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Supplement Consumption and Facial Care Products on Acne Vulgaris: A Cross-Sectional Study Among Medical Students

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ABSTRACT

Introduction. Signs of acne vulgaris, a condition of widespread inflammation in pilosebaceous units, include blackheads, papules, pustules, and nodules. Acne vulgaris affects 85% of teenagers and young adults between the ages of 12 and 15. Acne vulgaris is primarily caused by hyperkeratinization of the pilosebaceous ducts, inflammation, mycobacterial infection, and excessive sebum production. The term dysseborrhea refers to the changes in sebum levels that happen during puberty, both in terms of quantity and quality. Apart from exogenous factors such as cosmetics and comedogenic medications, endogenous elements such as hormones and genetics can also contribute to the issue. The aim of this study is to investigate the relationship between the use of face care products and supplementation and the incidence of acne vulgaris in medical students at the University of Muhammadiyah Makassar (Unismuh). **Methods.** For the study, a cross-sectional technique was used. The sample method used is simple random sampling. A sixteen-item questionnaire was used to gather data, which the Chi-Square test was then used to analyze. **Results.** The analysis yielded two significant results, a value of p=0.552 (p>0.05) showed no significant correlation between the incidence of acne vulgaris and the use of face products, and a value of p=0.132 (p>0.05) showed no significant correlation between the incidence of acne vulgaris and consumption of supplements. **Conclusion.** There is no correlation between consuming vitamins and using face care products to stop pupils from getting acne vulgaris.

1. Introduction

Acne vulgaris is a general inflammatory condition in the polysebaceous unit which is characterized by the presence of comedones, papules, pustules and nodules. Acne vulgaris usually begins during puberty and often occurs in teenagers and young adults. Based on the Global Burden of Disease, the incidence of acne vulgaris affects 85% of young adults aged 12-15 years. Acne vulgaris cases in the Southeast Asia region reached 40-80%, while in Indonesia there was a recorded increase of 60% in 2006, 80% in 2007, and 90% in 2009.[1]

During puberty, quantitative and qualitative changes in sebum levels occur, which is called dysseborrhoea. This situation can be triggered by internal factors such as hormonal and genetic factors and external factors, such as cosmetics that contain comedogenic ingredients and drugs.[1–3] Continuous and alternating use of cosmetics without paying attention to hygiene aspects can be a risk factor for acne vulgaris. Cosmetics that contain comedogenic ingredients can be found in various types of cosmetics such as foundation powder, moisturizer, sunblock cream and night cream.[1,3,4] These beauty products are very popular among teenagers and young adults, where the incidence of acne vulgaris is most often found in those aged 14-17 years.[1,4]

Apart from that, from the results of research related to the incidence and risk factors of acne vulgaris in people aged 14-21 years in Palembang by R.M. Suryadi Tjekyan, concluded that drugs are not a risk factor for acne vulgaris but can trigger acneiform eruptions. Of the total respondents, only 144 people took medication, all of which had nothing to do with the incidence of acne vulgaris.[5] On the other hand, there were researchers who stated that steroids, lithium and several anti-epileptic drugs and iodides could stimulate the emergence of acne vulgaris.[6–8]

Regarding these facts and explanations, the author is interested in highlighting research that carries out

assessments that assess the influence of the use of facial care products and consumption of supplements on the emergence of acne vulgaris in students of the medical faculty at Muhammadiyah University in Makassar.

2. Methods

This research uses a cross sectional approach. Cross-sectional studies are often also referred to as prevalence studies or surveys and are the simplest and most frequently conducted studies. Cross-sectional studies simultaneously measure the dependent variable (for example, disease) and the independent variable (exposure). The design of this research was carried out by collecting data to determine the relationship between the use of facial care products and consumption of supplements on the incidence of acne vulgaris.

Data were collected using a 16-item questionnaire that asked the respondents about supplements and facial products. Other section of the questionnaire, they were asked about their history of any symptoms of acne vulgaris, for the past two weeks. A closed-ended questionnaire including multiple choice questions is utilized as a data collection method. The respondent selects the option that best aligns with his perspective from the available answers. In this study, questionnaires with established validity and reliability were employed as research materials/tools. After consulting with three competent professionals (expert validity), questions considered inappropriate were eliminated and subsequently tested on a number of representative participants.[9,10]

The respondents were 151 medical students from Class of 2019 to 2022, and using simple random sampling technique. Students from the Unismuh Makassar class of 2019–2022, who are willing to participate as respondents by signing an informed permission form, and who presently or have previously experienced acne vulgaris, use face care products, and take supplements, are the inclusion criteria. In the meantime, samples that complete the questionnaire after the deadline for collection or without providing all necessary information will be excluded from the study.

3. Results

This research was conducted at the Faculty of Medicine, Muhammadiyah University of Makassar. Data collection for this research was carried out in January-February 2023. This research was carried out by collecting data through distributing questionnaires, then respondents answered questions on the questionnaire which had been distributed in the form of a Google Form. The sampling technique in this research uses a cross sectional approach.

Based on Table 1, it shows the gender of the respondents, where there were 26 male respondents (17.2%) while there were 125 female respondents (82.8%), so the majority of respondents were female. The p-value, or greater than 0.05, is 0,0516 when comparing the genders of the two groups. This suggests that there is no conclusive evidence linking gender to the occurrence of acne vulgaris.

Based on Table 2, the percentage of respondents aged 17 years is 6 people (4%), 18-year olds are 40 people (26.5%), 19-year olds are 42 people (27.8%), 20-year olds are 35 people. (23.1%), 18 people aged 21 years (12%), and 10 people aged 22 years (6.6%). So, the largest number of respondents were respondents aged 19 years.

Table 3 shows that the percentage of respondents from the Class of 2019 was 21 people (13.9%), the Class of 2020 was 22 people (14.6%), the Class of 2021 was 43 people (28.5), and the Class of 2022 was 65 people (43%). So the class that experiences the most acne vulgaris is the class of 2022 with 49 people. This could be due to the stress experienced because the class of 2022 are still adapting to studying at medical school, which is very different from when they were still in high school.

Table 1. Respondent data by gender

Gender	Frequency (n)	Percentage (%)
Male	26	17.2
Female	125	82.8
Total	151	100

Table 2. Respondent data by age

Age (years)	Frequency (n)	Percentage (%)
17	6	4
18	40	26.5
19	42	27.8
20	35	23.1
21	18	12
22	10	6.6
Total	151	100

Table 3. Respondent data by batch

Class	Frequency (n)	Percentage (%)
2019	21	13.9
2020	22	14.6
2021	43	28.5
2022	65	43
Total	151	100

Table 4. Respondent data based on use of facial care products

Facial Care Products Use	Frequency (n)	Percentage (%)
Yes	145	96
No	6	4
Total	151	100

Table 5. Respondent data based on facial products

Supplement Consumption	Frequency (n)	Percentage (%)
Yes	20	13.2
No	131	86.8
Total	151	100

The percentage of respondents who use facial care products is 145 people (96%), and those who do not use facial care products are 6 people (4%) (Table 4). There were 20 people (13.2%) who took supplements, and those who did not take supplements were 131 people (86.8%) (Table 5). Table 6 shows the presentation of respondents who experienced acne vulgaris, namely 113 people (74.8%), and those who did not experience acne vulgaris, namely 38 people (25.2%).

Table 7 shows the presentation of the degree of acne vulgaris of respondents, namely that 11 people (7.3%) did not experience degrees of acne, as many as 117 people (77.5%) experienced degrees of comedone, papules (mild), as many as 20 people experienced degrees of blackhead acne, Papules, Pustules (moderate) and as many as 3 people experienced Degrees of Acne Papules, Pustule, Nodules, Cysts, Scars (severe).

Table 8 shows that 14 people (9.3%) of respondents who used facial care products experienced acne vulgaris and 131 people (86.7%) did not experience acne vulgaris, while respondents who did not use facial care products experienced acne vulgaris as many as 0 people (0%) and 6 people (4%) did not experience acne vulgaris.

Table 6. Respondent data based on acne vulgaris

Acne Vulgaris	Frequency (n)	Percentage (%)
Yes	113	74.8
No	38	25.2
Total	151	100

Table 7. Respondent data based on the degree of acne vulgaris

Degree of Acne Vulgaris	Frequency (n)	Percentage (%)
None	11	7.3
White or black heads, papules (mild)	117	77.5
White or black heads, papules, pustules (moderate)	20	13.2
Papules, pustules, nodules, cysts, scar (severe)	3	2
Total	151	100

Table 8. Relationship between facial care product use and acne vulgaris incidence

Use of Facial Products	Acne Vulgaris				Frequency		*p-value*
	(+)		(-)				
	n	%	n	%	n	%	
Yes	14	9.3	131	86.7	145	96	
No	0	0	6	4	6	4	0.552
Total	14	9.3	137	90.7	151	100	

Table 9. Relationship between supplement consumption and acne vulgaris incidence

Supplement Consumption	Acne Vulgaris				Frequency		*p-value*
	(+)		(-)				
	n	%	n	%	n	%	
Yes	1	0.7	19	12.6	20	13.3	
No	0	0.0	131	86.7	38	86.7	0.132
Total	3	2.0	148	98.0	151	100	

Table 9 shows that 1 person (0.7%) of respondents who consumed supplements experienced acne vulgaris and 19 people (12.6%) did not experience acne vulgaris, while 0 respondents who did not consume supplements experienced acne vulgaris (0.0%) and 131 people (86.7%) did not experience acne vulgaris. Hence, out of 151 participating respondents, 113 people experienced acne vulgaris, of which 14 people experienced acne vulgaris caused by using facial care products and one experienced acne vulgaris due to consuming supplements. There were 98 people experiencing acne vulgaris caused by other factors.

The results of the analysis using the Chi-Square test between the use of facial care products and the incidence of acne vulgaris showed a significant value of 0.552 ($p>0.05$), so Ha was rejected. Meanwhile, regarding the relationship between supplement consumption and the incidence of acne vulgaris, the significant value was 0.132 ($p>0.05$), so Ha was rejected. There was no significant relationship between the use of facial care products and consumption of supplements and the incidence of acne vulgaris in students at the Faculty of Medicine, Muhammadiyah University of Makassar who met the inclusion and exclusion criteria.

The odds ratio (OR) from the study is ≈ 1.39. This implies that the likelihood of having acne vulgaris is 1.39 times higher in individuals who had facial care than in those who did not. whereas the 95% Confidence Interval (CI) is between 0.078 and 24.87. There is a lot of ambiguity and no statistically meaningful correlation, as indicated by the interval's large range, which encompasses 1.

4. Discussion

Based on the Chi-Square test analysis, the results showed that there was no significant relationship between the use of facial care products and the incidence of acne vulgaris, with a value of $p = 0.552$ ($p>0.05$). Our study found 14 people (9.3%) used facial care products and experienced acne vulgaris. Facial skin care consists of powder, moisturizer, sunscreen and day/night cream. Facial care products should be chosen according to skin type, because each skin type has different characteristics and requires different nutrients. There was 1 person (0.7%) who took supplements and experienced acne vulgaris. Even though many people consume supplements, they do not cause acne vulgaris.

Research conducted on students from the Faculty of Medicine at Unismuh Makassar based on data showed that most of them suffered from acne vulgaris with degrees of comedones, papules (mild). This research on the use of facial care products and the incidence of acne vulgaris is not in line with research by Andriana, Effendi and Berawi which stated that there is a relationship between the use of facial care products and the incidence of acne vulgaris in female students at the Faculty of Medicine, University of Lampung. In the research, it was discovered that 136 respondents experienced acne, of which 125 people used facial care products and 11 people did not use facial care products. There were 94 respondents who did not experience acne vulgaris, of which there were 70 people who used facial care products and 24 people who did not use facial care products.[1,11]

This research on the use of facial care products and the incidence of acne vulgaris is in line with research by Sehat Kabau and strengthened by research which stated that there is no relationship between the use of facial care products and the incidence of acne vulgaris in university female students. In the research, it was found that 10.00% said they experienced acne vulgaris after using facial care products, while 90.00% of respondents stated that using facial care products did not affect the appearance of acne vulgaris.[10] The findings of this study are supported by articles written by Mah Zhook Yueng, Diah Mira Indramaya, and Arifa Mustika, who examined the impact of nutrition and cosmetics on the severity of acne vulgaris. They came to the conclusion that cosmetics such as cleansers, exfoliants, moisturizers, facial shields, and decorative items are also unrelated to the severity of acne vulgaris.[12]

A study investigating the relationship between the use of facial moisturizers and the incidence of acne vulgaris due to mask-wearing among healthcare workers during the COVID-19 pandemic found no significant association. The research, which involved 44 nurses diagnosed with acne vulgaris, showed that despite the theoretical benefits of moisturizers in maintaining skin barrier function, the results of the statistical analysis (Fischer's Exact Test) indicated no significant correlation ($p = 0.722$). This suggests that other factors, such as mechanical friction from mask use, might play a larger role in mask-related acne outbreaks, rather than facial moisturizer usage alone. Similar studies reinforce that while moisturizers help with skin barrier integrity, their role in preventing acne in such contexts remains inconclusive.[13]

Nevertheless, conflicting conclusions about the association between face care products and acne vulgaris incidence were drawn from multiple

investigations. Studies conducted on Padang public vocational school students reveal a connection between these products and the prevalence of acne vulgaris. Cleanser, moisturizer, protector, and thinner are among the facial care items that are compared.[14] The findings of a study by Aras, Ashari, and Lamabawa, which indicate that the routine of washing your face with face care products might affect the appearance of acne, also corroborate this.[15]

Based on the Chi-Square test analysis, the results showed that there was no significant relationship between supplement consumption and the incidence of acne vulgaris, with a value of p = 0.132 (p>0.05). This research on supplement consumption and the incidence of acne vulgaris is in line with research by Ozuguz which stated that there is a negative correlation between the severity of acne vulgaris and levels of Vitamin E and zinc, or it could be said that there is an indirect relationship between low levels of Vitamin E and the appearance of acne.[16] In one of the studies conducted by Rasha, it was explained that there was no correlation between vitamin C dermabrasion performed by patients and severe acne scars.[17]

The vitamins B6 and B12 are two examples of vitamins and supplements that might exacerbate acne vulgaris. High-doses of vitamin B6 and B12 (more than 5 mg to 10 mg per week) have been demonstrated to either trigger acne breakouts or exacerbate pre-existing acne, while the exact reason of these effects is yet unknown. According to one idea, the bacteria that cause acne, *Cutibacterium acnes* (C. acnes), requires vitamin B12 for metabolism. By taking a vitamin supplement, will effectively providing the bacteria with nourishment. Porphyrin is a substance that aids in the synthesis of red blood cells, and this increases its production, and acne and inflammation may result from this. Vitamin B6 and B12 in high doses have also been connected to rosacea fulminans, a disorder that resembles acne.[18,19]

After a review publication from Sachdeva et al., it became clear that many factors such as stress, gender differences, and lifestyle choices all had an impact on medical students' acne prevalence. [20] Medical students with acne experienced a variety of detrimental psychological and social effects, such as a lowered sense of self-worth, humiliation, anxiety, melancholy, and social disengagement. This research states lifestyle as diet, and also physical activity regularity (1–3). In terms of diet, eating dairy (p = 0.007), sweets (p = 0.001), chocolate (p = 0.001), and greasy food (p = 0.006) were all substantially linked to acne.[21] This result supports the study's hypothesis before that there is no relationship between the use of medications and cosmetics and the incidence of acne vulgaris.

This study is important because it provides distinctive insights on the population of medical students that may be used to develop customized preventative strategies. The study tackles two popular strategies used by young adults to avoid acne by examining the association between face care products, supplements, and acne. This analysis yields useful and immediately usable information.

Other significant variables including food, stress levels, sleep patterns, and other lifestyle factors that may contribute to acne were not taken into consideration in favor of the study's primary focus on face care products and supplements. In order to prove causality and gain a deeper understanding of the temporal association between face care products, supplements, and the onset of acne vulgaris, a longitudinal study is also necessary. To increase the generalizability of the results, the study will be expanded to include individuals from a variety of demographics, including age groups, locations, and backgrounds.

5. Conclusion

There is no correlation between taking vitamins and applying facial care products to prevent acne vulgaris in students.

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