



The Relationship between Hygiene Behaviour and Acne Vulgaris Incidence in Medical Students Sebelas Maret University

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ABSTRACT

Background: Hygiene behaviour is a person's actions in maintaining cleanliness to prevent the spread of infectious disease by cutting off the transmission of microorganisms that cause infection both in the community and in the health service. Various diseases caused by poor hygiene behaviour are diarrhea, dengue fever, leptospirosis, acute respiratory tract infections, typhoid fever, and various skin infections. One of the infectious skin diseases that affects almost the entire population is acne vulgaris. It is the highest disease prevalence worldwide and ranked 8th with 645.499.139 sufferers. **Purpose:** To determine the relationship between hygiene behaviour and acne vulgaris incidence in medical students at Sebelas Maret University. **Methods:** This study was an observational analytical study with a cross-sectional approach. This study was conducted on 45 male medical students at Sebelas Maret University. The questionnaire used was Hygiene Inventory (HI23). Data were analyzed using Fisher's Exact correlation test. **Result:** There is no relationship ($p = 0.720$) between hygiene behaviour and acne vulgaris incidence in medical students of the Sebelas Maret University. **Conclusion:** Hygiene behaviour has no relationship with acne vulgaris incidence in medical students at Sebelas Maret University.

Keywords: Hygiene behaviour, acne vulgaris, hygiene inventory (HI23), human and disease

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BACKGROUND

Behaviour is a person's efforts to respond to a situation observed directly or indirectly.¹ According to the Ministry of Health of the Republic of Indonesia, the definition of hygiene is an act to maintain personal hygiene, such as washing hands with clean water and soap, keeping dishes clean, and disposing of food that is not viable to maintain overall food hygiene. From these two understandings, it can be said that hygiene behaviour is the act of a person maintaining their cleanliness to prevent the spread of disease by cutting off the transmission of microorganisms both in the community and in health care.²

Various diseases caused by poor hygiene behaviour are diarrhea, dengue fever, leptospirosis, acute respiratory infection (ARI), typhoid fever, and various skin infections.³ One of the skin infections that is almost experienced by the entire population in the

world is acne vulgaris. It is a disease with the highest prevalence globally and is ranked 8th with 645.499.1394 sufferers.⁴ In Indonesia, the prevalence of acne vulgaris is increasing every year. In 2017, acne vulgaris patients reached 3.78%, 3.79% in 2018, and 3.81% in 2019.⁵

Acne vulgaris is a chronic inflammatory disease of the pilosebaceous unit (hair, hair follicles, m. erector pili, and sebaceous glands) due to a combination of increased sebum production and abnormal hyperproliferation of keratinocytes, resulting in follicular blockage and the formation of small, non-inflammatory lesions such as microcomedones. It can progress to inflammatory lesions such as papules, pustules, nodules, and cysts.⁶ Acne vulgaris most often appears on the face, back, and chest due to the high number of pilosebaceous glands in these areas.⁷ The concept of comedogenesis demonstrated an obstruction

in the pilosebaceous unit caused by the accumulation of corneocytes and hyperproliferation of keratinocytes in the pilosebaceous unit resulting in comedo formation.⁸

Acne vulgaris often affects about 85% of adolescents aged 12-25 years, both boys and girls, and in 50% of cases, it can persist into adulthood.^{9,10} A survey showed the prevalence of acne vulgaris occurred in 3% aged 7-9 years, 30% aged 10-12 years, 78% aged 13-15 years and 93% occurred aged 16-18 years.¹¹ Excessive production of androgen hormones during puberty can explain one of the triggering factors for acne vulgaris, which often occurs in adolescence.¹² In addition, other precipitating factors such as genetic factors play a role of around 50-90%; stress, cosmetics, food, and environmental factors can also affect the onset of acne vulgaris.¹³

Acne vulgaris can occur due to the interaction between four factors: hyperproliferation of pilosebaceous follicles, excess sebum production, inflammation, and proliferation of bacteria that can cause acne, such as *C. acnes*, *S. epidermidis*, and *M. furfur*.¹³ Sebum, a lipid-rich secretion from the sebaceous glands, plays a significant role in the pathogenesis of acne vulgaris by promoting the accumulation and colonization of bacteria that cause acne vulgaris. The skin is a part of the body's organs that is susceptible to bacterial infection; therefore, someone with poor hygiene behaviour will develop acne vulgaris because dirty and oily skin is a good place for bacteria to colonize.¹⁴

Therefore, researchers are interested in conducting this study to determine the relationship between hygiene behaviour and acne vulgaris incidence. Given the perception of South Asians, who think that poor hygiene behaviour plays an essential role in the pathogenesis of acne vulgaris, especially washing the face.¹² In addition, the behaviour of touching the face with dirty hands also plays an essential role because hands are vectors of transmission of infection, so the risk of disease transmission is high due to bacterial colonization on the part of the face that is touched.¹⁵

METHODS

This study was an observational analytical study with a cross-sectional approach. This study was conducted on male students in the class of 2018 – 2020 of the Medical Study Program, Faculty of Medicine, Sebelas Maret University, Surakarta.

The study subjects had inclusion criteria, namely male, aged 17-22 years, and are the students of the Sebelas Maret University Medical Study Program class of 2018-2020. Exclusion criteria were long-term treatments for acne vulgaris, such as doctor's care and

using skincare containing benzoyl peroxide, retinoids, salicylic acid, and vitamin C.

This study used a purposive sampling technique; sampling was carried out based on the researcher's specific criteria. The sample size was determined using the Slovin's formula. A total of 45 samples will be taken.

Primary data were collected using a questionnaire and stock photos of facial lesions. The questionnaire used to assess hygiene behaviour was the Hygiene Inventory (HI23), which consists of 5 subcategories: personal hygiene, general hygiene, food hygiene, household hygiene, and hand hygiene techniques. The questionnaire consists of 23 question items, and each answer has a score between 1 – 4. Scores were accumulated and categorized as good hygiene behaviour ($x \geq \text{mean}$) or poor hygiene behaviour ($x < \text{mean}$).

Data analysis for this study was carried out with univariate analysis to determine the frequency distribution of each variable and bivariate analysis with Fisher's Exact correlation test. This research has been approved by the Ethics Committee review in RSUD Dr. Moewardi (Number: 940/X/HREC/2021)

RESULT

The study was conducted on October 14th, 2021- November 15th, 2021, 45 male medical students Sebelas Maret University aged 18-22 years, participated in this study (Table 1). Collecting the data was carried out using Google form, and all respondents were chosen according to inclusion and exclusion criteria. This study was conducted by taking stock photos of facial lesions and filling out the Hygiene Inventory (HI23) questionnaire.

Table 1. Age-Sample Characteristics

Characteristics	Frequency (person)	Percentage (%)
Age (years)		
18	1	2,22
19	5	11,11
20	14	31,11
21	19	42,22
22	6	13,34
Total	45	100

Using SPSS 25.0 for Mac, researchers used univariate analysis to identify the frequency distribution of each variable and bivariate analysis to evaluate whether there was a relationship between two variables.

Based on the diagnosis of a dermatologist on 45 male students, 35 students (77.8%) had acne vulgaris

and 10 students (22.2%) had no acne vulgaris (Table 2).

Table 2. Diagnosis by Dermatologist

Diagnosis	Frequency (person)	Percentage (%)
Acne vulgaris	35	77,78
Non-acne vulgaris	10	22,22
Total	45	100

The measuring instrument used to measure hygiene behaviour was the Hygiene Inventory (HI23). HI23 was created by Stevenson et al. in 2009 after the previous simplification from 27 items to 23 items. Furthermore, the data were analyzed to obtain descriptive data on the hygiene behaviour variable. The descriptive data from the reported hygiene behaviour variable is the mean value of 66.86; the minimum value of 55.00; the maximum value of 83; and the standard deviation of 59.35.

The hygiene behaviour score categorization is divided based on the average or mean of the total score obtained from the respondents; namely, the total score greater than the mean is categorized into good hygiene behaviour, and the total score more diminutive than the mean is categorized into poor hygiene behaviour.

Table 3. Hygiene behaviour score categorization based on Hygiene Inventory (HI23) questionnaire

Hygiene Behaviours	Diagnosis			Total
	Acne vulgaris	Non-acne vulgaris	P-values	
Good	21	5	0.720	26
Poor	14	5		19
Total	35	10		45

Table 4. The relationship between hygiene behaviour and acne vulgaris incidence

Characteristic	Total Score	Frequency (person)	Percentage (%)
Hygiene Behaviour			
Good	≥ 66.86	26	57.78
Poor	< 66.86	19	42.22
Total		45	100

Based on the table above, according to the Hygiene Inventory (HI23) questionnaire, the number of

respondents categorized as good hygiene behaviour was 26 students (57.8%). In comparison, respondents categorized as poor hygiene behaviour was 19 students (42.2%) (Table 3).

There were 26 students categorized as good hygiene behaviours which is consisted of 21 students with acne vulgaris and 5 students with no acne vulgaris. Among 19 students categorized as poor hygiene, 14 students had acne vulgaris and 5 students had no acne vulgaris (Table 4).

Bivariate analysis was conducted to determine the relationship between hygiene behaviour and acne vulgaris incidence using the Fisher's Exact correlation test because it did not meet the criteria for the Chi-Square correlation test; namely, the expected value of less than 5 does not exceed 20% of the total cells. Based on the results of the statistical tests, a significance value (p) = 0.720 (Table 4) was obtained. Due to the p -value = 0.720 > 0.05, it can be concluded that there is no relationship between hygiene behaviour and acne vulgaris incidence in medical students of Sebelas Maret University.

DISCUSSION

This study's absence of a relationship between hygiene behaviour and acne vulgaris incidence in medical students at Sebelas Maret University contradicts the researcher's hypothesis. The results of this study are in line with the findings of Bhate and Williams (2013) that there is no relationship between poor hygiene behaviour and the onset of acne vulgaris. A study also showed that sweating does not cause acne vulgaris on the back.¹⁶ In line with that, the findings obtained by Shrewsbury (2015) show that poor hygiene behaviour does not cause acne vulgaris, and the formation of blackheads is not due to the accumulation of dirt and debris in the skin pores. However, harsh skincare products such as exfoliating products can trigger inflammation in acne vulgaris.¹⁷

Poor skin hygiene is one of the ancient beliefs regarding the pathogenesis of acne vulgaris. Therefore, good skin hygiene is needed to maintain by acne vulgaris sufferers. Some people think that the appearance of whiteheads and blackheads is due to dirty skin, but the black color that appears on blackheads can occur due to lipid oxidation. In addition, excessive sebum production does occur in some people with acne vulgaris. Acne vulgaris patients tend to clean sebum from the skin surface, preventing pore blockages and lowering the risk of acne vulgaris. However, lipids on the skin surface are not associated with the development of acne vulgaris. Although the pores are functionally clogged, this obstruction occurs at a depth that washing cannot achieve. Excessive

scrubbing and cleaning efforts will not affect acne vulgaris management.¹⁸

The result of this study was contradicted from previous studies from Lynn et al. (2016) regarding the perception of the population in South Asia that acne vulgaris occurs due to poor hygiene behaviour and by Kokandi et al. (2013) that as many as 80% of medical students at King Abdul Aziz University consider that the onset of acne vulgaris is due to poor hygiene behaviour.^{12,19}

Irrelevant results in this study can be caused by several factors, i.e., uncontrolled stress factors, because stress can trigger the release of androgen hormones by the adrenal glands and cause hyperplasia of the sebaceous glands. Stress causes activation of the hypothalamic-pituitary-adrenal (HPA) axis, resulting in an increase in cortisol levels in the body. Corticotropin-releasing hormone (CRH) works by stimulating the production of lipids in the sebaceous glands and steroidogenesis, which contribute to the formation of acne vulgaris.²⁰

In addition, genetic factors also play an important role but are not yet known in this study. In one study, students with a family history of acne vulgaris showed a higher prevalence of moderate or severe acne vulgaris (19.9%) than those without a family history of acne vulgaris (9.8%).²¹

Based on the research that has been done, it can be concluded that there is no relationship between hygiene behaviour and acne vulgaris incidence in the medical students of Sebelas Maret University.

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