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## THE CORRELATION OF COSMETIC USE WITH INCIDENT OF ACNE VULGARIS

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## THE CORRELATION OF COSMETIC USE WITH INCIDENT OF ACNE VULGARIS

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### ABSTRACT

Acne vulgaris (AV), commonly known as acne, is a common skin problem that can cause skin damage. AV is a form of chronic inflammation of the pilosebaceous follicles due to blockage. According to the Global Burden of Disease (GBD), 85% of people, including young adults aged 12 to 25, have experienced AV. One factor that often exacerbates the occurrence of AV is the use of cosmetics with comedogenic properties. Therefore, the purpose of this study was to determine whether there is a relationship between cosmetic use and the occurrence of AV in female students of the Faculty of Medicine, Christian University of Indonesia class of 2023. Observational analysis research with a cross-sectional approach was used in this study. A total of 85 samples were obtained using the research method, namely purposive sampling. Data collection was conducted at a single point in time to explore cosmetic use related to AV events. Data analysis using univariate and bivariate techniques. From the total, 76 respondents (89.4%) experienced AV and 9 respondents (10.6%) didn't. The Fisher Exact Test results obtained a P value > 0.05, this indicates that there was no significant relationship between cosmetic use and AV incidents in these female students.

Keywords: acne vulgaris; comedogenic; cosmetic; pilosebaceous follicles

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### INTRODUCTION

Acne vulgaris (AV) is the most common skin problem that can cause skin damage (Leung et al., 2021). It is a form of chronic inflammation of the pilosebaceous follicle, due to follicle blockage (Andriana et al., 2018; Harlim et al., 2024; Ulfah, 2020). The clinical manifestations that can be seen in this condition are characterized by the presence of various types of lesions, such as comedones (blackheads and whiteheads), papules, pustules, nodules and cysts (Harlim et al., 2024). AV usually spreads in places where many pilosebaceous follicles are found, such as the face, shoulders, neck, chest, upper back and upper arms (Mauliza et al., 2020). AV is a common skin problem and is often experienced by teenagers and young adults, although AV is not classified as a fatal disease, it is quite annoying for some people (Harlim & Pritianti, 2023).

The prevalence of AV is very high, especially among adolescents. Although it often resolves after puberty, some individuals continue to experience the condition into adulthood. Factors such as age, gender, family history, and overweight status significantly contribute to the development and severity of AV (Heng & Chew, 2020). According to research conducted by the Global Burden of Disease (GBD), approximately 85% of young adults aged 12-25 experience AV. In the United States, AV is one of the three most common skin conditions. Meanwhile, in Singapore, approximately 88% of adolescents aged 13-19 are also affected by this condition. AV is most common in boys, but after adolescence, the prevalence tends to be higher in girls (Wetarini, 2020).

AV is caused by various factors, namely internal factors such as excess sebum production, hair follicle hyperkeratosis, Propionibacterium acnes (P. acne) bacterial colonies in the pilosebaceous unit, and the occurrence of inflammatory reactions, as well as extrinsic factors such as genetics, hormones, diet, use of cosmetics, trauma, psychological factors, infections, climate, and the environment (Mauliza et al., 2020; Sifatullah, 2021). Acne occurs when bacteria damage the skin's layers by releasing chemicals that damage the stratum corneum and stratum germinativum, causing inflammation. As a result, sebum accumulated in the skin becomes trapped and hardens, forming acne. If exposed to unclean hands or nails, the inflammation can worsen, causing the acne to enlarge (Imasari & Emasari, 2022).

The use of comedogenic or acnegenic cosmetics is one of the factors that often complicates the treatment of AV (Astiah et al., 2024). According to BPOM Regulation No. 12 of 2020, cosmetics are defined as substances or products used on the external parts of the human body, including the outer skin, hair, nails, lips, teeth, external genitalia, and oral mucous membranes. The purpose of their use is to cleanse, provide a pleasant aroma, improve appearance and eliminate unpleasant odors from the body, and maintain good body condition (BPOM, 2020). Based on research conducted by Suhartomi on AV, it shows that the use of cosmetics such as compact powder, blemish balm cream (BB cream), and foundation can increase the frequency and severity of AV. Furthermore, patients who regularly use compact powder and foundation tend to experience worsening of their AV condition (Suhartomi et al., 2024). Meanwhile, research conducted by Harlim et al. showed that only the use of compact powder had a significant correlation with the occurrence of AV (Harlim et al., 2024). Therefore, this study aims to analyze the relationship between cosmetic use and AV incidents in female students of the Faculty of Medicine, Christian University of Indonesia class of 2023, considering that cosmetics are widely used among female students and AV incidents often occur among young adults.

## METHOD

The type of research method used is observational analytic with cross-sectional research. Data collection was carried out at one point in time to explore individual experiences related to AV incidents in female students of the Faculty of Medicine, Christian University of Indonesia class of 2023 and the independent variables were the use of compact powder, two-way cake powder, loose powder, foundation, cushion, BB cream, blush on, and eye shadow. The location of the study was carried out at the Faculty of Medicine, Christian University of Indonesia. This study was conducted on March, 4-6<sup>th</sup> of 2025. This study was conducted on a population that met the inclusion criteria, namely the population of female students of the Faculty of Medicine, Christian University of Indonesia class of 2023 aged 18-25 years who experienced AV. The total number of respondents was 85 people. Data analysis was carried out using univariate and bivariate analysis. Univariate analysis was carried out to see whether the data distribution was normal or not. Bivariate analysis was carried out to assess the relationship between variables. The P value was calculated using the Fisher Exact Test.

## RESULT

Table 1.

Frequency Distribution of Respondents Based on Acne Vulgaris (AV) Incidence

AV	f	%
AV	76	89.4
Non- AV	9	10.6

Table 1, shows that the AV incident variable is known to consist of 76 or 89.4% of respondents who experienced AV and 9 or 10.6% of respondents who did not experience AV.

Table 2, it can be concluded that the highest percentage of AV incidents occurred with the use of Blush On, at 82.4%. Meanwhile, the lowest percentage of AV incidents occurred with the use of BB Cream, at 2.4%.

Table 2.

Univariate Analysis of the Relationship between the Use of Various Types of Cosmetics and the Incidence of Acne Vulgaris (AV)

Types of Cosmetics	f		%
	AV (+)	AV (-)	
Compact Powder	21	64	24.7
Two-Way Cake Powder	10	75	11.8
Loose Powder	45	40	52.9
Foundation	17	68	20
Cushion	53	32	62.4
Blemish Balm Cream (BB Cream)	2	83	2.4
Blush On	70	15	82.4
Eye Shadow	27	58	31.8

Table 3.

Bivariate Analysis of the Relationship between the Use of Various Types of Cosmetics and the Incidence of Acne Vulgaris (AV)

Types of Cosmetics	Using Cosmetics		No Cosmetics		P value
	AV (+)	AV (-)	AV (+)	AV (-)	
Compact Powder	17	4	59	5	0.215
Two-Way Cake Powder	8	2	68	7	0.285
Loose Powder	40	5	36	4	1.000
Foundation	15	2	61	7	1.000
Cushion	48	5	28	4	0.723
Blemish Balm Cream (BB Cream)	2	0	74	9	1.000
Blush On	61	9	15	0	0.350
Eye Shadow	23	4	53	5	0.456

Table 2, it can be concluded that all types of cosmetics are not significantly related to the occurrence of AV. From these results, the highest or least significant P value was found for the use of loose powder, foundation, and BB cream, at 1.000 for the occurrence of AV. Meanwhile, the lowest or closest to significant P value was found for the use of compact powder, at 0.215.

DISCUSSION

The Relationship between the Use of Compact Powder and the Incidence of AV

The results of the bivariate analysis of the relationship between the use of compact powder and AV in this study are in line with the research conducted by Inayati and Darmawan, where the results of the Chi-Square analysis between the use of compact powder and the incidence of AV obtained P value 0.057 indicating that there was no significant relationship between the use of compact powder cosmetics and the incidence of AV (Inayati & Darmawan, 2022). Another study conducted by Khansa et al., also showed that there was no relationship between the use of compact powder and the incidence of AV (Khansa et al., 2019). Compact powder often contains ingredients like silica or talc, which help absorb excess oil on the face. By reducing oiliness, compact powder can help prevent acne breakouts, which can occur due to excess oil production on the face (Mona S et al., 2022). AV can get worse due to factors other than the use of cosmetics, for example stress (Bhaijamal & Nayak, 2020). Stress can also trigger increased production of androgen hormones, which can cause the sebaceous glands to enlarge, resulting in increased sebum production. High sebum production and increased keratinocytes can lead to the appearance of AV (Yadnya et al., 2020).

The Relationship Between the Use of Two-Way Cake (TWC) Powder and the Incidence of AV

Research conducted by Elvira, of 82 respondents, 75 respondents (91.5%) experienced AV, and 8 respondents used TWC powder (Nanda Elvira, 2022). This research is supported by the results of univariate analysis of AV incidents that can be triggered by stress factors due to academic tasks that can influence AV incidents. TWC Powder is a powder that is easy to apply to the skin, providing a natural, smooth, matte finish. It offers excellent coverage thanks to its foundation formula. It's

highly recommended for covering blemishes and dark spots with long-lasting results (Mona S et al., 2022). TWC powder has the ability to absorb excess oil on the face, so TWC powder can help control oil production (Fitriyanti, 2022). This has the potential to reduce the risk of AV.

### **The Relationship Between Loose Powder Use and AV Incidences**

The results of the bivariate test of this study are in line with the research of Kaprawi et al., where the results of the Chi-Square analysis between the use of loose powder and the incidence of AV obtained a P value 0.450, so it can be concluded that there is no relationship between the use of loose powder and the incidence of AV (Kaprawi et al., 2021). The reason loose powder doesn't cause acne is because it typically has a finer, finer texture and is able to absorb excess oil, thus reducing the likelihood of clogged pores. Furthermore, loose powder specifically formulated for acne-prone skin often contains non-comedogenic ingredients, which prevent it from clogging pores (N et al., 2024). Things that can cause AV are using powder for a long time and having excess oil content, the function of which is to make facial skin look smoother (Kaprawi et al., 2021).

### **The Relationship Between Foundation Use and AV Incidents**

This research aligns with research conducted by Ulfah, who found that out of 126 respondents, 57 (66.7%) used foundation, and 51 (40.5%) experienced AV. The study also concluded that there was no correlation between foundation use and AV events (Ulfah, 2020). Research conducted by Nabila et al. also stated that the analysis results showed a P value 0.307, based on these results, it can be concluded that there is no relationship between the use of foundation and AV (Nabila et al., 2025). The duration of use and the thickness of the application method of foundation are risk factors for the emergence of AV (Fitriyanti, 2022). The occurrence of AV can also be influenced by other factors such as stress, hormonal changes, genetic factors, as well as a diet high in fat, carbohydrates and iodine, as well as eating spicy foods (Kabau, 2012).

### **The Relationship Between Cushion Use and AV Incidence**

This research is in line with Retno's research, where the analysis results obtained with a P value 0.691, so it was concluded that there was no relationship between cushion use and AV incidents in female employees in Yogyakarta (Anggraeni, 2021). These insignificant results can also occur because the cushion contains ingredients that can maintain healthy skin, such as ceramides, centella, and hyaluronic acid (Livia, 2023).

### **The Relationship Between BB Cream Use and AV Incidents**

This study aligns with Panjaitan's study, which found that 21 of 94 patients (16.0%) used BB Cream. The study concluded that there was no association between BB Cream use and AV events (Panjaitan, 2020). Another study conducted by Tooy et al., concluded that there was no significant relationship between the use of BB Cream and the incidence of AV in female students of the 2015 and 2016 intakes of the Faculty of Medicine at Sam Ratulangi University (Tooy et al., 2019). BB cream is a cosmetic product that combines moisturizer, concealer, sunscreen, and foundation in cream form. Its function is to even out skin tone, provide moisture, brighten the appearance of the face, disguise fine lines, and also protect the skin from sun exposure (Astiah et al., 2024).

### **The Relationship Between Blush on Use and AV Incidents**

This study aligns with research conducted by Ulfah, who found that out of 126 respondents, 83 (65.9%) used blush, and 51 (40.5%) experienced AV. The study also concluded that there was no relationship between blush use and the incidence of AV (Ulfah, 2020). Research conducted by Harlim et al. also showed insignificant results. Blush on comes in various forms, including powder or pressed blush, cream blush, and liquid blush. Loose powder blush tends to be safer for acne-prone skin because its particles are larger, making it less likely to clog pores and cause acne. Liquid blush is also less likely to trigger acne because its primary solvent is water or hydroalcohol, which is relatively safe for the skin (Harlim et al., 2024).

## Relationship between Eye Shadow Use and AV Events

1 Eyeshadow is a cosmetic product often applied to the eye area to add color. Available in a variety of colors and textures, eyeshadow can be found in powder, cream, compact, and liquid forms (usually packaged in tubes). Formulas also vary, including matte, pearlescent (gritty and shiny), shimmer, and glossy (oil-like) (Yolindasari, 2020). Other factors that can cause the appearance of AV so that no relationship was found between the use of eye shadow and the occurrence of AV are stress, hormones, family history (genetics), and diet/foods high in fat, high in carbohydrates and iodine (Harlim & Sari, 2020).

## CONCLUSION

22 1 It can be concluded that the majority of female students experienced AV. From the 85 students, 76 (89.4%) experienced AV, and 9 (10.6%) did not. The most frequently used cosmetics were blush (82.4%), cushion (62.4%), and loose powder (52.9%). Meanwhile, there was no significant association between the use of compact powder, TWC powder, loose powder, foundation, cushion, BB cream, blush on, and eye shadow with the incidence of AV among the female students.

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