



THE RELATIONSHIP BETWEEN SLEEP QUALITY AND ACNE SEVERITY (ACNE VULGARIS) IN MEDICAL STUDENTS OF PRIMA INDONESIA UNIVERSITY, CLASS OF 2022

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Abstrak

Acne vulgaris merupakan salah satu penyakit kulit yang paling umum di dunia dengan prevalensi global 9,38% untuk semua kelompok usia, khususnya mempengaruhi mahasiswa kedokteran yang mengalami stres akademik tinggi dan pola tidur tidak teratur. Meskipun banyak penelitian telah meneliti hubungan antara kualitas tidur dan acne vulgaris, temuan penelitian menunjukkan inkonsistensi yang signifikan. Penelitian ini bertujuan mengidentifikasi hubungan kualitas tidur dengan tingkat keparahan acne vulgaris pada mahasiswa Fakultas Kedokteran Universitas Prima Indonesia angkatan 2022. Penelitian cross-sectional analitik observasional dilakukan menggunakan metode kuantitatif. Populasi terdiri dari seluruh mahasiswa kedokteran angkatan 2022 (199 mahasiswa) dengan sampel 67 responden yang ditentukan menggunakan rumus Slovin dengan tingkat kepercayaan 90%. Teknik simple random sampling diterapkan dengan kriteria inklusi mahasiswa dengan acne vulgaris yang bersedia berpartisipasi. Pengumpulan data menggunakan instrumen tervalidasi: Pittsburgh Sleep Quality Index (PSQI) untuk mengukur kualitas tidur dan Global Acne Grading System (GAGS) untuk menilai keparahan acne. Analisis data dilakukan menggunakan SPSS versi 29 dengan analisis univariat dan bivariat menggunakan uji Chi-square. Hasil menunjukkan 70,1% responden memiliki kualitas tidur baik dan 92,5% memiliki acne tingkat ringan. Uji Chi-square menunjukkan tidak ada hubungan signifikan antara kualitas tidur dengan tingkat keparahan acne vulgaris ($p\text{-value} = 0,994$, $p > 0,05$). Penelitian ini menyimpulkan bahwa kualitas tidur tidak berpengaruh signifikan terhadap tingkat keparahan acne vulgaris pada mahasiswa kedokteran, menunjukkan bahwa pendekatan multifaktorial yang fokus pada manajemen stres, pola makan, higiene kulit, dan penggunaan kosmetik mungkin lebih efektif untuk penanganan acne.

Kata Kunci: *Acne Vulgaris, Kualitas Tidur, Mahasiswa Kedokteran, Mahasiswa Universitas, Pittsburgh Sleep Quality Index*

Abstract

Acne vulgaris is one of the most common skin diseases worldwide with a global prevalence of 9.38% for all age groups, particularly affecting medical students who experience high academic stress and irregular sleep patterns. Despite numerous studies investigating the relationship between sleep quality and acne vulgaris, research findings show significant inconsistencies. This study aimed to identify the relationship between sleep quality and acne vulgaris severity among medical students at Prima Indonesia University batch 2022. A cross-sectional analytical observational study was conducted using quantitative methods. The population consisted of all medical students from batch 2022 (199 students) with a sample of 67 respondents determined using the Slovin formula with 90% confidence level. Simple random sampling technique was applied with inclusion criteria of students with acne vulgaris who were willing to participate. Data collection used validated instruments: Pittsburgh Sleep Quality Index (PSQI) to measure sleep quality and Global Acne Grading System (GAGS) to assess acne severity. Data analysis was performed using SPSS version 29 with univariate and bivariate analysis using Chi-square test. Results showed that 70.1% of respondents had good sleep quality and 92.5% had mild acne severity. The Chi-square test revealed no significant relationship between sleep quality and acne vulgaris severity ($p\text{-value} = 0.994$, $p > 0.05$). This study concludes that sleep quality does not significantly affect acne vulgaris severity in medical students, suggesting that multifactorial approaches focusing on stress management, dietary patterns, skin hygiene, and cosmetic use may be more effective for acne management.

Keywords: *Acne Vulgaris, Medical Students, Pittsburgh Sleep Quality Index, Sleep Quality, University Students*

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INTRODUCTION

Research Phenomenon

Acne vulgaris is one of the most common skin diseases worldwide, with a global prevalence of 9.38% across all age groups, and ranks as the 8th most common dermatological disease according to the Global Burden of Disease Study. This condition is not only a cosmetic problem but can also have a significant psychosocial impact on sufferers, especially adolescents and young adults. In Indonesia, the prevalence of acne vulgaris is high, reaching 85-87.5% in the adolescent population, with lesions characterized by open and closed comedones, papules, pustules, nodules, and cysts that commonly appear on the face, chest, and back. Recent research shows that the prevalence of acne in medical students ranges from 34.38% to 97.9%, with an average of around 64.3%, indicating a high incidence of this problem in the academic population.

College students, particularly medical students, are at high risk of developing acne vulgaris due to various factors related to their lifestyle and the academic pressures they face. Academic stress experienced by medical students can trigger the activation of the Hypothalamic-Pituitary-Adrenal (HPA) axis, which in turn increases the production of cortisol and androgen hormones, thereby stimulating the sebaceous glands to produce excessive sebum. Furthermore, irregular sleep patterns and poor sleep quality are common phenomena among students, which can contribute to the pathogenesis of acne vulgaris through hormonal disruption, particularly decreased melatonin production, which plays a role in suppressing androgen synthesis. Research shows that 75.8% to 88.9% of college students have poor sleep quality, which is then correlated with an increased incidence and severity of acne vulgaris.

Research Problems

Although the relationship between sleep quality and acne vulgaris has been extensively studied, the results show significant inconsistencies. Some studies indicate a significant positive association between poor sleep quality and increased incidence and severity of acne vulgaris, with p-values ranging from 0.000 to 0.041. However, other studies report no significant association between the two variables, as demonstrated by a study of Hasanuddin University Faculty of Medicine students with a p-value of 0.859 and a study of Klabat University Faculty of Nursing students with a p-value > 0.05. These inconsistencies in research findings suggest the need for further research with more specific populations and methodologies to clarify this relationship.

Pathophysiologically, poor sleep quality can affect the production of melatonin, a circadian regulator that suppresses androgen production

through the regulation of steroidogenic proteins such as StAR, P450 SCC, 3 β -HSD, and 17 β -HSD. When melatonin production is disrupted due to sleep deprivation or late night sleep, androgen activity increases, stimulating the sebaceous glands to produce excess sebum, which can lead to clogged pores and the formation of acne vulgaris lesions. Furthermore, sleep deprivation can also increase cortisol levels, which have pro-inflammatory effects and can worsen existing inflammation in the pilosebaceous unit.

The 2022 intake of students from the Faculty of Medicine at Prima Indonesia University is an interesting group to study due to their homogenous characteristics in terms of age, education level, and academic stress. Previous studies on similar populations have shown varying results, with some finding significant associations while others have not. This variability may be due to differences in research methodology, measurement instruments used, and other external factors such as diet, stress, cosmetic use, and genetics, which have not been fully controlled for in previous studies.

Purpose, Urgency, and Novelty of the Research

This study aims to identify the relationship between sleep quality and acne vulgaris severity in medical students from the Faculty of Medicine, Prima Indonesia University, Class of 2022, using validated instruments such as the Pittsburgh Sleep Quality Index (PSQI) and the Global Acne Grading System (GAGS). The urgency of this study lies in the need to provide an empirical contribution to address the inconsistencies in previous research results and provide a scientific basis for the development of sleep-based prevention and intervention strategies for acne vulgaris management in the medical student population. The novelty of this study includes the use of a specific population of medical students with homogeneous characteristics, the application of cross-sectional methodology with stricter variable controls, and the use of internationally validated measurement instruments to ensure the accuracy and reliability of the research results. This is expected to provide evidence-based recommendations for clinical practice and campus health policies in managing acne vulgaris in students.

METHOD

Types and Methods of Research

This study employed a quantitative research method with a cross-sectional, observational analytical design. According to Sugiyono (2021), cross-sectional research is a type of observational study that uses data from a population or sample at a specific point in time to simultaneously study the relationship between independent and dependent variables. The cross-

sectional design was chosen because it aligns with the research objective of identifying the relationship between sleep quality and acne vulgaris severity, where measurements of the independent and dependent variables are conducted simultaneously without follow-up. The observational analytical method used aims to explore how and why health phenomena occur, then analyze the dynamics of the correlation between risk factors and effect factors. Creswell (2023) explains that quantitative research is an appropriate approach for examining relationships between variables using standardized instruments and statistical analysis.

Population and Sample

The population in this study was all 199 students of the Faculty of Medicine, Prima Indonesia University, Class of 2022. Sampling was determined using the Slovin formula with a 90% confidence level ($e = 0.1$) to obtain a minimum sample of 67 respondents. The Slovin formula was chosen because it is appropriate for research with a relatively small and homogeneous population, where the value of $e = 0.1$ (10%) is used for large populations as explained by Sugiyono (2021). The sampling technique used was simple random sampling, which is a technique of drawing samples randomly from the population without considering the strata within the population. According to Sujarweni (2020), simple random sampling is a simple technique and is able to produce a representative sample from a homogeneous population. Inclusion criteria included students of the Faculty of Medicine, Prima Indonesia University, Class of 2022 who suffered from acne vulgaris, were willing to complete the research questionnaire, and were willing to participate in the study after obtaining informed consent. While exclusion criteria included students who had chronic skin diseases other than acne, were currently taking supplements or medications that affect sleep or acne, and did not complete the questionnaire accurately and completely.

Data Analysis Instruments and Techniques

The research instruments used consisted of two standardized questionnaires, namely the Pittsburgh Sleep Quality Index (PSQI) to measure sleep quality and the Global Acne Grading System (GAGS) to assess the severity of acne vulgaris. The PSQI questionnaire consists of 7 components with each component having a rating range of 0-3, so that the total score ranges from 0-21, where a score ≤ 5 indicates good sleep quality and a score > 5 indicates poor sleep quality. The PSQI instrument has been proven to have good validity and reliability for the Indonesian population, although in several studies showed varying reliability values depending on the population studied. The GAGS questionnaire assesses acne vulgaris based on the location of the lesion (forehead, right cheek, left cheek, nose, chin, chest

and back) with different weights, as well as the type of lesion (blackheads = 1, papules = 2, pustules = 3, nodules = 4), where the assessment results are categorized as mild (1-18), moderate (19-30), severe (31-38), and very severe (> 39). Data analysis was performed using SPSS version 29 software, with univariate analysis to describe respondent characteristics and bivariate analysis using the Chi-square test to examine the relationship between variables. The statistical test selection followed the provisions that for 2x2 contingency tables with fulfilled assumptions, Continuity Correction was used, while if the assumptions were not met, Fisher's Exact Test was used.

Research Procedures

The research procedure began with a preparatory phase, which included developing a research proposal, consulting with a supervisor, and holding a proposal seminar. After obtaining approval, the researcher obtained research permits from the relevant institutions and coordinated with the Faculty of Medicine, Prima Indonesia University. During the implementation phase, the researcher approached potential respondents who met the inclusion criteria by explaining the purpose and benefits of the research. Ethical research principles were applied through informed consent, a form of agreement between the researcher and respondents, anonymity to maintain the confidentiality of respondents' identities using a code system, and confidentiality to ensure the confidentiality of all collected information. Data collection was conducted using a Google Form questionnaire distributed to respondents who had given their consent. Each respondent was asked to complete both questionnaires completely and correctly to ensure the validity of the data obtained. The collected data were then processed and analyzed using established statistical methods to answer the research question regarding the relationship between sleep quality and the severity of acne vulgaris in students of the Faculty of Medicine, Prima Indonesia University, Class of 2022.

RESULTS AND DISCUSSION

Univariate Analysis

Table 1. Analysis Results

Age	N	%
< 21 years	51	76.1%
22–26 years	13	19.4%
27–30 years old	2	3.0%
> 30 years	1	1.5%
Total	67	100%

Based on the table above, it is known that the majority of respondents were aged <21 years, namely 51 people (76.1%). There were 13 respondents aged 22–26 years (19.4%), 2 respondents aged 27–30 years (3.0%), and 1 person aged >30 years (1.5%). This indicates that the majority of respondents were in the young age group (<21 years).

Table 2. Description of Respondents' Gender

Gender	N	%
Man	29	43.3%
Woman	38	56.7%
Total	67	100%

Based on the table above, it is known that the respondents in this study were dominated by women, namely 38 people (56.7%), while there were 29 men (43.3%).

Table 3. Overview of Respondents' Sleep Quality

Sleep Quality	N	%
Bad	20	29.9%
Good	47	70.1%
Total	67	100%

Based on the table above, it is known that the majority of respondents have good sleep quality, namely 47 people (70.1%), while respondents with poor sleep quality numbered 20 people (29.9%).

Table 4. Overview of Respondents' Acne Severity Level

Acne Severity Level	N	%
Low	62	92.5%
Currently	5	7.5%
Heavy	0	0.0%
Total	67	100%

Based on the table above, the majority of respondents (62 people) had low-severity acne, while 5 (7.5%) had moderate-severity acne. No respondents had high-severity acne.

Bivariate Analysis

Table 5.

Acne Severity Level			p-value
Low	Currentl y	Total	

Sleep Qualit y	N	%	N	%	N	%	
Bad	1	90.0	2	10.0	2	100.0	0.99
	8	%		%	0	%	4
Good	4	93.6	3	6.4%	4	100.0	
	4	%			7	%	

Based on the Chi-Square test results in the table above, the Continuity Correction value obtained a significance value of 0.994, which is significantly greater than 0.05 (p-value > 0.05). This indicates that there is no significant relationship between sleep quality and acne severity.

Cross-tabulations revealed that 18 respondents (90.0%) had low levels of acne severity, while only 2 (10.0%) had moderate levels. Similarly, 44 respondents (93.6%) had moderate levels of acne, while only 3 (6.4%) had moderate levels. These findings suggest that both the poor and good sleep quality groups tended to have low levels of acne severity, with no significant differences between the two groups.

Discussion

The results of this study indicate that there is no significant relationship between sleep quality and acne vulgaris severity in students of the Faculty of Medicine, Prima Indonesia University, Class of 2022, with a p-value of 0.994 (p > 0.05) based on the Continuity Correction test. This finding indicates that variations in sleep quality in the study population do not affect the severity of acne vulgaris experienced by respondents. Statistically, these results indicate that the null hypothesis is accepted, meaning there is no significant relationship between the two variables studied.

Cross-tabulation analysis showed a relatively homogeneous distribution between respondents with good and poor sleep quality in terms of acne severity. In the poor sleep group, 90% had mild acne and 10% moderate, while in the good sleep group, 93.6% had mild acne and 6.4% moderate. These nearly identical proportions indicate that sleep quality does not significantly influence the severity of acne vulgaris in the study population.

Comparison with Previous Research

The findings of this study are consistent with several previous studies that also reported no significant association between sleep quality and acne vulgaris. Research by Marfia (2024) on preclinical students at the Faculty of Medicine, Muslim University of Indonesia found similar results, concluding that there was no significant association between sleep quality and the incidence of acne vulgaris. Similarly, research by Horisanto (2023) on students from the Faculty of Medicine, Hasanuddin University, Class of 2019, obtained a p-value of 0.859 with a correlation

coefficient of 0.018, indicating no significant association between the two variables.

However, the results of this study contrast with several other studies that found a significant association. Research by Ramadhani et al. (2024) showed a significant association with a p-value of 0.000, while research on nursing students at Yatsi Madani University also found a significant association with a p-value of 0.000. Research by Silvia et al. (2019) on students of the Faculty of General Medicine at Malahayati University also reported a significant association with a p-value of 0.000. These inconsistencies in results suggest that the association between sleep quality and acne vulgaris may be influenced by various population factors, research methodology, and sample characteristics that differ across studies.

Analysis of Factors Affecting Results

The multifactorial etiology of acne vulgaris may explain why this study's results showed no significant association with sleep quality. According to Asrinda (2025), factors influencing acne vulgaris in Indonesian adolescents include skin type, facial hygiene, diet, body mass index (BMI), sleep quality, and cosmetic use. Oily skin can increase the risk of acne vulgaris up to 54 times compared to dry skin, while a high-fat diet, high glycemic index, and consumption of full-fat milk trigger sebum production and inflammation. Other factors such as academic stress, cosmetic use, and hormonal factors may have a more dominant influence than sleep quality in the medical student population.

The demographic characteristics of the respondents may also influence the study results. The majority of respondents (76.1%) were under 21 years of age and were predominantly female (56.7%), a group with high hormonal activity and complex risk factors for acne vulgaris. At this age, androgen hormone fluctuations are still very active, especially in women experiencing menstrual cycles, so hormonal influences may be more dominant than sleep quality factors. Furthermore, high academic pressure in medical students can cause chronic stress that affects the Hypothalamic-Pituitary-Adrenal (HPA) axis and cortisol production, which can trigger or worsen acne vulgaris.

Research Limitations and Methodological Implications

This study used a cross-sectional design, which has several methodological limitations that should be considered when interpreting the results. The cross-sectional nature of the design precludes conclusions about causal relationships between variables, as data were collected at a single point in time. This design can only demonstrate associations, not causal relationships, and therefore cannot determine whether poor sleep quality causes acne vulgaris or vice versa.

The relatively small sample size (67 respondents) and the predominance of respondents with mild acne severity (92.5%) may impact the study's statistical power and ability to detect significant relationships, if any. Furthermore, the use of self-report instruments such as the PSQI questionnaire can introduce reporting bias, as respondents may not provide accurate answers regarding their sleep quality. The Indonesian version of the PSQI also has limited reliability, with a Cronbach's alpha value of 0.63, particularly for the "daytime dysfunction" component, which is considered inconsistent with the English version.

Clinical and Practical Implications

Although this study did not find a significant association, this does not mean that sleep quality is unimportant in the context of overall skin health. Pathophysiologically, poor sleep quality can still affect melatonin production, which plays a role in circadian regulation and suppresses androgen production. Sleep deprivation can also increase cortisol levels, which have pro-inflammatory effects and can exacerbate existing inflammation in the pilosebaceous unit.

These findings offer practical implications: Managing acne vulgaris in medical students may need to focus on other, more dominant factors, such as stress management, improved diet, good skin hygiene, and appropriate cosmetic use. A multifactorial approach to acne vulgaris prevention and treatment is needed rather than solely focusing on improving sleep quality.

Recommendations for Future Research

Based on the limitations and findings of this study, further research with a more robust design is needed to understand the relationship between sleep quality and acne vulgaris. A prospective study with longitudinal follow-up would be more appropriate to evaluate the causal relationship between the two variables. A larger sample size and a more heterogeneous distribution of acne vulgaris severity would increase statistical power and generalizability of the study results.

Future research should also control for confounding factors such as stress, diet, cosmetic use, hormonal factors, and family history to obtain a more accurate picture of the influence of sleep quality on acne vulgaris. Using objective instruments to measure sleep quality, such as actigraphy or polysomnography, can reduce bias associated with self-report questionnaires. Furthermore, better validation and adaptation of the Indonesian version of the PSQI instrument are needed to improve the accuracy of sleep quality measurement in the Indonesian population.

CONCLUSION

This study shows no significant association between sleep quality and acne vulgaris severity in students of the Faculty of Medicine, Prima Indonesia University, Class of 2022, with a p-value of 0.994 ($p > 0.05$). The main findings revealed that the majority of respondents had good sleep quality (70.1%) and low acne severity (92.5%), with a relatively homogeneous distribution between the good and poor sleep quality groups. These results are consistent with several previous studies that also reported no significant association, but contrast with other studies that found a significant correlation. The multifactorial etiology of acne vulgaris may explain these findings, where factors such as skin type, hygiene, dietary patterns, academic stress, cosmetic use, and hormonal fluctuations may have a more dominant influence than sleep quality in the medical student population.

Limitations of this study include its cross-sectional design, which precludes causal conclusions, a relatively small sample size (67 respondents), a predominance of respondents with mild acne, and potential reporting bias from self-report instruments. Future research should employ a prospective, longitudinal design with a larger, more heterogeneous sample, control for confounding factors, and utilize objective instruments to measure sleep quality. The practical implications of this study suggest that the management of acne vulgaris in medical students should utilize a multifactorial approach focusing on stress management, dietary improvement, good skin hygiene, and appropriate cosmetic use, rather than solely focusing on sleep quality improvement. Nevertheless, sleep quality remains important in the context of overall skin health through hormonal regulation and anti-inflammatory processes that influence the pathophysiology of acne vulgaris.

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