



THE EFFECT OF THE USE OF MASK ON THE INCIDENCE OF ACNE VULGARIS IN STUDENTS OF MEDICAL FACULTY DIPONEGORO UNIVERSITY

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ABSTRACT

Background: Acne vulgaris (AV) is an inflammatory condition of pilosebaceous follicles that is commonly experienced in adolescents and young adults. The pathogenesis of AV is multifactorial, such as caused by inflammation and external factors of acne exposome, which have an impact on the pathogenesis of acne in the use of masks. **Objective:** To determine the effect of using a mask and the number of acne vulgaris on students of the Faculty of Medicine, Diponegoro University. **Methods:** This research is an observational type with a cross sectional design. The research subjects were 58 students of the Faculty of Medicine, Diponegoro University with an age range of 19-23 years who used masks. The data obtained are primary data from the questionnaire. The analytical test used is bivariate chi square analysis. **Results:** This study showed that there was no significant effect between the type of mask and the incidence of acne vulgaris $p = 0.610$ ($p > 0.05$), the duration of the use of masks and the incidence of acne vulgaris $p = 0.200$ ($p > 0.05$), and the frequency of using masks with the incidence of acne vulgaris $p = 0.689$. ($p > 0.05$) **Conclusion:** There is no effect between the use of masks and the incidence of acne vulgaris.

Keywords: Acne Vulgaris, Mask, Acne Exposome

INTRODUCTION

Acne vulgaris (AV) is a chronic obstructive and inflammatory skin disease in the pilosebaceous unit which is a polymorphic dermatosis and has a polygenetic role.¹ Usually occurs in adolescents and young adults characterized by comedones, papules, cysts, pustules, nodules and scarring. Acne is often the first sign of puberty and can occur a year before menarche or the first menstruation. Although not life-threatening, AV can have a socioeconomic impact and affect the quality of life for sufferers.^{2,3}

Acne vulgaris (AV) is a common skin disease that occurs in both men and women when puberty begins at the age of 12-25 years, up to almost 80%, and most commonly affects the 15-24 year age group. In Southeast Asia, there are 40-80% cases of acne vulgaris, while according to Indonesian cosmetic dermatology studies, it shows that 60% of acne vulgaris sufferers in 2006, 80% occurred in 2007 and 90% in 2009.⁴ The highest prevalence is age 14-17 years in women ranged from 83-85% and in men aged 16-19 years ranged from 95-100%.⁵

The pathogenesis of acne is multifactorial, but four theories have been identified as to the etiopathogenesis of acne. The four pathogenesis are hyperkeratinization which causes blockage of keratin from the pilosebaceous ducts, excess sebum

production, colonization of microorganisms in the sebaceous follicles such as bacteria *Propionibacterium acnes* (*P. acnes*), *Staphylococcus epidermidis* and *Pityrosporum ovale*, and inflammation.^{6,7} These four elements are interconnected and influenced by immunity, hormones and heredity.² In addition to these factors, there are also external factors known as *acne exposome* which are thought to have an influence on the pathogenesis of acne.⁸ Various factors included in *acne exposome* include: medication, nutrition, facial care, mechanical occupational factors, lifestyle/ *personal hygiene*, psychology, climate and pollution.^{8,9}

Coronavirus disease 2019 (COVID-19) is a respiratory disease caused by *Severe acute respiratory syndrome coronavirus 2* (SARS-CoV-2), which was first discovered in China in December 2019 and has spread throughout the world and is therefore designated a pandemic.⁹ Corona virus can be prevented by washing hands, using hand sanitizer and keeping a distance, but it can also routinely use masks.^{8,10} Masks can be used either to protect a healthy person (worn to protect themselves when in contact with an infected person) or to control the source of infection (worn by an infected person to prevent further transmission).^{8,11} The use of masks in



the long term can actually cause some problems on the skin such as acne, dermatitis, redness and pigmentation on the face. The incidence of acne is a problem that is most often reported and almost complained of from various circles. *Maskne* is most influenced by 3 factors of *acne exposome*, namely mechanical occupational factors, personal hygiene and climatic factors.⁹

Based on the explanation described above, researchers are interested in conducting research on the effect of using masks on the incidence of acne vulgaris. research is still few in Indonesia.

METHOD

This study used an observational research type with a design *cross sectional*. The research was conducted in the area of the Faculty of Medicine, Diponegoro University and was carried out at the home of the respective research subjects during the Covid-19 pandemic. This research was conducted from June to August 2021.

The sample in this study were students of the Faculty of Medicine, University of Diponegoro who met the inclusion criteria. The inclusion criteria for this study were students of the Faculty of Medicine, Diponegoro University aged 19-23 years who used masks during the pandemic, were willing to sign *informed consent* and were allowed to participate in the study. The sample selection was *method purposive sampling* with a sample size of 58 Undip Medical Faculty students.

The data collection process was carried out by means of all research subjects being given explanations for filling out questionnaires and asking for facial documentation for research purposes. The data is then processed, coded, and entered into a computer for descriptive analysis and hypothesis testing. Hypothesis testing regarding the effect of using a mask on the incidence of acne vulgaris was analyzed using the analysis test *chi square bivariate*.

RESULTS

This research was conducted from June to August 2021 involves 58 students of the Faculty of Medicine UNDIP who have met the inclusion and exclusion criteria of the study.

Based on Table 1. of the 58 research subjects, all subjects were active students of the Faculty of Medicine, Diponegoro University (100%), all research subjects also used masks when carrying

out their activities (100%). Research subjects aged 19 years were 3 people (5.2%), subjects aged 20 years were 39 people (67.2%), subjects aged 21 years were 15 people (25.9%), subjects aged 22 years were 0 people (0 %), the subject with the age of 23 years is 1 person (1.7%). Subjects with female sex as many as 43 people (74.1%), subjects with male sex as many as 15 people (25.9%)

Table 1. Characteristics of Research Subjects

Characteristics	F	%
Active students of the Faculty of Medicine, University of Diponegoro		
Yes	58	100%
No	0	0%
Use a mask when doing activities		
Yes	58	100%
No	0	0%
18-25 years old		
Yes	58	100%
No	0	0%
Age		
19	3	5.2%
20	39	67.2%
21	15	25.9%
22	0	0%
23	1	1.7%
Gender		
Female	43	74.1%
Male	15	25.9%

Table 2. The Effect of Mask Type with Incidence Rate of Acne vulgaris

The types of masks used of Subject	Incidence of Acne Vulgaris				P
	Yes		No		
	n	%	n	%	
Medical/ surgical Mask	33	82.5%	7	17.5%	0.610
KN95 mask	2	66.7%	1	33.3%	
Disposable non medical Mask	12	92.3%	1	7.7%	
Cloth Mask	2	100.0%	0	0.0%	
Total	49	84.5%	9	15.5%	

Based on table 2. The effect of the type of mask on the incidence of acne vulgaris obtained *p* value of 0.610 ($p > 0.05$). so it does not show a significant effect.



Table 3. The Effect Duration of Using Masks On the Incidence Rate of Acne vulgaris

Duration of using Mask	Incidence of Acne Vulgaris				P
	Yes		No		
	F	%	F	%	
Normal (1-4 hours)	39	88.6%	5	11.4%	0.200
Long time (5-8 hours)	9	75.0%	3	25.0%	
Very long time (> 8 hours)	1	50.0%	1	50.0%	
Total	49	84.5%	9	15.5%	

Based on table 3. The effect of the duration of using masks on the incidence of acne vulgaris obtained *p* value of 0.200 ($p > 0.05$). so it does not show a significant effect.

Table 4. The Effect of Frequency of Using of Masks on Incidence of Acne vulgaris

Frequency of Using Masks	Incidence of Acne Vulgaris				P
	Yes		No		
	F	%	F	%	
Rarely (1-2 times a week)	10	76.9%	3	23.1%	0.689
Often (3-4 times a week)	14	87.5%	2	12.5%	
Always (>4 times a week)	25	86.2%	4	13.8%	
Total	49	84.5%	9	15.5%	

Based on table 4 The effect of the frequency of using masks on the incidence of acne vulgaris obtained *p* value of 0.689 ($p > 0.05$).so it does not show a significant effect.

DISCUSSION

Theoretically, *Acne Exposome* has impact on the pathogenesis of acne in the use of masks. The effect of this *acne exposome* on the incidence, duration and severity of acne. Factors included in *acne exposome* include: medication, nutrition, facial care, mechanical occupational factors, lifestyle / personal hygiene, psychology, climate and pollution. Acne due to masks is most influenced by 3 *acne*

exposome factors, namely mechanical occupational factors, personal hygiene and climatic factors.⁹

Occupational mechanical factors such as rubbing, friction, friction and pressure can damage the skin barrier and interfere with sebum production, triggering acne that causes inflammation. In addition, climate factors also affect humidity which can interfere with sebum production which triggers the appearance of blackheads. When ruptured, the entire contents of the comedo enter the dermis which causes a more severe reaction which contains giant cells as a result of the release of keratin material. In the infiltrate of acne vulgaris, bacteria were found *Propionibacterium acnes* outside and inside the leukocytes. Lesions appear as pustules, nodules, and papules depending on the location and extent of inflammation. Furthermore, the fibrous tissue contrast that is formed can cause scar tissue.¹²

Based on the analysis in this study, the results of the effect of the type of mask on the incidence of acne vulgaris *p* value of 0.610 ($p > 0.05$), the results of the effect of the duration of using masks on the incidence of acne vulgaris *p* value of 0.200 ($p > 0.05$) and for the results of the effect of the frequency of using masks on the incidence of acne vulgaris *p*-value of 0.689 ($p > 0.05$). This shows that there is no significant effect between the use of masks and the incidence of acne vulgaris.

The results of this study are in accordance with Giovanni et al's research which states that the use of masks in terms of age, gender, type of mask, duration and frequency of using masks has no effect on the incidence of acne vulgaris.¹³ This is also in accordance with Hidajat and Kosasih's statement that masks are not the cause of acne vulgaris, but because of a combination of friction, repeated pressure when wearing a mask, sweat, or stress on the skin that causes acne or exacerbation of existing acne.^{8,9}

The hypothesis that there is an influence between the use of masks on the incidence of acne vulgaris in students of the Faculty of Medicine, Diponegoro University is not proven. This may be caused by several factors, including the type of mask that has less variation, the state of the research subject, and the uncontrolled consumption of anything, especially foods containing saturated fat. Acne vulgaris can also be influenced by several factors such as genetics, hormones, food consumed, use of cosmetics, and stress. The circumstances of the research subjects can also affect the results of this



study. These include psychological stress conditions that increase the release of pro-inflammatory cytokines and increase androgens, obesity which causes excessive expression of pro-inflammatory cytokines due to chronic systemic inflammation and also increases androgens, female research subjects who are menstruating or not because they affect hormones and a diet high in fat and carbohydrates that can affect the occurrence of inflammation. However, this situation was not explored further in this study.¹⁴

The limitations in this study are the diagnosis is only based on photos not through direct physical examination, the questions are less specific and detailed in the questionnaire, the number of research subjects is limited due to the difficulty of finding research subjects who want to fill out the questionnaire by sending photos of faces during the Covid-19 pandemic which was carried out manually. online, the research design *cross-sectional* only looks at the condition of the research subject, so it does not examine in detail the factors that existed during the study.

CONCLUSION

Based on the results of this study, it was found that there was no significant effect between the use of masks and the incidence of acne vulgaris in students of the Faculty of Medicine, Diponegoro University.

In future research, it is recommended to use samples from outside the Diponegoro University Faculty of Medicine students and use a larger number of samples. And it is recommended to do further research on other factors that influence the incidence of acne vulgaris, and it is hoped that it can be done offline so that supervision is more strict and objective and the diagnosis is made through a physical examination not only with photos.

Ethical Approval

This study received Ethical Clearance from the Health Research Ethics Commission, Faculty of Medicine, Diponegoro University with ethical clearance number No. 149/EC/KEPK/FK-UNDIP/V/2021.

Conflicts of Interest

There are no conflict of interest in this study.

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