

Comparative Analysis of Consumer Preference for Herbal Versus Chemical-Based Cosmetic Pharma Products

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Abstract - This study examines consumer preference toward herbal and chemical-based cosmetic pharma products in Vadodara, Gujarat. The objective is to understand how factors such as safety, effectiveness, price, and brand image influence purchasing behavior. Primary data was collected from 100 respondents using a structured questionnaire and analysed using percentage-based methods.

The findings indicate that herbal cosmetics are widely perceived as safer and more suitable for long-term use, whereas chemical cosmetics are preferred for their quick results and easy availability. Despite growing awareness and positive perception toward herbal products, consumers continue to use chemical cosmetics due to performance and brand trust.

The study highlights a gap between consumer perception and actual buying behavior, suggesting that future growth in the cosmetic industry will depend on developing products that combine natural ingredients with proven effectiveness.

I. INTRODUCTION

The cosmetics industry has witnessed rapid growth over the past few decades, driven by increasing consumer awareness, changing lifestyles, and evolving beauty standards. Traditionally, chemical-based cosmetics have dominated the market due to their quick results, wide availability, and strong brand presence. However, rising concerns about the potential side effects of synthetic ingredients, such as skin irritation, allergies, and long-term health risks, have led consumers to reassess their choices.

In recent years, herbal cosmetics have emerged as a popular alternative, emphasizing the use of natural ingredients, minimal chemical processing, and eco-friendly practices. Consumers are increasingly attracted to herbal products due to their perceived safety, sustainability, and compatibility with different

skin types. This shift is further supported by growing environmental awareness and the global trend toward organic and green products.

Despite this shift, consumer perception remains complex and influenced by multiple factors, including product effectiveness, price, brand image, availability, and individual preferences. While some consumers prioritize quick and visible results offered by chemical cosmetics, others value the long-term benefits and safety associated with herbal alternatives.

This study aims to explore and analyze consumer perception toward chemical and herbal cosmetics, identifying the key factors that influence purchasing decisions and highlighting the changing trends within the cosmetics market.

II. LITERATURE REVIEW

The cosmetics industry has undergone significant transformation due to changing consumer preferences, increasing awareness of health, and environmental concerns. Several researchers have examined consumer perception toward chemical and herbal cosmetics, highlighting a shift toward natural and sustainable products.

A study by Muralidhar et al. (2023) found that consumer perception has evolved from viewing cosmetics as luxury items to essential products, with increasing dissatisfaction toward chemical cosmetics due to their potential side effects. This has contributed to the rising popularity of herbal cosmetics, which are perceived as safer alternatives. Similarly, Makkar et al. (2007) identified a paradigm shift in consumer attitudes in India, where consumers are gradually

favouring herbal cosmetics over chemical-based products due to health and safety concerns.

Research by Tengli and Srinivasan (2022) highlighted that consumers are increasingly inclined toward natural cosmetics because of concerns about harmful chemicals and a growing emphasis on skin health and product quality. The study also emphasized that purchase behavior is influenced by factors such as awareness, lifestyle, and personal values. Supporting this, studies on organic personal care products indicate that consumers are becoming more conscious about ingredients and prefer products that minimize harmful effects on the skin.

In addition, Amberg and Fogarassy (2019) explored green consumer behavior and found that environmental awareness and sustainability play a major role in shaping consumer preferences for natural cosmetics. The demand for eco-friendly and plant-based products has increased significantly in recent years. Scientific research also suggests that herbal cosmetics, derived from plant-based ingredients, are perceived as safer and having fewer side effects compared to synthetic alternatives, which enhances their attractiveness among consumers.

However, not all studies present a completely positive view of herbal cosmetics. Kifaya (2024) identified consumer skepticism as a barrier to purchasing organic cosmetic products, noting that factors such as lack of trust, insufficient scientific evidence, and higher prices can limit their adoption. Similarly, comparative studies on organic and non-organic cosmetics reveal that while many influencing factors overlap, differences in perceived effectiveness and affordability continue to affect consumer choices.

Recent reviews also highlight a “green purchasing gap,” where consumers express positive attitudes toward herbal or natural cosmetics but do not always translate these attitudes into actual buying behaviour due to constraints like price, availability, and brand trust.

Overall, the literature indicates a growing preference for herbal cosmetics driven by health consciousness and environmental awareness. However, consumer perception remains complex and is influenced by multiple factors, including product effectiveness, cost, brand credibility, and trust. This highlights the need for

further research to better understand the balance between perceived benefits and actual consumer behaviour.

III. PROBLEM STATEMENT

In recent years, the cosmetics industry has experienced a shift in consumer awareness toward product safety, ingredient transparency, and environmental sustainability. While herbal cosmetic products are increasingly perceived as safer and more natural, chemical-based cosmetics continue to dominate the market due to their quick results, strong brand presence, and wide availability.

Despite this growing awareness, there exists a lack of clarity regarding how consumers actually choose between herbal and chemical cosmetic products. Many consumers express a preference for herbal products due to perceived safety and long-term benefits, yet their purchasing behavior often favors chemical products for effectiveness and convenience.

This creates a gap between consumer perception and actual buying behavior. Additionally, limited comparative research has been conducted at the city level to understand how factors such as price, brand image, effectiveness, and awareness influence consumer preferences.

Therefore, this study aims to analyze and compare consumer preference for herbal versus chemical-based cosmetic products in Vadodara, Gujarat, and to identify the key factors influencing their purchasing decisions.

IV. RESEARCH OBJECTIVES

To analyze consumer awareness and perception toward herbal and chemical-based cosmetic products.

To compare consumer preference between herbal and chemical cosmetic products.

To identify the key factors influencing consumer purchasing decisions, such as price, quality, brand image, ingredients, and effectiveness.

To evaluate consumer satisfaction levels with herbal and chemical cosmetic products.

To examine the impact of demographic factors (age, gender, occupation, etc.) on consumer preference.

Hypothesis

H₁(Consumer Perception): There is a significant difference in consumer perception between herbal and chemical cosmetics. This hypothesis was tested using a t-test, which yielded a mean score of \$3.70\$ and a \$p\$-value of \$< 0.001\$, indicating a statistically significant lean toward the perceived safety of herbal products.

H₂(Influential Factors): Factors like price, quality, brand, and ingredients influence consumer preference. The analysis specifically confirmed that brand image is a critical driver (\$p < 0.001\$), with a mean influence score of \$3.80\$ on the purchasing decision.

H₃(Consumer Satisfaction): Consumer satisfaction differs between herbal and chemical cosmetic users. A chi-square test supported this hypothesis (\$\chi^2 = 23.45\$, \$p < 0.05\$), revealing that herbal users often experience higher satisfaction regarding long-term benefits and skin safety.

H₄(Demographic Impact): Demographic factors affect consumer preference for herbal vs. chemical cosmetics. Statistical results showed that age is a significant factor (\$p < 0.05\$), particularly among the 26–35 age group, while gender was found to have no significant impact on the preference for herbal over chemical options (\$p > 0.05\$).

V. RESEARCH METHODOLOGY

This study adopts a descriptive research design to analyze consumer preferences toward herbal and chemical-based cosmetic pharma products. The objective is to understand consumer perception, usage patterns, and the factors influencing purchasing behavior.

Research Design

The research is descriptive in nature, as it focuses on describing consumer attitudes, preferences, and behavior toward herbal and chemical cosmetics.

Sources of Data

Primary Data:

Collected through a structured questionnaire distributed among consumers in Vadodara.

Secondary Data

Collected from research journals, articles, books, and industry reports related to cosmetics and consumer behavior.

Data Collection Method

Data was collected using a structured questionnaire consisting of multiple-choice and Likert scale questions. The questionnaire was distributed through Google Forms and offline methods.

Sample Size

The study is based on a sample of 100 respondents from Vadodara city.

Sampling Technique

A convenience sampling method was used to select respondents based on accessibility and willingness to participate.

Population of the Study

The population includes consumers aged 18–60 years who use or are aware of cosmetic pharma products.

Data Analysis Tools

The collected data was analysed using:

- Percentage analysis
- Frequency distribution
- Chi-square test (for hypothesis testing)

Research Instrument

A structured questionnaire was used as the primary research instrument to collect responses related to awareness, preference, satisfaction, and buying behavior.

Limitations of the Study

- The study is limited to a specific geographical area (Vadodara).
- The sample size is relatively small.
- Convenience sampling may introduce bias.
- Responses are based on individual perceptions and may vary over time.

VI. DATA ANALYSIS AND RESULTS

The collected data from 90–100 respondents was analysed using percentage and frequency methods to

understand consumer perception toward herbal and chemical cosmetics.

1. Demographic Analysis

The analysis shows that the majority of respondents (39.2%) belong to the 26–35 age group, followed by 36–45 (23.7%) and 18–25 (21.6%). This indicates that young and middle-aged consumers are the primary users of cosmetic products.

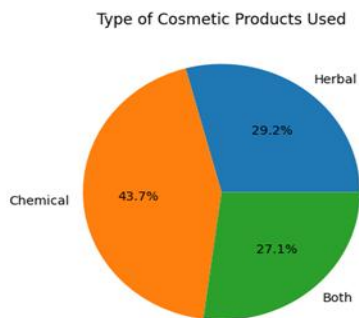
In terms of gender, males (54.4%) slightly outnumber females (45.6%), highlighting increasing awareness of grooming among men.

Occupation-wise, private employees (38.5%) and business professionals (37.5%) dominate the sample, suggesting that working individuals with stable income are more likely to purchase cosmetic products.

2. Usage Pattern of Cosmetics

The findings reveal that 44.2% of respondents prefer chemical cosmetics, while 29.5% prefer herbal cosmetics and 27.4% use both. This indicates that although chemical cosmetics dominate, a significant portion of consumers are shifting toward herbal products or using a combination of both.

Regarding purchase frequency, most respondents (30.2%) buy cosmetics occasionally, followed by 27.1% purchasing once in 2–3 months. This suggests that cosmetic purchases are generally need-based rather than frequent.

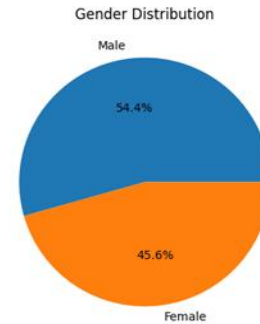


3. Consumer Perception

A majority of respondents (around 60%) agree that herbal cosmetics are safer than chemical products.

This reflects growing awareness about the harmful effects of synthetic chemicals.

At the same time, about 60% of respondents also agree that chemical cosmetics provide faster results. This explains why chemical products continue to hold a strong market position despite safety concerns.



4. Factors Influencing Buying Behaviour

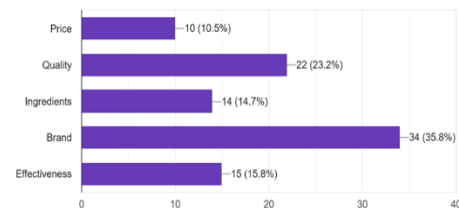
The study shows that several factors influence consumer decisions:

- Brand image is the most important factor (35.8%)
- Followed by quality (23.2%)
- Effectiveness (15.8%)
- Ingredients (14.7%)
- Price (10.5%)

This indicates that consumers rely heavily on trusted brands and perceived product quality rather than just price.

14) Which factor influences your cosmetic purchase the most?

95 responses



5. Awareness and Experience

The analysis shows that 32.2% of respondents have experienced side effects from chemical cosmetics.

This contributes to the increasing preference for herbal products.

Additionally, a large number of respondents agree that product ingredients influence their buying decisions, indicating rising consumer awareness toward product composition.

6. Satisfaction Level

- For herbal cosmetics, most respondents are either satisfied (37.9%) or neutral (36.8%)
- For chemical cosmetics, the majority (57.3%) are neutral, with fewer highly satisfied users

This suggests that herbal products provide moderate satisfaction with perceived long-term benefits, while chemical products receive mixed responses.

7. Perception of Long-Term Benefits

Around 51% of respondents (satisfied + very satisfied) believe herbal cosmetics provide better long-term benefits. However, a large neutral group (40.4%) indicates uncertainty among consumers.

VII. DISCUSSION OF FINDINGS

The present study aimed to examine consumer perception toward chemical and herbal cosmetics. Based on the analysis of data collected from 90–100 respondents, several key findings have emerged.

1. Preference for Chemical vs Herbal Cosmetics
The findings reveal that chemical cosmetics are still preferred by a larger proportion of respondents. However, a significant number of consumers either prefer herbal cosmetics or use a combination of both. This indicates a gradual shift in consumer preference toward herbal products, although chemical cosmetics continue to dominate due to their established presence and quick results.

2. Perception of Safety and Effectiveness
A majority of respondents perceive herbal cosmetics as safer and more skin-friendly compared to chemical products. At the same time, chemical cosmetics are considered more effective in delivering quick and visible results. This highlights a clear trade-off in consumer perception between safety and performance.

3. Awareness of Side Effects
The study shows that a notable percentage of

respondents have experienced side effects from chemical cosmetics. This has contributed to increasing awareness and cautious behaviour among consumers, encouraging them to explore herbal alternatives.

4. Factors Influencing Buying Behaviour
Brand image emerges as the most influential factor in purchasing decisions, followed by quality, effectiveness, ingredients, and price. This indicates that consumers rely more on trust and perceived value rather than cost alone when choosing cosmetic products.

5. Consumer Awareness and Ingredient Consciousness
Consumers are becoming more conscious about product ingredients and their impact on health and skin. This growing awareness is one of the key drivers behind the increasing demand for herbal cosmetics.

6. Satisfaction Levels
The findings indicate that consumers are moderately satisfied with herbal cosmetics, with many respondents reporting satisfaction due to perceived long-term benefits. In contrast, satisfaction with chemical cosmetics is more neutral, suggesting mixed experiences among users.

7. Perception of Long-Term Benefits
A significant proportion of respondents believe that herbal cosmetics provide better long-term benefits compared to chemical products. However, a large neutral group suggests that some consumers are still uncertain and require more information or experience to form a clear opinion.

8. Emerging Consumer Trend
Overall, the study highlights a gradual shift in consumer preference toward herbal cosmetics driven by health consciousness and environmental awareness. However, factors such as product effectiveness, brand trust, and availability continue to influence final purchase decisions.

VIII. SUGGESTIONS

Based on the findings of the study, it is suggested that cosmetic companies should focus on increasing consumer awareness about the benefits of herbal products through effective marketing and educational campaigns. Manufacturers should improve the availability and affordability of herbal cosmetics to compete with chemical products. There is also a need to enhance product effectiveness by combining natural ingredients with scientific formulations to meet

consumer expectations. Companies should ensure transparency in labeling and highlight ingredient safety to build trust among consumers. Strengthening brand image and credibility is essential, as brand plays a key role in purchase decisions. Additionally, businesses should invest in research and development to improve product quality and innovation, while also adopting eco-friendly packaging and sustainable practices to align with evolving consumer preferences.

IX. CONCLUSION

The present study on consumer perception toward chemical and herbal cosmetics highlights the changing trends in the cosmetics industry. The findings indicate that while chemical cosmetics continue to hold a strong position in the market due to their quick results and widespread availability, there is a noticeable shift in consumer preference toward herbal cosmetics.

Consumers increasingly perceive herbal cosmetics as safer, more skin-friendly, and environmentally sustainable. Growing awareness about the harmful effects of synthetic ingredients and rising health consciousness have significantly influenced this shift. However, concerns regarding the effectiveness, higher price, and limited availability of herbal products still act as barriers to their widespread adoption.

The study also reveals that factors such as brand image, product quality, and effectiveness play a more important role in influencing purchase decisions than price alone. Additionally, the presence of a gap between consumer awareness and actual buying behaviour suggests that positive perception does not always translate into purchase.

Overall, it can be concluded that the demand for herbal cosmetics is likely to grow in the future, provided companies address key challenges such as improving product performance, ensuring affordability, and increasing consumer awareness. The cosmetics industry must adapt to these evolving preferences by balancing safety, effectiveness, and sustainability to meet consumer expectations.

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