

ORIGINAL ARTICLE

Potential of Morage Leaf Combination of Rice Flour as A Mask for Healing Acne Vulgaris

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ABSTRACT

Background: Acne known as acne vulgaris is an inflammatory disease consisting of comedones, papules, pustules, and nodules, mainly appearing in adolescence. Acne on the face is caused by *P. acnes* bacteria. This disease is not dangerous but affects the beauty of the face, treatment of this disease can use mask therapy made from Moringa leaves in combination with rice flour, these ingredients have bioactive properties that play a role in inhibiting bacteria that cause acne.

Objective: To observe if Morage leaf combination of rice flour can act as a mask for healing acne vulgaris. **Methods:** This cross-sectional study was done using a one group pre-test and post-test methods. Samples were taken using a non-probability purposive sampling technique as many as 35 respondents. The independent variable is the administration of a combination of Moringa leaf mask with rice flour and the dependent variable is the treatment of acne vulgaris in adolescents. The SOP instrument for giving Moringa leaf masks is a combination of rice flour and observation sheets. The research data were analyzed using the Wilcoxon signed rank test and the Mann-Whitney test. **Results:** the results of the Wilcoxon signed rank test statistic in the treatment group at dose 1 obtained count ($p=0.083$) meaning that the intervention had no significant effect during pre-test and post-test on the healing of acne vulgaris, in the treatment group dose 2 obtained count ($p=0.046$) means that the intervention has an effect on reducing acne vulgaris. The results of the Mann-Whitney statistical test were obtained ($p=0.551$), meaning that there was no difference in the treatment dose 1 and treatment dose 2 on the healing of acne vulgaris after the intervention. **Conclusion:** Both have the potential to reduce the severity or inhibit the growth of the *P. acnes* bacteria that causes acne.

Keywords: Acne vulgaris; face mask; moringa leaves; rice flour

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INTRODUCTION

Beauty for teenagers is very important, so always pay attention to their beauty properly, the type of treatment that is most in demand is facial care. Types of facial care carried out by teenagers using skin care or cosmetic products. The use of skin care or cosmetic products can cause acne on the face, this is because they contain comedogenic substances such as lanolin, petrolatum, butyl stearate, lauryl alcohol and oleic acid¹.

Comedogenic substances in skin care or cosmetics can accumulate and clog in the skin follicles, causing the sebum produced by the sebaceous glands to be trapped in the follicles and trigger an inflammatory reaction that leads to acne². Acne (acne vulgaris) is the most common chronic inflammation of the pilosebaceous follicles on the face. Acne on the face is caused by *P. acnes* bacteria, these bacteria are not dangerous but are quite worrying because they are associated with decreased self-confidence due to reduced facial

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beauty in adolescents³.

According to Tan & Bhate, acne is a common type of disease, it ranks eighth in the world, where the prevalence is 9.4%⁴. Meanwhile, the prevalence of acne in Indonesia has increased from year to year⁵. In East Java alone there are 38% of women and 36.5% of men experiencing acne. While the results of observations at the Islamic high school (MA) Nahdhotul Ulama Petung school on January 28, 2022, the total number of students from class X, XI, XII was 95 children with some with acne there were around 35 students.

Efforts made by adolescents in treating acne use anti-acne preparations containing synthetic antibiotics such as erythromycin and clindamycin. These synthetic antibiotics play a role in inhibiting enzymes or binding to receptors⁶. The use of synthetic antibiotics as antibacterials can have side effects such as irritation and long-term use can cause resistance and even organ damage and immunosensitivity⁷. In addition to using synthetic antibiotic drugs in the treatment of acne, it is also possible to use organic masks made from Moringa combined with rice flour. The use of organic masks as acne treatment is safer when compared to the use of anti-acne preparations containing synthetic antibiotics; this is because organic masks made from Moringa, a combination of rice flour, contain antioxidants. Types of antioxidants in Moringa are cytokinins which are very strong antioxidants. These antioxidants play a role in replacing body cells, reducing the risk of aging and acne⁸. The results of research conducted by Tarigan et al. showed that the use of Moringa leaf extract gel can inhibit the growth of *P. acnes* bacteria which is the bacteria that causes acne⁹.

Other natural ingredients used in organic masks are white rice which contains an antioxidant, namely gamma oryzanol. The antioxidants in white rice function to regulate collagen production, counteract ultraviolet radiation, remove black spots, remove dead skin cells and the vitamin E content can make facial skin clean, smooth and radiant¹⁰. Moreover, a research conducted by Wati showed the comparison of celery and rice flour on acne healing¹¹. Another study done by Silalahi et al. also showed that the cold powder of the Mahkota Dewa herbal medicine could inhibit the growth activity of *P. acne* at concentrations of

3%, 5%, 7% and 9%. The concentration of cold powder (white rice) of Mahkota dewa herbal can inhibit the growth of *Propionibacterium acne*, namely 3% with an inhibition zone diameter of 0.8 cm¹².

METHODS

This cross-sectional study was done using a one group pre-test and post-test design. The number of samples used as many as 32 teenage girls in a state of acne. Sampling in this study used a non-probability purposive sampling technique namely choosing a sample among the population in accordance with what the researcher wants based on inclusion and exclusion criteria. The inclusion criteria in this study were: (1) patients with acne vulgaris aged 15-25 years, mild-moderate grade (grade 1-grade 2) acne papules and pustules based on Kligman's criteria; (2) young women aged 15-18 years; (3) willing to become research subjects by signing a letter of consent, while the exclusion criteria were: (1) undergoing acne treatment or topical corticosteroids within two weeks, (2) undergoing systematic antibiotic treatment, (3) sufferers of comedogenic acne vulgaris.

The research was carried out at the Nahdhotul Ulama MA, Petung Village, Panceng District, Gresik Regency, Indonesia. The design of this study seeks to reveal the significant effect of giving a Moringa leaf face mask with rice flour combination by involving 2 treatment groups, each with the first dose (5gr:10gr) of 16 respondents and the second dose (10gr:5gr) of 16 respondents being observed before and after treatment. Giving a face mask of Moringa leaves combined with rice flour for two weeks, where one week the mask is given three times. Giving the mask before going to bed with a time of 15 minutes after being given the mask then the face is cleaned with water. After being given treatment using a Moringa leaf face mask with a combination of rice flour, an observation of the level of acne healing was carried out according to severity, referring to Ramdani¹³. The SOP instrument for giving Moringa leaf masks is a combination of rice flour and observation sheets. The research data were analyzed using the Wilcoxon signed rank test and the Mann-Whitney test.

RESULTS

Acne healing rate before and after intervention at dose 1:

Based on Table 1, it can be explained that before the intervention was carried out according to the level of acne healing dose 1, almost all of the respondents experienced mild pain, namely 11 respondents (68.8%) and it was found that a small proportion had moderate acne 5 respondents (31.2%). After the intervention at dose 1, namely mild acne, 14 respondents (87.5%) experienced healing, while 2 respondents (12.5%) had moderate acne.

The results of the Wilcoxon Signed Rank Test obtained p value of 0.083 ($\alpha > 0.05$) meaning that there was no effect of severity before and after the intervention at dose 1.

Table 1. Acne Healing Rate Before and After Intervention Dose 1

No.	Acne Severity Tingkat	Before the Intervention Dose 1		After the Intervention Dose 1	
		N	%	N	%
1.	Light	11	68.8	14	87.5
2.	Currently	5	31.2	2	12.5
3.	Heavy	0	0.0	0.0	0.0
Total		16	100.0	16	100.0
mean		1.31		1.12	
Std. Deviation		0.479		0.342	
Wilcoxon Signed Rank Test		p=0.083			

Acne healing rate before and after intervention at dose 2: Based on Table 2, it can be explained that before the intervention was carried out according to the level of acne healing dose 2, almost all

experienced mild acne, 11 respondents (68.8%) and found a small proportion experiencing moderate acne 5 respondents (31.2%). After the intervention at dose 2, 15 respondents (93.8%) experienced healing, while only 1 respondent (6.2%).

The results of the Wilcoxon Signed Rank Test obtained a p value = 0.046 ($\alpha < 0.05$) meaning that there was an effect of severity before and after the intervention at dose 2.

Table 2. Acne Healing Rate Before and After Intervention Dose 2

No.	Acne Severity Tingkat	Before the Intervention Dose 1		After the Intervention Dose 1	
		N	%	N	%
1.	Light	11	68.8	15	93.8
2.	Currently	5	31.2	1	6.2
3.	Heavy	0	0.0	0.0	0.0
Total		16	100.0	16	100.0
mean		1.31		1.06	
Std. Deviation		0.479		0.250	
Wilcoxon Signed Rank Test		p=0.046			

Effect of Moringa leaf face mask combination of white rice flour on acne healing dose 1 and dose 2:

Based on Table 3, it can be explained that the results of the Mann-Whitney statistical test showed p value of 0.551 ($\alpha > 0.05$), meaning that there was no difference in treatment dose 1 and dose 2 treatment on acne healing after intervention or given Moringa leaf face mask. rice flour combination. Meanwhile, from the statistical test results of the Wilcoxon Signed Rank Test calculate dose 1 (p=0.083) which proves that the intervention has no significant effect before and after the intervention on acne healing and from calculates dose 2 (p=0.046) which proves that this

intervention has an effect on before and after the intervention on acne healing.

Table 3. Differences Moringa Leaf Face Mask Combination of White Rice Flour on Acne Healing

No.	Acne Severity Tingkat	Before the Intervention Dose 1		After the Intervention Dose 1	
		N	%	N	%
1.	Light	14	87.5	15	93.8
2.	Currently	2	12.5	1	6.2
3.	Heavy	0	0.0	0.0	0.0
Total		16	100.0	16	100.0
Wilcoxon Signed Rank Test		p=0.083		p=0.046	
Mann-Whitney Test		p=0.551			
Wilcoxon Signed Rank Test		p=0.046			

DISCUSSION

Based on table 1, it can be explained that before the intervention, according to the level of acne healing in the treatment group dose 1, almost all of the respondents experienced mild pain, namely 11 respondents (68.8%) and some experienced moderate acne, as many as 5 respondents (31.2%). Acne is a common inflammatory condition of the polysebaceous unit that occurs in adolescence characterized by the appearance of comedones, papules, pustules, and nodules⁵. At that age physical growth develops very rapidly and is seen as a very important thing, but when physical conditions are not in accordance with expectations it can cause dissatisfaction and self-confidence due to reduced beauty on the face due to acne¹⁴. According to research based on table 1 shows that all respondents rarely clean their faces. This is because many respondents only clean their faces when bathing. Thus, causing excess sebum production, this triggers the activity of *P. acnes* bacteria that comes out of the sebaceous glands¹⁵.

After the intervention at dose 1, according to the severity of acne, there was a decrease in acne, which was initially mild acne by 11 respondents to 14 respondents (87.5%) while moderate acne which was originally 5 respondents left 2 respondents (12.5%). This is because the respondents followed the given procedure and were able to apply it well, besides that the Moringa leaf mask also contains antioxidants. Types of antioxidants in Moringa are cytokinins, which are very strong antioxidants. These antioxidants play a role in replacing body cells, reducing the risk of aging and acne⁸. Whereas, white rice contains an antioxidant, namely gamma oryzanol. The antioxidants in white rice function to regulate collagen production, counteract ultraviolet radiation, remove black spots, remove dead skin cells and the vitamin E content can make facial skin clean, smooth and radiant¹⁰.

Based on the research data, the data were analyzed using the Wilcoxon Signed Rank Test. The results showed that the p value of 0.083 ($\alpha > 0.05$) meaning that there was no significant effect on the severity before and after the intervention at dose 1 on adolescent acne. This is because the dose given is too small.

Based on table 2, it can be explained that before the intervention was carried out according to the level of acne healing dose 2, namely some experienced mild acne 11 respondents (68.8%) and some experienced moderate acne 5 respondents (31.2%). Acne is a harmless disease that can heal by itself, characterized by seborrhoea, comedones, papules, pustules, nodules, and scar tissue¹⁶. There are many kinds of pimple with severity ranging from mild to severe, pimple light weight is quite easy to handle; however, pimple heavy ones can be damaging and require special medical treatment.

According to research based on table 2 shows that this is because most respondents cannot regulate a good diet, respondents prefer fatty snacks, so that the fat that we eat will be stored in the body from excess, it will be excreted through the skin pores, so that the skin removes a lot of oil on the face. An oily face can cause acne to grow easily¹⁷. But this can be overcome by giving Moringa leaf

masks a combination of white rice flour. In this 2nd dose treatment, 10gr for Moringa leaves and 5gr for white rice flour. This intervention is given 3 times a week for 2 weeks.

After the intervention at dose 2 according to the severity of acne decreased, namely mild acne by 15 respondents (93.8%) while only 1 respondent (6.2%). This is because the respondents followed the given procedure and were able to apply it well, besides that the content of Moringa leaves is also good for the face, especially for acne prone faces because it contains quercetin which is the best natural anti-inflammatory agent. While 1 respondent still has moderate acne because they still consume fatty foods. The results of the study remained from mild to mild but there were most of the changes that were reduced by 10 respondents, which was characterized by the disappearance of postules and comedones. Based on the research data, the data were analyzed using the Wilcoxon Signed Rank Test.

Effect of Moringa Leaf Face Mask Combination of White Rice Flour on Healing Acne Vulgaris Dose 1 and Dose 2

The results of the Wilcoxon Signed Rank Test statistical test in the dose 1 treatment group obtained count dose 1 ($p = 0.083$) ($\alpha > 0.05$) which proved that the intervention had no significant effect before and after the intervention on acne healing. Although the effect was not significant, the dose 1 treatment group showed a difference, while the increase was not significant because respondents did not regularly clean their faces after activities or finished using cosmetics, dose 1 was too low, so that significant results needed to give more Moringa leaf powder than rice flour, This is because there are more ingredients to cure acne in Moringa leaves, so the results obtained will be significant.

The results of the Wilcoxon Signed Rank Test statistical test in the dose 2 treatment group obtained count ($p = 0.046$) ($\alpha < 0.05$) which proves that the intervention influences reduction of acne. This is because the Moringa leaf powder contains cytokinins, one of which is Zeatin that has high antioxidant with antiaging properties. Helps replace body cells at an age-appropriate rate and gives the skin a much younger appearance.

Inflammation that occurs in the skin, especially the face, often occurs due to prolonged exposure to the sun, weather, pollution and various cosmetic products. Hence, the best way to reduce the risk of bad things like acne is to provide nutrition with anti-inflammatory on a regular basis. Moringa leaves also contain the main active compound quercetin which has antibacterial properties¹⁸. Quercetin has a mechanism of action as an antibacterial that causes acne, namely by inhibiting the synthesis of fatty acids in bacteria and inhibiting the production of toxin metabolites in bacteria¹⁹. The rice used in making traditional masks is white rice which has benefits for brightening the face, reducing wrinkles and repairing damaged cells. White rice has several benefits, namely maintaining skin moisture and making the skin look white and clean, antioxidants that counteract free radicals on the skin, warding off ultraviolet rays that can damage the skin while renewing damaged skin pigment²⁰. Rice also has a high antioxidant content to remove dead skin cells. If there is no removal of dead skin cells, the skin pores and hair follicle channels will be clogged and can cause acne.

The results of the Mann-Whitney statistical test showed a p-value of 0.551 ($\alpha > 0.05$), meaning that there was no difference in the treatment dose 1 and treatment dose 2 on the healing of acne vulgaris after the intervention. Both can reduce the severity of acne.

This research study is in line with research conducted by Elfine giving Moringa leaf mask extract, it was found that acne recovery and dry acne conditions were obtained²¹. There is a significant effect of giving Moringa leaf mask extract (moringa oleifera) on the recovery of acne (acne). Then from the previous experimental research using a guava mask and mashed rice flour, as reported by Dewita & Rahmiati, showed benefits for treating acne and rice that is used as flour as an ingredient for mixing masks to increase adhesion²².

In this study, respondents were given a Moringa leaf mask with a combination of white rice flour which was divided into 2 groups, namely the 1 dose treatment group with a dose of 5gr:10gr total 15gr (this dose is used for 3 treatments). Hence, for one treatment, use a dose of 1.7gr: 3.3gr,

which makes a total of 5gr. Treatment group dose 2 with a dose of 10gr:5gr (this dose is used for 3 treatments). Therefore, for 1 treatment, use a dose of 3.3gr: 1.7g, which makes a total of 5gr. There can be a decrease from initially experiencing moderate acne to mild.

CONCLUSION

Before the intervention was given, most of the respondents in the first dose treatment group experienced mild acne and after the intervention, most of them experienced healing, namely most of them decreased to mild acne with signs of decreasing inflammatory and non-inflammatory lesions. Before the intervention was given, most of the respondents in the second dose treatment group experienced mild acne and after the

intervention, most experienced healing, most of them decreased to mild acne with signs of decreasing inflammatory and non-inflammatory lesions. There is a potential of Moringa leaves combined with rice flour to cure acne in MA adolescents. Nahdlotul Ulama, Petung Village, Panceng District, Gresik Regency, Indonesia.

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