Medicina Biomedica Journal
Vol. 1, No. 2, Juli 2022, pp. 45 ~ 55
ISSN: 2827- 8275, DOI: 10.30596/mbj.v1i1

THE LONG-TIME EFFECT OF MASK-WEARING DURING COVID-19 PANDEMIC ON THE ACNE INCIDENCE OF UMSU MEDICAL STUDENTS CLASS 2018

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ABSTRACT

Mask is a protective device that covers the mouth and nose to minimize directtransmission of infectious agents in accordance with relevant standards. The use of masks is a fundamental non-pharmacological intervention and has proven to be effective as a barrier to the transmission of viruses that cause several respiratory diseases, such as Coronavirus disease (COVID- 19). The use of masks has been proven to have a significant protective effect and is effective in reducingthe risk and cases of COVID-19 infection. In addition to having a positive impact, the use of masks as personal protective equipment (PPE) to prevent transmission and infection of COVID-19, also has a negative impact, because it causes some changes in the skin that will increase the occurrence of skin problems, especially in areas covered by masks. TO find out the effect between the duration of using a mask and the incidence of acne in UMSUmedical students class 2018. The results of the study showed that the duration of using masks for one to three hours, four to eight hours, and more than 8 hours related to the incidence of acne in UMSU medical students batch 2018 respectively as many as 30 people (85.7 %), 34 people (94.4%), and 4 people (80%). The results ofthe bivariate analysis between the duration of using masks and the incidence of acne in FK UMSU students batch 2018 was p = 0.260 (P>0.05).

Keyword : Acne, COVID-19, mask

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ISSN: 2827- 8275, DOI: 10.30596/mbj.v1i1

1. INTRODUCTION

A mask is a protective device that coversthe mouth and nose to minimize direct transmission of infectious agents in accordance with relevant standards, including medical, surgical masks, and respirators with or without valves. The use of masks is a fundamental non- pharmacological intervention and has proven to be effective as a barrier to the transmission of viruses that cause several respiratory diseases such as influenza, Severe Acute Respiratory Syndrome Coronavirus (SARS), and Middle East Respiratory Syndrome (MERS).[1]

Coronavirus disease (COVID-19) is a disease caused by infection with Severe Acute Respiratory Syndrome Coronavirus 2 (SARS- CoV-2). Human-to-human transmission occursvia respiratory droplets produced when talking, coughing, or sneezing. The World Health Organization (WHO) officially declared COVID- 19 a pandemic on March 11, 2020.[2,3]

The Center for Disease Control and Prevention (CDC) The Center for Disease Control and Prevention (CDC) recommends several measures to prevent the transmission of COVID-19 such as vaccination, wearing a mask that covers the nose and mouth, maintaining a distance of about 2 m, avoiding crowds and rooms with minimal ventilation, and washing hands with soap and water, or hand sanitizer if soap and water are not available.4 The use of masks has been shown to have a significant protective effect and is effective in reducing the risk and cases of COVID-19 infection.[5,6] In addition to having a positive impact, the use of masks as personal protective equipment(PPE) toprevent the transmission and infection of COVID-19, also has a negative impact because it causesseveral changes in the skin such as an increase in temperature, pH, humidity, and sebum production on the skin surface. in the cheek,perioral, and chin area due to sweat and airexhaled when breathing. This will further increasethe occurrence of skin problems such as erythema, eruptions, pustules, papules, acne, pigmentation, and contact dermatitis, especially in areas covered by masks. Long-term use of masks is also associated with acne exacerbations in patients with a previous history of acne.[6-8] Acne, the most common skin disease,is an inflammation of the pilosebaceous glands, which can be acute or chronic with a variedpicture of lesions. Non-inflammatory lesions include comedones (open and closed), inflammatory lesions (papules, pustules, and nodules), and scars or scars of varying severity. The prevalence of acne reaches 85% and mostlyoccurs during adolescence.[9,10]

Maskne is a term that comes from 2 words, namely, mask which means mask, and, acne which means acne, both of these describe the condition of facial skin that is acne or irritated, especially the nose, mouth, and chin area due tousing a mask. Maskne is classified as mechanical acne, because it is related to mechanical occupational factors such as friction, friction, and pressure on the facial skin in the area covered bythe mask, and also related to skin microbiota dysbiosis factors. Both of these factors are influenced by an increase in the duration or duration of using a mask.[10-13]

The prevalence of masks or acne inducedby the use of masks during the COVID-19 pandemic is more common in groups of people who work as health workers than in the general public. This can be found in various literature, such as a report from Rosner which stated that of the 343 respondents who worked as health workers in hospitals in several US states such asNew York and New Jersey, 53.1% (182) of themexperienced acne. Acne in 11.1% (38) ofrespondents appeared after using a mask for 1-3hours, and in 47.8% (164) of respondents, itappeared after using a mask for 3 hours. A total of 35.3% (121) of the 182 respondents wereknown to have a history of acne.14 Next is a report from Techasatian in Thailand with a total of833 respondents of which 42.9% (357) are healthworkers and 57.1% (476) are not health workers,it was found that 54.5% (454) of them experienced skin reactions due to the use ofmasks and the most common skin reactions witha percentage of 39.9% (333) were cases of acne.6 Meanwhile, a report from Ramesh in India, with a total of 400 respondents, stated thatof 58% (232) respondents who used masks for anaverage of fewer than six hours per day, 43%

(172) of them experienced acne were 39% (67) respondents experienced acne for the first time, and 61% (105) of respondents experienced an exacerbation of acne.[15]

The COVID-19 pandemic is still ongoing, so the application of health protocols, one of which is to use PPE in the form of masks according to standards, must also continue to be applied, where this will have implications for facial skin health. Based on this, researchers are interestedin researching the effect of the long use of masksduring the COVID-19 pandemic on the incidenceof acne in 2018 UMSU Medical Faculty students.

2. METHOD

The type of research is a comparative causal analytic with a cross-sectional study design. The research was started by searching literature and processing data during the period from July to December 2021. This research was conducted at the UMSU Medical Faculty campus.Sampling in this study uses the purposive sampling technique.

3. RESULTS

After the research is done, the data that hasbeen obtained is then processed through the process of editing, coding, data entry, and analyzing to obtain research results. Data analysis was carried out in stages, namely univariate to describe the frequency distribution and describe the variables studied, and bivariateanalysis to determine the effect of the duration ofusing masks on the incidence of acne in the 2018UMSU Medical Faculty students.

Table 1 Distribution of UMSU Medical Faculty Student Data Class of 2018

UMSU Medical Faculty Student Data	n	%
By Gender		
Man	22	28.9
Woman	54	71.1
By Age		
19-20 years old	13	17.1
21-22 years old	59	77.6
23-24 years old	4	5.3

Table 1. above explains that the sex of the 2018 UMSU Medical Faculty students who became the most respondents were women with 54 respondents (71.1%) compared to men, namely 22 respondents (28.9%), and the age of the most respondents was 21. -22 years, namely 59 respondents (77.6%) compared to the age of 19-20 years which amounted to 13 respondents (17.1%), and the age of 23-24 years which amounted to 13 respondents (5.3%).

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Table 2 Use of Masks for 2018 UMSU Medical Faculty Students

Use of Mask	n	%
Always	39	51.3
Ofteb	30	39.5
Sometimes	7	9.2
Total	**76**	**100**

Table 2. above, explains that the most distribution of data on the use of masks in FK UMSU students class 2018 is that they always use masks with a total of 39 respondents (51.3%), compared to frequently using masks, which are 30 respondents (39.5%), and sometimes use a mask that is 7 respondents (9.2%).

Table 3 Types of Masks Used by FK UMSU Students

Mask Type	n	%
Medical mask	47	61.8
FFP; KN95, KF94	27	35.6
The medical mask is covered with a cloth mask	2	2.6
Total	**76**	**100**

Tabel 3 above , explains that the most common types of makes used by FK UMSU students batch 2018 are the types pf medicial masks used by 47 respondents (61.8%), compared to the type of FFP masks ; KN95, KF94 used by 27 respondents (35.6%), and medical masks covered with cloth masks used by 2 respondents (2.6%).

Table 4 Length of Use of Masks for 2018 UMSU Medical Faculty Students

Long Use of Mask	n	%
1-3 hours	35	46
4-8 hours	36	47.4
>8 hours	5	6.6
Total	**76**	**100**

Table 4. above explains that the longest duration of using masks in FK UMSU students batch 2018 is 4-8 hours, namely 36 respondents(47.4%), compared to using masks for 1-3 hours,totaling 35 respondents (46%), and for >8 hours
totaling 5 respondents (6.6%).

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Table 5 Frequency of Changing Masks for 2018 UMSU Medical Faculty Students

Frequency of Changing Masks	n	%
>2 times	14	18.4
2 times	23	30.3
1 time	27	35.5
Don't change the mask	12	15.8
Total	**76**	**100**

Table 5. above explains that the highest frequency of changing masks among FK UMSU students batch 2018 is once in 27 respondents (35.5%), compared to twice, namely 23 respondents (30.3%), and more than two times, namely in 14 respondents (18.4%).

Table 6 Acne Incidence in 2018 UMSU Medical Faculty Students based on Gender

		Acne incident				Total	
		Not		Yes			
		n	%	n	%	n	%
Gender	Man	2	9.1	20	90.9	22	100
	Woman	6	11.1	48	88.9	54	100
Total		8	10.5	68	89.5	76	100

Table 6. above, explains that the incidence of acne based on gender in the 2018 UMSU Medical Faculty students is mostly female,namely, 48 respondents (88.9%), compared to the male sex, namely 20 respondents (90.9 %).

Table 7 Incidence of Acne in FK UMSU Students Class of 2018 against Age

		Acne incident				Total	
		Not		Yes			
		n	%	n	%	n	%
Age	19-20 years	1	16.7	5	83.3	6	100
	21-22 years old	7	10.6	59	89.4	66	100
	23-24 years	0	0	4	100	4	100
Total		8	10.5	68	89.5	76	100

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Table 8 Description of Acne History in FK UMSU Students Batch 2018

Acne History	n	%
Not	8	10.5
Yes	68	89.5
Total	**76**	**100**

Table 8. above, explains that the most historical description of acne in FK UMSU students batch 2018 is having a history of acne in68 respondents (89.5%), and no history of acne in 8 respondents (10.5%).

Table 9 Overview of Acne Exacerbation After Using Masks in 2018 UMSU Medical Faculty Students

Acne Exacerbation	n	%
Yes	17	22.4
Not	59	77.6
Total	**76**	**100**

Table 10 Overview of Acne in FK UMSU Students Batch 2018 based on the type of lesion

Lesion Type	n	%
Comedo; open and closed	36	40
Papules	24	26.7
Pustules	26	28.9
Nodules	4	4.4

Table 10 above, explains that the most common types of acne lesions in FK UMSU students class of 2018 are comedone lesions in the form of open comedones and closed comedones (40%), compared to the type of pustule lesions (28.9%), papular lesions. (26.7%), and nodular lesion type (4.4%).

Table 11 Overview of Acne in FK UMSU Students Class of 2018 based on Lesion Locations

Acne lesion location	n	%
Cheek	47	54
Nose	7	8
Around the lips	6	6.9
Chin	27	31

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Table 11. above explains that the description of acne based on the location of the most lesions in FK UMSU students class 2018 ison the cheeks (54%), compared to lesions on thechin (27%), the bridge of the nose (7%), and around the lips (6%).

Table 12 Incidents of Acne in FK UMSU Students Class 2018 based on the type of mask used

		Acne incident				Total	
		Not		Yes			
		n	%	n	%	n	%
Mask Type	Medical mask (surgical/surgical 3 plies)	5	10.6	42	89.4	47	100
	The medical mask covered with a cloth mask	1	50	1	50	2	100
	Filtering Face Pieces (FFP)	2	7.4	25	92.6	27	100
Total		8	10.5	68	89.5	76	100

Table 12 above explains that the incidence of acne in FK UMSU students batch 2018 based on the type of mask used is the typeof medical mask (surgical/surgical 3 layers) that is 42 respondents (89.4%) of a total of 47 respondents who use this type of medical mask.

4. Discussions

The results of this study indicate that the incidence of acne based on the sex of FK UMSU students batch 2018 is mostly female, namely 48respondents (88.9%) compared to men, namely 20 respondents (90.9%). This is in accordance with Techasatian's research which stated that of a total of 454 respondents who experienced skinreactions due to using masks, 345 respondents (75.99%) of whom were female.[6] This is also in accordance with Ramesh's research in India which stated that out of a total of 400 respondentswho used masks, 316 respondents (79%) were female, of whom experienced skin reactions dueto the use of masks. of the respondents (69.9%) were female.[16] This is also in line with Chaiyabutr's research which states that of a totalof 323 female respondents, 176 respondents (54.5%) of them experienced skin reactions due to the use of masks.[17] This is This can happen because female respondents use cosmetic products more often that can cause pore occlusion, which will induce various skin reactions, especially on facial skin covered by masks.[15]

The results of this study indicate that the incidence of acne based on the age of the 2018 UMSU Medical Faculty students is the most at theage of 21-22 years, namely in 59 respondents (89.4%), compared to the age of 19-20 years, namely in 5 respondents (83.3%), and age 23-24 years in 4 respondents (100%). This is in accordance with Ramesh's research in India which stated that of a total of 400 respondents who used masks, 178 respondents (44.5%) of whom experienced skin reactions due to using masks were aged 20-25 years.[15] Based on data from the Global Burden of Disease (GBD), the prevalence of acne is commonly found in the population aged 12-25 years. Although the peak incidence of acne occurs at the age of 15-17 years, the incidence of acne will continue and slowly decrease until the third decade of life, thisis thought to be related to the onset of puberty which is influenced by the hormone DHT in both males and females, and the effect of its decline insulin and insulin-like growth factor-1 (IGF-1)levels slowly

in adulthood which can lead to increased production of sebum andkeratinocytes.[18]

The results of this study show a description of the history of acne in the 2018 UMSU Medical Faculty students, most of them had a history of acne in 68 respondents (89.5%),and did not have a history of acne in 8 respondents (10.5%). The results of this study are in line with Chaiyabutr's research which states that of a total of 767 respondents who experienced skin reactions due to the use ofmasks, 557 respondents of whom had a history of acne with mild, moderate, and severe degrees, respectively, in 495 respondents, 56 respondents, and 6 respondents. However, the results of this study are not in line with Yaqoob's research which stated that out of a total of 193 respondents, 137 respondents (71%) of whom had no history of acne.[16] Next is the description of acne exacerbations after using masks in FK UMSU 2018 students who did not experience acne exacerbations, namely in 59 respondents (77.6%), compared to those who experienced acne exacerbations, namely 17 respondents (22.4%). This is not in accordance with Han's research which stated that of a total of 24 patientsdiagnosed with acne, most of them were cases ofacne that had relapsed or had exacerbations, and5 of them were new cases of acne. That acne exacerbation is the most common skin reaction experienced by respondents who use masks.[17] Meanwhile, Ramesh's study showed the same proportion in 134 respondents who experienced acne after using a mask.

The history of acne and acne exacerbations with the incidence of acne due to the use of masks has a close relationship, where respondents who previously did not have acne can experience acne occurrences after using a mask for a certain time. Likewise, respondents who have a history of acne can experience acneexacerbations due to the use of masks. This is caused by many factors such as the use of masksthat cause several changes in skin conditions such as an increase in temperature, skin moisture, the effect of pore occlusion on the surface of the facial skin covered by the mask, and the presence of a dark side effect mechanicalstress caused by the use of masks such as maskstraps, and materials, as well as the shape of the masks used, so that they can cause new occurrences of acne or local exacerbations.

The results of this study showed that acnebased on the type of lesions in FK UMSU students class of 2018 was the type of comedonelesion in the form of open comedones and closed comedones (40%), compared to the type of pustule lesion (28.9%), the type of papule lesion (26.7 %), and the type of nodular lesion (4.4%). The results of this study are in line with Han's research which stated that of a total of 5 patientsnewly diagnosed with acne, 4 of them had comedone lesions, and all patients had papules.That from a total of 134 respondents who experienced acne due to the use of masks, the most reported types of lesions were papules, comedones, pustules, and nodules with the percentages being 45%, 41%, 29%, and 7%, respectively.

The results of this study showed that the most common lesions based on the location of the lesions in FK UMSU students class 2018 were on the cheeks (54%), compared to lesions on the chin (27%), the bridge of the nose (7%), and around the lips (6%). Each study respondentcan have more than one picture of acne lesions. This is in accordance with Ramesh's study which stated that the location of the distribution of acnedue to the use of masks was mostly reported on the cheeks, chin, and bridge of the nose with a percentage of 75%, 43%, and 29%, respectively. Most of the skin caused by the use of masks occurred on the cheeks (70.61%), chin (46.67%), lips and perioral area (40.48%), and nose (21.52%). temperature, pH, humidity, and sebum production on the surface of the skin in the cheek,perioral, and chin area due to sweat and air exhaled when breathing. This will further increasethe occurrence of skin problems such as erythema, eruptions, pustules, papules, acne, pigmentation, and contact dermatitis, especially in areas covered by masks. The use of masks fora long period of time can also trigger acne exacerbations in patients who have a previous history of acne. 6-8 In addition to the above, the distribution of acne lesions is also associated withthe material and type of mask used. Fabric masks cause fewer skin reactions than medical masksor respirators such as N95 masks.

The results of this study indicate the incidence of acne in FK UMSU students batch 2018 based on the type of mask used the most isthe type of medical mask (Surgical / 3-layer surgery) that is 42 respondents (89.4%) of a totalof 47 respondents who use this type of medical mask (Surgical). 3 layer surgery), compared to the types of FFP masks (KN95 and KF94), namely 25 respondents (92.6%) of a total of 27 respondents who used FFP masks (KN95 and KF94), and the types of medical masks were covered with cloth masks, namely in 1 respondent (50%) out of a total of 2 respondentswho used this type of medical mask was coveredwith a cloth mask. The results of this study are inaccordance with the research of Techasatian andChaiyabutr et al which stated that medical masks are the most common types of masks that cause skin reactions compared to FFP masks and clothmasks. This is related to the medical mask material made of 3-4 layers, where the more layers used, the more occlusive effect on the skincovered by the mask.6,16 The results of this study are not in line with Ramesh's research which states the type of mask used. The most common cause of acne is cloth masks. Cloth masks that are used repeatedly for 2-3 dayswithout washing can cause the accumulation of sweat and dirt, causing a humid condition when worn.[15,17] The results of this study are not in line with Ramesh's research which states that the type of mask that causes the most acne is cloth masks. Cloth masks that are used repeatedly for2-3 days without washing can cause the accumulation of sweat and dirt, causing a humid condition when worn.[15,17] The results of this studyare not in line with Ramesh's research which states that the type of mask that causes the mostacne is cloth masks. Cloth masks that are used repeatedly for 2-3 days without washing can cause the accumulation of sweat and dirt, causing a humid condition when worn.[15,17]

The results of this study indicate the incidence of acne in FK UMSU students batch 2018 based on the type of medical mask used by47 respondents, and based on the length of use

of medical masks found the most use of medicalmasks for 4-8 hours, namely in 20 respondents (95.2%), compared to the use of medical masks for 1-3 hours in 18 respondents (85.7%), and >8 hours in 4 respondents (80%). The results of thisstudy indicate the incidence of acne in FK UMSU students batch 2018 based on the type of FFP mask used by 27 respondents and based on the length of use of the mask, the highest number was found in the use of FFP masks for 4-8 hours, namely in 13 respondents (100%), compared to the use of FFP masks. medical masks for 1-3 hours in 12 respondents (85.7%). The results of this study indicate the incidence of acne in FK UMSU students batch 2018 based on the type ofmedical mask coated with cloth masks used by 2respondents and based on the duration of use ofmedical masks covered with cloth masks for 4-8 hours found in 1 respondent (50%). Meanwhile, the results of this study indicate that the overall incidence of acne based on the length of use of the mask without considering the type of mask used was found mostly in respondents who usedmasks for 4-8 hours, namely 34 respondents (94.4%) of a total of 36 respondents who used masks. for 4-8 hours, compared to the length of use of masks for 1-3 hours, namely in 30 respondents (85.7%) of a total of 35 respondentswho used masks for 1-3 hours, and also the duration of using masks > 8 hours, namely in 4 respondents (80%) of a total of 5 respondents who used masks for >8 hours. This is in accordance with Techasatian's research which stated that of a total of 454 respondents who experienced skin reactions due to the use ofmasks, 222 respondents (48.9%) of them used masks for 4-8 hours. This Techasatian study alsostated that the use of masks for 4-8 hours and >8hours increased the risk of skin reactions by 1.24and 1.96 times, respectively, compared to the useof masks for <4 hours.6 The results of this study are also supported by Ramesh's research which stated that of a total of 400 respondents who experienced skin dermatosis due to the use of masks, 232 (58%) of them used masks for <6 hours increase in facial skin temperature after using the mask for 1 and 6 hours. Every 1°C increase in temperature will increase the sebum excretion rate (SER) by 10%. This will cause thesurface of the skin to become moist and oily, which, when added to the

presence of sweat, will cause occlusion of the pores, irritation of the infundibulum, and inflammation of the keratinocytes in the pilosebaceous follicles, which causes acute obstruction, leading to acne.The increase in facial skin temperature will be constant after reaching a certain level due to the homeostatic process to keep the temperaturewithin normal limits so the incidence of acne on the use of masks > 8 hours is not very significant.

The results of this study indicate that there is no significant relationship between the durationof using a mask and the incidence of acne. The results of the study obtained the value of Fisher'sExact Test Exact Sig. (2-sided) is 0.260 (P>0.05).The results of this study are in accordance with the research of Yaqoob et al which stated that there was no significant difference between the incidence of acne and the duration or length of the mask used.16 According to the researcher, this happened because this study was not acohort study so that the results of the study wereonly related to a certain time. . In addition, other factors such as skin type, use of cosmetics, stress, and hormones experienced by respondents because they were in the final phase of education when the research took place were not taken into consideration in this study.

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