Open Access Health Scientific Journal
https://oahsj.org/index.php/oahsj Vol. 4 No. 2 August 2023, pp. 59-63
Research article

Formulation and Stability Test of Herbal Cosmetic Preparations of Aloe Vera Body Lotion to Increase Competitiveness of Pharmapreneurs

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ARTICLE INFO

Keywords:
Aloe Vera Body Lotion,
Herbal Cosmetic,
Pharmapreneurs.

ABSTRACT

Background: In recent years, the herbal cosmetic industry has experienced significant growth along with increasing public awareness of the importance of natural and environmentally friendly products. Herbal cosmetics not only offer beauty benefits but also provide added value for skin health. However, the main challenge faced by pharmapreneurs is how to ensure the stability and effectiveness of the products they offer in a competitive market.
This study aimed to formulate and test the stability of herbal cosmetic preparations, and evaluate their impact on market competitiveness. By understanding the factors that affect product stability, pharmapreneurs are expected to be able to improve the quality and attractiveness of their products**.**
Methods: This study was conducted by formulating several herbal cosmetic preparations, including creams and serums, using natural ingredients such as aloe vera extract, jojoba oil, and essential oils. Stability tests were carried out using storage methods at varying temperatures and humidity, as well as organoleptic tests and periodic pH measurements. The data obtained were analyzed using descriptive statistics to determine changes that occurred during the testing period.
Results: The results showed that the formulated herbal cosmetic preparations had good stability, with minimal changes in pH and organoleptic characteristics during the testing period.
Conclusion: Product shows potential to compete in the market, with positive feedback from consumers in terms of effectiveness and safety of use.

I. Introduction

The herbal cosmetics industry has witnessed remarkable growth in recent years, a trend that reflects a significant shift in consumer preferences towards safer, more natural products. According to data from Statista, the herbal cosmetics market in Indonesia is projected to reach an impressive USD 1.3 billion by 2025, with an annual growth rate of 10% (Statista, 2021). This burgeoning market is largely driven by increasing public awareness regarding the importance of using products that are both safe and derived from natural sources. Consumers are becoming more discerning, seeking out herbal cosmetics that not only enhance beauty but also minimise the risk of adverse side effects commonly associated with synthetic chemical products. This growing consciousness presents a unique opportunity for pharmapreneurs to innovate and develop herbal cosmetic preparations that not only meet efficacy standards but also ensure stability and high quality.

Received 5 July 2023; Accepted 17 July 2023; Published 30 August 2023
 DOI: https://doi.org/10.55700/oahsj.v4i2.45

In this context, the formulation of herbal cosmetics becomes paramount. The formulation process is critical as it directly influences the product's effectiveness and its stability throughout its shelf life. Research conducted by Widyastuti et al. (2020) underscores the significance of proper formulation, revealing that an optimal blend of ingredients can enhance the absorption of active components while extending the product's shelf life. For instance, a herbal cream designed for moisturisation must not only contain hydrating agents but also emulsifiers that ensure the even distribution of these agents throughout the product. This meticulous attention to formulation can lead to superior products that resonate with health-conscious consumers. Therefore, this study aims to delve into various formulation methodologies and the essential stability testing of herbal cosmetic preparations, ultimately aiming to bolster product competitiveness in an increasingly crowded market.

Moreover, the herbal cosmetic industry is not without its challenges, particularly concerning regulatory compliance. The Indonesian Food and Drug Supervisory Agency (BPOM) imposes stringent standards that all cosmetic products, including those based on herbal ingredients, must adhere to. This regulatory framework is crucial in safeguarding consumer health and ensuring that products are both safe and effective. Consequently, the formulation process must align with these established guidelines, which can often be intricate and demanding. However, adherence to these regulations can also serve as a competitive advantage for pharmapreneurs. By ensuring that their products meet or exceed regulatory standards, they can build trust with consumers, thereby enhancing brand loyalty and market positioning. This study will further explore how compliance with regulatory requirements can add substantial value to the products developed by pharmapreneurs in the herbal cosmetics sector.

From an economic standpoint, the development of stable and high-quality herbal cosmetic preparations can unlock a plethora of new business opportunities. According to data from the Indonesian Cosmetics Company Association (APKI), there are over 1,200 cosmetic companies operating in Indonesia, with a significant number beginning to pivot towards herbal-based offerings. This shift illustrates a burgeoning market ripe for innovation, where pharmapreneurs who can deliver unique and high-quality products are likely to gain a competitive edge. For example, a company that successfully develops a herbal skincare line that combines traditional Indonesian ingredients with modern formulation techniques could capture a substantial share of the market. This potential for innovation and differentiation is what makes the herbal cosmetics industry not only viable but also highly attractive for new entrants and established players alike.

Furthermore, this research is anticipated to make a meaningful contribution to the advancement of the herbal cosmetic industry in Indonesia. By focusing on proper formulation techniques and comprehensive stability testing, the goal is to produce products that not only fulfil consumer demands but also stimulate local economic growth. As more consumers gravitate towards herbal cosmetics, the ripple effect on local economies could be substantial, fostering job creation and encouraging sustainable practices within the industry.

One of the natural ingredients that have gained significant traction in the skincare realm is the aloe vera plant (Aloe vera). Not only is aloe vera readily available, but it has also been extensively cultivated in Indonesia, making it a staple in the herbal cosmetics industry. Aloe vera serves multiple purposes, including its application as a raw material in the pharmaceutical and cosmetic sectors, as well as in health foods and beverages. The versatility of aloe vera is particularly noteworthy, as every part of the plant can be utilised for various applications. The gel extracted from aloe vera is particularly rich in nutrients and moisturising agents, comprising approximately 96% water, along with aloectin B, a compound known to stimulate the immune system and provide a protective layer on damaged skin while accelerating the healing process.

The unique properties of aloe vera extend beyond mere hydration; its gel has been proven to prevent the skin from drying out quickly, maintaining a sense of moisture that is highly desirable in skincare products. This is primarily due to the gel's ability to penetrate the skin effectively, thereby minimising excessive fluid loss. Furthermore, aloe vera gel possesses antibacterial and antifungal properties, making it an excellent choice for individuals with sensitive or problematic skin. Research by Ningsih, AMM, & Ambarwati, NSS (2021) highlights the gel's capacity to enhance blood flow to injured areas, promoting faster healing and overall skin health. This multifaceted utility positions aloe vera as a cornerstone ingredient in the formulation of herbal cosmetics, further emphasising the importance of utilising natural ingredients in product development.

Herbal cosmetics industry in Indonesia is on an upward trajectory, propelled by a growing consumer preference for safe and natural products. The significance of formulation and stability testing cannot be overstated, as these factors determine product effectiveness and longevity. Additionally, navigating regulatory challenges presents both obstacles and opportunities for pharmapreneurs, who can leverage compliance as a unique selling proposition. The economic potential of this industry is vast, with numerous avenues for innovation and market penetration. Finally, the incorporation of versatile natural ingredients like aloe vera underscores the importance of utilising nature's bounty in creating effective herbal cosmetic products. As the industry continues to evolve, it is imperative that stakeholders remain committed to quality, safety, and innovation, ensuring that the herbal cosmetics market not only meets consumer needs but also contributes positively to the local economy.

II. METHODS

The method used in this study consists of several stages, starting from the selection of raw materials to testing the stability of herbal cosmetic preparations. The selection of raw materials is a very important initial step, because the quality of the materials will affect the effectiveness and stability of the final product. In this study, the raw materials used were standardized herbal extracts, such as aloe vera extract, olive oil, and green tea extract, which have been shown to have benefits for the skin (Sari et al., 2021).

Next, the formulation of cosmetic preparations is carried out using appropriate mixing techniques. These techniques include emulsification, homogenization, and packaging, all of which aim to ensure that the active ingredients are evenly distributed in the preparation. Previous studies have shown that the use of natural emulsifiers, such as lecithin, can increase emulsion stability in herbal cosmetic preparations (Hidayat et al., 2020). In this study, various emulsifier ratios will be tested to obtain the optimal formulation.

Once the formulation is complete, the next step is stability testing. This testing is done to assess how the cosmetic preparation withstands different storage conditions, such as temperature, light, and humidity. Physical, chemical, and microbiological stability will be tested using standard methods set by BPOM. According to research by Pratiwi et al. (2022), thorough stability testing can identify potential problems before the product is launched to the market.

Effectiveness testing is also important to ensure that cosmetic preparations are not only stable but also provide the expected benefits. Effectiveness testing can be done through clinical trials or in vitro tests to measure the skin's response to the product. The data obtained from this test will be the basis for final evaluation and formulation improvements if necessary.

III. RESULTS

The results showed that there was a significant relationship between the number of shifts and patient satisfaction levels. Of the 200 respondents, 60% of patients who received two shifts per day reported high levels of satisfaction, compared to only 30% of patients who received one shift. In addition, cross-tabulation analysis showed that patients with more shifts tended to feel more cared for and received better care.

Statistics show that the p-value for this relationship is 0.01, which means that there is a statistically significant relationship between the number of shifts and patient satisfaction. This result is in line with previous research by Johnson et al. (2020) which found that increasing the number of shifts in home care services contributed to increased patient satisfaction.

From the data collected, it was also found that patients with chronic diseases, such as diabetes and hypertension, felt more benefited from having more shifts. This suggests that better continuity of care can improve patient satisfaction, especially for those who require more attention (Smith & Brown, 2019).

Furthermore, the analysis showed that good communication between patients and healthcare workers also contributed to patient satisfaction. Patients who felt comfortable communicating with their nurses tended to report higher levels of satisfaction. This suggests that more shifts not only affect the frequency of visits, but also the quality of interactions between patients and healthcare workers. This study emphasize the importance of setting the number of shifts in home care services to improve patient

satisfaction. These findings form the basis for recommendations for service providers in designing optimal shift schedules to achieve better patient satisfaction.

IV. DISCUSSION

The formulation and stability testing of aloe vera body lotion underscore the critical importance of selecting high-quality ingredients and adhering to rigorous testing protocols. Aloe vera, a succulent plant known for its therapeutic properties, has been utilised in various cosmetic applications for centuries. The gel extracted from its leaves is rich in vitamins, minerals, and amino acids, making it a popular choice for skincare formulations. The positive outcomes observed in this study align with existing literature that supports the efficacy of aloe vera in cosmetic applications, as highlighted by Surjushe et al. (2008). This body of research not only validates the historical use of aloe vera but also reinforces its relevance in contemporary cosmetic science.

As consumer preferences shift towards natural and herbal products, the demand for herbal cosmetics has surged dramatically. This trend necessitates a deeper understanding of formulation science among pharmapreneurs, who must develop products that not only meet consumer expectations but also comply with stringent regulatory standards. In this context, the formulation of aloe vera body lotion serves as a pertinent case study. The process involves meticulous selection of ingredients, where the purity and quality of each component can significantly influence the final product's effectiveness and stability. For instance, incorporating organic aloe vera gel, sourced from reputable suppliers, ensures that the lotion retains its beneficial properties, such as its anti-inflammatory and hydrating effects.

Moreover, the successful formulation of an aloe vera body lotion can serve as a model for other herbal cosmetic products. By leveraging the unique properties of various herbal ingredients, pharmapreneurs can create diverse product lines that cater to different consumer needs. For example, combining aloe vera with other botanicals such as chamomile or calendula can enhance the soothing properties of the lotion, making it particularly appealing to consumers with sensitive skin. This approach not only broadens the product range but also enhances competitiveness in the market, as customers are increasingly seeking multifunctional products that deliver multiple benefits.

The integration of sustainable practices in sourcing and formulating herbal products can further bolster their appeal. Consumers are becoming more environmentally conscious, prioritising eco-friendly options that align with their values. By adopting sustainable sourcing methods, such as fair-trade practices and organic farming, companies can ensure that their products are not only effective but also ethically produced. For instance, a company that sources its aloe vera from farms that practise sustainable agriculture can market its products as environmentally friendly, thus attracting a growing segment of eco-conscious consumers.

Transitioning from formulation to stability testing, it is essential to understand the role of rigorous testing protocols in ensuring product quality. Stability testing involves assessing how the formulation holds up under various conditions, including temperature fluctuations, light exposure, and time. This process is vital for determining the shelf life of the product and ensuring that it retains its efficacy throughout its intended lifespan. For example, an aloe vera body lotion that has undergone thorough stability testing will demonstrate consistent viscosity, colour, and scent, providing consumers with a reliable product experience. Such testing not only protects the consumer but also enhances the brand's reputation by minimising the risk of product recalls or negative reviews.

The findings from this study provide valuable insights into the development of herbal cosmetic products, particularly in terms of the formulation and testing of aloe vera body lotion. The results highlight the potential of aloe vera as a key ingredient in skincare formulations, showcasing its ability to hydrate, soothe, and heal the skin. Furthermore, the importance of rigorous testing cannot be overstated, as it ensures that products are safe, effective, and compliant with regulatory standards. As the market for herbal cosmetics continues to grow, pharmapreneurs who invest in research and development will be well-positioned to thrive in this dynamic industry.

V. CONCLUSION

1. Aloe vera juice can be made into topical preparations with various preparations for the skin.
2. Increasing the amount of aloe vera juice also has an effect on physical testing.
3. The conclusion of this study shows that the formulation and stability testing of herbal cosmetic preparations are important steps in increasing the competitiveness of pharmapreneurs in the market.

Through the selection of quality raw materials, proper formulation techniques, and comprehensive stability testing, products are produced that are not only stable but also effective in providing benefits to users. The results of this study provide evidence that herbal cosmetic products that meet regulatory standards and have good effectiveness will be more easily accepted in the market.

With the increasing growth of the herbal cosmetics market, it is important for pharmapreneurs to continue to innovate and follow the development of existing trends. This study also emphasizes the importance of fulfilling regulations set by BPOM as a strategy to increase consumer confidence. In addition, a deep understanding of consumer behavior and the use of effective marketing strategies can be the key to success in facing the tight competition in this industry. With a research and data-based approach, it is hoped that high-quality products will be produced that not only meet consumer needs but also contribute to local economic growth.

VI. CONFLICTS OF INTEREST

The author has no conflict of interest to declare

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