Association of sociodemographic, knowledge, attitude adn practice with pediculosis capitis

by Chairil Anwar29

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ASSOCIATION OF STUDENTS' SOCIODEMOGRAPHIC, KNOWLEDGE, ATTITUDE AND PRACTICE WITH PEDICULOSIS CAPITIS IN PONDOK PESANTREN TAHFIDZIL QUR'AN YAYASAN TIJAROTAL LAN TABUR PALEMBANG, INDONESIA

Linda Amelia[1], Chairil Anwar[2*], Wardiansah[3]

[1] Undergraduate Student, Faculty of Medicine, Universitas Sriwijaya

[2] Department of Parasitology, Faculty of Medicine, Universitas Sriwijaya

[3] Department of Anatomy, Faculty of Medicine, Universitas Sriwijaya

*Corresponding Author E-mail: chairil53@yahoo.co.id

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Abstract

Background

Pediculosis capitis is an infection of scalp and hair in humans caused by infestation of *Pediculus humanus capitis* and usually extends rapidly in a dense environment such as boarding schools.

Objective

The aim of this study was to determine the association of students' sociodemographic, knowledge, attitude and practice with pediculosis capitis in Pondok Pesantren Tahfidzil Qur'an Yayasan Tijarotal Lan Tabur Palembang.

Methods

The research was an analytical observational study with a *cross sectional* design conducted on November 2018. There were 117 samples that had the inclusion criteria and hadn't exclusion criteria. Data collected from anamnesis, questionnaires and hair examinations of respondents. The results were analyzed using *Chi-Square* and *Logistic Regression*.

Results

Out of 117 students, 57 students (48.7%) has been found positive pediculosis capitis. Statistical test showed that age (p<0.001), gender (p<0.001), education level (p<0.001), knowledge (p=0.035), attitude (p=0.003) and practice (p =0.043) have significant association to the prevalence of pediculosis capitis. However, there was no significant association between father's education (p=1.000), mother's education (p=0.743), father's job (p=0.314), mother's job (p=1.000) and parents' income (p=1.000) to the prevalence of pediculosis capitis. The results of Multiple Logistic Regression analysis showed that gender, knowledge and practice were the most influential factors to the prevalence of pediculosis capitis (p<0.05) with the probability of 96.7%.

Conclusion

There was a significant association between age, gender, education level, knowledge, attitude and practice to the prevalence of pediculosis capitis, and the most dominant variables were gender, knowledge and practice.

Keyword: *Pediculosis capitis, sociodemographic, knowledge-attitude-practice, boarding school*

Background

Pediculosis capitis is an infection of scalp and hair in humans caused by infestation of *Pediculus humanus capitis*. This infestation mainly affects young children and rapidly expanding in dense environments such as boarding schools and orphanages. The dominant initial symptoms are itching in the occiput and temporal areas and can extend to the entire head. The itching triggers the sufferer to scratch their head continuously so that erosion, excoriation and secondary infection can occur (pus and crust)[1].

Pediculosis capitis is endemic in both developing and developed countries and affect people of all socioeconomic backgrounds [2]. In Asia, prevalence varies from 0.7% to 59% and was higher in girls and women, in Europe 0.48% to 22.4%, in Africa 0% to 58.9%, in America 3.6% to 61.4% and in Australia 13% [3]. In Kloposawit Yogyakarta Elementary School, the prevalence of pediculosis capitis was 32.6% [4]. Head Lice infestations at Liga Dakwah Orphanages in West Sumatera was 58% [5]. Other studies state that at Pondok Pesantren Qodratullah Desa Langkan, Banyuasin, South Sumatra, there were 51.1% of students who positive pediculosis capitis [6]. In Palembang, Pondok Pesantren IGM Al Ihsaniyah Gandus, the prevalence of pediculosis capitis was 39.6% [7]. Pediculosis capitis often affects the students who living in boarding school because there are many factors that supporting the infestation [8]. This research provides information about the prevalence of pediculosis capitis in Pondok Pesantren Tahfidzil Quran Yayasan Tijarotal Lan Tabur Palembang and its association with student's sociodemographic, knowledge, attitude and practice.

Methods

This research was an analytic observational study with a cross sectional design. The study was conducted at Pondok Pesantren Tahfidzil Qur'an Yayasan Tijarotal Lan Tabur Palembang and Laboratory of Parasitology Medical Faculty of Universitas Sriwijaya from June to December 2018. The population was all students who lived in this boarding school. The sample was all students who lived in this boarding school that had the inclusion criteria and hadn't the exclusion criteria. The inclusion criteria were students who registered and lived in this boarding school and students who agreed to become respondents and filled out questionnaires completedly. The exclusion criteria were students who were not present at the time of the study and students who bald. This research used total sampling. The independent variables in this study included age, gender, education level, father's education level, mother's education level, father's job, mother's job, parents' income level, knowledge, attitude and practice. The dependent variable included prevalence of pediculosis capitis and the severity of the head lice infestation. The diagnosis of pediculosis capitis considered if at least one stage

of development of *Pediculus humanus* (eggs, nymphs and adult) found at their hair and scalp. The severity of the head lice infestation assessed based on the number of adult or nymph that found in the respondent's hair: mild (≤ 9 adults or nymphs) and moderate (10-24 adult or nymphs) [9].

Results

There were 123 students, consisting of 65 male and 58 female. This place was a boarding school for learned and memorized Al-Qur'an (*Tahfidz Qur'an*), so that all students attend school outside the boarding school, where every students went to school in different places. The male dormitory had 3 large rooms with each room occupied by ± 20 people. The female dormitory had 8 rooms with each room occupied by 7-8 people. Each dormitory had a small kitchen, bathroom and clothes drying area that was used together. The number of samples in this study was 117 respondents.

Table 1 shows the respondents had an age range of 10-22 years old old with the most respondents aged 14 years old (15.4%). There were 49.6% of female and more in junior high school/MTs/ equivalent (53.0%). Most of the father's education level was low (82.1%), mother's education level was low (80.3%), employed father (92.3%), unemployed mother/housewife (73.5%) and parents's income was low (85.5%). More respondents have less knowledge (87.2%), good attitude (82.1%) and less practice (69.2%). Of the 117 respondents studied there were 57 people (48.7%) who positive pediculosis capitis.

Table 1. Distribution of Characteristics Respondents with Pediculosis Capitis

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Characteristics of Respondents	N	%
Age (years old)		
10	2	1.7
11	3	2.6
12	16	13.7
13	16	13.7
14	18	15.4
15	15	12.8
16	14	12.0
17	16	13.7
18	7	6.0
19	4	3.4
20	1	0.9
21	1	0.9
22	4	3.4
Gender		
Female	58	49.6
Male	59	50.4
Education Level		
Junior High School	62	53.0
Senior High School	55	47.0
Father's Education Level		
Low	96	82.1
Middle-High	21	17.9
Mother's Education Level		
Low	94	80.3
Middle-High	23	19.7
Father's Job		
Unemployed	9	7.7
Employed	108	92.3
Mother's Job		
Unemployed/Housewife	86	73.5
Employed	31	26.5
Parent's Income Level		
Low	100	85.5
Enough	17	14.5
Kowledge		
Low	102	87.2
Good	15	2.8
Attitude		
Low	21	7.9
Good	96	82.1
Practice		
Low	81	69.2
Good	36	30.8
Pediculosis Capitis		
Positive	57	48.7
Negative	60	51.3
Total	**117**	**100.0**

Table 2. Distribution of Characteristics of Respondents with Severity of The Head Lice Infestation

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Characteristics of Respondents	N	%
Age (years old)		
10	2	3.5
11	2	3.5
12	12	21.1
13	13	22.8
14	10	17.5
15	8	14.0
16	1	1.8
17	6	10.5
18	3	5.3
Gender		
Female	52	91.2
Male	5	8.8
Education Level		
Junior High School	43	75.4
Senior High School	14	24.6
Father's Education Level		
Low	47	82.5
Middle-High	10	17.5
Mother's Education Level		
Low	47	82.5
Middle-High	10	17.5
Father's Job		
Unemployed	6	10.5
Employed	51	89.5
Mother's Job		
Unemployed/Housewife	42	73.7
Employed	15	26.3
Parent's Income Level		
Low	49	86.0
Enough	8	14.0
Kowledge		
Low	54	94.7
Good	3	5.3
Attitude		
Low	17	29.8
Good	40	70.2
Practice		
Low	45	78.9
Good	12	21.1
Severity of The Head Lice Infestation		
Moderate	3	5.3
Mild	54	94.7
Total	**117**	**100.0**

In Table 2 the respondents had a age range of 10-18 years old with the most respondents aged 13 years old (22.8%). There were 91.2% of female and more were in junior high school/MTs/equivalent (75.4%). Most of the father's education level was low (82.5%), mother's education level was low (82.5%), employed father (89.5%), unemployed mother/housewife (73.7%)

and parent's income was low (86.0%), less of knowledge (94.7%), good attitude (70.2%) and less of practice (78.9%). Of the 57 respondents studied there were 3 people (5.3%) with moderate severity and 54 people (94.7%) with mild severity.

Table 3. Bivariate Analysis of Factors Associated with Pediculosis Capitis

Variabel	Pediculosis Capitis (+) N	(+) %	(-) N	(-) %	*p*	PR	95% CI
Age							
≤ 15 years old	47	67.1	23	32.9	< 0.001	3,2	1.8-5.6
> 15 years old	10	21.3	37	78.7			
Gender							
Female	52	89.7	6	10.3	< 0.001	10.6	4.5-24.6
Male	5	8.5	54	91.5			
Education Level							
Junior High School	43	69.4	19	30.6	< 0.001	2.7	1.7-4.4
Senior High School	14	25.5	41	74.5			
Father's Education Level							
Low	47	49.0	49	51.0	1.000	1.03	0.6-1.7
Middle-High	10	47.6	11	52.4			
Mother's Education Level							
Low	47	50.0	47	50.0	0.743	1.15	0.7-2
Middle-High	10	43.5	13	56.5			
Father's Job							
Unemployed	6	66.7	3	33.3	0.314	1.4	0.8-2.3
Employed	51	47.2	57	52.8			
Mother's Job							
Unemployed/Housewife	42	48.8	44	51.2	1.000	1.009	0.7-1.5
Employed	15	48.4	16	51.6			
Parent's Income Level							
Low	49	49.0	51	51.0	1.000	1.04	0.6-1.8
Enough	8	47.1	9	52.9			
Kowledge							
Low	54	52.9	48	47.1	0.035	2.6	0.9-7.4
Good	3	20.0	12	80.0			
Attitude							
Low	17	81.0	4	19.0	0.003	1.9	1.4-2.7
Good	40	41.7	56	58.3			
Practice							
Low	45	55.6	36	44.4	0.043	1.6	1.01- 2.7
Good	12	33.3	24	66.7			
Total	**57**	**48.7**	**60**	**51.3**			

In Table 3 showed that Pediculosis capitis was higher on students aged ≤ 15 years old (67.1%), female (89.7%), junior high school/ MTs/equivalent level (69.4%), low father's education (49.0%), low mother's education (50.0%), unemployed father (66.7%), unemployed mother (48.8%), low parent's income (49, 0%), less of knowledge (52.9%), attitude (81.0%) and practice (55.6%). From the results of the Chi-Square, there were a significant association between age (p<0.001, PR 3.2), gender (p<0.001, PR 10.6), education level (p<0.001, PR 2.7), knowledge (p=0.035, PR 2.6), attitude

(*p*=0.003, PR 1.9) and practice (*p*=0.043, PR 1.6) with pediculosis capitis. However, there were no significant association between father's education level (*p*=1,000, PR 1.03), mother's education level (*p*=0.743, PR 1.15), father's job (*p*=0.314, PR 1.4), mother's job (*p*=1,000, PR 1,009) and parent's income (*p*=1,000, PR 1.04) with pediculosis capitis. Students age ≤15 years old (3.2 times), female (10.6 times), junior high school (2.7 times), less of knowledge (2.6 times), attitude (1.9 times) and practice (1.6 times) had higher risk of pediculosis capitis than students age >15 years old, male, senior high school/MA/equivalent, good knowledge, attitude and practice.

Table 4. Bivariate Analysis Factors Associated with Severity of The Head Lice Infestation

Variabel	Severity of The Head Lice Infestation				*p*	PR	95% CI
	Moderate		Mild				
	N	%	N	%			
Age							
≤ 13 years old	2	6.9	27	93.1	1.000	1.9	0.18-20.11
> 13 years old	1	3.6	27	96.4			
Gender							
Female	3	5.8	49	94.2	1.000	-	-
Male	0	0.0	5	100			
Education Level							
Junior High School	3	7.0	40	93.0	0.568	-	-
Senior High School	0	0.0	14	100			
Father's Education Level							
Low	2	4.3	45	95.7	0.446	0.4	0.043-4.25
Middle-High	1	10.0	9	90.0			
Mother's Education Level							
Low	2	4.3	45	95.7	0.446	0.4	0.043-4.25
Middle-High	1	10.0	9	90.0			
Father's Job							
Unemployed	0	0.0	6	100	1.000	-	-
Employed	3	5.9	48	94.1			
Mother's Job							
Unemployed/Housewife	3	7.1	39	92.9	0.559	-	-
Employed	0	0.0	15	100			
Parent's Income Level							
Low	3	6.1	46	93.9	1.000	-	-
Enough	0	0.0	8	100			
Knowledge							
Low	3	5.6	51	94.4	1.000	-	-
Good	0	0.0	3	100			
Attitude							
Low	3	5.6	51	94.4	0.209	-	-
Good	0	0.0	3	100			
Practice							
Low	3	6.7	42	93.3	1.000	-	-
Good	0	0.0	12	100			
Total	**3**	**5.3**	**54**	**94.7**			

In Table 4 showed that of the 57 students that positive pediculosis capitis were aged ≤ 13 years old (6.9%), female (5.8%), junior high school/MTs/equivalent (7.0%), father's education in medium-high level (10.0%), mother's education in medium-high level (10.0%), employed father (5.9%), unemployed mother (7.1%), low parent's income (6.1%), also less of knowledge (5.6%), attitude (5.6%) and practice (6.7%) suffered pediculosis capitis with moderate severity. Of the 57 students who were positive pediculosis capitis, there were fewer students with moderate severity (5.3%) than mild (94.7%).

From analysis using Chi-square, all the independent variables were not significant association (p>0.05) with the severity of the head lice infestation.

All variables in bivariate analysis that had p value <0.25 were entered into the logistic regression analysis, then simultaneously testing with the Enter method, the variables that had the highest p value would be excluded one by one from the analysis gradually and manually. The process would stop until no more variables could be excluded from the analysis.

Table 5. The Early Model of Logistic Regression with the Enter Method

Variabel	Coefficients	Exp (B)	*P*
Age	-18.091	0.000	0.997
Gender	-37.649	0.000	0.994
Education Level	-17.403	0.000	0.997
Knowledge	-19.667	0.000	0.996
Attitude	-19.004	0.000	0.996
Practice	-0.142	0.868	0.885
Constant	167.116	3.779E+72	0.994

Table 5 showed that the variables among age, gender, education level, knowledge, attitude and practice were simultaneously did not have significant influence to pediculosis capitis in Pondok Pesantren Tahfidzil Qur'an Yayasan Tijarotal Lan Tabur Palembang (p> 0.05). After eliminating all variables that had p value > 0.05, the final model was obtained as shown in Table 6.

Table 6. Final Model of Logistic Regression with the Enter Method

Variabel	Coefficients	Exp (B)	*P*
Gender	-5.183	0.006	0.000
Knowledge	-2.657	0.070	0.019
Practice	-1.920	0.147	0.028
Constant	13.139	508209.097	0.000

Table 6 showed that the most dominant variable influencing pediculosis capitis were gender, knowledge and practice (p<0.05). The male students who knowledgeable and well-behaved could prevented pediculosis capitis in Pondok Pesantren Tahfidzil Qur'an Yayasan Tijarotal Lan Tabur Palembang.

The logistic regression model with the formula $Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta iXi$, we would get Y = 3.379. The results of that model were included in the probability formula to predicted the magnitude of the influence of gender, knowledge and practice toward pediculosis capitis in Pondok Pesantren Tahfidzil Qur'an Yayasan Tijarotal Lan Tabur Palembang. With the probability formula $p = 1 / (1 + e\text{-}y)$, we would get p = 96.7%. Thus the female students who less knowledge and less practice had 96.7% probability to be affected pediculosis capitis, the remainder was due to other factors.

Discussion

The overall prevalence of pediculosis capitis in Pondok Pesantren Tahfidzil Qur'an Yayasan Tijarotal Lan Tabur Palembang was 48.7%. The results of this study is not much different from the research conducted by Karimah *et al*. (2016) in elementary school children in Jatinangor by 55.3% [10]. But Different to the results of research in elementary school children in South Jordan by Khamaiseh (2018) was 20.4% [11]. In another study by Assaedi *et al*. (2018) showed that the infestation was 64.2% [12]. The difference in the prevalence of pediculosis capitis in various studies can be caused by differences in risk factors at the place where the study was conducted.

Pediculosis capitis mainly affects the young and rapidly expanding to children in dense environments, for example in dormitories and orphanages [1]. Infestation of head lice occurs throughout the world and is most common in children between the ages of 3 and 12 [13]. This is due to behavioral factors in which children at a young age has direct physical contact more often with each other, so the rate of infestation will increase. Physical contact will decrease as children get older, so pediculosis capitis is less common at older ages [14]. Young children also have a lower level of knowledge than adults so they tend to have worse practice [15]. In this study, there was significant association between age and pediculosis capitis (p<0.001). Khamaiseh (2018) also found a significant association between age and pediculosis capitis with p value = 0.046 [11]. So was the study of Tohit *et al*. (2017) with p value = 0.001[16]. Whereas according to the results of Putri's research (2016), there was no significant association (p=0.08) [7]. The prevalence of pediculosis capitis was more in girls compared to boys. This is because girls usually have long hair and tend to be more intimate, allowing more frequent direct contact between hair-to-hair than boys [2]. In this study we found a significant association between gender and pediculosis capitis (p<0.001). Likewise with the results of

the study of Assaedi *et al*. (2018) which got *p*=0,000 [12]. Other results from Khamaiseh (2018) *p* = 0.012 [11].

According to Mubarak *et al*. (2012) the practice of a person or the public about the health determined by knowledge and attitude [17]. Poor knowledge about head lice infestation can increase the risk of pediculosis capitis [18]. Age and education level are factors that can affect the knowledge. The lower education level of a person, the more difficult it is for him to receive information and makes him less knowledge, so it will inhibit the development of his attitude towards the acceptance, information, and newly introduced values [19]. In this study, there was a significant association between education level with pediculosis capitis (*p*<0.001). In line with the research of Haghi *et al*. (2014) who agot *p* = 0.04 [20]. But different from Putri (2016) with *p* = 0.182 [7]. The results of this study also found a significant association between knowledge (*p*=0.035), attitude (*p*=0.003) and practice (*p*=0.043) with pediculosis capitis. The research from Kassiri and Esteghali (2016) showed that there was a significant association between knowledge and pediculosis capitis (*p*=0.005) [21]. While Anggraini *et al*. (2018) got *p* value = 0.126 [5].

In this study, there was no significant association between father's education level (p=1,000), mother's education level (*p*=0.743), father's job (*p*=0.314), mother's job (*p*=1,000) and parent's income level (*p*=1,000) with pediculosis capitis. Although it is usually associated with the lower income group, none of other income groups is spared. Head lice infestation is not limited to uneducated or poor strata. This can be caused by children from higher economic strata still being affected by infestations when they are in school. In addition, many parents work and leave their children with caregivers or at daycare facilities during the day. At that place the risk of transmission is high because children contact each other for long periods of time and almost every day. Head-to-head contact is the most important factor in the transmission of head lice infestation through various uses of infested items including combs, hats, scarves and pillows [16].

Kassiri and Esteghali (2016) showed that there were no significant association between father's education level (*p*=0.46), mother's education level (*p*=0.67) and mother's job (*p*=0.241) with pediculosis capitis, but there was a significant association between father's job with pediculosis capitis (*p*=0.009) [21]. This is also in line with Tohit's study (2017) which showed no significant association between father's education level (*p*=0.297) and mother's education level (*p*=0.431) with pediculosis capitis [16]. In contrast to research from Soleimani-Akhmadi *et al*. (2017) who obtained a significant association between father's (*p*=0.021) and mother's education level (*p*=0.032) with the infestation, but there was no significant association between father's job (*p*=0.89) and mother's job (*p*=0, 31) with head lice infestation [22]. According to Putri's study (2016) there was no significant association

between the parent's income level (p=0.791) with pediculosis capitis [7]. Whereas Abriyanti (2017) found a significant association (p=0.013) [6].

From the results of Chi-square, all the independent variables were found to have no significant association with the severity of head lice infestation because of the most respondents only found the nits when their hair examined. Based on anamnesis, we found the students had sweeping their hair by themselves with the comb 1-3 days prior this study held, so it could be another factor that could affect the number of adult or nymphs taken during the study.

Conclusion

The prevalence of pediculosis capitis in Pondok Pesantren Tahfidzil Qur'an Yayasan Tijarotal Lan Tabur Palembang was 48.7%. There were significant association between age, gender, education level, knowledge, attitude and practice with pediculosis capitis. However, there were no significant association between father's education level, mother's education level, father's job, mother's job and parent's income level with pediculosis capitis. Gender, knowledge and practice were the most dominant factors affecting the prevalence of pediculosis capitis in this boarding school.

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