



## The Effectiveness of Aloe Vera in Multiple Moist Spray Products as a Hair Tonic to Reduce Students Scalp Irritation

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### Abstract

Skin irritation on the scalp is often experienced by men. This happens due to the high increase in sebum production and frequent use of excessive products like pomade. For men with sensitive scalp, this causes hair problems such as dandruff. Proper hair care can help manage dandruff, including the use of a hair tonic containing aloe vera. This research aims to investigate the influence of aloe vera content on dandruff treatment. The study design employed pre-experimental research with a pre-post test group, involving a population of 23 respondents and a sample of 23 respondents selected through total sampling. Statistical analysis utilized paired t-tests with significance set at  $<0.05$ . Results from 23 respondents indicated that 19 respondents (82.6%) experienced a decrease in scores, while 4 respondents (17.4%) showed an increase. Statistical analysis revealed significant results with a p-value of  $0.000 < 0.05$ . The conclusion drawn is that the aloe vera content in Multiple Moist Spray has a beneficial effect on treating dry dandruff. Therefore, individuals with dandruff are encouraged to be selective in choosing scalp treatments.

**Keywords:** Aloe Vera, Hair Tonic, Multiple Moist Spray, Scalp

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## 1. BACKGROUND

For some people, hair is considered a crown to support their appearance. Scalp problems such as dirty and itchy hair are often considered minor problems. However, this problem causes discomfort and a lack of self-confidence for those affected.

One of the hair problems that interferes with appearance is dandruff.

Seborrheic dermatitis or dandruff is the excessive shedding of dead scalp cells (Delta & Marwiyah, 2014). Dandruff is a scalp condition caused by overactive sebaceous or sebum glands, characterized by excessive itching (Primawati et al., 2021).

According to research (Maryanti et al., 2014), dandruff is triggered by the fungus *Pityrosporum ovale*, a lipophilic

organism belonging to the genus *Malassezia*. This fungus is a natural scalp flora located in the stratum corneum's upper layer, which can cause dandruff to develop. Some signs of dandruff include white to yellow and blackish scales, shiny and dry on the scalp, and some odor (Delta & Marwiyah, 2014). Almost 50% of the global population, from puberty to adulthood, regardless of ethnicity and race, experiences dandruff (Mamatha, 2017). Dandruff begins at puberty, peaks in incidence and severity at around 20 years of age, and is rarely found in people over 50 (Primawati et al., 2021). Research conducted in the US and China found that the prevalence rate of dandruff is around 81-95% among African Americans, 66-82% among Caucasians, and 30-42% among the Chinese population. According to data from the US Census Bureau's International Date Base in 2004, Indonesia reported a dandruff prevalence of 18% of its population, ranking fourth after China, India, and the United States (Borda, 2015). Based on gender, men experience dandruff more often than women because it is related to male sex hormones, namely androgens, which can cause increased sebum production (Luis, 2016). Men also tend to use pomades that irritate the scalp. Dandruff occurs when changes occur in the

epidermis layer known as the stratum corneum, characterized by excessive cell proliferation, increased intercellular and intracellular lipids, and parakeratosis. These changes cause the formation of fine, dry, layered flakes that often peel off spontaneously, accompanied by itching (Ningrum et al., 2018). An overly oily scalp also causes dandruff. Excessive oil on the hair can be a food source for fungi that grow on the scalp, where the fungus will stimulate excessive scalp peeling and cause dandruff, and wet dandruff that often occurs in oily scalp types (Delta & Marwiyah, 2014).

Dandruff can be overcome by doing proper hair care. One is using a hair tonic with ingredients to overcome dandruff. The use of anti-dandruff drugs that contain many chemicals is indeed recommended by health and beauty experts. However, natural ingredients are safer for some people with sensitive scalps. Natural ingredients that can be used as anti-dandruff hair tonic ingredients, one of which is aloe vera.

Based on the description above, a study was conducted to examine aloe vera's effectiveness in the Multiple Moist Spray product as a dandruff-reducing hair tonic. The study results are expected to be used as empirical and theoretical evidence

to determine and evaluate how to minimize problems with dandruff hair.

## 2. METHODS

The research design in this study used pre-experimental research with a pre and post-test group research type. The subjects of this study were students of Stikes Pemkab Jombang who had dandruff

problems. The population in this study consisted of 23 students. The total sampling technique was used for sampling this study. This study used a questionnaire to assess dandruff scores before and after treatment. Data analysis was carried out univariate and bivariate. The results of the normality test data showed normal, so this study used the Paired T-test.

## 3. RESULTS

### Univariate Analysis

**Table 1. Respondent characteristics (N=23)**

| Characteristic                | Variable        | Freqwency | Precentage (%) |
|-------------------------------|-----------------|-----------|----------------|
| Gender                        | Male            | 23        | 100.0          |
| Class Level                   | 1 <sup>st</sup> | 3         | 58.5           |
|                               | 2 <sup>nd</sup> | 4         | 41.5           |
|                               | 3 <sup>rd</sup> | 5         | 13.0           |
|                               | 4 <sup>th</sup> | 5         | 17.4           |
|                               | Nurse program   | 6         | 21.7%          |
| The habit of using hair tonic | Hair gel        | 23        | 100.0          |

Table 1 shows that this study involved twenty-three male respondents (100%). Three respondents from level one (13.0%), four respondents from level two (17.4%), five respondents from level three (21.7%),

five respondents from level four (21.7%), and six respondents from level nurses (26.1%) and have a habit of using hair gel (100%).

### Bivariate Analysis

**Table 2. Frequency distribution of respondents with dandruff before using multiple moist spray as hair tonic (N=23)**

| Observation                 | Dandruff Frequency |                |     |     |
|-----------------------------|--------------------|----------------|-----|-----|
|                             | Mean               | Std. Deviation | Min | Max |
| Before using Multiple Moist | 13,09              | 0,73           | 12  | 15  |
| After using Multiple Moist  | 11,35              | 1,402          | 10  | 15  |

Table 2 shows that the average value of respondents with dandruff before using

Multiple Moist was 13.09 with a Std. Deviation of 0.73, a minimum score of 12,

and a maximum of 15. After using Multiple Moist, the average respondent became 11.35

with a Std-deviation of 1.402, a minimum score of 10, and a maximum of 15.

**Table 3. Changes in scores after using multiple moist spray as hair tonic (N=23)**

| Dandruff       | Mean Pre | Mean Post | Dandruff Frequency<br>dif | Std Deviation | P Value |
|----------------|----------|-----------|---------------------------|---------------|---------|
| Dandruff score | 13,09    | 11,35     | 1,739                     | 1,054         | ,000    |

Table 3 shows that there is a tendency for a decrease in dry dandruff scores before and after treatment; namely, the average dandruff score before using Multiple Moist Spray is 13.09, and the average dandruff score after using Multiple Moist Spray is 11.35, so the difference in the average score before and after using Multiple Moist Spray is 1,739. This study used a 95% confidence level with a fundamental level of 5%-dependent t-test (paired t-test) on the experimental group before and after treatment. The table shows that the significance of  $P = 0.000 < \alpha = 0.05$ , so  $H_0$  is rejected and  $H_a$  is accepted, meaning the hypothesis that states there is effectiveness in reducing dandruff before and after using Multiple Moist Spray containing Aloe Vera.

#### 4. DISCUSSION

##### Respondents Before Using Multiple Moist Spray as Hair Tonic.

Table 2 shows that twenty-three respondents before using Multiple Moist Spray had an average score of 13.09,

indicating that the respondents experienced severe dandruff.

Dandruff can occur due to factors such as air and water pollution, lifestyle changes, poor hygiene practices, immune system disorders, sweating, mental stress, and others that can cause bacterial and fungal infections. Poor dietary habits, inadequate hygiene, genetic predisposition, hormonal imbalances, and infections are also contributing factors to the development of dandruff. (Putri et al., 2020). The fungus that grows in the sebaceous glands is *Pityrosporum ovale* (P. ovale), naturally found on the scalp and other body parts (Ningrum et al., 2018). The study (Pramodani et al., 2017) stated that excessive use of hairspray and hair gel can also cause dandruff.

In Table 1, it was found that all respondents with dandruff also used hair gel. In line with previous research (Yaneski et al., 2021), out of 108 respondents who used pomade, 64 people (59.3%) used pomade more than twice a week. These respondents experienced more dandruff

(71.9%) than those without dandruff (28.1%).

The ingredients found in pomade, such as petrolatum jelly and beeswax, are believed to contribute to dandruff in individuals who use pomade for hair styling purposes. These components are intended to provide better shine, moisture, and smoothness to the hair. However, excessive or improper use of pomade can increase sebaceous gland activity and lipid production. This excessive lipid production can accelerate the growth of *Malassezia* sp. on the scalp, a common cause of dandruff (Utami et al, 2018).

## Respondents Before Using Multiple Moist Spray as Hair Tonic

Table 2 shows that twenty-three respondents, after using Multiple Moist Spray containing aloe vera, obtained an average score of 11.35.

According to (Ningrum et al., 2018), aloe vera is highly valued for its health and beauty benefits. Known for its medicinal and cosmetic properties, aloe vera is widely used in modern health and beauty products. It is famous for its natural moisturizing properties and effectiveness in treating dandruff, reducing baldness, and soothing burns.

Aloe vera contains vitamins A and B, amino acids, and Zn, which help reduce dandruff (Rahmawati, 2019). The study also explained that Aloe vera has the same pH level as human skin, thus helping to prevent skin allergies for its users. Lignin compounds help increase the absorption of essential nutrients for the scalp and hair. In addition, the saponins found in aloe vera effectively clean the scalp from dirt and excess oil while increasing the soaping effect. Aloe vera contains approximately 5.651% saponins per 100 grams.

Given its significant benefits and minimal side effects, aloe vera was chosen in this study because it effectively addresses dry dandruff-related issues, thereby reducing symptoms in respondents.

## Effectiveness of Aloe Vera in Multiple Moist Spray as a Hair Tonic to Reduce Dandruff

Table 3 shows a tendency for a decrease in dry dandruff scores before and after treatment. Namely, the difference in the average score before and after using Multiple Moist Spray is 1,739. This study proves that after using Multiple Moist Spray, dandruff decreases.

Multiple Moist Spray uses natural ingredients as an alternative to treating dry

dandruff without the side effects of chemical treatments. Traditional ingredients sourced from the environment are believed to be able to regulate sebum production on the scalp. Aloe vera, which contains compounds such as phosphorus, vitamins A and B, amino acids, saponins, and flavonoids, is a natural remedy for dry dandruff. Its chemical components, especially saponins with antimicrobial, anti-inflammatory, and cytotoxic properties and flavonoids with various therapeutic effects, contribute to its effectiveness.

According to Madduluri et al. (2013), saponins function by disrupting cell membranes, causing protein and enzyme leakage. Its detergent-like properties reduce the tension and permeability of cell walls, penetrating the membrane to disrupt its stability. This process gradually hydrates the dry scalp and reduces white flakes. Based on this theory, Multiple Moist Spray reduced respondents' dandruff. Dandruff can appear unexpectedly, potentially damaging the scalp and causing discomfort if left untreated. Therefore, early intervention with non-pharmacological treatments such as Multiple Moist Spray is recommended because it is easy to apply, non-toxic to the skin, and available from natural sources.



Figure 1. Multiple Moist Spray

## 5. CONCLUSION

Nursing implementation carried out over 3 sessions can increase knowledge and can change family behavior that is ineffective in hypertension health care. Apart from health education, physical exercise therapy can help hypertensive clients improve the client's quality of life.

## AUTHOR CONTRIBUTIONS

The author contribute all research activity such as conceptualization, data curation, analysis, writing & editing, manuscript revisions.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest for this publication.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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