷. If this is true, then higher knowledge students should understand more than their lower knowledge peers.

The data obtained by students from specialized educational backgrounds tend to be the same, because they live close to each other and often interact in the same dormitory. Furthermore, in their dormitories, students from Islamic junior high schools (MTs) share rooms with each other from grades 7 to 9. *Pediculosis capitis* can also infect people living with inflamed people, regardless of the amount

of data that a particular student may have. Another concern is that some college students who have a certain amount of data may hesitate to use it in real life because they may be too used to the rigors of the dormitory. It is possible that some of the respondents' positive attitudes towards non-personal hygiene arose because of their previous testimonies of meeting such demands. Conversely, negative views must come from people who do not see the importance of fulfilling their non-personal hygiene needs. One of the variables that influence how people practice *Personal hygiene* is their mindset. A person's mindset expresses their sentiments, perceptions and tendency to act in a certain way. Maintaining good *Personal hygiene* can be done through a positive outlook. Health experts want to advise and teach people about the importance of *Personal hygiene* which will foster a positive attitude. We hope this will encourage people to practice *Personal hygiene*.

There are some respondents who have a good attitude towards *personal hygiene*. On the other hand, negative impacts on *personal hygiene* can result from respondents not understanding the importance of meeting these needs. Behavior, which forms one of the factors that can influence *personal hygiene* actions in individuals, consequently makes people more aware of *personal hygiene* and encourages them to have a positive attitude. With a good attitude, positive behavior in *personal hygiene* can also develop. To develop positive behaviors, education and guidance delivered by health workers on the importance of *personal hygiene* needed to create positive behaviors. I hope this will encourage people to practice *personal hygiene*.

Conclusion

The analysis shows that there is a significant relationship between *personal hygiene* knowledge and the incidence of *pediculosis*

capitis in female students. This is because the majority of female students do not perform *personal hygiene* appropriately, and from the results of the study, many cases of *pediculosis capitis* are due to santriwati sleeping together with people who suffer from *pediculosis capitis* (p-value = 0.001). Health education and counseling can help increase positive behavior towards *personal hygiene*. Therefore, to obtain more comprehensive information, future researchers are advised to use a larger sample size in their studies, in order to obtain larger data later.

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Conflict of Interest Statement

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