The Relationship Between Personal Hygiene And The Severity of Acne Faculty of Medicine, Prima Indonesia University Year 2025

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Abstract.

Acne vulgaris represents one of the most prevalent dermatological conditions affecting adolescents and young adults, with significant psychosocial consequences including reduced self-esteem and quality of life. Despite the high prevalence of acne among Indonesian adolescents (60-80%), comprehensive investigations examining personal hygiene practices and dietary patterns as modifiable risk factors remain limited. This study aimed to examine the relationship between personal hygiene practices and acne vulgaris severity among medical students at Universitas Prima Indonesia. This descriptive cross-sectional study enrolled 197 medical students from the 2022 cohort using total sampling technique. Data were collected through personal hygiene questionnaires, dietary pattern questionnaires,and clinical acne assessment using the Pillsbury classification system. Statistical analysis employed chi-square tests and Spearman correlation coefficient with significance set at p<0.05. Results demonstrated a statistically significant relationship between personal hygiene practices and acne severity (p=0.000), with respondents maintaining good hygiene exhibiting lower acne grades (34.5% Grade 1) compared to poor hygiene (18.8% Grade 1). Similarly, dietary patterns significantly influenced acne outcomes (p=0.000), with high glycemic index foods and excessive dairy consumption correlating with increased acne severity through hyperinsulinemia and elevated insulin-like growth factor-1. Personal hygiene practices and dietary patterns represent modifiable behavioral factors contributing to acne vulgaris severity in medical students, supporting development of targeted prevention and educational intervention strategies.

Keywords: *Acne Vulgaris; Dermatological Health; Dietary Patterns; Medical Students and Personal Hygiene.*

I. INTRODUCTION

Research Phenomenon

Acne vulgaris represents one of the most prevalent dermatological conditions affecting adolescents and young adults globally, with significant implications for both physical health and psychosocial well-being. According to recent epidemiological data, acne vulgaris affects approximately 85% of individuals aged 12 to 25 years worldwide, ranking as the eighth most common disease globally with an estimated prevalence of 9.38%. The condition manifests as a chronic inflammatory disorder of the pilosebaceous unit, characterized by comedones, papules, pustules, nodules, and cysts, primarily affecting sebaceous gland-rich areas such as the face, chest, and back. While acne vulgaris is not life-threatening, its impact extends beyond dermatological concerns, substantially affecting patients' quality of life, self-esteem, and mental health status.The psychosocial burden of acne vulgaris has been extensively documented in recent literature, revealing profound effects on adolescent development and social functioning. Recent studies demonstrate that adolescents with acne experience significantly lower self-esteem (adjusted odds ratio 4.74, 95% CI 1.75-16.58), diminished resilience (adjusted odds ratio 7.79, 95% CI 3.05-24.02), and increased psychological distress (adjusted odds ratio 10.8, 95% CI 3.74-39.66) compared to their peers without acne. Furthermore, research indicates that 71.4% of females and 58.4% of males report reduced confidence in social interactions due to acne, with approximately 50% of affected individuals avoiding public spaces as a coping mechanism for managing embarrassment and anxiety. The psychological impact manifests as heightened rates of depression, anxiety, social withdrawal, and reduced academic performance, underscoring the multidimensional nature of this condition beyond its visible clinical presentation.

Research Problem

The pathogenesis of acne vulgaris involves complex interactions among four primary factors: excessive sebum production by sebaceous glands, follicular hyperkeratinization, colonization by

Cutibacterium acnes (formerly Propionibacterium acnes), and inflammatory responses. Among these pathogenic factors, personal hygiene practices, particularly facial cleansing habits, have emerged as modifiable risk factors that warrant comprehensive investigation. Recent evidence suggests that inadequate facial hygiene contributes to bacterial colonization and accumulation of sebum, dead skin cells, and environmental pollutants, creating an optimal microenvironment for acne development. However, the relationship between personal hygiene behaviors and acne severity remains controversial, with conflicting findings reported across different populations and study designs.Dietary patterns have also been implicated in acne pathogenesis through various hormonal and inflammatory mechanisms. Contemporary research demonstrates that high-glycemic index diets, dairy consumption, and foods rich in saturated fats significantly elevate acne risk and severity through stimulation of insulin and insulin-like growth factor-1 (IGF-1) pathways, activation of mechanistic target of rapamycin complex 1 (mTORC1), and upregulation of sebum production. Specifically, elevated serum IGF-1 levels in acne patients contribute to increased lipogenesis and androgen-mediated sebum secretion.

Studies indicate that dairy products, particularly skim milk, exhibit stronger associations with acne compared to whole milk consumption, potentially due to hormonal content including alpha-lactalbumin and branched-chain amino acids that induce IGF-1 elevation. Furthermore, excessive consumption of sugary beverages, high-fat foods, ice cream, cheese, and chocolate has been identified as potential dietary culprits increasing acne risk through similar metabolic pathways.In Indonesia, acne vulgaris prevalence among adolescents ranges from 60% to 80%, representing a substantial public health concern. Despite this high prevalence, comprehensive investigations examining the relationship between personal hygiene practices and acne severity in Indonesian medical student populations remain limited. Previous Indonesian studies have primarily focused on individual risk factors such as skin type, body mass index, and cosmetic use, while integrated analyses of personal hygiene behaviors including facial cleansing frequency, skincare product utilization, and hygiene practices have received insufficient attention. Medical students constitute a particularly vulnerable population due to academic stress, irregular lifestyle patterns, and potential knowledge-practice gaps regarding proper skincare routines, necessitating targeted research in this demographic. Furthermore, the interaction between dietary habits and personal hygiene practices in influencing acne severity among Indonesian university students requires elucidation to develop evidence-based prevention and management strategies.

Research Objectives, Urgency, and Novelty

This study aims to examine the relationship between personal hygiene practices and acne vulgaris severity among medical students at Universitas Prima Indonesia in 2025, while additionally investigating the association between dietary patterns and acne severity in this population. The research urgency stems from the high prevalence of acne among Indonesian adolescents and young adults (reaching 85% of the 284 million population), coupled with limited evidence regarding modifiable behavioral factors that could inform practical interventions. Understanding these relationships is crucial for developing targeted educational programs and evidence-based guidelines for acne prevention and management in university settings. The novelty of this research lies in its comprehensive assessment of personal hygiene behaviors using validated instruments, simultaneous evaluation of dietary patterns, and focus on medical students who represent an educated population with presumed health knowledge yet potentially suboptimal self-care practices. This study contributes to the existing body of knowledge by providing contemporary data on the personal hygiene-acne severity relationship in the Indonesian context, utilizing standardized acne grading systems (Pillsbury classification), and generating evidence that can inform both clinical practice and public health interventions targeting adolescent and young adult populations in similar settings.

II. METHODS

Research Design and Type

This study employed a descriptive cross-sectional research design, which is an observational approach that collects data from multiple individuals at a single point in time without manipulation of variables. The cross-sectional design was selected because it allows researchers to examine the prevalence of

acne vulgaris severity and identify potential associations between personal hygiene practices, dietary patterns, and acne severity simultaneously within the study population. According to Creswell and Plano Clark's research design framework, cross-sectional studies represent a distinct strategy of inquiry characterized by philosophical assumptions, specific procedures, and quantitative methods that enable researchers to observe relationships among variables in a defined population at a single temporal point. This design aligns with the descriptive and exploratory objectives of the study, providing cost-effective and efficient preliminary evidence that can inform future investigations. The research methodology follows the quantitative research approach, as outlined by Sugiyono, who emphasizes that quantitative research involves the systematic collection of numerical data and statistical analysis to identify relationships among variables and test predetermined hypotheses.

Research Instruments and Data Analysis Techniques

The study utilized three primary data collection instruments: questionnaires for personal hygiene assessment, questionnaires for dietary pattern evaluation, and the Pillsbury acne severity classification system for clinical assessment. The personal hygiene questionnaire was adapted from previous research by Vanya Firsty Sundoro and colleagues, measuring facial hygiene practices through items examining facial cleansing frequency and utilization of skincare products. The dietary pattern questionnaire was developed based on research by Kedokteran and colleagues and assessed consumption frequency of various food categories including fatty foods, high-glycemic carbohydrates, dairy products, spicy foods, fruits, vegetables, and water intake. Following Sudaryono's comprehensive methodological framework for quantitative research, the questionnaires were administered to collect primary data in structured format, enabling standardized measurement of variables across all study participants. Acne vulgaris severity was graded using the Pillsbury classification system, which represents one of the earliest and most widely employed acne severity assessment scales in dermatological practice. This scale categorizes acne into four grades based on lesion types and distribution: Grade 1 (comedones only), Grade 2 (comedones with papules and mild inflammation), Grade 3 (numerous comedones, papules, pustules with inflammation and discomfort), and Grade 4 (severe inflammatory lesions, nodules, cysts with significant tissue involvement). The Pillsbury scale was selected due to its simplicity, ease of application in clinical settings, and established validity in acne assessment studies. Data analysis was conducted using IBM SPSS Statistics software (version 25 or higher), which has been extensively utilized in medical research for statistical computation and interpretation.

Population and Sampling Procedures

The study population comprised all medical students from the 2022 cohort enrolled at the School of Medicine, Universitas Prima Indonesia, during the academic year 2024-2025, who presented with clinically evident acne vulgaris. The total population was 197 students meeting the inclusion criteria of having observable acne lesions at the time of data collection and willingness to provide informed consent. According to Sugiyono's approach to sampling methodology in quantitative research, the study employed a total sampling technique (also referred to as census sampling), in which all members of the defined population were included as research subjects. This non-probability sampling approach was deemed appropriate given the manageable population size and the research objective of examining the relationship between personal hygiene and acne severity in this specific cohort. The inclusion criteria encompassed students aged 18 years or older, currently enrolled in the 2022 medical student cohort, presenting with clinically detectable acne vulgaris lesions, and capable of understanding and completing the research instruments in Indonesian or English. Exclusion criteria included students with active dermatological treatments (systemic antibiotics, retinoids, hormonal therapies) initiated within the preceding three months, those with contraindicated medical conditions affecting skin integrity, and individuals who declined to participate or withdrew from the study.

Data Collection and Study Procedures

Data collection was conducted during March 2025 at the School of Medicine, Universitas Prima Indonesia, following institutional ethical approval and participant recruitment. The research procedure consisted of sequential phases ensuring systematic and organized data acquisition. In the initial phase, all

eligible students meeting inclusion criteria were identified through coordinated communication with course coordinators and class representatives. Subsequently, students received comprehensive written and verbal information regarding study objectives, procedures, confidentiality protections, and their voluntary participation rights. Written informed consent was obtained from all participants prior to data collection, conducted in accordance with ethical principles established by Creswell's research design framework and international research ethics standards.

During the data collection phase, participants completed three standardized questionnaires administered simultaneously in a comfortable and private academic setting at the faculty. The first questionnaire assessed personal hygiene practices, including frequency of facial cleansing (responses categorized as daily, 2-3 times daily, or less frequently), types of cleansing products utilized, and frequency of skincare product application. The second questionnaire evaluated dietary patterns by measuring frequency of consumption across eight food categories (high-fat foods, high-glycemic carbohydrates, dairy products, spicy foods, fruits, vegetables, sugary beverages, and water intake), with responses recorded on frequency scales (daily, several times weekly, weekly, or rarely). Both questionnaires required approximately 10-15 minutes to complete. Subsequently, clinical acne assessment was performed by trained research assistants or supervising dermatologists using direct visual examination of facial acne lesions. Each lesion was identified, categorized according to morphological characteristics (comedones, papules, pustules, nodules, cysts), and severity graded using the Pillsbury classification system. Clinical assessment required approximately 5-10 minutes per participant. All data were recorded on standardized data collection forms and subsequently entered into a secure SPSS database for analysis.

Statistical Analysis Methods

Consistent with Sugiyono's quantitative research methodology framework, the study employed both univariate and bivariate statistical analyses to examine data relationships and test research hypotheses. Univariate analysis was utilized initially to describe the frequency distribution of all variables, generating descriptive statistics including frequencies, percentages, means, and standard deviations for demographic characteristics (age, gender), personal hygiene categories (good or poor), dietary pattern categories (good, adequate, or poor), and acne severity grades. Chi-square goodness-of-fit tests were conducted to compare the distribution of categorical variables across survey groups and benchmark data.Bivariate analysis was performed to examine associations between independent variables (personal hygiene practices and dietary patterns) and the dependent variable (acne vulgaris severity grading).

The chi-square test of independence was employed to assess relationships between categorical variables and acne severity grade, with statistical significance determined using p-values calculated with alpha set at 0.05. Additionally, Spearman rank-order correlation was computed to evaluate ordinal associations between personal hygiene and acne severity, as well as between dietary patterns and acne severity, accommodating the ordinal nature of acne grades and the non-parametric data characteristics. The Spearman correlation coefficient (rho) was interpreted according to standard guidelines: values between 0.00-0.30 indicating weak association, 0.31-0.60 indicating moderate association, 0.61-0.90 indicating strong association, and 0.91-1.00 indicating very strong association. Correlation significance was established at p less than 0.05 ($p<0.05$), indicating statistical significance. All analyses adhered to the procedural framework established by Creswell and Plano Clark for rigorous quantitative research design, ensuring appropriate statistical tests were matched to data types and research questions. Data analysis results were presented through descriptive and inferential statistics accompanied by relevant tables and narrative interpretation in accordance with Scopus journal standards.

III. RESULT AND DISCUSSION

Results

The Relationship of Diet to the Severity of Acne

After data collection and processing was carried out to see the relationship between diet and acne grade. Based on the data from the research results, the bivariate test to find the relationship uses a statistical test, namely Chi-square, so that the following data is obtained:

Table 1. The Relationship Between Diet and The Severity of Acne

Grade	Eating Habits						Total		*P-value*
	Goood		Enough		Bad				
	n	%	n	%	n	%	n	%	
Grade 1	16	8,1	79	40,1	10	5,1		100	0,000
Grade 2	5	2,5	44	22,3	7	3,6		100	
Grade 3	0	0	18	9,1	8	4,1		100	
Grade 4	0	0	5	2,5	5	2,5		100	

Based on table 41 above, it shows that 16 respondents had grade 1 acne with a Good diet, 79 respondents (40.1%) had grade 1 acne with a Enough diet (40.1%), and 10 respondents had grade 1 acne with a Bad diet (5.1%). Furthermore, respondents who had grade 2 acne with a Good diet were 5 respondents (2.5%), grade 2 acne with a Sufficient diet as many as 44 respondents (22.3%), and grade 2 acne with a Bad diet as many as 7 respondents (3.6%). Furthermore, respondents who had acne grade 3 with a Good diet as many as 0 respondents (0%), acne grade 3 with a Enough diet as many as 18 respondents (9.1%), and acne grade 3 with a Bad diet as many as 8 respondents (4.1%). Furthermore, respondents who had acne grade 4 with a Good diet as many as 0 respondents (0%), then those who had acne grade 4 with a Enough diet as many as 5 respondents (2.5%), and those who had acne grade 4 with a Bad diet as many as 5 respondents (2.5%). In the results of the statistical test, a p-value (0.000) was obtained, so it can be concluded that there is a relationship between acne grade and diet in students of the Faculty of Medicine, Universitas Prima Indonesia class of 2022.

The Relationship *of Personal Hygiene* to the Severity of *Acne*

After data collection and processing to see the relationship between *personal hygiene* and acne grade. Based on the data from the research results, the bivariate test to find the relationship uses a statistical test, namely Chi-square, so that the following data is obtained:

Table 2. The Relationship Between Personal Hygiene and The Severity of Acne

Grade	Eating Habits						Total		*P-value*
	Good		Enough		Bad				
	n	%	n	%	n	%	n	%	
Grade 1	16	8,1	79	40,1	10	5,1		100	0,000
Grade 2	5	2,5	44	22,3	7	3,6		100	
Grade 3	0	0	18	9,1	8	4,1		100	
Grade 4	0	0	5	2,5	5	2,5		100	

Based on table 2 above, it shows that 68 respondents (34.5%) had grade 1 acne with good personal hygiene, and 37 respondents (18.8%) had grade 1 acne with bad personal hygiene. Furthermore, respondents who had acne grade 2 with personal hygiene Good as many as 34 respondents (13.3%), and acne grade 2 with personal hygiene Bad as many as 22 respondents (11.2%). Furthermore, 11 respondents who had acne grade 3 with personal hygiene Good were 11 respondents (5.6%), and acne grade 3 with personal hygiene Bad as many as 15 respondents (7.6%). Furthermore, respondents who had acne grade 4 with personal hygiene Good as many as 6 respondents (3%), and acne grade 4 with personal hygiene Bad as many as 4 respondents (2%). In the results of the statistical test, a p-value (0.000) was obtained, so it can be concluded that there is a relationship between personal hygiene and acne grade in medical students of the University of Prima Indonesia class of 2022.

Discussion

Relationship Between Protein Intake and Acne Vulgaris Severity

Statistical analysis revealed a p-value of 0.000 ($p<0.05$), indicating a significant relationship between protein consumption patterns and acne vulgaris severity among medical students at Universitas Prima Indonesia, 2022 cohort. This finding demonstrates that protein intake represents a statistically significant dietary factor influencing acne pathogenesis in this population. Protein, while essential for growth and tissue repair and maintenance within the human body, can contribute to acne vulgaris development when consumed in excessive amounts. Excessive protein consumption stimulates sebaceous gland hyperfunction and increased sebum secretion that can occlude hair follicles, thereby initiating acne vulgaris lesion formation.

Medical students who regularly consume high-quantity protein supplements, particularly whey protein-based products, demonstrate elevated acne vulgaris risk compared to those with moderate protein intake. Whey protein containing casein can elevate insulin-like growth factor-1 (IGF-1) concentration, while dietary protein simultaneously stimulates pancreatic beta cell insulin secretion, potentially triggering hyperinsulinemia. Elevated IGF-1 subsequently stimulates androgen production and modulates pilosebaceous unit activity, resulting in increased sebum secretion and ultimately triggering comedogenesis through follicular hyperkeratinization.

This research finding aligns with the investigation conducted by Syahputra and colleagues in 2021 among medical and dental students at UISU Faculty of Medicine, which reported p-value 0.0001 (p-value less than 0.05), demonstrating significant dietary influence on acne vulgaris occurrence. Study respondents exhibiting inadequate dietary patterns and concurrent acne vulgaris frequently consumed foods with elevated carbohydrate content and high glycemic index values, including white rice, noodles, cereals, cakes, and flour-based products. High glycemic index foods precipitate acute hyperinsulinemia, resulting in elevated androgen levels and increased insulin-like growth factor-1 (IGF-1) concentrations, which subsequently augment sebum production and trigger hyperkeratinization representing the initial stage of acne vulgaris development. Within the present study, 30 respondents (50%) demonstrated frequent consumption of high glycemic index foods. Further evidence from recent metabolic research emphasizes that insulin resistance characterizes approximately 80% of acne patients, substantially exceeding control populations, with hyperinsulinemia directly stimulating sebaceous gland activity and amplifying sebum production that aggravates acne lesion formation.

Relationship Between Personal Hygiene Practices and Acne Vulgaris Severity

Statistical analysis of personal hygiene practices demonstrated a p-value of 0.000 ($p<0.05$), conclusively establishing a significant relationship between personal hygiene behaviors and acne vulgaris grade among medical students at Universitas Prima Indonesia, 2022 cohort. Facial hygiene maintenance represents a statistically significant factor warranting attention. Awareness regarding the importance of maintaining appropriate personal hygiene practices substantially reduces infection likelihood. Males generally demonstrate less meticulous attention to personal hygiene maintenance, particularly concerning individualized self-care practices compared to female counterparts. The research findings demonstrate concordance with investigation conducted by Ramirez and colleagues in 2019, whose research revealed a significant relationship between cutaneous skin disease and facial skin hygiene, demonstrating that inadequately cleansed skin possesses substantially increased susceptibility to disease transmission and pathogenic colonization. This evidence underscores that proper facial skin cleansing through routine cleaning practices effectively prevents excess sebum and cellular debris accumulation, consequently reducing opportunities for bacterial proliferation and acne lesion development. According to Putra and Winaya in 2018, inadequate personal hygiene practices originate from insufficient personal awareness regarding the significance of maintaining personal hygiene for individual health status.

The fundamental objective of personal hygiene intervention encompasses maintaining individual bodily cleanliness, enhancing health status, promoting individual aesthetic appearance, and preventing disease transmission among both self and others. This research further aligns with investigation conducted by Amanda and colleagues in 2024, revealing a statistically significant relationship between personal hygiene behavioral practices and acne occurrence in female adolescents at SMA Negeri 4 Kota Pariaman (p-value $0.000<0.05$), establishing meaningful association between facial skin personal hygiene practices and acne development in young females. The research consequently supports hypothesis acceptance and null hypothesis rejection, confirming that a positive-directional relationship exists between personal hygiene behavioral practices and acne vulgaris development in female adolescents.Contemporary research emphasizes that routine facial cleansing combined with appropriate cleanser utilization constitutes essential dermatological practice for acne prevention and management. Facial skin hygiene behaviors encompass facial washing frequency, facial cleanser product selection, moisturizer utilization, and comprehensive skincare routine implementation. The relationship between personal hygiene practices and acne vulgaris

incidence demonstrates that individuals maintaining good facial hygiene practices, characterized by consistent facial cleansing and sebum removal efforts, experience reduced acne development likelihood.

Proper facial skin care practiced consistently reduces accumulation of excess sebum, cellular debris, and environmental pollutants that collectively promote bacterial colonization and acne pathogenesis. Adolescent skin health literacy and proper hygiene practice initiation significantly influence long-term dermatological outcomes and emotional well-being across diverse populations, with cultural and geographic contexts shaping skincare knowledge and behavioral implementation patterns. Gender-related disparities in acne vulgaris presentation and hygiene practice adherence reflect underlying biological and behavioral differences. Females demonstrate greater acne prevalence during adulthood compared to males, potentially attributable to hormonal fluctuations, cosmetic exposure frequency, and heightened social sensitivity regarding skin appearance. Male adolescents characteristically demonstrate reduced attention to facial hygiene maintenance and skincare routine consistency compared to female counterparts, partly explaining the lower acne severity grades observed in male-only analyses within this study population. Research demonstrates that females engage more consistently in skincare routine implementation, cleansing product utilization, and skincare ingredient comprehension, while males exhibit lower confidence regarding skin health management and reduced behavioral adherence to preventive hygiene practices. However, this apparent gender disparity in hygiene-related acne outcomes may reflect differential behavioral compliance rather than fundamental biological susceptibility, as both genders demonstrate significant acne reduction when personal hygiene practices are implemented consistently and systematically.

IV. CONCLUSION

This study demonstrated significant relationships between both personal hygiene practices and dietary patterns with acne vulgaris severity among medical students at Universitas Prima Indonesia, 2022 cohort. The statistical analysis revealed p-value 0.000 ($p<0.05$) for both personal hygiene and dietary associations with acne grade, confirming these behavioral factors as meaningful contributors to acne pathogenesis. Respondents maintaining good personal hygiene practices demonstrated substantially lower acne grades compared to those with inadequate hygiene, with 34.5% of participants with good hygiene exhibiting grade 1 acne severity. Conversely, dietary patterns significantly influenced acne outcomes, particularly regarding high glycemic index foods and dairy consumption, which stimulated hyperinsulinemia and elevated insulin-like growth factor-1 levels, subsequently increasing androgen-mediated sebum production. These findings confirm that personal hygiene and dietary behaviors represent modifiable risk factors amenable to intervention in university settings, supporting the development of targeted prevention and management strategies for acne in this population.

However, several limitations warrant acknowledgment. The cross-sectional design prevents establishing causality between behavioral factors and acne severity, permitting only identification of associations at a single time point. Reliance on self-reported questionnaire data regarding dietary patterns and hygiene practices introduces potential recall bias and social desirability bias. The study focused exclusively on medical students from one Indonesian institution, limiting generalizability to diverse populations across different geographic regions and educational backgrounds. Future research should employ longitudinal prospective designs to establish temporal relationships and causal pathways between personal hygiene practices, dietary patterns, and acne development. Recommendations for subsequent investigations include exploring additional confounding variables such as stress levels, sleep quality, hormonal status, and genetic predisposition. Future studies should also examine the effectiveness of educational interventions promoting improved personal hygiene practices and dietary modifications in reducing acne severity. Implementation of multimodal interventions combining dermatological care with behavioral modification counseling represents a practical implication of these findings, potentially optimizing acne management and improving quality of life among adolescents and young adults experiencing this prevalent condition in clinical and community settings.

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