Pediomaternal Nursing Journal

Original Article

The combination effect of *moringa* leaf and white rice flour as a facial mask on acne vulgaris among female teenagers

Lilis Fatmawati[1*], Khoiroh Umah[2], Silvia Zulmiatin[1]

ABSTRACT

Introduction: Acne vulgaris, commonly known as acne, is an inflammatory skin condition characterized by comedones, papules, pustules, and nodules, primarily affecting adolescents. Although not dangerous, it can be managed with both pharmacological and non-pharmacological treatments, such as facial masks made from a combination of Moringa leaves and white rice flour. This study aims to evaluate the effect of Moringa leaf masks combined with white rice flour on the healing of acne vulgaris with two different dosages.

Methods: This study used a two-group pre-post test design. A non-probability purposive sampling technique was employed to select 35 respondents. The independent variable was the administration of Moringa leaf masks combined with white rice flour, while the dependent variable was the healing of acne vulgaris in adolescents. The mask combinations used were 10 grams of Moringa leaves and 5 grams of rice flour, and vice versa. An observation sheet assessed the level of acne vulgaris severity. Data were analyzed using the Wilcoxon Signed Rank Test and the Mann-Whitney Test.

Results: The Wilcoxon Signed Rank Test showed a *P*-value 0.083 for dose 1, indicating that the intervention had no significant effect on acne vulgaris healing between pre-test and post-test. However, dose 2 had a *P*-value 0.046, suggesting a significant effect in reducing acne vulgaris. The Mann-Whitney Test revealed a *P*-value 0.551, indicating no significant difference between dose 1 and dose 2 in the healing of acne vulgaris after the intervention.

Conclusion: Both dosages of the Moringa leaf mask combined with white rice flour were effective in reducing the severity of acne vulgaris.

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

INTRODUCTION

Beauty for teenagers is very important; a women must always apply care to their beauty; one the treatments most often in demand are facial treatments, especially in teenagers. However, in reality, many teenagers of MA Nahdlotul Ulama Petung students had acne because they used skincare or products cosmetics containing mercury and hydroquinone. This is because many MA Nahdlotul Ulama Petung students want to whiten their faces instantly to look beautiful. Using the cosmetic products in adolescence does not have to be excessive because it causes irritation reactions (redness and swelling of the skin) and allergic reactions, in the form of change in skin color until it becomes grayish or blackish (Zegita et al., 2024).

Apart from that, the factors that cause acne (acne vulgaris) in the case of teenage students at MA Nahdlotul Ulama Petung are such as: hormonal changes such as stress, menstrual periods, frequent exposure to light direct sunlight, exposure to dust/dirt (Hanafiah, 2022).

Basically, acne is a reaction to inflamed pores and blockage leading to sebaceous ducts. As a result, through skin secretions of oily oil, pores become clogged, enlarge and will eventually trigger bacteria *Propionibacterium Acn*e (P.acne) (Yuliansari & Puspitorini, 2020). P acne is a Gram positive bacteria which is part of the normal flora present on the skin and can cause opportunistic infections that result in lipase as a contributor to acne formation (Dian & Ansori, 2018).

Based on observations and surveys, the efforts made by female students at MA Nahdlotul Ulama Petung to treat acne, include those did microneedling treatment (MTS) acne treatment at a beauty salon but it was not continued due to financial constraints, some have used anti-acne medication but instead it appears reddish so it is not used again, and also those who have used a Moringa leaf face mask combined with rice or cold powder, but it is not done routinely and until now. The effect of using a Moringa leaf mask combined with rice flour on acne healing is still not explained.

The Global Burden of Disease Project estimates the prevalence of acne vulgaris reached 9.4%, and was ranked eighth as the most common disease throughout the world. Incidence is highest in girls 14-17 years with predominant lesions as blackheads and papules. From a survey in the Southeast Asia region, there are 40-80% of acne vulgaris cases (Qonnayda & Sutini, 2021). In Indonesia acne vulgaris can be found in approximately 80% of adolescents. Incidence

***Correspondence**: Lilis Fatmawati (lilisfatmawati13@gmail.com)
[1]Nursing Science Study Program, Faculty of Health Sciences, Universitas Gresik, Gresik, Indonesia
[2]Nursing Study Program, Faculty of Health Sciences, Universitas Gresik, Gresik, Indonesia

Volume 10 (2): 56-62
http://dx.doi.org/10.20473/pmnj.v10i2.52864

e-ISSN: 2355-1577 | p-ISSN: 2656-4629

Article History
Received: December 18, 2023 | Revised: August 08, 2024 | Accepted: August 15, 2024 | Published: September 01,2024

of acne in adolescents varies between 30-60% with the highest incidence at the age of 14-17 years in women and 16-19 years in men (Jintan et al., 2024). East Java itself has 38% women and 36.5% men experiencing acne. It is mostly experienced by teenagers in puberty (Lestari et al., 2020). Based on observations at the MA Nahdlotul school Ulama Petung on January 28 2022, there were 95 children from classes X, XI, XII, some of whom had acne among them around 35 female students.

In general, many teenagers have problems with acne vulgaris which can cause torment to them. This disease is classified as not dangerous but has a big impact on teenagers both physically and psychologically, which can cause anxiety and depression and also influences psychosocial development, including self-trust. Added to this is the impact of a lack of knowledge about the causal factors. There are many or multifactorial causes of acne vulgaris, including: other genetic factors, racial factors, food factors, climate factors, factors skin type, hygiene factors, cosmetic use factors, stress factors, factors infections and occupational factors. These sufferers usually complain of a rash skin in the form of blackheads, papules, pustules, nodes, or cysts and can be accompanied by a feeling of itching in predilection places, namely the face, shoulders, neck, chest, back upper and upper arms due to the sebaceous glands in the active area (Sifatullah & Zulkarnain, 2021).

To avoid the growth of more P.acne bacteria on the facial skin, several methods can be used to prevent acne. A simple way to stop acne is to wash your face with soap. But that's not enough, we can also choose treatment from a doctor or expensive beauty clinic or relatively more cheap independent natural treatments. One simple care product is one with active compounds of plants such as making an organic mask from a combination of Moringa leaves and rice flour by doing it correctly and regularly. Organic masks made from natural ingredients that have lots of good nutritional content for the face, which is certainly no less than a beauty doctor's treatment.

Moringa leaves (*Moringa Oleifera Lamk*) are one of the natural ingredients that can be used to make facial masks. Moringa leaves contain chemical compounds that are beneficial for body or skin health, namely tannins, flavonoids, steroids, alkaloids, and quercetin and also have 46 strong antioxidant compounds which can neutralize free radicals that damage cells in the body thus preventing aging and acne. Because it is powder or it has been dried, the water mass will be lower, and the mask lasts longer and it's easy and safe to make your own Moringa leaf mask (Lestari et al., 2020).

This opinion is in accordance with Lestari et al. (2020) who stated that Moringa leaves are the richest in nutrients, namely more than 90 almost perfectly balanced compounds including 46 antioxidants and 36 anti-inflammatory. One natural combination is quercetin which is the best natural anti-inflammatory agent, and is currently being tested in Mayo Clinic in the treatment of several types of disease. Quercetin also contains vital flavonoids with antioxidant properties that can help replace body cells thereby preventing aging and acne.

Another natural ingredient that contains good antioxidant compounds for skin is white rice. White rice contains gamma oryzanol, a powerful antioxidant which functions to regulate collagen production, counteract ultraviolet radiation, can remove blemishes black, removes dead skin cells and contains vitamin E that makes facial skin clean, smooth and radiant. Without it removal of dead skin cells from the skin pores and follicular ducts will not happen, hair will get clogged and can cause acne (Masluhiya & Fidiastuti, 2019).Based on previous experiments by administering Moringa leaf mask extract recovery of acne and dry acne conditions was obtained. There's an influence significant effect of administering Moringa oleifera leaf mask extract on the recovery of acne.

Previous experimental research found using a guava mask and mashed rice flour (Lestari et al., 2020) is useful for treating acne and rice made into flour as a mask, mixing ingredients to increase adhesion. Based on the description above, in this research, researchers are interested to conduct research on the effect of administering mask extracts of Moringa leaves (*Moringa Oleifera Lamk*) with a combination of white rice flour on curing acne vulgaris in teenagers.

METHODS

Design

The design used in this research is quasi-experimental method with a two group pre-post test design.

Sample and Setting

Population in this study is teenage girls who experiences acne at school MA. Nahdlotul Ulama, Petung Village, Panceng District, Gresik Regency as many as 32 female students. The sample in this study was 32 respondents who were divided into two groups, namely in the first dose intervention group there were 16 respondents and in the second dose intervention group there were 16 respondents. A non-probability purposive technique was used for sampling. Criteria Inclusions in this research are: 1) Acne vulgaris sufferers aged 15-25 years, mild-medium degree (grade 1- grade 2) acne papules pustules based on Kligman criteria; 2) Young women aged 15-18 years; 3) Willing to become research subjects by signing informed consent. Exclusion Criteria: 1) Undergoing acne treatment or topical corticosteroids within two years; 2) Undergoing systemic antibiotic treatment; 3) Sufferers of comedogenic type acne vulgaris. The research was carried out from June 15-28, 2022. The location of this research is MA Nahdlotul Ulama, Petung Village, Panceng District, Gresik Regency.

Variable

The independent variable in the research is a Moringa leaf mask combined with white rice flour. The dependent variable in this study is the healing of acne vulgaris in teenagers.

Instruments

The type of instrument in the research is operational standards procedure (SOP) for administering a Moringa leaf mask combined with rice flour white and observation sheet assessing the severity of acne in respondents.

Data Collection

Researchers divided the respondents into two treatment groups, with each group receiving different doses: 5g:10g and 10g:5g (1:2 and 2:1). Female students who participated as research subjects were examined for acne vulgaris on the face, shoulders, upper chest, and back. The intervention involved a Moringa leaf mask combined with white rice flour, prepared in different dosages for each group. The researchers informed the participants about the day and time for applying the mask, which was to be done at bedtime. Participants were instructed

Table 1. Criteria healing acne according to level of severity

Degree of Severity	Criteria
Grade 1: Mild Degree	1. Some non-inflammatory lesions, at 1 predilection. 2. Few non-inflammatory lesions in some place's predilection 3. Few inflammatory lesions at 1 predilection
Grade 2: Medium Degree	1. Lots of non-inflammatory lesions at 1 predilection 2. Several non-inflammatory lesions on more than predilection 3. Several inflammatory lesions at 1 predilection 4. Few inflammatory lesions on more than 1 predilection
Grade 3: Severe Degree	1. Many non-inflammatory lesions in more than 1 predilection 2. Many inflammatory lesions on 1 or more predilection

Note: Little <5, some 5- 10, many >10; non-inflammation: whiteheads, blackheads, papule Inflammation; pustule, nodule, cyst

to apply the mask for 15 minutes or until it dried, and then rinse it off immediately. This intervention was administered three times a week over two weeks, with the treatment group receiving the Moringa leaf and rice flour mask while adhering to health protocols. The researchers observed and assessed the presence of acne after the second treatment session. Table 1 outlines the criteria for assessing acne healing based on the severity level and categorized into three grades.

Data Analysis

Data in ratio form were processed and analyzed using the Wilcoxon signed-rank test to determine differences in the dependent variable before and after treatment, with a significance level of *P*-value <0.005. Additionally, the severity levels before and after the intervention were compared to assess the impact. The purpose of this analysis was to evaluate the effect of Moringa leaf masks combined with white rice flour on acne in teenagers. The Mann-Whitney test was employed to assess differences between the two means of unpaired samples. If the *P*-value <0.05, the hypothesis is accepted.

Ethical Clearance

Ethical approval was obtained from the University of Gresik under number 125/PSIK.UG/EX/V/2022.

RESULTS

In the dose group 1, data showed that six respondents were 15 years old (37.5%). All respondents were female (100%), with nine respondents (52.6%) reporting the use of cosmetics. All respondents (100%) indicated that they sometimes cleaned their faces, and nine respondents (56.2%) experienced acne before menstruation. Additionally, seven respondents (43.8%) did not take any action when acne appeared. In dose group 2, the majority of respondents were 16 years old (43.8%). Like group 1, all respondents were female (100%), but 10 respondents (62.5%) used cosmetics. In this group, 10 respondents (62.5%) frequently consumed fatty foods, and 15 respondents (93.8%) sometimes cleaned their faces. Furthermore, 11 respondents (68.8%) reported getting acne during menstruation, and 7 respondents (43.8%) sought treatment at a beauty salon when acne appeared (Table 2).

Based on the Table 3, it can be explained that before doing this intervention according to the level of acne healing dose 1, the respondents experiencing mild pain was 11 respondents (68.8%) and it was found that a small percentage five respondents (31.2%) experienced medium acne. After Intervention was carried out at dose 1, namely mild acne, 14 respondents (87.5%) experienced healing, while the remaining two respondents had medium acne (12.5%). The results of the Wilcoxon Signed Rank Test showed that the value was *P*-value 0.083. This means that there is no influence on the level of severity before and after intervention at dose 1 was carried out.

Based on Table 4, before the intervention with dose 2, most respondents (11, 68.8%) had mild acne, while a smaller portion (5, 31.2%) had moderate acne. After the intervention, 15 respondents (93.8%) experienced healing, with only one respondent (6.2%) still having moderate acne. The Wilcoxon Signed Rank Test yielded a *P*-value of 0.046, indicating a significant difference in acne severity levels before and after the intervention with dose 2.

Based on Table 5, the Mann-Whitney test results show a *P*-value of 0.551, indicating no significant difference between treatment dose 1 and treatment dose 2 in terms of healing acne vulgaris after the intervention. Additionally, the Wilcoxon Signed Rank Test results for dose 1 show a *P*-value of 0.083, suggesting no significant effect on acne healing before and after the intervention. In contrast, for dose 2, the Wilcoxon Signed Rank Test yielded a *P*-value of 0.046, indicating a significant effect of the intervention on acne healing.

DISCUSSION

Acne Healing Rate Before and After Treatment with Dose 1

Based on Table 3, it can be explained that before intervention was carried out 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 five respondents experienced medium acne (31.2%). Acne, commonly known as acne vulgaris, is a disease inflammation or inflammation experienced by the skin from the pilosebaceous unit and mainly appears in adolescence (Dian & Ansori, 2018). At that age physical growth develops very rapidly and is seen as something that is very important; however, when the physical condition does not match expectations (body image mismatch with self-image) it can cause dissatisfaction and self-doubt, especially with acne. Acne can appear on the face, shoulders, upper chest and upper back. Other skin locations, for example the neck, upper arms, and gluteus are sometimes affected. From the data, all 16 respondents were female respondents (100%) and almost all of them were 15 years old (6, 37.5%). This is because women of that age are entering the early stages of puberty, where the activity of the hormone estrogen in the body increases. This causes the oil

Table 2. Characteristics of Respondents

Category	Dose 1		Dose 2	
	n	%	n	%
Age				
15 years	6	37.5	3	18.8
16 years	5	31.2	7	43.8
17 years	4	25.0	3	18.8
18 years	1	6.2	3	18.8
Gender				
Female	16	100	16	100
Using Cosmetics				
Yes	7	43.8	10	62.5
No	9	52.6	6	37.5
Consuming Fatty Food				
Often	14	87.5	15	93.8
Seldom	2	12.5	1	6.2
Cleaning Face				
Often	0	0	1	6.2
Seldom	16	100	15	93.8
Acne Appearance During Menstruation				
Yes	9	56.2	11	68.8
No	7	43.8	5	31.2
Acne Treatment Approaches				
Medicine from Doctor	1	6.2	3	18.8
Traditional Care	5	31.2	4	25.0
Salon Treatment	3	18.8	7	43.8
Not at all	7	43.8	2	12.5

Table 3. Acne Healing Rates Before and After Treatment Intervention at Dose 1

Category	Before		After	
	n	%	n	%
Mild	11	63.8	14	87.5
Medium	5	31.2	2	12.5
Mean	1.31		1.12	
St. Deviation	0.479		1.12	
Wilcoxon Test	*P*-value 0.083			

Table 4. Acne Healing Rates Before and After Treatment Intervention at Dose 2

Category	Before		After	
	n	%	n	%
Mild	11	63.8	15	93.8
Medium	5	31.2	1	6.2
Mean	1.31		1.06	
St. Deviation	0.479		0.250	
Wilcoxon Test	*P*-value 0.046			

Table 5. The Effectiveness of Moringa Leaf Facial Masks Combined with White Rice Flour in Treating Acne Vulgaris

Category	Dose 1 Post-intervention		Dose 2 Post-intervention	
	n	%	n	%
Mild	14	87.5	15	93.8
Medium	2	12.5	1	6.2
Wilcoxon Test	*P*-value 0.046			
Mann-Whitney Test	*P*-value 0.551			

glands to produce oil sebum in amounts greater than the body needs and triggers the appearance of acne.

According to research based on Table 2, it shows that respondents all of them rarely clean their face. This is due to many respondents only clean your face when they shower (Sitompul et al., 2016). This causes excess sebum production, which triggers the activity of Propionibacterium Acne (P.acne) on facial skin and can cause AV (Sitompul et al., 2016). Simply put, the P.acne bacteria produce a lipase enzyme that can break down sebum into free fatty acids. These fatty acids cause recruitment of neutrophils resulting in tissue inflammation of the P bacterial cell wall. Acne contains carbohydrate antigens that can stimulate antibodies, i.e. anti-Propionibacterium. These antibodies are able to increase the inflammatory response by means of complement activation which is the start of the proinflammatory cascade. This response causes microcomedones to form and lesions to appear which become inflamed until turning into pustules, papules and nodules (Masluhiya & Fidiastuti, 2019). This issue can be addressed by using a Moringa leaf mask combined with white rice flour. For treatment with dose 1, the ratio is 5 grams of Moringa leaves to 10 grams of white rice flour. The intervention involves applying this mask three times a week for two weeks, totaling six treatments.

After intervention at dose 1 the severity of the acne decreased, namely from mild acne from 11 respondents to 14 respondents (87.5%) while medium acne which initially had five respondents there remained two respondents (12.5%). This is because the respondents followed the procedure given and were able to apply it well, apart from which masks made from Moringa leaves also contain more than 90 nutrients, almost perfectly balanced compounds, including 46 antioxidants and 36 anti-inflammatory and rice flour itself contains vitamin E which can make facial skin clean, smooth and radiant. It also contains Gamma oryzanol (a powerful antioxidant) which functions to regulate collagen production, counteract ultraviolet radiation, can eliminate black spots, and remove dead skin cells. If there is no removal of dead skin cells, the skin pores and hair follicle ducts will become blocked and can cause acne (Yuliansari & Puspitorini, 2020). Meanwhile, two respondents were still experiencing medium acne because they rarely cleaned their face. Apart from that hormonal factors during menstruation can cause the appearance of acne. The research results remained from mild to mild but there were a few changes that decreased in five respondents marked with the disappearance of pustules and blackheads. Based on the research data, the Wilcoxon Signed Rank Test was used for analysis.

The result yielded a *P*-value 0.083 ($\alpha > 0.05$), indicating that there was no significant effect on the severity of acne before and after the intervention with dose 1. This lack of significance is likely due to the dose being too low.

Acne Healing Rate Before and After Treatment with Dose 2

Based on Table 3, it can be explained that before doing this intervention according to the level of acne healing dose 2, 11 respondents (68.8%) had mild acne and five respondents (31.2%) experienced medium acne. Acne is a harmless disease that can be cured It can even heal by itself, but gives residual symptoms in the form of spots or patches and hypertrophic scar tissue (scar) (Dian & Ansori, 2018). There are many types of acne with levels of severity ranging from mild to severe, Mild acne is quite easy to treat, but severe acne can damage and requires special medical treatment (Lestari et al., 2020).

From the respondent data, there were 16 female respondents (100%) with almost half aged 16 years. This is due to the presence of stress triggers such as a large number of factors activities outside of school, group work, and lots of assignments done at home. According to results, it shows that this is because most respondents cannot regulate their eating patterns well, respondents prefer fatty snacks. Food will be stored in the body and when it becomes excessive it will be excreted through skin pores, so the skin releases a lot of oil on the face. That oily face will cause acne to grow easily (Lestari et al., 2020). But this can be overcome by giving a Moringa leaf mask combined with white rice flour. In treatment, dose 2 was at a dose of 10gr: 5gr, namely 10gr for Moringa leaves and 5g of white rice flour. This intervention was given 3x a week for two weeks (6x treatment).

After intervention at 2 doses, the severity of the acne decreased, namely mild acne in 15 respondents (93.8%) while for medium acne there was only 1 respondent (6.2%). This is because the respondents followed the procedures given and were able to apply them well, Apart from that, the content of Moringa leaves is also good for the face, especially for the facial acne because it contains quercetin, which is the best natural anti-inflammatory agent. Meanwhile, one respondent still experienced acne medium due to still consuming fatty foods. The research remained from mild to medium but there was a large decrease in the number of 10 respondents marked by the disappearance of the pustules and blackheads.

Based on research data, the data were analyzed using Wilcoxon Signed Rank Test. The results obtained *P*-value 0.046 ($\alpha<0.05$). This means that there is an influence on the level of severity before and after intervention at dose 2 was carried out.

Effect of Moringa Leaf Facial Mask Combined with White Rice Flour on Acne Vulgaris Healing: Dose 1 vs. Dose 2

Results of the Wilcoxon Signed Rank Test in the treatment group dose 1 obtained α calculated dose 1 (*P*-value 0.083)

(α>0.05) which proves that there was no significant effect before and after the intervention to cure acne vulgaris. Although influence of dose is not significant, the 1st dose treatment group showed a difference; the increase was not significant because respondents were not regularly cleaning their face after activities or after using cosmetics. Dose 1 was too low, for significant results you need to give Moringa leaf powder much more than rice flour, this is due to the content so as to cure acne; there is more in Moringa leaves, so the results obtained will be significant.

Results of the Wilcoxon Signed Rank Test in the treatment group dose 2 obtained a calculated α (*P*-value 0.046) (α<0.05), which proves that this intervention had an effect on reducing acne vulgaris. This is because Moringa leaf powder contains cytokines, one of which is the compound Zeatin, a high anti-oxidant with anti-aging properties. It helps replace body cells at an age-appropriate rate, and gives a much more youthful appearance to inflammatory skin which occurs on the skin, especially the face, which often occurs due to prolonged exposure to sun, weather, pollution and various products. The best way to reduce the risk of things like acne is by providing nutrition with anti-inflammatory regularly. Moringa leaves have a combination of quercetin which contains vital flavonoids with antioxidants properties that can help replace body cells, thereby preventing aging and acne (Sifatullah & Zulkarnain, 2021). Rice used in traditional mask making 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 skin look white and clean, antioxidants that ward off free radicals skin, wards off ultraviolet rays which can damage the skin and renews damaged skin pigment (Masluhiya & Fidiastuti, 2019). Rice also has high antioxidant content to remove dead skin cells. If dead skin cells from the skin pores and follicular ducts are not removed, hair will get clogged and can cause acne (Masluhiya & Fidiastuti, 2019).

The advantage of this non-pharmacological method is that it has no side effects and does not harm the body's condition, so it is safe. Using it regularly can help in healing. There are also lots of plants around that can be utilized and are very easy to find. The results of the Mann-Whitney statistical test showed a value of (*P*-value = 0.551) (α>0.05), meaning there is no difference between treatment dose 1 and treatment dose 2 toward healing acne vulgaris after intervention. Both are the same and can reduce the severity of acne.

This research study is in line with research conducted by Yuliansari and Puspitorini (2020) that by administering Moringa leaf mask extract acne recovery and acne drying conditions are obtained. There is a significant influence effect of administering Moringa oleifera leaf mask extract on the recovery of acne. Previous experimental research using a mask of guava and rice flour mashed (Sifatullah & Zulkarnain, 2021) was found useful for treating acne and rice used as flour as a mask mixing ingredients for additional sticky power. In this study, respondents were treated with a Moringa leaf mask combined with white rice flour, divided into two groups based on treatment doses.

For Group Dose 1, the total dose administered was 15 grams, consisting of 5 grams of Moringa leaves and 10 grams of white rice flour. Each application involved using 1.7 grams of Moringa leaves and 3.3 grams of rice flour, totaling 5 grams per treatment. This regimen was applied three times. In contrast, Group Dose 2 received a total of 15 grams, comprising 10 grams of Moringa leaves and 5 grams of rice flour. Each treatment used 3.3 grams of Moringa leaves and 1.7 grams of rice flour, also totaling 5 grams per application. This treatment was administered three times as well. Both treatment regimens aimed to reduce the severity of acne.

CONCLUSION

Before the intervention, most respondents had mild acne. The application of a *Moringa* leaf mask combined with white rice flour presents a potential alternative treatment. This combination is beneficial due to its anti-inflammatory properties, high antioxidant content, and flavonoids, which can help treat acne when used at the correct dosage and frequency. By adhering to these guidelines, it is hoped that individuals can effectively address and manage acne vulgaris independently.

Declaration of Interest

The authors declare that there is no conflict of interest.

Acknowledgment

The author extends gratitude to Gresik University for its support and appreciates MA Nahdlotul Ulama Petung Panceng Gresik for providing the venue and time for the research. Special thanks are also due to the students in grades 1-3, aged 15-18 years, who generously contributed their time and participated in the study from start to finish.

Funding

None.

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

REFERENCES

Dian, R. S., & Ansori, M. (2018). *Efektivitas masker wajah dengan bahan dasar tepung kentang dan beras untuk menghilangkan bekas jerawat* [The effectiveness of potato and rice flour-based facial masks for removing acne scars]. *BBHE, 7*(2), 32–37.

Hanafiah, R. G., & Astuti, M. (2022). *Kelayakan masker daun nangka dan tepung beras untuk perawatan kulit berjerawat* [The feasibility of jackfruit leaf and rice flour masks for acne skin care]. *Jurnal Pendidikan Tambusai, 6*(1), 2444–2453. https://doi.org/10.31004/jptam.v6i1.2957

Jintan, D. A. N., Nigella, H., & Untuk, S. L. (2024). *Pengaruh penggunaan masker tepung beras* [The effect of using rice flour masks]. *JSHI: Jurnal Studi Humaniora Interdisipliner, 8*(2), 74–79.

Lestari, R. T., Gifanda, L. Z., Kurniasari, E. L., Harwiningrum, R. P., Kelana, A. P. I., Fauziyah, K., Widyasari, S. L., Tiffany, T., Krisimonika, D. I., Salean, D. D. C., & Priyandani, Y. (2020). *Perilaku mahasiswa terkait cara mengatasi jerawat* [Student behavior related to acne treatment]. *Jurnal Farmasi Komunitas, 8*(1), 15. https://doi.org/10.20473/jfk.v8i1.21922

Livana, P. H., Mubin, M. F., & Mahmudah, A. R. (2016). *Respons emosi dan sosial remaja berjerawat* [Emotional and social responses of teenagers with acne]. *Jurnal Keperawatan Jiwa, 4*(2), 132–136.

Masluhiya, A. F. S., & Fidiastuti, H. R. (2019). *Efektivitas natural face mask dalam meningkatkan kelembaban kulit wajah* [The effectiveness of natural face masks in improving facial skin moisture]. *Care: Jurnal Ilmiah Ilmu Kesehatan, 7*(3), 138. https://doi.org/10.33366/jc.v7i3.1389

Wardani, H. N. (2019). The potency of soursop leaf extracts for the treatment of acne skin. *Jurnal Penelitian Perawat Profesional, 2*(4), 563–570. https://doi.org/10.37287/jppp.v2i4.218

Qonnayda, U., & Sutini, T. (2021). *Hubungan akne vulgaris dengan citra tubuh remaja di Desa Lonam Kabupaten Sambas Kalimantan Barat* [The relationship between acne vulgaris and body image among adolescents in Lonam Village, Sambas Regency, West Kalimantan]. *Indonesian Journal of Nursing Science and Practice, 4*(1), 41–48.

Sifatullah, N., & Zulkarnain. (2021). *Jerawat (Acne vulgaris): Review penyakit infeksi pada kulit* [Acne vulgaris: A review of skin infections]. *In Prosiding Biologi Achieving the Sustainable Development Goals* (pp. 19–23).

Sitompul, A., Siregar, J. S., & Atmanto, D. (2016). *Perbedaan hasil pengurangan jerawat pada kulit wajah menggunakan masker kefir susu kambing* [Differences in acne reduction results on facial skin using goat milk kefir masks]. *Jurnal Pendidikan Teknik dan Vokasional, 2*(2), 42–49.

Yuliansari, M., & Puspitorini, A. (2020). *Proses pembuatan masker bunga rosella dan tepung beras sebagai pencerahan kulit wajah* [The process of making rosella flower and rice flour masks for skin brightening]. *E-Jurnal, 09*(2), 367–375.

Zegita, Z., Prissy, N. S., Monicha, V. L., & Rahmiati. (2024). *Kelayakan masker mentimun dan tepung beras untuk mencegah kulit berjerawat* [The feasibility of cucumber and rice flour masks for preventing acne-prone skin]. *Jurnal Tata Rias, 14*(1), 85–97.