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Haircare practice and dandruff problems among Indonesian medical students

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Abstract

Background: Dandruff is an understated hair and scalp problem that causes striking social and concentration issues among medical students. Haircare practice among them may or may not be related to the dandruff incident.

Methods: A cross-sectional study was conducted on 74 pre-clinical medical students at Atma Jaya Catholic University of Indonesia. Trained health staff assessed dandruff prevalence by physical examination, and the haircare practice was measured using a questionnaire. Bivariate analysis was utilized to assess the association between haircare practice and dandruff prevalence's.

Result: Among respondents, 85.1% of them have dandruff. Respondents who shampooed less than five times a week, combed their hair more than seven times a week, did not use hair care and styling products were associated with higher dandruff prevalence ($p < 0.05$). Anti-dandruff shampoo ($p = 0.466$) and the changing towels frequency ($p = 0.367$) were not significantly associated with dandruff.

Conclusion: There was a significant association between haircare practice and dandruff in medical students.

Keywords: dandruff, haircare practice, hair problem, medical students, scalp

Background

Dandruff is a scalp condition characterized by flaking of the stratum corneum, causing small white or gray flakes in hair and scalp, usually accompanied by itching. Dandruff is a mild form of seborrheic dermatitis because it does not show clinical inflammation and is limited to the scalp.¹ The social and psychological problems are more significant than health problems in people with dandruff. Dandruff can cause discomfort, embarrassment, and low self-confidence in sufferers.²

Dandruff is a chronic disorder, and sufferers usually experience repeated incidents.³ It affects nearly 50% of the world's population without races and genders predisposition.¹ Several factors influence dandruff, namely sebaceous gland

activity, *Malassezia*, and individual susceptibilities, such as immunological factors, emotional stress, nutritional factors, genetic factors, environmental factors, and haircare practice.^{4,5} Several studies have proven the association between hair care practice and dandruff incidence.^{6,7}

The researcher has searched Google Scholar and has not found any research on the association between haircare practice and dandruff among university students in Indonesia. Researcher searched by keywords: "*perilaku perawatan rambut*" or "haircare practice", "*ketombe*" or "dandruff", "*mahasiswa*" or "university students", and "Indonesia". The incidence of dandruff is high in the world's population, and dandruff can cause social and psychological problems for sufferers. Thus, the researchers are interested in conducting further research. Our study aimed to investigate the association between haircare practice, which

includes the frequency of using shampoo, the use of anti-dandruff shampoo, the frequency of changing towel, the frequency of combing the hair, and the use of hair care and styling products with dandruff, among students in School of Medicine and Health Sciences Atma Jaya Catholic University of Indonesia.

Methods

A cross-sectional study was conducted to assess dandruff and related haircare practice. Dandruff was set as a dependent variable, whereas haircare practice, consisting of the frequency of using shampoo, the use of anti-dandruff shampoo, the frequency of changing towels, the frequency of combing the hair, and the use of hair care and styling products, were set as independent variables. The ethical approval was issued by Atma Jaya Ethical Committee with approval number 07/01/KEP-FKUAJ/2020.

The study population was pre-clinical medical students in School of Medicine and Health Sciences Atma Jaya Catholic University of Indonesia. The inclusion criteria for this study were respondents who signed the written informed consent and were willing not to wash their hair for two days before the physical examination. They are allowed to use styling products, comb, and towel changing as usual. This study's exclusion criteria were students who suffer from other scalp diseases besides dandruff, immune system disorders, and stress. These factors could influence dandruff and interfere with the results of this study. Students who suffered from other scalp diseases and immune system disorders were identified by filling out the questionnaire, while students who experienced stress were identified by filling out the DASS (Depression Anxiety Stress Scales) test.⁸

Haircare practice was measured by filling out a self-reported questionnaire made by the author and validated by expert dermatologists. The questionnaire measured the frequency of using shampoo in one-week, anti-dandruff shampoo usage, the frequency of changing towels in one month, the frequency of combing hair in one week, and hair care and styling products usage, such as pomade and hair oil. Data categories of each group were obtained from median data.

Dandruff was identified by physical examination through inspection of white or gray scales on the respondent's scalp by the researcher and selected medical student, who had been trained by dermatovenereologists. During the examination, examiners were supervised by a dermato-venereologist. The

research data were statistically analyzed using R version 4.0.3 (R core team, 2020). The minimum sample size is 74. The frequency of using shampoo, frequency of changing towels, and frequency of combing the hair were obtained in numerical form from filling out the questionnaire, then categorized as nominal form based on the median data. Univariate analysis was performed to obtain respondents' characteristics. Bivariate analyses using Chi-square and Fisher's Exact test were performed to determine the association between haircare practice and dandruff.

Results

A total of 113 respondents aged 17-21 participated in our study. According to the inclusion and exclusion criteria, 39 respondents were excluded due to stress (n=36), immune system disorders (n=1), and suffer from other scalp disease (n=2). Of 74 eligible respondents, 63 (85.1%) had dandruff, whereas 11 (14.9%) did not. Table 1 shows the dandruff prevalence based on the characteristics of respondents. The prevalence of dandruff was slightly higher among females. Table 2 presents using shampoo <5 times per week, combing the hair ≥ 7 times per week, and not using hair care and styling products was significant association with dandruff. Using anti-dandruff shampoo and the frequency of changing towels were not significantly associated with dandruff ($p>0.05$).

Discussion

This study indicated that of 74 respondents aged 17-21 years, 85.1% experienced dandruff. This condition was consistent with the previous findings, which showed that dandruff increases at the age after puberty, when the sebaceous gland activity is the highest. According to epidemiologic study the highest prevalence of dandruff (21.6%) is in the age range of 15-24 years.^{1,9} Previous studies stated that dandruff was more prevalent in males because dandruff may be associated with androgens.^{4,10} However, the results of this study showed that female respondents experienced more dandruff (86%) than male respondents (83.3%), though the margin is not significant. There were more females in the medical student population. Hence, it could cause more female respondents that might interfere with this study's result. Previous research in India stated that dandruff was more common in women (61%) than

men (39%).² But, there was no further discussion about the prevalence of dandruff based on gender in the study.

Table 1. Dandruff Prevalence Based on Characteristics of Respondents of Pre-clinical Atma Jaya Medical Students in 2020 (N=74)

Characteristics	Dandruff				Total	
	Yes		No		n	%
	n	%	n	%		
Age (in year)						
17	3	100%	0	0%	3	100%
18	12	85.7%	2	14.3%	14	100%
19	26	86.7%	4	13.3%	30	100%
20	16	80%	4	20%	20	100%
21	6	85.7%	1	14.3%	7	100%
Gender						
Male	20	83.3%	4	16.7%	24	100%
Female	43	86%	7	14%	50	100%

Table 2. Association between Haircare Practice and Dandruff of Pre-clinical Atma Jaya Medical Students in 2020 (N=74)

Variable	Dandruff				Total		P-value
	Yes		No		n	%	
	n	%	n	%			
Frequency of using shampoo							
< 5 times per week	30	96.8%	1	3.2%	31	100%	0.016*
≥ 5 times per week	33	76.7%	10	23.3%	43	100%	
Using anti-dandruff shampoo							
Yes	16	88.9%	2	11.1%	18	100%	0.466
No	47	83.9%	9	16.1%	56	100%	
Frequency of changing towels							
< 4 times per month	6	100%	0	0%	6	100%	0.367
≥ 4 times per month	57	83.8%	11	16.2%	68	100%	
Frequency of combing the hair							
≥ 7 times per week	37	94.9%	2	5.1%	39	100%	0.013*
< 7 times per week	26	74.3%	9	25.7%	35	100%	
Using hair care and styling products							
Yes	19	73.1%	7	26.9%	26	100%	0.038
No	44	91.7%	4	8.3%	48	100%	

*Significant association with $p < 0.05$

This study showed that using shampoo less than 5 times per week was significantly associated with higher prevalence of dandruff ($p=0.016$). Our results were in agreement with a study by Karim *et al.* ($p<0.001$).⁶ Sebaceous lipids are one of the factors of dandruff. Infrequent use of shampoo causes a build-up of the metabolic products of *Malassezia*.¹¹ This can cause or worsen dandruff.¹²

The bivariate analysis showed no significant relationship between using anti-dandruff shampoo and dandruff ($p=0.466$). Several factors such as sebaceous gland activity, *Malassezia*, and individual susceptibilities could influence dandruff.^{4,5} Even though the respondents of this study had met the inclusion criteria (not suffering from immune disorders and were not experiencing stress), dandruff can be caused by other factors

that may interfere with this study's results. Previous studies have also revealed no significant relationship between using anti-dandruff shampoo and dandruff.^{7,13} However, there was no further discussion about the relationship in these studies.

Our study found that most respondents changed their towels at least once a week. Bivariate analysis showed no significant association between the frequency of changing towels and dandruff ($p=0.367$). The results obtained differed from a study in high school students which found a significant relationship between changing towel frequency and dandruff ($p<0.05$).⁷ Although there was no significant relationship in this study, all respondents who seldom changed their towels experienced dandruff.

Combing the hair more than 7 times per week was found to be significantly associated with dandruff ($p=0.013$). Our findings were similar to the research conducted in United Arab Emirates ($p\leq 0.001$).⁶ Hard combing or over-combing can cause minimal chronic irritation of the scalp and damage the epidermal barrier. The epidermal barrier is the outermost physical defence, and its damage results in an increase in the number of *Malassezia* in the scalp.^{5,14}

The bivariate analysis indicated a significant relationship between hair care and styling products such as pomade and hair oil with dandruff. ($p=0.038$). This study found that respondents who did not use hair care and styling products experienced more dandruff (91.7%) than those who used hair care and styling products (73.1%). Using pomade can make hair moist and increase *Malassezia* growth. The risk of dandruff can be prevented if pomade is used accordingly, namely using enough volume and washing hair after using pomade.¹⁵ This study also found that among respondents who used hair products, some of the pomades and hair oils had additional anti-dandruff ingredients such as lemon peel extract, *Mentha piperita* (peppermint) oil, *Aloe vera*, and jojoba oil.¹⁶⁻¹⁸ Nevertheless, this study could not determine the additional ingredients in hair care and styling products used by all respondents.

Conclusion

Based on the results of our study, there was a significant relationship between hair care practice, which includes the frequency of using shampoo, the frequency of combing the hair, and the use of hair care and styling products with dandruff in students at the School of Medicine and Health

Sciences Atma Jaya Catholic University of Indonesia.

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Author Contributions

JRW and LW designed the research idea. The data was collected by JRW and supervised by LW. The data was analysed by JRW. The manuscript was written by JRW, LW, YA, RR.

Conflict of Interests

The authors declared no conflict of interest.

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