

The Influence of Green Perceived Quality, Green Perceived Risk, and Green Brand Image on Green Satisfaction

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Abstract

The rapid growth of Indonesia's skincare industry and rising environmental awareness have increased demand for green skincare products, making consumer satisfaction essential for market competitiveness. This study aims to examine the effects of green perceived quality, green perceived risk, and green brand image on green satisfaction among consumers of Sensatia Botanicals green skincare products in Yogyakarta. This study adopted a quantitative explanatory research design based on primary data obtained through questionnaire surveys administered to 100 respondents selected using purposive sampling. The collected data were processed through analytical procedures, including validity and reliability assessments, classical assumption tests, multiple linear regression analysis, hypothesis testing, and the coefficient of determination. The results demonstrate that green perceived quality exerts a positive and statistically significant influence on green satisfaction. In contrast, green perceived risk shows a negative and significant effect on green satisfaction, whereas green brand image contributes positively and significantly to green satisfaction. Furthermore, the three independent variables collectively explain 81.7% of the variance in green satisfaction. These findings indicate that improving product quality, minimizing consumers' perceived risk, and strengthening a brand's environmental image are essential strategies for enhancing green satisfaction and sustaining competitiveness in the green skincare industry.

Keywords

Green Brand Image, Green Perceived Quality, Green Perceived Risk, Green Satisfaction.

1. Introduction

Indonesia's skincare industry has recorded substantial expansion in recent years, positioning it among the most rapidly developing sectors within the country's consumer goods market. Based on the report by Vibizmedia (2026), the Indonesian cosmetics market grew from approximately USD 8.09 billion in 2023 to USD 9.17 billion in 2024. Furthermore, the market is expected to sustain this upward trend, with an estimated compound annual growth rate of around 4.0–4.8% through 2029. This expansion reflects not only rising consumer purchasing power but also changing preferences toward products that emphasize health, sustainability, and environmental responsibility. In particular, green skincare products have attracted increasing attention because consumers perceive them as safer for long-term skin health and less harmful to the environment. Consequently, sustainability has become a strategic consideration in both product development and consumer purchasing decisions (Ferdiansyah & Sudarso, 2024; Fitri, 2025).

The growing demand for environmentally friendly skincare products presents both opportunities and challenges for companies in the cosmetics industry (Ali et al., 2019; Al Amin & Dewi, 2021). Firms are expected to develop products that deliver high functional performance while meeting consumers' increasing expectations for environmental sustainability. Sensatia Botanicals has strengthened its position in the Indonesian market by emphasizing natural ingredients, eco-friendly production processes, and sustainable business practices. However, the rapid growth of the green skincare market has intensified competition, making customer satisfaction a key factor for sustaining competitive advantage. In this context, green satisfaction reflects consumers' overall evaluation of whether a green product meets both functional and environmental expectations, which can foster trust, repurchase intention, and loyalty (Dirwan et al., 2025). Therefore, identifying the factors influencing green satisfaction is essential for enhancing long-term business competitiveness.

Previous research conducted by Yuwono (2017) indicates that green satisfaction is largely influenced by consumers' perceptions of product quality, perceived risk, and brand image. Green perceived quality refers to consumers' assessment of a product's overall quality together with its environmental performance. When consumers perceive higher quality, they are more likely to believe that environmentally friendly products provide benefits equal to or greater than those offered by conventional alternatives. In contrast, green perceived risk describes the uncertainty consumers experience regarding the possible adverse outcomes associated with purchasing or using green products, such as concerns about their effectiveness, performance, or overall value (Konuk, 2018). A lower level of green perceived risk is anticipated to increase consumers' satisfaction with green products by reducing uncertainty associated with their purchase and use. In addition, green brand image reflects consumers' beliefs that a brand consistently upholds environmental responsibility and remains committed to sustainable practices (Riyadi, 2022). Such perceptions strengthen the brand's credibility while increasing

its appeal to environmentally conscious consumers (Kotler & Keller, 2016). Collectively, these three constructs provide a comprehensive framework for explaining consumers' satisfaction with environmentally friendly skincare products.

Despite extensive research on green consumer behavior, empirical findings remain inconsistent. Several studies by Imaningsih (2019) and Siregar et al. (2024) reported that green perceived quality has a positive and significant effect on green satisfaction. Likewise, green brand image has been found to positively influence green satisfaction by strengthening consumers' trust in environmentally responsible brands (Mahendra & Sulistyawati, 2017; Wadyatenti & Pranatasari, 2025). Conversely, green perceived risk has been shown to negatively affect green satisfaction because higher uncertainty reduces consumers' confidence in green products (Zhen et al., 2025). However, other studies by Sherwani and Ali (2017) and Sofyan and Batu (2023) found that green perceived quality and green perceived risk do not significantly influence green satisfaction, indicating that the relationships among these variables remain inconclusive across different research contexts. These contradictory findings reveal an empirical gap that warrants further investigation.

This study addresses the existing research gap by examining the simultaneous effects of green perceived quality, green perceived risk, and green brand image on consumers' green satisfaction with Sensatia Botanicals green skincare products in Yogyakarta. Unlike previous studies that generally examined these relationships across broader green product categories or different geographical settings, this research focuses on a leading Indonesian green skincare brand within a rapidly expanding local market. This context represents the study's novelty by providing updated empirical evidence on the determinants of green satisfaction in Indonesia's green skincare industry. The findings are expected to enrich the literature on sustainable consumer behavior and green marketing while offering practical insights for skincare companies in designing effective strategies to improve product quality perceptions, reduce perceived risk, strengthen green brand image, and ultimately enhance consumer satisfaction and long-term competitiveness.

2. Literature Review and Hypothesis Development

2.1. The Influence of Green Perceived Quality on Green Satisfaction

Green perceived quality refers to consumers' perception of the overall excellence of an environmentally friendly product based on its environmental performance and the company's commitment to sustainability (Chen & Chang, 2013; Konuk, 2019). This construct reflects consumers' evaluation of whether a product genuinely delivers superior environmental value while maintaining high functional quality (Yuwono, 2017). Within the green skincare market, consumers evaluate products not only based on their effectiveness but also on the extent to which they meet environmental expectations. These evaluations include the use of sustainable ingredients, environmentally responsible manufacturing practices, and

product characteristics that ensure safety for both consumers and the environment. Accordingly, green perceived quality encompasses several dimensions, including worthiness, reliability, durability, performance, product safety, and attention to detail, all of which influence consumers' overall quality perceptions (Marakanon & Panjakajornsak, 2017; Hashish et al., 2022).

Green perceived quality is regarded as a key determinant of green satisfaction, as consumers tend to experience higher levels of satisfaction when they believe that a product effectively delivers both strong functional performance and environmental responsibility. High perceived quality strengthens consumers' confidence that a green product can meet or exceed their expectations, leading to more favorable evaluations after use. Empirical evidence provided by Imaningsih (2019) and Siregar et al. (2024) consistently demonstrates that green perceived quality exerts a positive and significant influence on green satisfaction. These findings suggest that consumers experience greater satisfaction when they perceive higher levels of environmental quality in green products. Furthermore, products perceived as reliable, safe, and environmentally responsible reinforce positive consumption experiences, thereby increasing green satisfaction (Putra & Rastini, 2017; Mawaddah et al., 2024).

H1: Green perceived quality has a positive and significant effect on green satisfaction.

2.2. The Influence of Green Perceived Risk on Green Satisfaction

According to Taufique et al. (2017), green perceived risk represents consumers' perception of the uncertainty and possible adverse outcomes that may arise from purchasing or using environmentally friendly products. This construct reflects consumers' concerns that a green product may not deliver the expected environmental or functional benefits or may involve unforeseen risks compared with conventional alternatives (Konuk, 2018). Within the green skincare sector, consumers often express uncertainty regarding product effectiveness, skin compatibility, reliability, and the credibility of environmental claims. As a result, green perceived risk comprises several dimensions, including performance risk, functional risk, psychological risk, social risk, and financial risk, all of which influence how consumers evaluate green products (Marakanon & Panjakajornsak, 2017; Chrisjatmiko, 2018).

Green perceived risk is widely recognized as an important antecedent of green satisfaction, as greater perceived uncertainty reduces the likelihood that consumers will form positive evaluations of environmentally friendly products. Greater perceived risk reduces consumers' confidence in a product's ability to fulfill both functional and environmental expectations, leading to lower satisfaction after product use. Empirical evidence by Imaningsih (2019) and Zhen et al. (2025) consistently indicates that green perceived risk has a negative effect on green satisfaction, suggesting that increased perceived risk diminishes consumers'

satisfaction with green products. Conversely, when consumers perceive minimal risk, they feel more secure and confident in their purchasing decisions, resulting in more positive consumption experiences and higher levels of green satisfaction (Chrisjatmiko, 2018; Juliana et al., 2020).

H2: Green perceived risk has a negative and significant effect on green satisfaction.

2.3. The Influence of Green Brand Image on Green Satisfaction

Green brand image refers to the set of environmental associations that consumers attach to a brand based on the company's commitment to sustainability and its ability to communicate environmentally responsible values effectively (Kotler & Keller, 2016). It reflects consumers' overall perception of a company's environmental responsibility and the extent to which the brand is recognized as genuinely supporting sustainable practices (Adelina & Hutabarat, 2023). In the green skincare industry, a strong green brand image enhances consumers' confidence that the brand consistently fulfills its environmental commitments through sustainable products and responsible business operations. This construct is generally assessed using several indicators, namely top-of-mind awareness, reputation, success, establishment (consistency), and trustworthiness. Collectively, these indicators capture consumers' perceptions of a brand's environmental credibility and its position within the market (Chang & Chen, 2014; Chrisjatmiko, 2018).

Green brand image plays a crucial role in shaping green satisfaction because a favorable environmental image strengthens consumers' trust and reinforces positive evaluations of green products. When consumers perceive a brand as environmentally responsible and credible, they are more likely to believe that its products can fulfill both functional and environmental expectations, leading to greater satisfaction. Evidence from previous studies by Mahendra and Sulistyawati (2017) and Wadyatenti and Pranatasari (2025) consistently indicates that green brand image exerts a positive and significant influence on green satisfaction. These findings suggest that consumers are more satisfied with environmentally friendly products when they perceive the brand to have a strong green image. Similarly, Chrisjatmiko (2018) and Zahrok et al. (2024) reported that consumers who regard a brand as trustworthy and genuinely committed to sustainability are more likely to experience higher levels of green satisfaction (Chrisjatmiko, 2018; Zahrok et al., 2024).

H3: Green brand image has a positive and significant effect on green satisfaction.

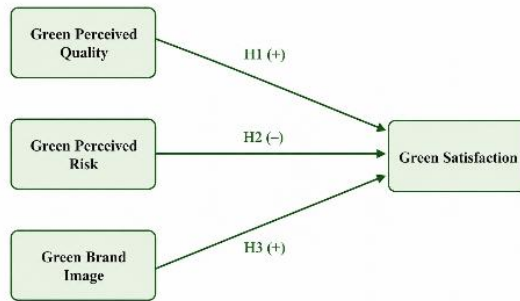


Figure 1. Research Framework

Figure 1 illustrates the conceptual framework of this study. Green perceived quality, green perceived risk, and green brand image are proposed as independent variables influencing green satisfaction. Green perceived quality and green brand image are hypothesized to have positive effects on green satisfaction, whereas green perceived risk is hypothesized to have a negative effect on green satisfaction.

3. Methods

This study adopted a quantitative explanatory research approach to investigate the causal relationships among green perceived quality, green perceived risk, green brand image, and green satisfaction. The proposed hypotheses were evaluated through statistical analysis to explain the relationships between these variables. The research focused on consumers of Sensatia Botanicals green skincare products in the Special Region of Yogyakarta, Indonesia. Primary data were gathered using a structured questionnaire distributed directly to eligible respondents, whereas secondary data were sourced from official company documents, published reports, and relevant academic literature. The study population comprised all consumers who had purchased and used Sensatia Botanicals green skincare products in Yogyakarta. Given that the population was treated as infinite, respondents were selected through a non-probability purposive sampling technique. The final sample consisted of 100 participants who met the established criteria, namely being at least 17 years of age and having purchased Sensatia Botanicals products at least once within the preceding three months.

Data collection was carried out using a structured questionnaire based on a five-point Likert scale, with response options ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument was designed to measure four research constructs: green perceived quality (X1), green perceived risk (X2), green brand image (X3), and green satisfaction (Y). Green perceived quality describes consumers' assessment of a green product's overall excellence and environmental quality (Yuwono, 2017;

Konuk, 2019). Green perceived risk refers to consumers’ perceptions of the uncertainty and potential adverse consequences associated with purchasing or using environmentally friendly products (Taufique et al., 2017). Green brand image represents consumers’ perceptions of a brand’s commitment to environmental sustainability and responsible business practices (Kotler & Keller, 2016). Meanwhile, green satisfaction reflects consumers’ overall evaluation of the extent to which a green product meets both their functional needs and environmental expectations (Dirwan et al., 2025).

Before conducting hypothesis testing, the research instrument underwent validity and reliability assessments to ensure the quality of the measurement. Construct validity was tested using the Pearson Product-Moment correlation, with questionnaire items deemed valid if the calculated correlation coefficient was greater than the critical value ($r > 0.196$) and the significance level was less than 0.05. Reliability was evaluated using Cronbach’s Alpha, where a coefficient above the minimum threshold of 0.60 indicated that a construct was reliable. Following these procedures, classical assumption tests were performed to verify the appropriateness of the regression model. The Kolmogorov-Smirnov test was applied to examine data normality, multicollinearity was assessed using Tolerance and Variance Inflation Factor (VIF) values, and the Glejser test was employed to detect heteroscedasticity.

The hypotheses were tested using multiple linear regression analysis with the following model: $Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \varepsilon$. Partial effects were examined using the *t*-test at a significance level of 0.05, while the coefficient of determination (R^2) was used to measure the proportion of variance in green satisfaction explained by the independent variables. This analytical approach enabled the study to evaluate both the individual and collective contributions of green perceived quality, green perceived risk, and green brand image in explaining consumers’ green satisfaction toward Sensatia Botanicals green skincare products in Yogyakarta.

4. Results

Prior to hypothesis testing, the research instrument underwent validity and reliability assessments to verify the accuracy and consistency of the measurement items. Construct validity was examined using the Pearson Product-Moment correlation, whereas reliability was determined through Cronbach’s Alpha. The outcomes of both assessments are summarized in Table 1.

Table 1. Validity and Reliability Test

Variable	Item	r-value	Sig.	Cronbach’s Alpha	Information
Green Perceived Quality (X1)	X1.1	0.848	0.000	0.904	Valid & Reliable
	X1.2	0.840	0.000		
	X1.3	0.834	0.000		
	X1.4	0.900	0.000		

Variable	Item	r-value	Sig.	Cronbach's Alpha	Information
Green Perceived Risk (X2)	X1.5	0.815	0.000	0.931	Valid & Reliable
	X1.6	0.703	0.000		
	X2.1	0.921	0.000		
	X2.2	0.904	0.000		
	X2.3	0.887	0.000		
	X2.4	0.862	0.000		
Green Brand Image (X3)	X2.5	0.858	0.000	0.848	Valid & Reliable
	X3.1	0.808	0.000		
	X3.2	0.786	0.000		
	X3.3	0.791	0.000		
	X3.4	0.769	0.000		
Green Satisfaction (Y)	X3.5	0.811	0.000	0.895	Valid & Reliable
	Y1	0.845	0.000		
	Y2	0.827	0.000		
	Y3	0.893	0.000		
	Y4	0.929	0.000		

Table 1 demonstrates that all measurement items meet the required criteria for validity and reliability. The calculated r-values range from 0.703 to 0.929, all of which are higher than the critical r-table value of 0.1966, while the significance values are 0.000 ($p < 0.05$). These results indicate that every questionnaire item is capable of accurately measuring its intended construct. Furthermore, the reliability analysis shows that the Cronbach's Alpha coefficients for all variables range from 0.848 to 0.931, exceeding the recommended minimum threshold of 0.60. Among the constructs, green perceived risk exhibits the highest level of internal consistency ($\alpha = 0.931$), followed by green perceived quality ($\alpha = 0.904$), green satisfaction ($\alpha = 0.895$), and green brand image ($\alpha = 0.848$). These findings confirm that the measurement instrument possesses adequate validity and reliability, providing a sound basis for conducting further statistical analyses and hypothesis testing.

Table 2. Normality Test

Statistic	Value
Sample Size (N)	100
Mean of Residuals	0.000
Standard Deviation	1.327
Most Extreme Differences (Absolute)	0.049
Most Extreme Differences (Positive)	0.049
Most Extreme Differences (Negative)	-0.036
Kolmogorov-Smirnov Test Statistic	0.049
Asymp. Sig. (2-tailed)	0.200

Table 2 shows that the regression residuals satisfy the normality assumption. The Kolmogorov-Smirnov test produced a statistic of 0.049 with an Asymp. Sig. (2-tailed) value of 0.200, which is higher than the required significance level of 0.05. These results confirm that the residuals are normally distributed, indicating that the data are suitable for subsequent multiple linear regression analysis.

Table 3. Multicollinearity Test and Heteroscedasticity Test

Variable	Tolerance	VIF	Sig. (Glejser Test)	Information
Green Perceived Quality (X1)	0.376	2.660	0.616	No Multicollinearity and No Heteroscedasticity
Green Perceived Risk (X2)	0.606	1.649	0.801	No Multicollinearity and No Heteroscedasticity
Green Brand Image (X3)	0.407	2.454	0.549	No Multicollinearity and No Heteroscedasticity

Table 3 presents the results of the multicollinearity and heteroscedasticity tests. All independent variables have tolerance values ranging from 0.376 to 0.606, exceeding the minimum threshold of 0.10, and VIF values between 1.649 and 2.660, which are well below the maximum acceptable value of 10. In addition, the Glejser test shows significance values ranging from 0.549 to 0.801, all of which are greater than 0.05. These results indicate that the regression model is free from multicollinearity and heteroscedasticity, confirming that the classical assumption requirements for multiple linear regression have been satisfied.

Table 4. Path Analysis

Variable	B	Beta	t-statistics	p-value	Hypothesis
Green Perceived Quality (X1)	0.511	0.664	9.458	<0.001	Supported (H1)
Green Perceived Risk (X2)	-0.074	-0.119	-2.147	0.034	Supported (H2)
Green Brand Image (X3)	0.243	0.202	3.003	0.003	Supported (H3)

The results summarized in Table 4 indicate that all proposed hypotheses are accepted. Green perceived quality (X1) exerts a positive and statistically significant influence on green satisfaction ($B = 0.511$, $\beta = 0.664$, $t = 9.458$, $p < 0.001$), suggesting that higher levels of perceived quality are associated with greater consumer satisfaction. In contrast, green perceived risk (X2) demonstrates a negative and significant effect on green satisfaction ($B = -0.074$, $\beta = -0.119$, $t = -2.147$, $p = 0.034$), implying that reduced perceived risk enhances consumer satisfaction. Furthermore, green brand image (X3) has a positive and significant impact on green satisfaction ($B = 0.243$, $\beta = 0.202$, $t = 3.003$, $p = 0.003$). Among all independent variables, green perceived quality emerges as the most influential predictor, as

reflected by the largest standardized coefficient ($\beta = 0.664$). These findings provide empirical support for H1, H2, and H3.

Table 5. Coefficient of Determination (R^2)

Statistic	Value
R	0.907
R Square (R^2)	0.822
Adjusted R-Square	0.817
Std. Error of the Estimate	1.347

Table 5 indicates that the regression model possesses substantial explanatory capability. The correlation coefficient (R) of 0.907 reflects a strong association between the independent variables and green satisfaction. Moreover, the R^2 value of 0.822 shows that green perceived quality, green perceived risk, and green brand image collectively account for 82.2% of the variance in green satisfaction. After adjusting for the number of predictors, the adjusted R^2 decreases slightly to 0.817, indicating that the model explains 81.7% of the variation in the dependent variable. Consequently, the remaining 18.3% of the variance is explained by factors beyond the scope of this study. Additionally, the standard error of the estimate is 1.347, suggesting a relatively low level of prediction error and confirming that the regression model provides a good fit to the observed data.

5. Discussion

The hypothesis testing results indicate that green perceived quality has a positive and significant effect on green satisfaction among consumers of Sensatia Botanicals green skincare products in Yogyakarta. This finding suggests that higher consumer perceptions of the environmental and functional quality of green skincare products lead to greater levels of green satisfaction. The descriptive analysis supports this result, as green perceived quality achieved a mean score of 3.97, indicating a high level of consumer agreement. The highest-rated indicator was the perception that the product maintains its effectiveness despite being formulated with natural ingredients. This finding implies that consumers value environmentally friendly products when sustainability is accompanied by consistent product performance and quality. These findings are in line with the results reported by Putra and Rastini (2017), Imaningsih (2019), and Siregar et al. (2024), which identify green perceived quality as an important determinant of green satisfaction. This relationship suggests that higher perceived quality enhances consumers' confidence that green products are capable of meeting both their functional needs and environmental expectations.

The second hypothesis confirms that green perceived risk has a negative and significant effect on green satisfaction. This result indicates that lower perceived risk is associated with higher consumer satisfaction with green skincare products. Descriptive analysis shows that green perceived risk obtained a mean score of 2.35,

representing a low level of perceived risk among respondents. The highest-rated indicator concerned consumers' financial concerns if the product failed to meet their expectations. Nevertheless, the overall low perceived risk suggests that consumers generally trust the safety, effectiveness, and environmental performance of Sensatia Botanicals products. These findings indicate that reducing uncertainty regarding product performance and environmental claims can significantly improve consumer satisfaction. The results are consistent with previous studies by Chrisjatmiko (2018), Juliana et al. (2020), and Zhen et al. (2025), reporting that lower green perceived risk enhances consumers' confidence in environmentally friendly products and subsequently increases green satisfaction. Therefore, companies should strengthen product transparency, provide credible environmental information, and maintain consistent product quality to minimize perceived risk.

The third hypothesis demonstrates that green brand image has a positive and significant effect on green satisfaction. This finding indicates that a favorable environmental brand image enhances consumers' satisfaction with green skincare products. The descriptive analysis reveals that green brand image achieved a mean score of 3.72, indicating a high level of positive consumer perception. The strongest indicator was the brand's consistency in demonstrating concern for environmental issues. This result suggests that consumers appreciate brands that consistently communicate and implement sustainable business practices. A strong and credible green brand image enhances consumer trust while fostering more favorable evaluations of environmentally friendly products. This finding is consistent with previous studies by Mahendra and Sulistyawati (2017), Zahrok et al. (2024), and Wadyatenti and Pranatasari (2025), which demonstrate that green brand image positively affects green satisfaction by strengthening consumers' perceptions of a company's commitment to environmental sustainability and the credibility of its brand.

The findings confirm that green perceived quality, green perceived risk, and green brand image all have significant effects on green satisfaction. Based on the coefficient of determination, these three predictors collectively explain 81.7% of the variance in green satisfaction, while the remaining 18.3% is associated with factors outside the scope of the present study. This high level of explanatory power demonstrates that consumers' perceptions of product quality, perceived risk, and brand image are key determinants of satisfaction with green skincare products (Sabono & Murwaningsari, 2022; Hutagaol et al., 2025). Moreover, the results provide empirical support for the Stimulus–Organism–Response (SOR) theory, suggesting that external stimuli, represented by green perceived quality, green perceived risk, and green brand image, are cognitively evaluated by consumers and subsequently lead to behavioral responses in the form of green satisfaction. Consequently, this study contributes to the green marketing literature by validating the applicability of the SOR framework in the context of green skincare products and provides practical guidance for firms seeking to improve customer satisfaction

through higher product quality, lower perceived risk, and a stronger green brand image.

6. Conclusion

This study examined the effects of green perceived quality, green perceived risk, and green brand image on green satisfaction among consumers of Sensatia Botanicals green skincare products in Yogyakarta. The findings demonstrate that green perceived quality has a positive and significant effect on green satisfaction, indicating that consumers are more satisfied when they perceive environmentally friendly products as high quality and effective. Green perceived risk has a negative and significant effect, suggesting that lower perceived risk enhances consumer satisfaction. In addition, green brand image positively and significantly influences green satisfaction, confirming that a strong environmental brand image strengthens consumers' overall satisfaction. These findings provide practical implications for skincare companies by highlighting the importance of maintaining high product quality, reducing consumers' perceived risk through transparent and credible environmental claims, and strengthening green brand positioning to improve customer satisfaction and long-term competitiveness.

Despite these contributions, this study has several limitations. First, the research was limited to consumers of Sensatia Botanicals green skincare products in Yogyakarta; therefore, the findings cannot be generalized to consumers in other regions with different demographic, cultural, and environmental characteristics. Second, the study focused only on green perceived quality, green perceived risk, and green brand image as predictors of green satisfaction, although other factors may also influence consumers' evaluations. Future research is therefore encouraged to examine broader geographical settings and incorporate additional variables, such as green perceived value, environmental consciousness, green trust, or green purchase intention, to develop a more comprehensive understanding of the determinants of green satisfaction in the green skincare industry.

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