ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

A Study on Consumers' Perception towards Herbal Cosmetic Products in Karur District

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Abstract

The growing interest in herbal cosmetic products has increased the importance of understanding the factors influencing consumer perception and purchase intention. This study examines the determinants of consumer perception and purchase intention towards herbal cosmetic products in Karur District, Tamil Nadu. Specifically, it investigates the influence of Health Consciousness and Perceived Safety, Brand Trust and Ingredient Authenticity, Social Influence and Subjective Norms, and Environmental and Ethical Concern on Consumer Perception. It also examines the relationship between Consumer Perception and Purchase Intention and the moderating role of Perceived Price Fairness. The study adopts a cross-sectional research design based on primary data collected from 350 consumers across four taluks of Karur District: Karur, Kulithalai, Aravakurichi and Krishnarayapuram. The collected data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM), bootstrapping with 5,000 resamples and Multi-Group Analysis (MGA). The results indicate that all four antecedents have significant positive relationships with Consumer Perception, with Health Consciousness and Perceived Safety demonstrating the strongest relationship ($\beta = 0.342$, $p < 0.001$), followed by Brand Trust and Ingredient Authenticity ($\beta = 0.289$, $p < 0.001$), Social Influence and Subjective Norms ($\beta = 0.194$, $p < 0.001$), and Environmental and Ethical Concern ($\beta = 0.118$, $p = 0.011$). Consumer Perception also exhibits a strong positive relationship with Purchase Intention ($\beta = 0.638$, $p < 0.001$). Perceived Price Fairness significantly moderates this relationship negatively ($\beta = -0.148$, $p = 0.004$), indicating that the positive relationship becomes weaker as perceived price fairness increases. The model explains 64.8% of the variance in Consumer Perception and 58.2% of the variance in Purchase Intention. Multi-Group Analysis identifies significant urban/semi-urban and rural differences in the relationships involving Brand Trust and Ingredient Authenticity, Social Influence and Subjective Norms, and the moderating interaction between Consumer Perception and Perceived Price Fairness, while the difference in the Health Consciousness and Perceived Safety relationship is not statistically significant. The findings highlight the relevance of product safety, brand credibility, social influence, environmental and ethical considerations, and price-related evaluations in understanding consumer perceptions and purchase intentions towards herbal cosmetic products in regional markets.

Keywords: *Herbal Cosmetic Products; Consumer Perception; Purchase Intention; Health Consciousness and Perceived Safety; Brand Trust and Ingredient Authenticity; Social Influence and Subjective Norms; Environmental and Ethical Concern; Perceived Price Fairness; PLS-SEM; Multi-Group Analysis.*

I. INTRODUCTION

The growing awareness of personal health, product safety, environmental sustainability and ethical consumption has increased consumer interest in herbal and naturally derived cosmetic products. Consumers are increasingly considering not only the functional benefits of cosmetics but also their ingredients, perceived safety, brand credibility and environmental implications when making purchasing decisions. Herbal cosmetic products, which are generally marketed using plant-based ingredients and traditional formulations, have consequently gained attention as alternatives to conventional cosmetic products. However, consumer acceptance of these products depends on several considerations, including perceived product quality, trust in product claims, affordability and the availability of reliable information (Kim & Chung, 2011; Ghazali et al., 2017; Chakraborty et al., 2022a).

Consumer behaviour towards herbal cosmetics can be understood through established theoretical perspectives. The Theory of Planned Behaviour explains that behavioural intentions are influenced by attitudes, subjective norms and perceived behavioural

ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

control (Ajzen, 1991). In the context of herbal cosmetic products, consumers' evaluations of product safety, perceived benefits and environmental attributes may shape their overall perception, while recommendations and opinions from family members, friends and other social groups may influence their purchasing decisions. Similarly, Perceived Value Theory suggests that consumers evaluate products by comparing the benefits they expect with the sacrifices involved in obtaining them, including monetary and non-monetary costs (Zeithaml, 1988). These perspectives provide a theoretical foundation for examining the factors influencing consumer perception and purchase intention towards herbal cosmetic products.

Previous studies have identified several factors associated with the purchase of organic, natural and environmentally friendly personal care products. Kim and Chung (2011) examined the role of health consciousness, appearance consciousness and other consumer-related factors in the purchase intention towards organic personal care products. Ghazali et al. (2017) highlighted the relevance of health-related and product-related considerations in consumers' evaluation of organic personal care products. Research on green skincare products has also demonstrated the importance of attitudes, perceived benefits and consumer-related factors in explaining purchase intentions (Hsu et al., 2017). More recent research on Ayurveda and green cosmetic products has further examined the roles of consumer values, trust, perceived benefits and ethical considerations in shaping purchase-related behaviour (Chakraborty et al., 2022a, 2022b; Suphasomboon & Vassanadumrongdee, 2022; Testa et al., 2024a).

Health consciousness and perceived product safety are particularly relevant to cosmetic consumption because consumers may consider the potential effects of product ingredients on their skin, hair and general well-being. Brand trust and ingredient authenticity are also important because consumers may find it difficult to independently verify product composition and the claims made by manufacturers. In this context, credible product information and confidence in a brand can influence consumers' overall evaluations (Kim & Chung, 2011; Chakraborty et al., 2022b). Social influence and subjective norms may further shape consumer perceptions through recommendations, family preferences and information shared within social networks. In addition, environmental and ethical concerns may influence the evaluation of products promoted as natural, sustainable or environmentally responsible (Paul et al., 2016; Yadav & Pathak, 2017; Suphasomboon & Vassanadumrongdee, 2022).

Consumer perception is an important consideration in the development of purchase intention. Consumers who form favourable evaluations of a product may demonstrate a stronger willingness to purchase it. Nevertheless, favourable perceptions do not necessarily translate into purchase intention in every situation, as consumers may also consider affordability and the perceived fairness of product prices. Perceived value research indicates that consumers assess the relationship between product benefits and monetary sacrifices when evaluating purchase alternatives (Zeithaml, 1988; Sweeney & Soutar, 2001). Price fairness may therefore influence how consumers translate their overall product perceptions into purchase intentions. The role of price-related evaluations is particularly relevant for herbal cosmetics when consumers compare their prices with those of conventional alternatives (Xia et al., 2004).

Although previous studies have examined consumer behaviour towards organic personal care products, green skincare and Ayurveda-based products, further investigation is useful to understand how health-related, brand-related, social and environmental factors operate together in regional Indian markets. Consumer perceptions may also vary according to geographical context because urban, semi-urban and rural consumers may differ in product availability, market access and exposure to product information. Examining these differences can provide a more context-specific understanding of the factors associated with herbal cosmetic consumption (Chakraborty et al., 2022a; Ruf et al., 2024; Testa et al., 2024b).

Against this background, the present study examines consumer perception towards herbal cosmetic products in Karur District, Tamil Nadu. It investigates the influence of Health Consciousness and Perceived Safety, Brand Trust and Ingredient Authenticity, Social Influence and Subjective Norms, and Environmental and Ethical Concern on Consumer Perception. It further examines the relationship between Consumer Perception and Purchase Intention and evaluates the moderating role of Perceived Price Fairness in this relationship. The study also compares the relevant relationships between urban/semi-urban and rural consumers using Partial Least Squares Structural Equation Modelling (PLS-SEM) and Multi-Group Analysis (MGA).

1.1 Statement of the Problem

The increasing availability and promotion of herbal cosmetic products have created greater opportunities for consumers to choose products marketed as natural or plant-based alternatives. However, the growing presence of such products does not necessarily ensure consumer confidence or purchase acceptance. Consumers may evaluate herbal cosmetics differently depending on their awareness of product ingredients, perceived safety, trust in brands, social recommendations, environmental considerations and perceptions of price fairness. Concerns regarding the credibility of product claims and the difficulty of verifying ingredient authenticity may also influence their overall evaluations (Chen & Chang, 2013; Szabo & Webster, 2021).

Although previous research has examined purchase intentions towards organic personal care products, green skincare and Ayurveda-based products, the combined influence of health consciousness and perceived safety, brand trust and ingredient authenticity, social influence and subjective norms, and environmental and ethical concern on consumer perception requires further examination in regional markets. In addition, the relationship between consumer perception and purchase intention may be influenced by

ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

consumers' evaluations of price fairness. The extent to which these relationships differ between urban/semi-urban and rural consumers also requires investigation.

In Karur District, understanding these factors is important for identifying the considerations that shape consumers' evaluations and purchase intentions towards herbal cosmetic products. Therefore, the present study addresses this research problem by examining the determinants of consumer perception, the relationship between consumer perception and purchase intention, the moderating role of perceived price fairness, and differences between urban/semi-urban and rural consumer groups.

1.2 Objectives of the Study

The primary objective of the study is to examine consumer perception and purchase intention towards herbal cosmetic products in Karur District, Tamil Nadu.

The specific objectives are:

1. To examine the influence of Health Consciousness and Perceived Safety on consumer perception towards herbal cosmetic products.
2. To analyse the influence of Brand Trust and Ingredient Authenticity on consumer perception.
3. To assess the influence of Social Influence and Subjective Norms on consumer perception.
4. To investigate the relationship between Environmental and Ethical Concern and consumer perception.
5. To examine the influence of consumer perception on purchase intention towards herbal cosmetic products.
6. To evaluate the moderating role of Perceived Price Fairness in the relationship between consumer perception and purchase intention.
7. To compare the relationships among the study constructs between urban/semi-urban and rural consumers.

1.3 Research Questions

The study is guided by the following research questions:

1. How do Health Consciousness and Perceived Safety influence consumer perception towards herbal cosmetic products?
2. To what extent do Brand Trust and Ingredient Authenticity influence consumer perception?
3. What is the influence of Social Influence and Subjective Norms on consumer perception?
4. How does Environmental and Ethical Concern relate to consumer perception?
5. Does consumer perception significantly influence purchase intention towards herbal cosmetic products?
6. Does Perceived Price Fairness moderate the relationship between consumer perception and purchase intention?
7. Do the relationships among the study constructs differ between urban/semi-urban and rural consumers?

1.4 Scope of the Study

The study focuses on consumers of herbal cosmetic products in Karur District, Tamil Nadu. The geographical coverage includes four taluks: Karur, Kulithalai, Aravakurichi and Krishnarayapuram. The study is based on primary data collected from 350 valid respondents and examines seven constructs: Health Consciousness and Perceived Safety, Brand Trust and Ingredient Authenticity, Social Influence and Subjective Norms, Environmental and Ethical Concern, Perceived Price Fairness, Consumer Perception and Purchase Intention. The analysis examines the relationships among these constructs and compares urban/semi-urban and rural consumer groups. The study employs Partial Least Squares Structural Equation Modelling (PLS-SEM), bootstrapping and Multi-Group Analysis to assess the proposed relationships.

1.5 Significance of the Study

The study is significant because it provides an understanding of the factors associated with consumer perception and purchase intention towards herbal cosmetic products in a regional Indian market. For manufacturers and marketers, the findings offer insights into the importance of product safety, ingredient authenticity, brand trust, social influence and environmental considerations in

ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

developing favourable consumer perceptions. The findings may also help retailers understand the relevance of price fairness and the differing requirements of urban/semi-urban and rural consumers when developing product and marketing strategies.
From a consumer perspective, the study highlights the importance of product-related information, ingredient transparency and informed evaluation when selecting herbal cosmetic products. From an academic perspective, the study contributes to the literature on consumer behaviour by examining health-related, brand-related, social and environmental factors together with the relationship between consumer perception and purchase intention. It also extends the regional understanding of herbal cosmetic consumption by examining differences between urban/semi-urban and rural consumer groups in Karur District.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Theoretical Grounding

The present study draws on the Theory of Planned Behaviour (TPB), developed by Ajzen (1991), and the perceived value perspective presented by Zeithaml (1988), to explain consumer perception and purchase intention towards herbal cosmetic products. The Theory of Planned Behaviour provides a framework for understanding how attitudes, subjective norms and perceived behavioural control contribute to behavioural intentions. In the context of herbal cosmetics, health consciousness and perceived product safety, together with environmental and ethical concerns, represent additional attitudinal considerations that may shape consumers' evaluations. Social influence and subjective norms reflect the role of family members, peers and other reference groups in influencing consumer perceptions and decisions. These additional factors extend the application of the TPB framework to the specific context of herbal cosmetic consumption (Ajzen, 1991; Paul et al., 2016).

The perceived value perspective complements this framework by explaining how consumers evaluate the benefits received from a product in relation to the monetary and non-monetary sacrifices involved in purchasing it. Product quality, perceived safety, authenticity and expected benefits may contribute to consumers' overall evaluations, while price represents an important monetary consideration (Zeithaml, 1988). Sweeney and Soutar (2001) further demonstrate the multidimensional nature of consumer perceived value. In the present study, Perceived Price Fairness is considered a contextual factor that may influence the relationship between favourable consumer perceptions and purchase intention. Together, these perspectives provide a theoretical basis for examining the proposed relationships among the study constructs.

2.2 Hypotheses Development

Health Consciousness and Perceived Safety (HCPS)

Health consciousness and perceived product safety are important considerations in consumers' evaluations of herbal cosmetic products. Consumers may consider product ingredients, perceived safety and possible side effects when selecting personal care products. Awareness of ingredient composition and concerns about the potential effects of certain cosmetic ingredients may encourage consumers to evaluate herbal alternatives. Previous studies have highlighted the relevance of health-related motivations and product-related evaluations in the purchase of organic and natural personal care products (Kim & Chung, 2011; Ghazali et al., 2017). Accordingly, consumers who place greater importance on health and perceived product safety may develop more favourable perceptions towards herbal cosmetic products.

H1: Health Consciousness and Perceived Safety positively influence Consumer Perception towards herbal cosmetic products.

Brand Trust and Ingredient Authenticity (BTIA)

Brand trust and perceived ingredient authenticity are important considerations in developing consumer confidence in herbal cosmetic products. The increasing availability of products marketed as natural or herbal makes the credibility of brand claims and transparency of ingredient information particularly relevant. Consumers may experience uncertainty regarding the authenticity of product claims when manufacturers provide insufficient information about ingredient composition, sourcing and formulation. Previous research has demonstrated that greenwashing can undermine consumer trust and that the credibility of environmental claims is relevant to consumer evaluations of green brands (Chen & Chang, 2013; Akturan, 2018). Applying these insights to herbal cosmetics, credible brand reputation and transparent ingredient information are expected to contribute to favourable consumer perceptions.

H2: Brand Trust and Ingredient Authenticity positively influence Consumer Perception towards herbal cosmetic products.

Social Influence and Subjective Norms (SISN)

Social influence and subjective norms represent the role of interpersonal relationships and social expectations in consumer decision-making. Recommendations from family members, friends, peers and other reference groups may shape consumers' awareness, evaluations and willingness to consider herbal cosmetic products. Social media and digital communication may also expose consumers to product-related information, recommendations and consumer experiences. Previous research applying the Theory of Planned Behaviour to green skincare has identified subjective norms as an important component of purchase intention, while research on social media and green consumption highlights the relevance of digital communication in consumer engagement (Hsu et al., 2017; Pop et al., 2020). Such social interactions may contribute to consumers' evaluations of herbal cosmetic products by

ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

providing information and influencing perceived acceptance. Therefore, social influence and subjective norms are expected to have a positive relationship with consumer perception.

H3: Social Influence and Subjective Norms positively influence Consumer Perception towards herbal cosmetic products.

Environmental and Ethical Concern (EEC)
Environmental and ethical concerns may influence consumers' evaluations of personal care products, particularly when products are associated with natural ingredients, sustainable production and responsible consumption. Consumers who place importance on environmental sustainability may consider factors such as responsible sourcing, packaging practices, environmental impact and ethical manufacturing when evaluating cosmetic products. Previous studies have identified environmental concern and sustainability-related motivations as relevant considerations in green product consumption and purchase behaviour (Paul et al., 2016; Lavuri, 2022). Research on sustainable cosmetics has also highlighted the relevance of perceived value and ethical considerations in consumer decision-making (Suphasomboon & Vassanadumrongdee, 2022). Accordingly, consumers with greater environmental and ethical concern are expected to develop more favourable perceptions towards herbal cosmetic products.

H4: Environmental and Ethical Concern positively influence Consumer Perception towards herbal cosmetic products.

Consumer Perception and Purchase Intention (CP–PI)
Consumer perception represents an overall evaluation of a product based on considerations such as perceived quality, safety, effectiveness, authenticity and value. Favourable evaluations may strengthen consumers' willingness to purchase herbal cosmetic products. Consistent with the Theory of Planned Behaviour, attitudes towards a product or behaviour contribute to the formation of behavioural intentions, although actual purchasing decisions may also depend on factors such as affordability and product availability (Ajzen, 1991). Previous research on green product consumption has also examined the relationship between consumer evaluations and purchase-related intentions (Paul et al., 2016; Yadav & Pathak, 2017). Therefore, favourable consumer perceptions are expected to be positively associated with purchase intention towards herbal cosmetic products.

H5: Consumer Perception positively influences Purchase Intention towards herbal cosmetic products.

Moderating Role of Perceived Price Fairness (PPF)
Perceived Price Fairness refers to consumers' evaluation of whether a product's price is reasonable in relation to its quality, benefits and perceived value. Consumers may compare the price of herbal cosmetic products with the prices of conventional alternatives and assess whether any price premium is justified by the perceived benefits. Price fairness is an important component of consumer evaluation because perceptions of reasonable or unreasonable pricing can influence product judgements and purchasing decisions (Xia et al., 2004). Similarly, research on price perceptions highlights the importance of consumers' assessments of monetary sacrifice in evaluating products (Lichtenstein et al., 1993; Zeithaml, 1988).

In the present study, Perceived Price Fairness is examined as a moderating variable in the relationship between Consumer Perception and Purchase Intention. It captures consumers' evaluations of price reasonableness, justification of price premiums and the accessibility of affordable product sizes. These evaluations may influence the extent to which favourable perceptions are associated with purchase intention. Accordingly, the study examines whether perceived price fairness changes the strength of the relationship between consumer perception and purchase intention.

H6: Perceived Price Fairness negatively moderates the relationship between Consumer Perception and Purchase Intention towards herbal cosmetic products, such that the positive relationship becomes weaker as perceived price fairness increases.

III. RESEARCH METHODOLOGY

3.1 Research Design and Study Area
The present study adopted a cross-sectional, descriptive and analytical research design to examine consumer perception and purchase intention towards herbal cosmetic products in Karur District, Tamil Nadu. The descriptive component was used to understand the demographic and consumer behaviour characteristics of the respondents, while the analytical component examined the relationships among the proposed constructs, the moderating role of Perceived Price Fairness and differences between urban/semi-urban and rural consumer groups.

The study covered four administrative taluks of Karur District, namely Karur, Kulithalai, Aravakurichi and Krishnarayapuram. For the purpose of the study, respondents from Karur and Kulithalai were classified as urban/semi-urban, while respondents from Aravakurichi and Krishnarayapuram were classified as rural. This geographical classification provided the basis for comparing the specified relationships across the two respondent groups.

ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

3.2 Sampling Design and Sample Size

The study employed a multi-stage stratified sampling approach to include respondents from the selected geographical areas and residential segments of Karur District. The sampling coverage included urban/semi-urban areas and rural areas across the four selected taluks. A total of 410 questionnaires were distributed among potential consumers through supermarkets, Ayurvedic retail outlets, community pharmacies and household clusters. After screening the returned questionnaires, 350 valid responses were retained for the final analysis. The remaining 60 questionnaires were excluded because they were incomplete or displayed straight-lining response patterns, as reported in the data screening process. The resulting valid response rate was 85.37%.

The adequacy of the sample size for Partial Least Squares Structural Equation Modelling (PLS-SEM) was considered using the inverse square root method proposed by Kock and Hadaya (2018). Based on an assumed minimum path coefficient of 0.15, a statistical power of 80% and a significance level of 5%, the estimated minimum sample requirement was 275 respondents. The final sample of 350 respondents exceeded this estimated requirement and was therefore considered adequate for the proposed model under the stated assumptions.

3.3 Questionnaire Design and Measurement of Constructs

Primary data were collected using a structured questionnaire developed with reference to established measurement scales and relevant literature. The questionnaire comprised two sections. The first section collected demographic and consumer behaviour information, including gender, age, residential locality, monthly family income, primary herbal cosmetic product category and preferred herbal cosmetic brand. The second section contained 23 measurement items relating to the seven constructs examined in the study.

The seven constructs were Health Consciousness and Perceived Safety (HCPS), Brand Trust and Ingredient Authenticity (BTIA), Social Influence and Subjective Norms (SISN), Environmental and Ethical Concern (EEC), Perceived Price Fairness (PPF), Consumer Perception (CP) and Purchase Intention (PI). The measurement items were adapted with reference to literature on consumer behaviour, health consciousness, brand trust, environmental concern, perceived price fairness and purchase intention (Ajzen, 1991; Kim & Chung, 2011; Chen & Chang, 2013; Paul et al., 2016; Xia et al., 2004).

All 23 measurement items were treated as reflective indicators and measured using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Higher scores therefore represented stronger agreement with the respective statements. The instrument was reported as pre-tested before its use in the main survey.

3.4 Data Collection and Data Screening

The study was based on primary survey data obtained from consumers in the selected areas of Karur District. Questionnaires were distributed through supermarkets, Ayurvedic retail outlets, community pharmacies and household clusters. Of the 410 questionnaires distributed, 350 valid responses were retained after screening, producing a valid response rate of 85.37%.
The returned questionnaires were examined for completeness and response quality. Incomplete questionnaires and responses exhibiting straight-lining patterns were excluded from the final dataset. The resulting dataset of 350 valid responses was used for descriptive analysis, measurement model evaluation, structural model assessment and urban/semi-urban versus rural group comparisons.

3.5 Common Method Bias Assessment

As the study relied on self-reported questionnaire responses collected through a single survey instrument, common method bias (CMB) was considered during the assessment of the data. The statistical assessment employed Harman's single-factor test and the full collinearity Variance Inflation Factor (VIF) approach.

The first unrotated factor accounted for 28.4% of the total variance, which was below the commonly applied 50% screening threshold. In addition, the full collinearity VIF values were below 3.3, with the highest value recorded at 2.18. These results did not indicate a substantial common method bias concern based on the diagnostic procedures employed (Kock, 2015). However, these statistical diagnostics should not be interpreted as proof that common method bias was completely absent.

3.6 Data Analysis Technique

The collected data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). This approach was employed to evaluate the measurement properties of the reflective constructs and to examine the hypothesised relationships among the study variables. The analysis was conducted in two principal stages: measurement model assessment and structural model assessment.

3.6.1 Measurement Model Assessment

The measurement model was assessed to establish the reliability and validity of the seven reflective constructs. Indicator reliability was examined using standardized outer loadings. Internal consistency reliability was evaluated through Cronbach's alpha and Composite Reliability (CR), while convergent validity was assessed using Average Variance Extracted (AVE). Discriminant validity was examined using the Fornell–Larcker criterion and the Heterotrait–Monotrait ratio (HTMT).

ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

The assessment indicated that all 23 standardized outer loadings exceeded 0.70. Cronbach's alpha values ranged from 0.812 to 0.881, and Composite Reliability values ranged from 0.876 to 0.918. The AVE values ranged from 0.639 to 0.737, exceeding the recommended minimum threshold of 0.50. The Fornell–Larcker criterion was also satisfied, with the square root of the AVE for each construct exceeding its correlations with the other constructs. The maximum HTMT value was 0.828, below the conservative threshold of 0.85. These results supported the internal consistency reliability, convergent validity and discriminant validity of the measurement model.

3.6.2 Structural Model Assessment

After establishing the measurement model, the structural model was evaluated to examine the proposed relationships among the constructs. Collinearity among predictor constructs was assessed using inner VIF values. The explanatory power of the model was examined through the coefficient of determination (R^2) and adjusted R^2. The effect sizes of the predictor constructs were assessed using f^2, while predictive relevance was examined using the blindfolding-based Stone–Geisser Q^2 statistic.

The hypothesised direct relationships and the moderating effect of Perceived Price Fairness were evaluated using bootstrapping with 5,000 resamples. The path coefficients, standard errors, t-statistics, p-values and confidence intervals were considered when evaluating the statistical significance of the proposed relationships. The interaction between Consumer Perception and Perceived Price Fairness was examined to determine whether perceived price fairness changed the strength of the relationship between Consumer Perception and Purchase Intention.

3.6.3 Multi-Group Analysis

Multi-Group Analysis (MGA) was conducted to examine whether the specified structural relationships differed between urban/semi-urban and rural consumers. Before comparing the structural relationships, measurement invariance was assessed using the Measurement Invariance of Composite Models (MICOM) procedure. Configural and compositional invariance were examined to establish whether the constructs could be meaningfully compared across the two groups.

Following the measurement invariance assessment, permutation-based MGA was used to compare the relevant path coefficients between urban/semi-urban and rural respondents. The analysis focused on differences in the relationships between the predictor constructs and Consumer Perception, as well as the moderating interaction between Consumer Perception and Perceived Price Fairness. The results were interpreted in terms of differences in structural relationships rather than differences in the average levels of the constructs.

3.7 Ethical Considerations

The study involved the collection of primary survey responses from consumers. Respondents' participation, the voluntary nature of participation, the manner in which informed consent was obtained and the procedures adopted to protect respondent confidentiality should be reported in accordance with the actual survey protocol. No institutional ethical approval or specific consent procedure is claimed in this section unless it was obtained and documented by the researcher.

IV. DATA ANALYSIS AND EMPIRICAL RESULTS

4.1 Demographic and Consumer Behaviour Profile

The demographic and consumer behaviour characteristics of the 350 respondents are presented in Table 1. The profile includes gender, age, residential locality, monthly family income, primary herbal cosmetic product category, and preferred brand. The distribution provides an overview of the respondents' socio-economic characteristics and purchasing preferences, establishing the basis for examining consumer perceptions towards herbal cosmetic products in Karur District.

Table 1: Demographic and Consumer Behaviour Profile of Respondents (N = 350)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Female	214	61.14
	Male	136	38.86
Age Group	18–25 Years	112	32.00
	26–35 Years	128	36.57
	36–45 Years	69	19.71
	Above 45 Years	41	11.71
Residential Locality	Urban/Semi-Urban	203	58.00
	Rural	147	42.00
Monthly Family Income	Below ₹25,000	74	21.14
	₹25,001–₹50,000	146	41.71
	₹50,001–₹1,00,000	89	25.43
	Above ₹1,00,000	41	11.71
Primary Product Category	Skin Care	142	40.57

ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

	Hair Care	118	33.71
	Oral and Bath Care	90	25.71
Preferred Brand	Himalaya Herbals	119	34.00
	Patanjali Ayurved	84	24.00
	Dabur/Vatika	63	18.00
	Biotique/Mamaearth/Others	84	24.00

Note: Urban/semi-urban respondents represent Karur and Kulithalai, while rural respondents represent Aravakurichi and Krishnarayapuram.

The demographic profile indicates that female respondents constituted 61.14% of the sample, while male respondents accounted for 38.86%. The largest age group was 26–35 years (36.57%), followed by 18–25 years (32.00%). Urban and semi-urban respondents represented 58.00% of the sample, whereas rural respondents accounted for 42.00%. Regarding monthly family income, the largest proportion belonged to the ₹25,001–₹50,000 category (41.71%). Skin care was the most preferred product category (40.57%), followed by hair care (33.71%). Himalaya Herbals emerged as the most frequently preferred brand, accounting for 34.00% of respondents.

4.2 Measurement Model Assessment: Reliability and Convergent Validity

Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed to assess the reliability and validity of the reflective measurement model. The assessment included standardized outer loadings, Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). As presented in Table 2, all standardized outer loadings exceeded the recommended threshold of 0.70. Cronbach's alpha values ranged from 0.812 to 0.881, while Composite Reliability values ranged from 0.876 to 0.918. Furthermore, the AVE values for all constructs exceeded the recommended minimum of 0.50. These results indicate satisfactory internal consistency reliability and convergent validity of the measurement model (Hair et al., 2021).

Table 2: Construct Reliability, Descriptive Statistics, and Convergent Validity

Construct and Measurement Items	Mean	SD	Loading	Cronbach's α	CR (ρc)	AVE
Health Consciousness and Perceived Safety (HCPS)	**4.18**	**0.64**	—	**0.874**	**0.914**	**0.726**
HCPS1	4.26	0.68	0.862			
HCPS2	4.09	0.75	0.834			
HCPS3	4.22	0.66	0.879			
HCPS4	4.15	0.71	0.831			
Brand Trust and Ingredient Authenticity (BTIA)	**3.92**	**0.72**	—	**0.859**	**0.904**	**0.703**
BTIA1	3.98	0.74	0.845			
BTIA2	4.04	0.79	0.858			
BTIA3	3.81	0.82	0.812			
BTIA4	3.85	0.78	0.838			
Social Influence and Subjective Norms (SISN)	**3.76**	**0.81**	—	**0.812**	**0.876**	**0.639**
SISN1	3.91	0.84	0.819			
SISN2	3.74	0.88	0.795			
SISN3	3.63	0.92	0.784			
Environmental and Ethical Concern (EEC)	**3.68**	**0.79**	—	**0.828**	**0.885**	**0.659**
EEC1	3.72	0.81	0.824			
EEC2	3.61	0.86	0.798			
EEC3	3.71	0.84	0.813			
Perceived Price Fairness (PPF)	**3.24**	**0.94**	—	**0.841**	**0.893**	**0.677**
PPF1	3.31	0.96	0.839			
PPF2	3.18	1.02	0.814			
PPF3	3.23	0.98	0.815			
Consumer Perception (CP)	**4.08**	**0.66**	—	**0.881**	**0.918**	**0.737**

ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

CP1	4.12	0.69	0.871			
CP2	4.10	0.71	0.864			
CP3	4.02	0.73	0.840			
Purchase Intention (PI)	**4.01**	**0.71**	—	**0.867**	**0.909**	**0.715**
PI1	4.09	0.72	0.868			
PI2	3.96	0.78	0.841			
PI3	3.98	0.76	0.827			

Note: The item codes represent the respective measurement statements. CR = Composite Reliability; AVE = Average Variance Extracted.

The descriptive statistics indicate that Health Consciousness and Perceived Safety recorded the highest construct mean (4.18), followed by Consumer Perception (4.08) and Purchase Intention (4.01). Perceived Price Fairness recorded the lowest mean (3.24), indicating comparatively moderate evaluations of herbal cosmetic pricing. Overall, the measurement results demonstrate satisfactory reliability and convergent validity across all seven constructs.

4.3 Discriminant Validity Assessment

Discriminant validity was evaluated using the Fornell–Larcker criterion (Fornell & Larcker, 1981) and the Heterotrait–Monotrait (HTMT) ratio of correlations (Henseler et al., 2015). These procedures were employed to determine whether the measurement constructs were empirically distinct from one another.

Table 3: Discriminant Validity – Fornell–Larcker Criterion

Construct	HCPS	BTIA	SISN	EEC	PPF	CP	PI
HCPS	**0.852**						
BTIA	0.542	**0.838**					
SISN	0.389	0.412	**0.799**				
EEC	0.476	0.395	0.318	**0.812**			
PPF	0.214	0.348	0.265	0.229	**0.823**		
CP	0.684	0.631	0.492	0.468	0.312	**0.858**	
PI	0.612	0.589	0.454	0.419	0.386	0.724	**0.846**

Note: Diagonal bold values represent the square root of AVE, while off-diagonal values represent inter-construct correlations.

The results indicate that the square roots of AVE for all seven constructs exceed their respective correlations with other constructs. Therefore, the Fornell–Larcker criterion is satisfied, providing evidence of discriminant validity.

Table 4: Discriminant Validity – Heterotrait–Monotrait (HTMT) Ratio

Construct	HCPS	BTIA	SISN	EEC	PPF	CP	PI
HCPS	—						
BTIA	0.624	—					
SISN	0.461	0.493	—				
EEC	0.558	0.468	0.387	—			
PPF	0.249	0.409	0.319	0.274	—		
CP	0.779	0.725	0.581	0.547	0.362	—	
PI	0.703	0.682	0.539	0.494	0.451	0.828	—

Note: All HTMT ratios are below the conservative threshold of 0.85.

The HTMT results further support discriminant validity, as all construct-level ratios remain below 0.85. The highest HTMT value is 0.828 between Consumer Perception and Purchase Intention, which remains within the recommended threshold. Taken together, the Fornell–Larcker and HTMT assessments provide satisfactory evidence that the constructs demonstrate adequate discriminant validity.

4.4 Structural Model Assessment and Hypothesis Testing

The structural model was evaluated using bias-corrected and accelerated (BCa) bootstrapping with 5,000 resamples to examine the significance and strength of the hypothesised relationships. Inner Variance Inflation Factor (VIF) values ranged from 1.34 to 2.18, indicating that multicollinearity was not a substantial concern.

The model explained 64.8% of the variance in Consumer Perception ($R^2 = 0.648$; Adjusted $R^2 = 0.644$) and 58.2% of the variance in Purchase Intention ($R^2 = 0.582$; Adjusted $R^2 = 0.578$). Furthermore, Stone–Geisser Q^2 values obtained through the blindfolding procedure were 0.469 for Consumer Perception and 0.411 for Purchase Intention, indicating predictive relevance for both endogenous constructs.

ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

Table 5: Structural Model Path Coefficients and Hypothesis Testing

Hypothesis	Structural Path	β	SE	t-statistic	p-value	95% BCa CI	f^2	Decision
H1	HCPS → CP	0.342	0.048	7.125	<0.001	[0.248, 0.436]	0.198	Supported
H2	BTIA → CP	0.289	0.051	5.667	<0.001	[0.189, 0.389]	0.146	Supported
H3	SISN → CP	0.194	0.044	4.409	<0.001	[0.108, 0.280]	0.079	Supported
H4	EEC → CP	0.118	0.046	2.565	0.011	[0.028, 0.208]	0.028	Supported
H5	CP → PI	0.638	0.042	15.190	<0.001	[0.556, 0.720]	0.684	Supported
H6	CP × PPF → PI	−0.148	0.051	2.902	0.004	[−0.248, −0.048]	0.041	Supported

Note: β = Standardised path coefficient; SE = Standard Error; CI = Confidence Interval; f^2 = Effect Size.

The structural model results indicate that all six hypothesised relationships are statistically significant. Health Consciousness and Perceived Safety exert the strongest positive influence on Consumer Perception (β = 0.342, $p < 0.001$), followed by Brand Trust and Ingredient Authenticity (β = 0.289, $p < 0.001$). Social Influence also demonstrates a significant positive relationship with Consumer Perception (β = 0.194, $p < 0.001$). Environmental and Ethical Concern has a comparatively smaller but statistically significant positive influence (β = 0.118, p = 0.011).

The relationship between Consumer Perception and Purchase Intention is positive and statistically significant (β = 0.638, $p < 0.001$), indicating that favourable evaluations of herbal cosmetic products are associated with stronger purchase intentions.
The interaction between Consumer Perception and Perceived Price Fairness is negative and statistically significant (β = −0.148, p = 0.004). This indicates that the interaction term has a negative association with Purchase Intention. The statistical evidence supports H6; however, the direction of the moderation must be interpreted in accordance with the coding of the Perceived Price Fairness construct.

4.5 Multi-Group Analysis: Urban/Semi-Urban and Rural Consumers

Multi-Group Analysis (MGA) was conducted to examine geographical differences in the structural relationships between urban/semi-urban and rural consumers. Before comparing the structural paths, Measurement Invariance of Composite Models (MICOM) was assessed. The results established configural and compositional invariance between the two groups, indicating partial measurement invariance and supporting the subsequent comparison of structural relationships (Henseler et al., 2016).
Permutation-based PLS-MGA with 5,000 permutations was subsequently employed to identify differences in the structural path coefficients. The results are presented in Table 6.

Table 6: Permutation-Based Multi-Group Analysis – Urban/Semi-Urban and Rural Consumers

Structural Path	Urban/Semi-Urban (n = 203)	Rural (n = 147)	Absolute Difference (Δβ)	Permutation p-value	Interpretation
HCPS → CP	0.361	0.312	0.049	0.412	Not Significant
BTIA → CP	0.334	0.218	0.116	0.038*	Stronger in Urban/Semi-Urban Areas
SISN → CP	0.142	0.279	0.137	0.019*	Stronger in Rural Areas
CP × PPF → PI	−0.098	−0.224	0.126	0.024*	More Negative in Rural Areas

*Note: Δβ represents the absolute difference between the group-specific path coefficients. $p < 0.05$.

The Multi-Group Analysis reveals significant geographical differences in three structural relationships. The influence of Brand Trust and Ingredient Authenticity on Consumer Perception is stronger among urban/semi-urban consumers (β = 0.334) than among rural consumers (β = 0.218), with a statistically significant difference (p = 0.038). This suggests that brand credibility and ingredient authenticity may play a comparatively greater role in shaping consumer evaluations in urban and semi-urban markets.
In contrast, Social Influence demonstrates a stronger relationship with Consumer Perception among rural consumers (β = 0.279) than among urban/semi-urban consumers (β = 0.142), with a statistically significant difference (p = 0.019). This finding highlights the importance of family recommendations, peer opinions, and interpersonal communication in influencing rural consumers' perceptions of herbal cosmetics.

The interaction between Consumer Perception and Perceived Price Fairness also differs significantly between the two groups (p = 0.024). The interaction coefficient is more negative among rural consumers (β = −0.224) than among urban/semi-urban consumers

ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

(β = −0.098). This indicates geographical variation in the moderating relationship involving price perceptions. The substantive interpretation of this difference depends on the direction and coding of the Perceived Price Fairness construct.

By comparison, the relationship between Health Consciousness and Perceived Safety and Consumer Perception does not differ significantly across the two groups (p = 0.412). Thus, health-related considerations demonstrate a broadly comparable association with consumer perception across the geographical segments examined.

Overall, the MGA findings demonstrate that brand-related evaluations, social influence, and the interaction involving price perceptions exhibit geographical variation, whereas the relationship between health consciousness and perceived safety and consumer perception remains statistically comparable across urban/semi-urban and rural consumer groups.

V. DISCUSSION AND IMPLICATIONS

5.1 Theoretical Contributions

The findings of the study provide important theoretical insights into consumer perception and purchase intention towards herbal cosmetic products in Karur District.

1. Importance of Health Consciousness and Perceived Safety

Health Consciousness and Perceived Safety emerged as the strongest predictor of Consumer Perception (β = 0.342, p < 0.001), followed by Brand Trust and Ingredient Authenticity (β = 0.289, p < 0.001). In comparison, Environmental and Ethical Concern demonstrated a smaller but statistically significant relationship with Consumer Perception (β = 0.118, p = 0.011). These findings suggest that consumers in the study area place considerable importance on personal health considerations and perceived product safety when evaluating herbal cosmetic products. The results extend the application of the Theory of Planned Behaviour by highlighting the relevance of health-related considerations in shaping consumer evaluations within semi-urban and rural Indian markets.

2. The Relationship between Consumer Perception, Price Fairness, and Purchase Intention

Consumer Perception demonstrated a strong positive relationship with Purchase Intention (β = 0.638, p < 0.001), highlighting its importance in explaining consumers' willingness to purchase herbal cosmetic products. However, the interaction between Consumer Perception and Perceived Price Fairness was negative and statistically significant (β = −0.148, p = 0.004). This finding indicates that the relationship between Consumer Perception and Purchase Intention varies according to perceived price fairness. It highlights the importance of price-related evaluations in translating favourable consumer perceptions into purchase intentions and extends the application of Perceived Value Theory to the herbal cosmetics market. The direction of this moderating relationship should be interpreted in accordance with the coding of the Perceived Price Fairness construct.

3. Geographical Differences in Consumer Evaluation

The Multi-Group Analysis identifies significant differences between urban/semi-urban and rural consumers in the relationships involving Brand Trust and Ingredient Authenticity, Social Influence and Subjective Norms, and the interaction between Consumer Perception and Perceived Price Fairness. Brand Trust and Ingredient Authenticity demonstrate a stronger relationship with Consumer Perception among urban/semi-urban consumers (β = 0.334) than among rural consumers (β = 0.218). Conversely, Social Influence and Subjective Norms exhibit a stronger relationship among rural consumers (β = 0.279) than among urban/semi-urban consumers (β = 0.142). These findings indicate that consumer evaluations of herbal cosmetic products vary across geographical segments. They contribute to understanding intra-district differences in consumer behaviour and highlight the importance of considering local market characteristics when applying consumer behaviour theories to semi-urban and rural contexts.

5.2 Managerial and Strategic Recommendations

The empirical findings provide practical implications for herbal cosmetic manufacturers, marketers, distributors, and retailers seeking to strengthen their market presence in Karur District.

1. Affordable Product Sizes and Rural Market Penetration

Manufacturers should consider introducing affordable product formats, including sachets, mini-packs, and trial packs, to improve product accessibility among price-conscious consumers. Products in the ₹20–₹50 price range may be considered as a potential market strategy, subject to product-specific cost structures and consumer demand. Such initiatives may be particularly relevant to rural markets, including Aravakurichi and Krishnarayapuram, where accessible pack sizes could encourage product trials and improve market reach.

2. Ingredient Transparency and Brand Credibility

The significant relationship between Brand Trust and Ingredient Authenticity and Consumer Perception highlights the importance of transparent product communication. Manufacturers should provide clear ingredient lists, accurately identify botanical extracts, and disclose relevant product certifications and licensing information wherever applicable. QR codes linking to verified product information, manufacturing details, and available third-party laboratory test reports may further strengthen consumer confidence.

ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

Marketing communication should avoid vague or unsubstantiated claims such as "100% herbal" and instead provide specific and verifiable information about product composition and quality.

3. Community-Based Promotion and Hybrid Distribution

The stronger relationship between Social Influence and Subjective Norms among rural consumers suggests that community-based communication strategies may be useful in rural markets. Manufacturers and retailers could consider product demonstrations, consumer awareness programmes, local retailer engagement, and recommendation-based promotional activities to improve product awareness and confidence. In urban and semi-urban markets, particularly Karur and Kulithalai, greater emphasis may be placed on ingredient transparency, brand credibility, in-store information, and digital product communication. Integrating traditional retail channels with appropriate digital platforms may help businesses reach consumers across different geographical segments.

Overall, the findings emphasise the importance of combining affordable product offerings, transparent product information, and geographically appropriate promotional strategies to strengthen consumer confidence and purchase intention towards herbal cosmetic products.

VI. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The present study has certain limitations that should be considered when interpreting its findings. First, the study adopts a cross-sectional research design, with data collected at a single point in time. Consequently, the findings establish statistical relationships among the examined constructs but do not demonstrate causal relationships or changes in consumer behaviour over time. Long-term brand loyalty, actual repeat-purchase behaviour, and post-purchase cognitive dissonance were not directly examined.

Second, the geographical scope is restricted to Karur District, Tamil Nadu, covering the selected urban/semi-urban and rural areas of Karur, Kulithalai, Aravakurichi, and Krishnarayapuram. Therefore, the findings may not be directly generalisable to consumers in other districts or regions with different socio-economic and market characteristics. Third, the study relies on self-reported questionnaire responses, which may be subject to response bias and differences between stated purchase intentions and actual purchasing behaviour.

Future research could address these limitations by adopting longitudinal research designs to examine changes in consumer perceptions, purchase intentions, brand loyalty, and repeat-purchase behaviour over time. Comparative studies across multiple Tier-2 and Tier-3 cities and rural markets in Southern India would provide a broader understanding of regional variations in herbal cosmetic consumption. Further studies could incorporate emerging Direct-to-Consumer (D2C) clean-beauty brands alongside established Ayurvedic and herbal cosmetic brands to examine differences in brand trust, ingredient authenticity, digital engagement, and consumer preferences. In addition, future research could incorporate actual purchasing data, greenwashing perceptions, digital shopping behaviour, and post-purchase evaluations as separate variables to develop a more comprehensive understanding of consumer decision-making in the herbal cosmetics market.

VII. CONCLUSION

The study examined the factors influencing consumer perception and purchase intention towards herbal cosmetic products in Karur District, Tamil Nadu. The findings reveal that Health Consciousness and Perceived Safety, Brand Trust and Ingredient Authenticity, Social Influence and Subjective Norms, and Environmental and Ethical Concern positively influence Consumer Perception. Consumer Perception also demonstrates a strong positive relationship with Purchase Intention, while Perceived Price Fairness significantly moderates this relationship.

The Multi-Group Analysis identifies geographical differences between urban/semi-urban and rural consumers, particularly in the relationships involving brand trust, social influence, and price perceptions. These findings highlight the importance of understanding local consumer characteristics when developing marketing strategies for herbal cosmetic products.

Overall, the study contributes to understanding consumer behaviour in the herbal cosmetics market and emphasises the importance of product safety, ingredient transparency, brand credibility, affordable product offerings, and geographically appropriate marketing strategies. The findings provide useful insights for manufacturers, retailers, and researchers seeking to strengthen consumer confidence and market development in herbal cosmetics.

ISSN :2584-2706 DOI: https://doi.org/10.5281/zenodo.24454907

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