

# Efficacy of Oral Aloe Vera Juice in Reducing Acne Vulgaris among Young Women: A Pre-experimental Study

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## Abstract

Acne Vulgaris is a chronic inflammatory condition often appearing in adolescence but affecting individuals of all ages. The objective of the study was to assess the effect of oral Aloe vera juice on severity of acne among young women. A pre-experimental research design was adopted. 37 young women aged 18–23 years were selected through purposive sampling technique and administered Aloe vera juice for 30 days. The juice was prepared using 30 ml of Aloe vera gel extracted from fresh Aloe vera leaves mixed with 30 ml of water. Acne severity was assessed using the Global Acne Grading Scale at baseline and on 15th, 30th and 37th day. Inter-rater reliability of the scale was measured and it was found to be highly reliable ( $r = 0.92$ ). Paired 't' test was used to analyze the data. Results revealed a significant reduction in mean acne scores ( $p < 0.0001$ ), with a paired t value of 6.597(df = 36). The findings suggest that daily consumption of Aloe vera juice markedly reduced acne severity in young women. Preparation of Aloe vera juice can be taught in the community, as it is an effective, safe and inexpensive adjunct for acne management.

## Keywords

Aloe vera juice, Acne vulgaris, Women.

## INTRODUCTION

Acne vulgaris is a common follicular disorder affecting the hair follicle, characterized by comedones both closed and open and by pustules, papules, nodules and cysts. Most commonly, it appears in adolescence but it may occur at any age [1].

Acne vulgaris is otherwise known as zits, pimples and blackheads. There are four factors involved in acne; that is plugging of the hair follicle, hyperactivity of the sebaceous gland, proliferation of *Propionibacterium acnes*, and inflammation [2].

Acne vulgaris is a chronic inflammatory disease of the hair follicles and oil glands that often lasts for a long time. It is a very common skin issue that can show up as inflamed or non-inflamed lesions. It mainly appears on the face as papules, pustules, or nodules, but it can also occur on the upper arms, chest, and back [3].

Worldwide Aloe vera is the oldest medicinal plant ever known. Traditionally, Aloe Barbadensis Miller (Aloe vera) has been recommended for skin care to reduce acne vulgaris. Also, it has anti-oxidant, anti-inflammatory and anti-septic properties [4].

Aloe vera is rich in micronutrients such as vitamin A, C, and E, minerals and amino acids. Aloe vera is grown extensively in various regions of India. It is a green colored medicinal plant. Epidemiological studies have demonstrated that regular topical application or oral ingestion of Aloe vera

products can protect against acne vulgaris and other digestive health problems. Also, it boosts the immune system and reduces the radiation-induced skin reaction in cancer patients. There are over 300 types of Aloe vera, but Aloe Barbadensis Miller is the most widely recognized type [4].

## Need for the Study

Acne affects an estimated 20% of the global population aged 16 and above. Regional data indicate peak prevalence in East Asia, Latin America, and the Middle East. Additionally, adult women and those of mixed or darker ethnicities demonstrate a greater predisposition to acne [5].

Globally, acne in people of reproductive age has increased substantially. Acne cases rose by 34%, from 23.1 million to 31.0 million. The number of people living with acne grew by 38%, from 65 million to 89.3 million. DALYs also increased by 37% from 1.38 million to 1.90 million. Overall, the annual percentage change has been steadily rising, between 0.17% and 0.28% [6].

As per the IP Indian Journal of Clinical and Experimental Dermatology, 72% of acne patients belong to the adolescent age group, while 27% are adults. Pediatric cases accounted for only 1%. The Indian Journal of Dermatology states that acne vulgaris is a long-term condition affecting over 85% of adolescents and young adults. It is among the most common human diseases, and its effect on quality of life is significant. However, data on how acne impacts quality of life in Indian patients is still lacking [8].

While acne is commonly associated with teenagers, adults too are affected. Research from rural central India showed that acne vulgaris was highest in the 16 to 20 and 21 to 25 year age groups the face was involved most often, with the back, arms, chest, and neck also affected. Among the participants, 49 had mild grade 1 acne, 126 had grade 2, 29 had grade 3, and 6 had severe grade 4 acne [9].

The long-term complications of acne are scarring and psychosocial burden, both of which can continue even after active lesions resolve. Documented psychological effects include poor body image, embarrassment, self-consciousness, low self-esteem, and social difficulties such as withdrawing from peers and limited job prospects. Studies also show higher rates of anxiety and depression in people with acne. Suicidal thoughts have been reported in approximately 6-7% of acne patients [10].

Acne vulgaris also affects the psychology of a person as well as quality of life. Anti-acne products are very expensive due to which many people cannot afford its treatment. Aloe vera is natural and easily found in India and can be grown at home. Aloe vera juice may turn out to be a cost-effective solution to manage acne vulgaris.

### **Review of Literature**

Rafikah and Forest (2014) performed a double-blind, randomized, placebo-controlled study at Tabriz University, Iran, to assess the impact of Aloe vera juice on mild to moderate acne vulgaris. Subjects were administered 50 cc of fresh Aloe vera juice or placebo once daily for 30 days. Findings indicated a reduction in acne lesions from baseline to endpoint in the intervention group, whereas the control group showed no statistically significant difference. The study concluded that oral Aloe vera juice may be effective in decreasing non-inflamed total facial acne lesions mild to moderate acne vulgaris [11].

In 2015, a systematic review on biological properties of Aloe vera stated the plant exhibits many pharmacological activities such as antioxidants, antimicrobial, immune boosting, anti-tumor, hypoglycemic, wound healing and anti-diabetic [12].

A study in Bhubaneshwar, 2024 examined the biological properties and clinical application of Aloe vera. The research concluded that Aloe vera shows anti-cancer effect on skin and digestive protection and antimicrobial properties [13].

A quasi-experimental study was done in Karnataka, 2023 on 57 students with facial acne and scars. Aloe vera gel was applied on face twice a day for four weeks. The study result showed that Aloe vera was effective for facial acne and scarring. Aloe vera can reduce the hyper-pigmentation of the skin and it is helpful for skin problems [14].

A study was done in 2025 by Emmanuel Ok and Edwin Frank. Result showed that topical application of an Aloe vera Barbadensis leaf juice was effective to treat mild to moderate acne. The Aloe vera group showed significant reduction in the acne severity, sebum production and bacterial load. Aloe vera group experienced decrease in the acne severity whereas

placebo group showed minimal reduction in the acne severity [15].

A study was conducted in United Kingdom by the General Pharmaceutical Council of Great Britain to examine the botany, photochemistry and therapeutic uses of Aloe vera. The study concluded that Aloe Barbadensis leaf juice has great potential as a natural treatment for acne in skin care mainly due to its exceptional anti-bacterial property [16].

There are many research articles available where it was evident that Aloe vera has antimicrobial, antioxidant and healing properties. [12], [13], [14], [15], [16] Some studies have also shown that topical application of Aloe vera gel has reduced severity of acne lesions and scars. Only one study, which was conducted in Iran, was available where oral Aloe vera juice was used and the study found that it was effective for mild to moderate acne. Hence, there is a need to explore the effect of oral Aloe vera juice on acne among Indian population.

### **Problem Statement**

A pre-experimental study to assess the effect of Aloe vera juice on Acne Vulgaris among young women residing in a selected hostel, Panchgani, Maharashtra.

### **Objectives of the Study**

- To assess the severity of Acne Vulgaris before and after administering Aloe vera juice among young women.
- To study the association between severity of Acne vulgaris and selected demographic variables.

### **MATERIALS AND METHODS**

Pre-experimental one group pre-test post-test design was adopted for this study. The study was conducted in a selected women's hostel in Panchgani, Maharashtra. Non-probability purposive sampling technique was used. The total sample size was 37 participants. Participants were selected based on the following criteria.

Inclusion criteria:

- Young women with mild, moderate or severe Acne Vulgaris between 18-23 years of age.
- Young women with Acne Vulgaris willing to participate in the study.

Exclusion criteria:

- Young women who were on anti-acne treatment.
- Young women with other skin diseases.
- Young women diagnosed with PCOS.
- Pregnant women
- Young women who were allergic to Aloe vera.

Data was collected by using observation method and questionnaire method to assess the severity of Acne Vulgaris. The Data collection tool consisted of two sections:

Section A - Questions related to baseline data (Age, Type of acne, Location of acne, Duration of acne, Type of skin and menstrual history). Content validity for the structured questions was obtained from 10 experts from the field of Nursing, Dermatology, Ayurveda, and Statistics.

Section B - Observation scale to assess the acne score by using the Global Acne Grading Scale (GAGS). GAGS was developed by Doshi, Zaheer & Stiller [17]. The GAGS divides the face (forehead, each cheek, nose, and chin), chest, and back into six areas, and the severity in each zone is then assessed on a scale of 0 to 4 (0 = no lesions; 1 = comedones; 2 = papules; 3 = pustules and 4 = nodules). The total score for all six zones is then calculated, and the acne severity is classified as either mild (1–18), moderate (19–30), severe (31–38) or very severe (>39).

Inter-rater reliability of the tool was assessed. The r value was 0.92. Hence the tool was found to be highly reliable. Pilot study was conducted on 10% of the sample size and the tool and methodology were found to be feasible. Permission for conducting the study was obtained from the Institutional Ethics Committee. Details of the study were explained to the participants and written informed consent was obtained. Confidentiality of participants is maintained.

Baseline data was collected and pre-test was done to assess the severity of Acne Vulgaris among the study participants.

#### Preparation of Aloe Vera Juice:

- Fresh Aloe vera leaves were taken and washed thoroughly.
- Thorny edges of the leaves were carefully trimmed, ensuring the avoidance of any yellow latex.
- A spoon/knife was used to scoop out the clear gel.
- 30 ml of Aloe vera gel and 30 ml of water was blended together to prepare the juice.
- A pinch of salt was added for taste. (Figure 2)

Freshly prepared Aloe vera juice was given to the participants every day before breakfast for 30 consecutive days. Post-test was conducted on the 37<sup>th</sup> day to assess the severity of Acne Vulgaris among the participants.



**Figure 1.** Aloe vera plant



**Figure 2.** Aloe vera Juice

## RESULTS

**Section A –** Baseline data of the participants was analyzed using frequency and percentage. The major findings were as follows: 64.87% participants were in the age group of 18-20 years. 45.95 % of participants had oily type of skin, 51.36 % participants had acne between 1 to 5 weeks of duration. The most common locations for acne were left cheek (78.37%), right cheek (75.63%) and forehead (70.27%). Menstrual cycle was regular for majority of the participants (78.37%). (Table no. 1)

**Table 1.** Baseline data of study participants [N = 37]

| Features                  | Baseline Variables   | Frequency (n) | Percentage (%) |
|---------------------------|----------------------|---------------|----------------|
| Age                       | 18 – 20 years        | 24            | 64.87%         |
|                           | 21 – 23 years        | 13            | 35.14%         |
| Type of skin              | Normal               | 5             | 13.51%         |
|                           | Dry                  | 8             | 21.62%         |
|                           | Oily                 | 17            | 45.95%         |
|                           | Mixed                | 7             | 18.92%         |
| Duration of acne in weeks | 1-5 weeks            | 19            | 51.36%         |
|                           | 6-10 weeks           | 7             | 18.92%         |
|                           | 11-15 weeks          | 1             | 2.71%          |
|                           | ≥ 16 weeks           | 10            | 27.03%         |
| Location of acne          | Forehead             | 26            | 70.27%         |
|                           | Left cheek           | 29            | 78.37%         |
|                           | Right cheek          | 28            | 75.63%         |
|                           | Nose                 | 8             | 21.62%         |
|                           | Chin                 | 9             | 24.32%         |
|                           | Upper back and chest | 14            | 37.83%         |
| Menstrual Regularity      | Regular              | 29            | 78.37%         |
|                           | Irregular            | 8             | 21.62%         |

## Section B – Analysis of Pre-test and Post-test Acne Scores

Pre-test findings revealed that 73 % had mild acne, 27% had moderate acne and none of the participants were in the category of severe or very severe acne (Figure 3). In this study observation of post-test acne scores was done on 15<sup>th</sup>, 30<sup>th</sup> and 37<sup>th</sup> day to efficiently monitor the effect of Aloe vera juice on acne. Day-wise mean acne scores have shown a reduction in acne among the study participants (Figure 4). [N = 37]

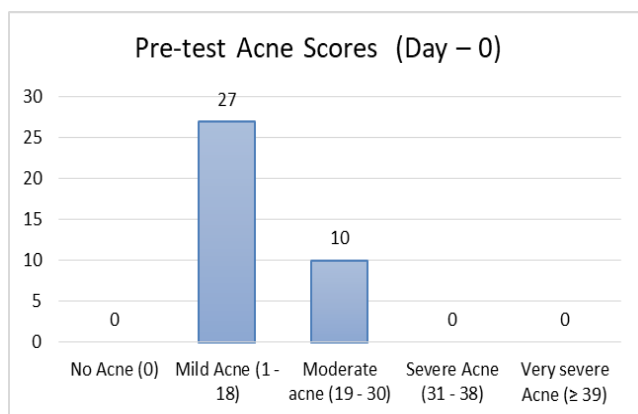


Figure 3. Pre-test acne scores

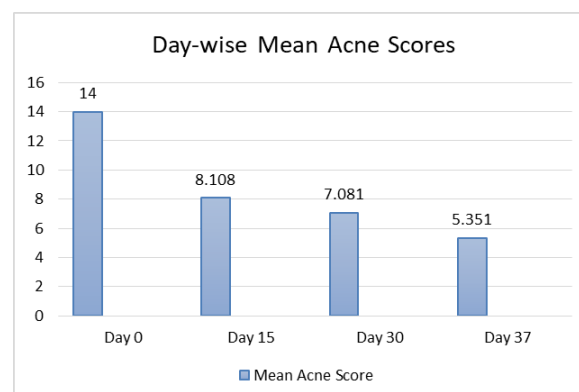


Figure 4. Comparison of day-wise mean acne scores

**Comparison of pre-test acne score with day-15 acne score:** Mean pre-test acne score was 14 and mean day-15 acne score was 8.108. There was a statistically significant reduction of the acne score on 15<sup>th</sup> day compared to the pre-test acne score. (t value = 7.352, p value = <0.0001).

**Comparison of pre-test acne score with day-30 acne score:** Mean pre-test acne score was 14 whereas the acne score on day-30 was 7.081. There was statistically significant reduction of the acne score on 30<sup>th</sup> day after administering Aloe vera juice. (t value = 9.539, p value = <0.0001).

**Comparison of pre-test acne score with day-37 acne score:** Mean pre-test acne score was 14 whereas the acne score on post-test (day 37) was 5.351. There was a statistically significant reduction in the acne score when compared with the 37<sup>th</sup> day score after administering Aloe vera juice. (t value = 6.597, p value = <0.0001). Comparison of pre-test acne score and post-test day 37 acne score is shown in Table 2.

Table 2. Comparison of pre-test acne score with post-test (day 37) acne score [N = 37]

|            | Frequency and percentage |                    | Pre-test acne score (Day 0) | Post-test acne score (Day 37) | Mean difference | t value | p value |
|------------|--------------------------|--------------------|-----------------------------|-------------------------------|-----------------|---------|---------|
| Acne Score | 37 (100%)                | Mean               | 14                          | 8.648                         | 5.351           | 6.597   | <0.0001 |
|            |                          | Standard deviation | 6.658                       | 6.111                         | 4.934           |         |         |
|            |                          | Minimum            | 4                           | 0                             | -2              |         |         |
|            |                          | Maximum            | 29                          | 24                            | 16              |         |         |
|            |                          | Median             | 12                          | 8                             | 4               |         |         |

Comparison of mean pre-test and mean post-test acne scores was done using t-test. All comparisons have shown a statistically significant difference between acne scores before and after administering Aloe vera juice, proving that Aloe vera juice was effective in reducing acne among study participants.

## Section C - Association Between Severity of Acne and Selected Demographic Variables.

Association between demographic variable was analyzed using Chi Square test and Fisher Exact Test.

Chi Square test was used to check the association between

type of skin and acne scores of participants before and after intervention. Chi Square value was 4.545 (p = 0.2083) which is not statistically significant. Thus, no association was found between type of skin (normal, dry, oily or mixed) and acne scores. This indicates that the intervention was equally effective on all types of skin.

Fisher Exact Test was used to check the association between regular and irregular menstrual cycle and acne scores of participants. It showed no statistically significant difference in the proportions (p = 0.3727). Thus, the intervention on acne was equally effective on both types of menstrual cycle.

## DISCUSSION

The study findings revealed that acne was more common among female participants in the age group of 18-20 years (64.87%) and 21-23 years (35.14%). Common areas of acne were, left cheek (78.37%), right cheek (75.63%), forehead (70.27%) and chin (24.32%) among the study participants. The present study's findings are similar to a study done by Sanjeevan Kaur and Rohan Tyagi who did a comparative analysis of acne vulgaris affecting Indian adolescent versus adult patients. Acne was more common females between 26 to 30 years. In adolescents, acne was more common on the cheeks (81%) and forehead (66%), and in adults it was cheeks (71%) and chin (51%) [18].

In present study majority participants with acne had oily type of skin (45.95%). An article by dermalife has stated that oily skin gives a lot of sebum, which mixes with dead cells and clogs the pores, leading to acne formation [19].

The baseline data of the participants showed that majority of the participants (62.16 %) with acne were in the luteal phase (n = 11) and bleeding phase (n = 11) of their menstrual cycle. A study by Jain, Chawda et al. demonstrated a significant link between menstrual cycle phases and acne severity in Indian women, with higher lesion counts occurring during late luteal phase and bleeding days [20].

The present study shows that oral ingestion of Aloe vera juice is effective for reducing mild to moderate acne vulgaris. 60 ml of Aloe vera juice was administered orally to 37 participants daily for 30 days. Post-test revealed statistically significant reduction in acne scores ( $t = 6.597$ ,  $p < 0.0001$ ). These findings are consistent with a study conducted by Jaclyn M and Naser Rafikhah in Iran to assess effectiveness of oral Aloe vera juice on acne. 40 volunteers with mild to moderate acne were randomly selected into two groups, receiving either 50 cc of freshly prepared Aloe vera juice or placebo once daily for 30 consecutive days. The mean acne scores significantly decreased from baseline ( $p = 0.53$ ) while the control group showed no was statistically significant changes ( $p = 0.96$ ). Thus, the study concluded that oral Aloe vera juice was effective in reducing mild to moderate acne [11].

## Limitations

- The study was done among young women between 18-23 years of age. Therefore, application of findings on other age groups remains unexplored.
- The sample size was limited to 37, which can make generalization of findings difficult.
- The study was done only on women; application of findings on men remains unexplored.
- Correlation of study findings with phases of menstrual cycle of women was not done as the study subjects were in different phases of their menstrual cycle.
- The duration of intervention was limited to 30 days.
- The study was carried out during monsoon season. The effect of intervention during other seasons remains unexplored.

## Recommendations

- The study can be conducted on larger samples.
- The study can be conducted by increasing the consumption of Aloe vera juice twice a day for individuals with severe acne vulgaris.
- This study can be conducted among adolescents or women in other age groups.
- The study can be conducted on men.
- The study can be conducted in other seasons.

## CONCLUSION

The study concluded that daily consumption of Aloe Vera juice markedly reduced acne severity among young women. Preparation of Aloe vera juice can be taught in the community as it is an effective, safe and inexpensive adjunct for acne management.

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