Evolution of consumer perceptions and intentions in the green cosmetics market: a thematic and trend analysis

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This study examines the evolving research landscape on consumer perceptions and intentions toward green cosmetics, highlighting significant trends and thematic developments. Additionally, it also emphasizes the need to use digital space to amplify the consumers' awareness level. Guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework, this review combines synthesizes bibliometric analysis and systematic review, highlighting selected research studies by discussing the moderating variables that may affect purchase intent for green cosmetics. A favorable attitude toward green cosmetics is, however, accompanied by a large "green purchasing gap" whereby green purchasing intentions do not necessarily translate to actual purchases. Thematic cluster further underscores the critical role of psychological and behavioral factors, such as attitudes toward sustainability and perceived product quality, in influencing purchase intentions. This review uncovers key thematic trends of consumer perceptions and intentions toward green cosmetics. It fills a gap by pointing to a persistent "green purchasing gap" and that people's psychological and behavioral factors make a palpable difference in purchase behavior. This analysis distinctively associates the bibliometric and systematic lenses to clarify the persistent "green purchasing gap" using both macro trends and behavioral constructs.

KEYWORDS

green purchase behavior, organic personal care products, organic cosmetic, Theory of Planned Behavior, natural cosmetics

1 Introduction

Green cosmetics have brought about a huge demand because the consumers of today are much more conscious concerning their health and the effect on the environment (Kifaya, 2024; Meliniasari and Mas'od, 2024; Ngo-Thi-Ngoc et al., 2024; Upadhyaya and Sijoria, 2024). This trend is well exhibited in several analyses conducted in different fields of the industry (Dini, 2024; Inal, 2023; Nguyen-Viet and Nguyen, 2024; Suphasomboon and Vassanadumrongdee, 2022). The global green cosmetic industry is also being defined by natural ingredients and eco-friendly processes (Limbu and Ahamed, 2023; Sasounian et al., 2024). Sustainable cosmetics, often known as green cosmetics, is an approach that takes into account one's whole environment while making decisions about one's appearance (Rhee and Lee, 2024; Shah S. S. H. et al., 2024). It considers the effect that the cosmetics business has on the environment, as well as the benefits to human and environmental health (Suphasomboon and Vassanadumrongdee, 2022). In contrast to synthetic materials like chemicals or dye additives, green cosmetics are made from organic materials like botanicals and fruit-based formulas and components (Shah K. C. et al., 2024).

In the past few decades, there has been a greater emphasis on the ecological and environmental concerns of the populace. One example of this is the introduction of environmentally beneficial or green cosmetics (Echchad and Ghaith, 2022). The public is increasingly knowledgeable about the contents of personal care products and cosmetics; however, they continue to have enquiries regarding certain aspects, such as the purportedly detrimental effects of synthetic materials and chemicals (Akhtar et al., 2022; Alhussaini et al., 2022; Mathur et al., 2024). As a result, consumers have shifted their focus from conventional to green purchasing practices (Park and Hong, 2024; Pop et al., 2020). It has been noticed that modern women, who pay much attention to sustainability, tend to use only natural cosmetics and beauty products because they believe it makes them healthier (Kazançoglu and Köse, 2024; Khan and Salim, 2021; Limbu et al., 2022a; Lius and Salim, 2024; Rani and Bharatwal, 2022; Recker et al., 2014; Sakhawat, 2019; Shimul et al., 2022; Singhal and Malik, 2018). In addition, research suggests that male consumers also exhibit a favorable disposition toward purchasing environmentally beneficial cosmetics (Ali et al., 2023; Jogalekar, 2020; Shrivastava et al., 2017).

Young consumers are becoming more health conscious, which reflects well for the natural beauty product industry (Hinčica et al., 2024; Menon and Chavadi, 2022). For instance, a 2023 research study shows the trend toward the use of natural cosmetics through the growing number of customers focused on their health, especially the generation of 18–35 years, due to increased concerns for the use of natural ingredients and influenced greatly by social media (Amberg, 2023). Natural and organic ingredient-based beauty products are here to stay, as seen by their adoption by multinational corporations (Ainapure, 2023; Pandey et al., 2024). All of these products promise to combine contemporary scientific knowledge with ancient Ayurveda formulas and plants to provide safe, effective, and natural remedies. However, despite this expansion, there are still obstacles for businesses to overcome before they can fully penetrate this market. Although many customers have a favorable impression of green cosmetics, studies demonstrate that this does not always translate into a firm commitment to buy them (Chen, 2007; Prakash et al., 2024). This is because variables like price, availability, and packaging might influence motivation (Vermeir and Verbeke, 2006). Various works have examined the role of social media on consumers' inclination toward green products (Ch et al., 2021; Hazra et al., 2024; Pandey et al., 2024; Zafar et al., 2021). However, social media's role has been largely overlooked. Research indicates that social media influence purchase decisions to a greater extent, especially Instagram and Facebook helping to increase awareness and build trust in green products (Tazeen and Mullick, 2023). Furthermore, the role of social media marketing and influencers in emphasizing green product purchases is important, especially among teenagers or millennials, but is overlooked in more global debates (Pitaloka et al., 2023). Moreover, research in Asian markets finds that being eco-friendly in businesses helps attract buyers, supporting the importance of local behavioral models such as the Extended Norm Activation Model for making sustainable choices (Ahmed et al., 2024).

Despite the increased interest in green cosmetics, this area is still not fully integrated with insights from psychology, behavior, and marketing. This study explicitly aims to examine how consumer perceptions and purchase intentions toward green cosmetics have evolved, paying particular attention to the persistent "green purchasing gap." It contributes to the existing literature by uniquely combining bibliometric mapping with a thematic synthesis in this underexplored niche, revealing theoretical saturation around the Theory of Planned Behavior (TPB), and encouraging interdisciplinary integration of consumer psychology, marketing, and digital influence perspectives.

To address these gaps, this review sets out to achieve the following objectives:

1. To review the progression of consumer perceptions and purchase intentions toward green cosmetics across global prose.
2. To analyze thematic and bibliometric trends, recognizing the most considered areas and key factors which influences the market.
3. To explore the ground sources of the green purchasing gap by synthesizing developments across behavior, pricing, packaging, confidence, and social media influence.
4. To point out underexplored themes and suggest further research directions for future.

The significance of the study lies in applying multiple disciplines to research sustainable cosmetics and highlighting that social media matters for Gen Z and millennial buyers. This paper uses two approaches—bibliometric mapping and a systematic review of literature—to spot trends, areas that need further study, and points where theory might be saturated. It expands understanding of why people's intentions to buy green sometimes do not result in actual purchases, especially regarding factors like price, packaging, and trust. Based on the synthesis of the current literature, the review will present an understanding of the factors driving the green cosmetics phenomenon and reveal the barriers to further market sharing by companies.

This paper's objective is to review the global green cosmetic industry, seeking to focus on the use of natural products, environmental conservation measures as well as green processing procedures. Further, this specific undercurrent review aims to find out the discrepancy between consumers' perception toward green cosmetics and their shopping behavior in terms of price, accessibility, product packaging and social media impacts.

In this study, Section 1 provides brief background information on the review, followed by the identification of the main goal of the review. In Section 2, the methodology that was used for the current review, in addition to the process of synthesizing the findings based on the data obtained from different sources, is described. In Section 3, bibliometric analysis is discussed in detail. Section 4 presents a reflection on the main findings of the studies presented in this research in light of the main theories of consumer behavior and the market for green cosmetics. Section 5 discusses trend topics and thematic analysis related to consumer perceptions and intentions for green cosmetics that have evolved over time. Section 6 restates the main ideas that the paper identified from the review that revisits the relevance of consumers' attitudes and intentions toward the use and purchase of green cosmetics. Sections 7, 8, and 9 provide theoretical and practical implications of the work, discuss

limitations, and offer directions for future research studies. Section 10 provides a conclusion.

2 Methodology

2.1 Research design

The research design integrates both quantitative (bibliometric) and qualitative (systematic) review elements (Passas, 2024). Bibliometric analysis helped identify global publication trends, core journals, key authors, and conceptual clusters related to green cosmetics. In parallel, a systematic review was conducted to explore consumer behavior dimensions—particularly perceptions, purchase intention, and the moderating role of variables such as price, availability, and social media. This design provides both macro-level insight and micro-level behavioral understanding.

This review was guided by the following research question (RQ):

RQ: How have consumer perceptions and purchase intentions toward green cosmetics evolved over the past decade, and what psychological and market factors contribute to the persistent green purchasing gap?

2.2 Data collection method

The peer-reviewed literature was searched electronically using online databases such as PubMed, Web of Science, Scopus, and Google Scholar. These databases were chosen because they contain vast amounts of information on scientific and consumer Behavior research. The timeframe of the analysis of this review examined the results from 2014 to 2024, capturing both early and very recent studies of this emerging field. The terms "green cosmetics", "organic cosmetics", "green personal care products, "consumer attitude", "purchase intention", "environmental awareness", "sustainable products", and "marketing strategies" were interchangeably used all together or in combination.

2.3 Selection criteria

In this study, the inclusion and exclusion criteria of the potential articles that were to be used in the present study were defined.

2.3.1 Inclusion criteria
- Empirical studies (quantitative, qualitative, or mixed methods), including intervention or observational designs;
- Studies involving consumers or potential consumers of green cosmetics;
- Studies that specifically examined factors influencing the relationship between consumer attitudes and purchase intentions in the context of green cosmetics;
- Peer-reviewed articles published in the English language;

2.3.2 Exclusion criteria
- Review papers, meta-analyses, editorials, conference abstracts, and commentaries;
- Studies not directly related to green cosmetics (e.g., those focused on general sustainable products, household goods, or unrelated product categories);
- Articles lacking a clear focus on consumer perception, behavior, or intent regarding green cosmetics;
- Non-English language publications.

This approach made the review very relevant and involved only the best quality research studies that were available in the databases (Figure 1). The sections given present the outcomes of bibliometric mapping and thematic clustering, which are tracked by a combination of consumer behavior trends and gaps identified in the existing literature.

2.4 Data extraction process

Data extraction was conducted meticulously to gather relevant information from each selected study, ensuring a comprehensive analysis. The review process combines bibliometric analysis using R software (Aria and Cuccurullo, 2017) and the bibliometrix package (Bhat et al., 2023; Farooq, 2023) and a systematic review guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. Figures such as the Bradford's Law distribution (Figure 2) were generated using the Bibliometrix package in RStudio, based on the authors' dataset extracted from Scopus.

The number of peer-reviewed studies included in this review was a total of 59 studies that fulfilled the inclusion criteria. They were applied in the bibliometric mapping (to identify publication trends, core journals, key authors, and thematic clusters) and in the overall thematic analysis (which examined shifting consumer perceptions and buyer intentions against green cosmetics). Furthermore, we found a selective number of 8 important empirical studies that helped us with the rich and comparable information on the basis of the consumer attitudes, underlying behaviors, and purchase predilection. Among these studies, 8 were chosen to be considered in a more detailed, comparative synthesis, summarized in Table 1. This method enabled us to embrace both general bibliometric patterns and detailed thematic insights into certain studies on consumer behavior.

3 Bibliometric analysis

Findings suggest that publications related to green cosmetics were not very high in earlier years. Notably, only one article was published in 2011; in the subsequent years, such as in 2015 and 2017, there were only two articles each. Surprisingly, the year 2018 had a slight improvement to three articles, however, it reduced to one in 2019. This appears to be the beginning of academic work with regard to the study of perception toward green products, particularly cosmetics. This growth goes on to 2021, during which published eight articles and boosted up to 2022 with the publication of eleven articles. This increase can be associated with a general
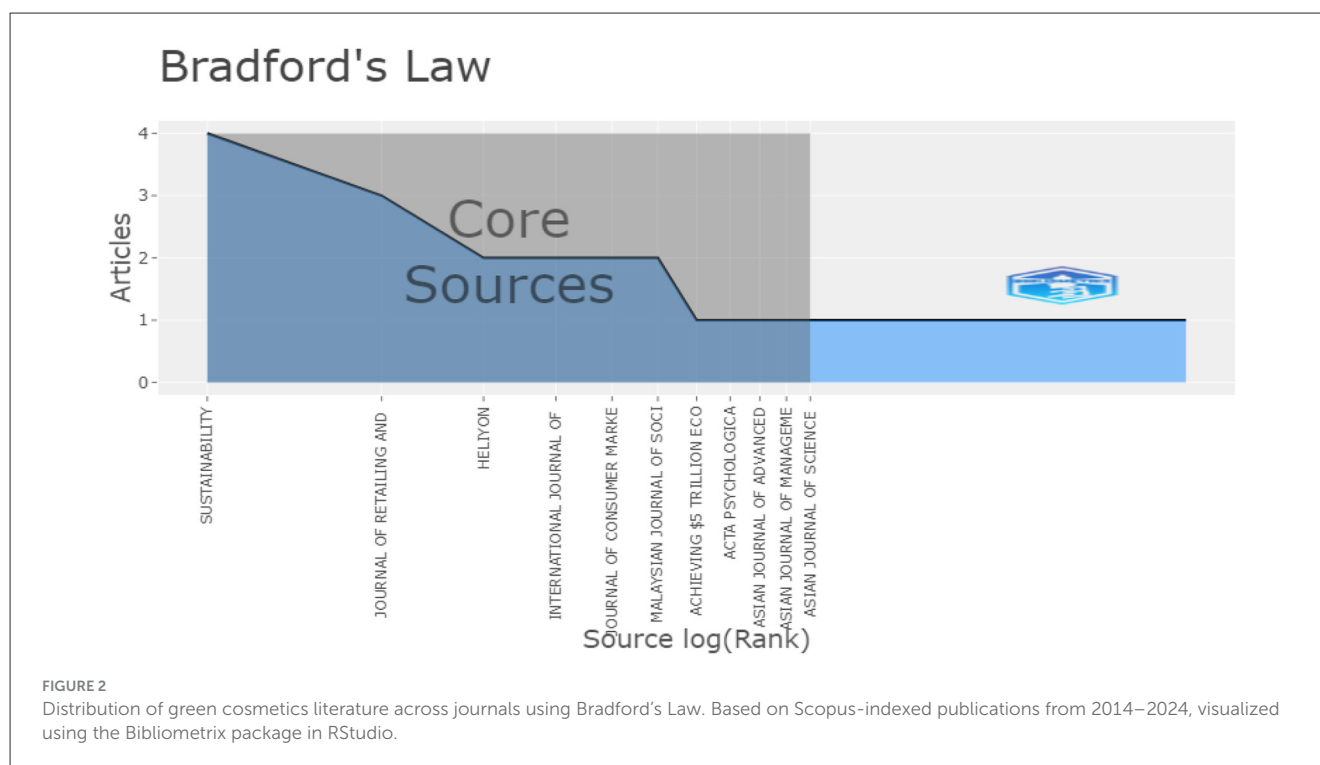
FIGURE 1
PRISMA flowchart.
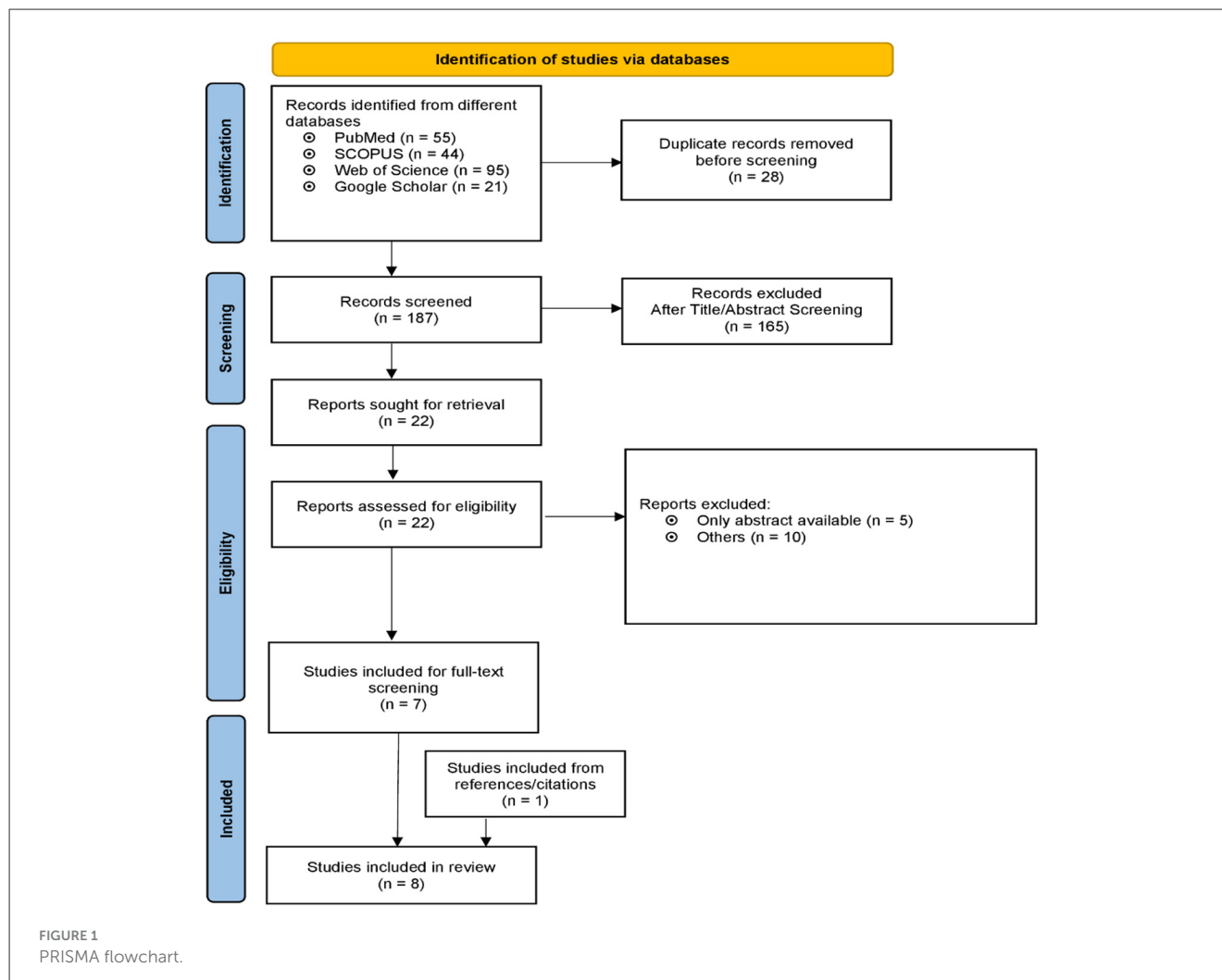
growth of interest in and awareness of sustainable development because ecological issues have become popular and are widely discussed all over the world. This increased academic output may be attributed to the researchers "growing interest in consumer products" effects on the environment and the factors behind green consumption. However, 2024 experienced a sharp increase to 16 articles, which gives an insight into the research activity done during that period.

The keyword count data offer a hierarchical view of the coverage of the advent and focus of studies on green cosmetics over the course of the years. While analyzing the value of the keywords "Purchase Intention," "Environmental Concern," "Attitude," and "Green Cosmetics" from 2014 to the year 2017, the authors noted that these terms were never mentioned during those years. The first sign of interest can be traced back to 2017, as reflected in the number of occurrences of the term "Organic Personal Care Products" at two, while the remaining terms are observed only once: "Perceived Values" and the "Theory of Planned Behavior". This means that there were studies done with scholars starting to look into these notions at that time. From the year 2019, some of the keywords can be seen that have appeared frequently in the list, while some keywords do not have any appearances in the entire list, such as "Theory of Planned

Behavior." Cognitive theory becomes an important framework for studying consumers' attitudes toward green cosmetics. Compared to the previous year, 2021 shows increased activity; specifically, keywords such as "Purchase Intention", "Perceived Quality," and "Perceived Values" are used more often, suggesting an increased focus on identifying the drivers that can impact consumers' choices in terms of green cosmetics. The year 2022 is marked by significant growth in the frequency of use of almost all the keywords mentioned till 2024. The term "Purchase Intention" experiences a dramatic increase, especially in 2024 where it features four occasions in recent research and hence is highly important. Similarly, the "Theory of Planned Behavior" retains the same significance, suggesting that it is still widely used in consumer Behavior analysis. The same applies to such keywords as "Environmental Concern", "Attitude," and "Green Cosmetics" and therefore, these factors are becoming relevant to affect consumers' intention toward green products. The term "Pro-Environmental Belief" is used for the first time in 2024; this might mean a new direction in the topic of green consumerism to reflect new trends in the world with an increasing concern for the environment.

From the Bradford Law analysis point of view, it is possible to gain insights into the distribution of research publications

FIGURE 2
Distribution of green cosmetics literature across journals using Bradford's Law. Based on Scopus-indexed publications from 2014–2024, visualized using the Bibliometrix package in RStudio.

for green cosmetics across different journals (Figure 2). It should also be noted that the journals identified as belonging to Zone 1 are viewed as the key sources of research on green cosmetics, consumer perception, and buying inclinations. The most relevant journal is "Sustainability" because this played a major role in developing this field of research contributing four articles. This journal is very popular for publishing articles in the area of environmental management; hence it attracts research work that cherishes both behavioral consumerism and sustainable practices such as green cosmetics. Soon after, it is the "Journal of Retailing and Consumer Services" which has produced three articles. This journal is relevant because it connects consumer behavior with services, which is important when analyzing how consumers make a purchase decision for sustainable products.

Despite the fact that Zone 2 journals have provided fewer articles, they are also crucial in the development of knowledge regarding green cosmetics. All the journals in this category have provided one article each, and this further affirms the fact that they offer more focused or targeted information about the subject in question. For instance, "Cleaner and Responsible Consumption" and "Cleaner Waste Systems" are concerned with the environmental impact of consumption and waste disposal, respectively, which are areas of extreme concern when studying sustainable consumer behavior. These journals provide insights on how the consumer perceives the environmental implications of their purchases, even products such as cosmetics, and how this determines the consumer's consumption pattern.

Teixeira et al. (2023) appear three times across the reviewed literature, which signifies a notable and prominent contribution to green cosmetics research. Nevertheless, based on a fractionalized count, it is 0, which means that this author often co-authors works, that is, shares the work of authorship. Nevertheless, Teixeira

et al. (2023) occupy a prominent position in the identified field as it has produced valuable research for the study of green cosmetics. For that reason, Shafira and Mayangsari (2020) and Bayaah Ahmad (2018) are special because they have a count in the numerator that is fractionalized at 1.00. This shows a high level of individual contribution and participation in the research area to make them precursors of the further exploration of consumer Behavior regarding green cosmetics. Mamun et al. (2020), Limbu and Ahamed (2023), and Nguyen-Viet and Nguyen (2024) each contributed articles, and the fractionalized count varies from 0.45 to 0.58. These authors are active contributors; they also work in pairs and in groups on their research. Together, their work enhances the debates on green consumerism even though their individual impact may not be as forceful following a collaborative effort. However, all four authors have published only a single article each, while fractional counts are mostly below 0.50. Such authors can be described as supportive of the given field, providing specialized information or focused research that fills the gaps in the vast open research field.

4 Understanding purchase inclinations in green cosmetics and model framework contribution

The systematic review conducted on the key research studies concerning green cosmetics revealed a diverse array of consumer behaviors, perceptions, and market dynamics across different regions and demographics. Table 1 provides an overview of the key research on green cosmetics, highlighting the work envisaged, findings, and future implications for each study.

TABLE 1 Overview of the key research on green cosmetics.

Researchers name	Year	Country	Work envisaged	Findings	Future implications
Misesa et al.	2022	Indonesia	This research analyses how the internet and social media impact customers' natural and organic cosmetic purchases.	The research conclusions show that perceived behaviors of the customers and their subjective norms are two factors that greatly influence their motivation to purchase green cosmetics.	Further studies based on bigger samples in different countries might provide more light on the green cosmetics market.
Rani and Bharatwal	2022	India	Finding out how cognizant and receptive customers in the Bhiwani District are to the concept of green cosmetics.	Results indicated that young female consumers were familiar with green cosmetics and had a favorable impression of them.	It is imperative that companies escalate their promotional activities with the aim of sensitizing consumers to the importance of green cosmetic products.
Lavuri et al.	2022	France	In this analysis, researchers examine how eco-friendly features affect consumers' desire to spend more on high-quality organic cosmetics.	This research indicates that customer's attitudes toward the purchase of organic beauty products are a critical determinant of their willingness to purchase.	The findings have important ramifications for the organic cosmetics industry and the study of India's premium organic beauty products market.
Sakhawat	2022	Pakistan	This study examines how a green attitude mediates green beauty business purchase intentions.	The research found that the use of sensory marketing for green beauty products significantly increased the likelihood that the target consumer would make a purchase.	The research advises marketers to focus on certain demographics by taking into account their preferences, values, cultural backgrounds, locations, and sensory qualities.
Shimul et al.	2022	South Africa	In this study, researchers look at the mindset of female consumers and their propensity to buy environmentally friendly beauty products.	The findings reveal that consumers' subjective norms significantly influence their propensity to buy green beauty products. Customers' opinions on green cosmetics are affected by their ecological motivations and levels of environmental literacy. Involvement further reinforces the favorable correlation between customers' disposition and their propensity to make a purchase.	According to the results, professionals in the field of green cosmetics should work to increase customers' awareness and participation in the industry.
Šniepiene and Jankauskiene	2021	Lithuania	The study's primary objective was to analyze respondents' socio-demographic variables in relation to their product preferences and actual use of organic cosmetics.	In the survey, almost half of the women reported using organic beauty products. In contrast to the less-than-average usage of pregnancy-specific skincare products, those designed for the face, body, and hair were found to be the most popular.	The most crucial identifiers are thought to be a) sufficient and comprehensive information on the label and b) reputable and well-known manufacturers.
Khan and Salim	2020	Kingdom of Saudi Arabia	The research looked at the buying patterns of Saudi women when it came to eco-friendly beauty products.	The data show that both students and housewives lack the knowledge necessary to make educated purchases. There is a market for environmentally friendly cosmetics, but only among professional women because of their health concerns.	This study suggests that motivating factors, customer attitudes, and relationship preferences can illuminate the development of different women's club members.
AL-Haddad et al.	2020	Jordan	The purpose of this research is to examine the impact of brand awareness, brand loyalty, and perceived quality on the purchase intent of female customers in Jordan with regard to eco-friendly items.	All the independent factors were shown to have a statistically significant positive influence on the dependent variables, with the greatest mean going to buy intent.	The results of this study may help cosmetics companies, both current and prospective, improve their operations and increase sales in step with the growing green movement in the United States.

5 Trend topics and thematic analysis

Figure 3 provides a detailed view of trend topics (2022–2024) related to green cosmetics that have evolved over time. One of the most prominent findings is the consistent importance of the "Theory of Planned Behavior" (Akter and Islam, 2020; Echchad and Ghaith, 2022; Jameel and Ferdinando, 2022; Shimul et al., 2022). This concept first gained prominence in 2020 and has remained a central framework for understanding consumer intentions, particularly in the context of green cosmetics. The fact
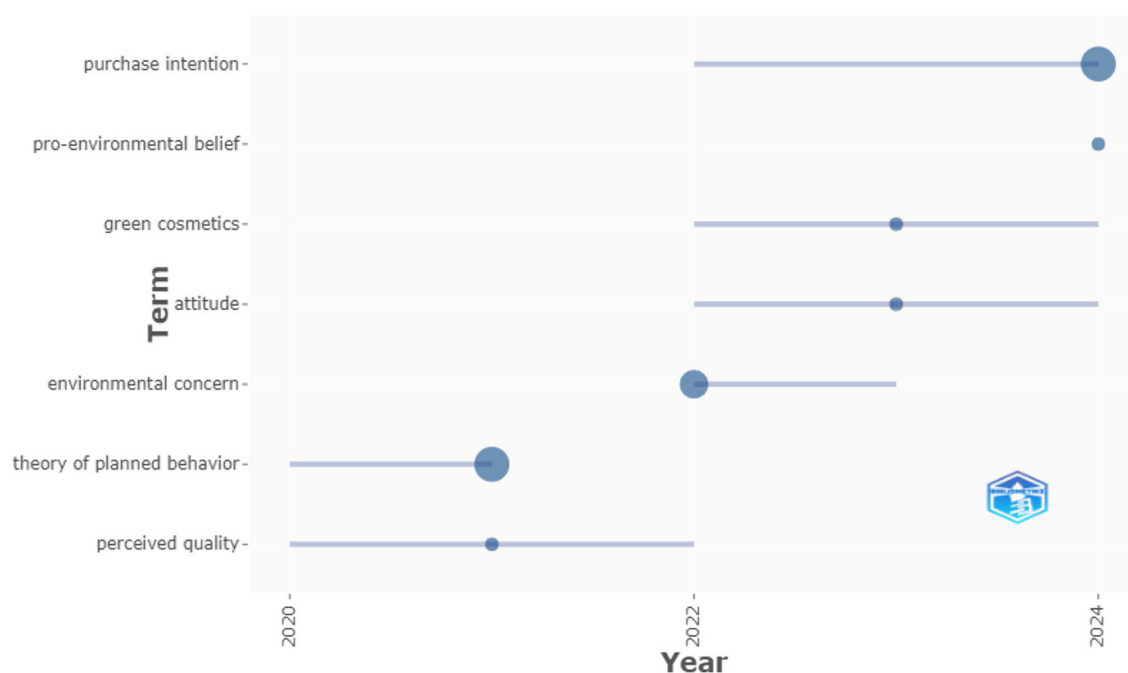
FIGURE 3
Trend topics in green cosmetics research (2020–2024) based on keyword frequency analysis using Bibliometrix.

that it appeared quite early and remained fairly consistent up through 2021 lends itself to the notion that it has been the go-to theory for most of the research done to articulate how attitudes and beliefs convert to buying decisions. It also shows that the concepts and indices used in the present theory are consistent in measuring consumer behavior related to sustainability problems. The trend topics discussed below are based on keyword data extracted from studies published between 2020 and 2024.

Another important area is "Perceived Quality" which emerged in the literature in about 2020 and has risen in popularity through year 2022 (Lili et al., 2022; Quoquab et al., 2020; Suphasomboon and Vassanadumrongdee, 2022). As the market for cosmetics developed alongside the principles of green chemistry, an increase in the role of quality perception has been observed. The topic of "Environmental Concern" started getting popular much later, the year of which is 2022 and continues up to 2023 (Bozza et al., 2022; Sharma et al., 2021). This is in line with the advanced knowledge and focus on environmental factors within investor behavior studies. Increased global awareness of sustainability issues gradually led to a growing interest in adopting insights about the role of environmental issues in explaining consumers' behavior. This trend indicates that researchers are expanding their evaluation of consumer attitudes and behavior beyond the immediate economic cost of products and with particular regard to green products.

The topic "Attitude and Green Cosmetics" suggests that they also came into focus in 2022, and their importance is predicted to rise till 2024 (Ayoun and Schmitz, 2024; Testa et al., 2024). These topics are connected as the consumers' perceptions of sustainability and environmental responsibility have a direct impact on their buying Behaviors. An especially interesting fact is that all of these topics emerged simultaneously, which implies

a developing interest in how positive attitudes toward green products can be developed and effectively transferred to the buying behavior level. The concept of "Purchase Intention" has emerged as an important stream of research over the last few years, especially post-2022, the significance of which is likely to register its highest in 2024 (Marbun et al., 2024; Meliniasari and Mas'od, 2024; Rodrigues et al., 2023; Szaban, 2023). This highlights a transition from an exploratory type of research aimed at establishing determinants of consumer behavioral intentions to purchase green cosmetics. With the enlargement of the market share of these products, the issue of what factors affect the purchase intention becomes all the more relevant in both research fields and marketing and product management. Finally, the new keyword "Pro-Environmental Belief" appearing in the literature in 2024 implies that the growth of green consumer research is still vast (Ali et al., 2023; Hidalgo-Crespo et al., 2023). This is late, but immediate relevance indicates that researchers are beginning to delve deeper into the psychological and ideological factors that underpin consumer behavior. As sustainability becomes more deeply ingrained in consumer identities, understanding these beliefs will likely become a key area of inquiry.

The thematic analysis presented in Figure 4 categorizes key concepts in research related to green cosmetics into distinct clusters. Each cluster of themes indicates the main directions in the development of the research in the field.

5.1 Cluster 1 – basic themes

The first cluster suggests themes related to Purchase Intention, in which there are four occurrences and related terms, including Green Cosmetics; Pro-Environmental Belief;

FIGURE 4
Thematic analysis categorizing key concepts in research related to green cosmetics into distinct clusters.
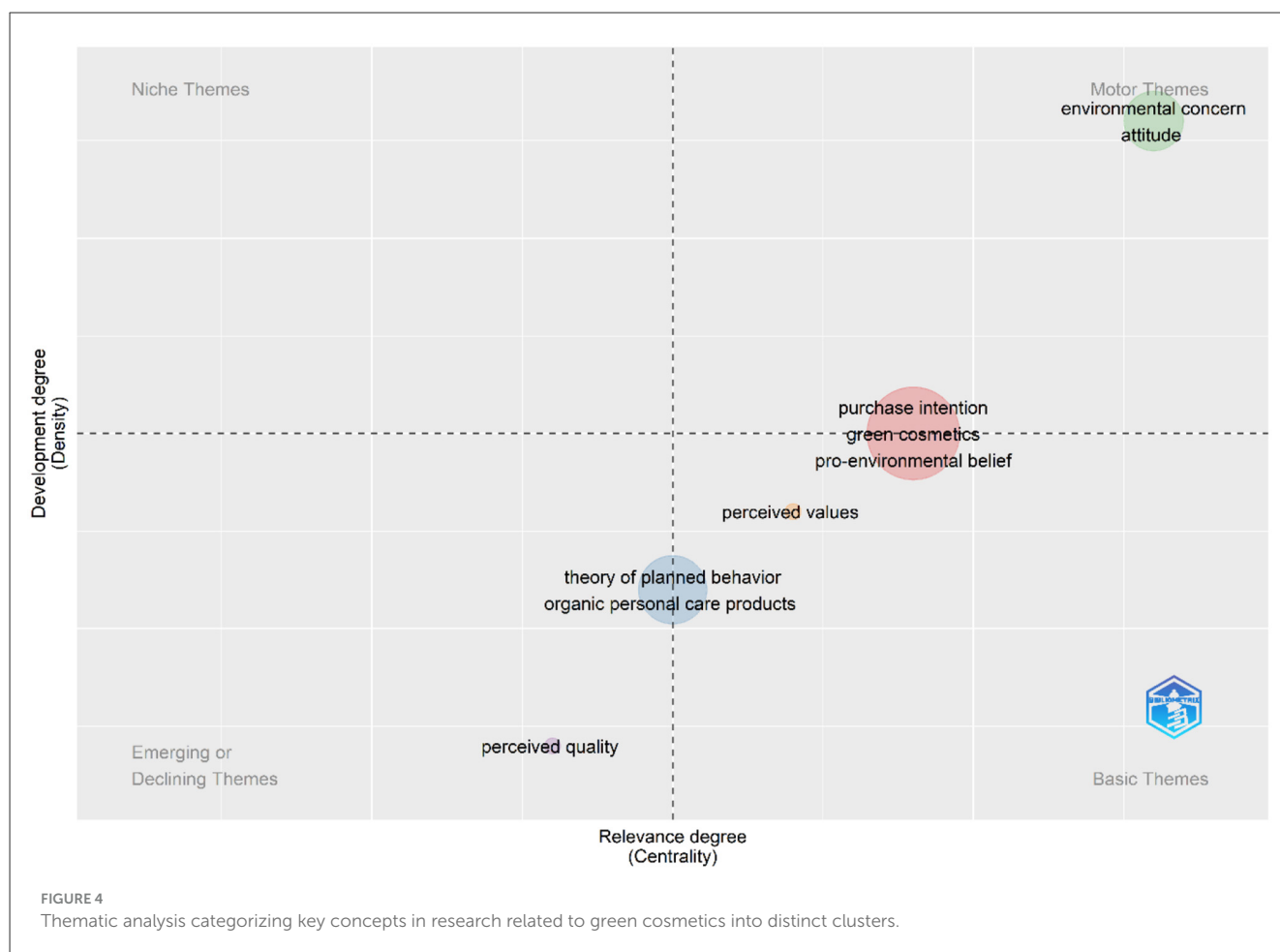
Theory of Planned Behavior. This cluster shows that a large part of the literature on green cosmetics is aimed at identifying consumers' perceived behavioral intentions toward such cosmetics. This is affirmed by the fact that "Green Cosmetics" and "Pro-Environmental Belief" are part of this cluster, which makes it evident that the intentions of the consumers are greatly in line with their attitude toward sustainability and the environment (Szaban, 2023). The "Theory of Planned Behavior" is also used in this cluster, and it demonstrates that it is a widely employed model for predicting and explaining these purchase intentions (Acikgoz et al., 2023). This cluster places emphasis on psychological and behavioral attributes that may compel consumers to use green cosmetics.

5.2 Cluster 2 – emerging or declining themes

The second largest cluster is associated with the Theory of Planned Behavior, which is cited four times and connected with such keywords as Organic Personal Care Products. This cluster shows the importance of this theory for the research on consumer behavior regarding cosmetics with environmental influence. The theory is applied to analyse how the consumer's attitude, perceived Behavior control, and

subjective norm affect decisions to purchase organic and environmentally friendly products. The connection with "Organic Personal Care Products" indicates that this particular type of market can be analyzed using the model of the Theory of Planned Behavior, which helps to build a clear approach toward consumer actions based on their beliefs and intentions (Zollo et al., 2021).

5.3 Cluster 3 – motor themes

The third cluster refers to the Environmental Concern with related terms such as attitude. This cluster suggests that environmental consciousness is a major determinant of consumers' perception of green cosmetics products. Concern for the environment is one of the most popular topics of study among researchers, who aim to identify how such concern impacts consumers' perceptions and their buying behaviors. The presence of "Attitude" in this cluster on its part further reinforces the relationship between environmental concern and the favorable attitude that consumers display while approaching green products (Kumar and Pandey, 2023; Macheka et al., 2024). This cluster reveals an understanding of the importance that environmental values occupy in decision making to purchase green cosmetics.

5.4 Cluster 4 – niche themes

Based on this cluster, it was found that perceived quality is a key driver that influences consumers' decisions toward green cosmetics. This implies that even though the consumers may possess positive purchase intentions, this ultimately can be changed by a perception of the quality of the said product. This goes a long way in showing that while brands need to market their products as green, they must also make sure that the end products are as good as the claims made about them. Perceived Values is another cluster figure repeated twice. Based on this cluster, the authors have it that perceived value, whether economic, functional, or emotional, might be influential to consumers. In choosing green cosmetics, perceived value can, therefore, be measured by the extent of product effectiveness, the price of the cosmetics, and the self-satisfaction with using green products (Ahmed et al., 2022). This cluster goes further to depict the fact that the consumer decision making process is a complex phenomenon and that value perception is as important as quality and environmental factors.

Overall, the findings suggest that green consumer research needs to expand its scope by considering models other than the Theory of Planned Behavior. Although social media is becoming more prominent, little research has directly studied how it influences people's actions. Notably, experimental and mixed-method approaches are not common, indicating a lack of such techniques in the existing scholarship.

Beyond the empirical findings, theoretical saturation is visible in the dominant use of TPB across reviewed studies. While the Theory of Planned Behavior (TPB) dominates the study on green consumer, this assessment recognizes the necessity to expand theoretical boundaries by integrating various models such as the Value-Belief-Norm (VBN) theory, the Norm Activation Model (NAM), and Innovation Diffusion Theory (IDT). These outlines can better explain how values, emotions, social norms, and peer inspires the consumer's commitment to green cosmetics, exclusively amongst Gen Z and millennial clienteles.

6 Discussion

In addition to highlighting similarities in research on green cosmetics, the review also looks at theoretical saturation, differences in demographics and how digital influence is underutilized, suggesting ways for academia and industry to move forward. This review also provides an overview of thematic and publication trends and reveals adherence to TPB frameworks, thus indicating the necessity to explore more general theoretical and inter-disciplinary multifaceted models to gain insight into sustainable consumption under the green cosmetics context. For instance, Misesa et al. (2022) demonstrated that consumers' subjective norms and environmental views significantly drive their intent to purchase eco-friendly cosmetics, a finding echoed by Shimul et al. (2022), who further emphasized the influence of ecological motivation and environmental literacy on purchase propensity. Similarly, the work of Lavuri et al. (2022) highlighted that while LOHAS (Lifestyles of Health and Sustainability) tendencies may not directly influence attitudes, green advertising

and brand image do positively impact consumer perceptions and willingness to buy premium organic products. In the same regard, research has it that environmental concern has a positive impact on green brand trust when it comes to attitude in regard to green cosmetics (Natasha and Soelasih, 2023). Green cosmetics consumers are more likely to make a purchase if they have a favorable impression of the brand, are loyal to the company, and believe the product to be of high quality (AL-Haddad et al., 2020). Green cosmetics have a notably positive subjective norm that drives consumer purchase intent, as shown by a study (Ali et al., 2023; Shimul et al., 2022). Baltaci et al. (2025) investigated how consumer attitudes help determine the impact of environmental and human values on buying green cosmetics. Their research results align with research done earlier that highlighted the contribution of subjective norms and values to why people buy.

The studies reviewed also highlighted significant demographic variations in the use and perception of green cosmetics. Rani and Bharatwal (2022) found that young female consumers in Bhiwani District are well-versed in green cosmetics and view them favorably, yet there exists a knowledge gap concerning specific brands. This is supported by Kazançoglu and Köse (2024), who found that sustainability-conscious attitudes significantly shaped women's preferences across different age and income groups. However, the purchase intention of green cosmetics for young women in Vietnam is influenced by their knowledge, attitude, subjective norm, and self-efficacy, with self-efficacy as a mediator (Limbu et al., 2022b). Evidently, research confirms that women are more conscious about the environment than men and are willing to pay for environment-friendly products.

Šniepiene and Jankauskiene (2021) identified that while organic products for the face, body, and hair are popular among Lithuanian women, pregnancy-specific products see less use, emphasizing the need for targeted product information and reputable branding to enhance consumer trust. Research by Khan and Salim (2021) delved into the distinct purchasing patterns among Saudi women, revealing that professional women are more inclined toward green cosmetics due to health concerns, whereas students and housewives lack the necessary knowledge to make informed purchases. Similarly, Hinčica et al. (2024) reported that Central European women prioritized safety and ingredient transparency over branding when choosing natural cosmetics. This indicates the importance of educational initiatives to broaden the appeal of green cosmetics across different societal segments. Additionally, they discovered that working women prioritize brand recognition and are considerably more inclined to acquire cosmetics when they are conveniently situated in close proximity to their workplace. Šniepiene and Jankauskiene (2021) discovered that there is a demographic and gender-based difference in the consumption of eco-friendly beauty products.

The research indicates that "green" advertisement has a positive relationship with "green" brand image and "perceived consumer effectiveness" in influencing the customer attitude toward high-end organic beauty products (Lavuri et al., 2022). Nguyen-Viet and Nguyen (2024) studied consumer beliefs in Vietnam and observed that doubts about green advertising and animal welfare concerns strongly influence a person's trust, attitude and brand image. They showed that what people perceive as genuine green claims is very

important in influencing overall opinions on green beauty care items. The study by Hardianti et al. (2024) proves that advertising Avo skin products in Indonesia as "green" directly affects buying decisions and the belief that they are environmentally friendly. Just as proactive environmental strategies have been shown to drive sustainable innovation in the pharmaceutical industry across Asia (Ahmed et al., 2021), similar frameworks could be leveraged in the green cosmetics sector to strengthen organizational commitment and consumer trust. Sakhawat (2022) established that sensory marketing increases the probability of purchase with the target consumers by noting that MCs ought to target the preferences and values of certain demographics. Furthermore, AL-Haddad et al. (2020) showed that in Jordan, brand loyalty, brand awareness, and perceived quality significantly influence purchase intention, with strategic implications for cosmetic firms that want to leverage the green wave. In a similar line, Murwaningtyas et al. (2020) affirm the influence of celebrities on social media platforms regarding consumers' interest in environmentally sustainable beauty products. Numerous other studies approve that social media shapes the trust (Pitaloka et al., 2023; Pandey et al., 2024), yet others advise to beware of misrepresentation and false influencer bias (Hazra et al., 2024). This suggests a twofold role—where digital networks performs as both enablers and barriers to green purchasing. This contradiction highlights the need for brands to carefully manage credibility and consistency in digital messaging. Far more engaging as compared to traditional media, social media works as a medium between businesses and consumers, particularly in the marketing of sustainable products.

From the research done by Murwaningtyas et al. (2020), it is evident that there is a need for green cosmetics companies to enhance their internet presence in order to increase awareness, knowledge, and usage of environmentally friendly products among their target market.

The changes in trends and patterns and the formation of thematic groups of research on consumer perceptions and intentions for green cosmetics indicate that the research area is not only developing in-depth but also expanding in breadth. The continuous usage of the "Theory of Planned Behavior" in the extant literature mitigates its reliability in explaining consumers' intentions with regard to sustainable consumption. The rising importance of "Perceived Quality" and "Environmental Concern" is evident, which shows that the consumer decision-making process has become challenging in the green cosmetics market due to quality and environmental consciousness.

In addition to the identified key themes, it is necessary to note that other essential factors that determine the consumer intent and their ultimate buying behaviors toward green cosmetics include price sensitivity, the appeal of packaging qualities, perceived quality of the product, confidence on brand assertions, health concerns, and the expectations in terms of product enhancement of beauty. Although these drivers and barriers were mentioned throughout different studies, their synthesis as such in this review introduces some additional color into the acknowledgment of why the green purchasing gap still exists.

The appearance of the significant topic, "Pro-Environmental Belief", in the article signals a shift in the direction of the research, which is discovering the psychological and ideological aspects of consumer behavior. Over time, the growth of the field appears to be well aligned with the goal of sustainable development and eco-conscious consumption among consumers of cosmetics and may offer a more thoughtful and profound outlook for future research across the expanding idea of sustainable cosmetics and health care.

7 Theoretical and practical implications

The implication of the study results for environmentally friendly cosmetics business prospects and marketing can be summarized as follows. To be effective, several marketing strategies must be targeted with the aim of countering the existing barriers, such as cost and availability. Emphasizing the benefits of using environmentally friendly cosmetics to the health of consumers and the environment will make consumers act on value rather than price. Furthermore, establishing the availability and access to "green" beauty products through the major store types, including online shops that are preferred by beauty shoppers, will bridge the gap between belief and purchase. A need that requires more aggressive consumer education efforts in order to enhance knowledge of the benefits of green cosmetics. This entails offering clear descriptions of products as well as explaining the content of conventional beauty products, their impact on the environment, and other factors. Another way is educational campaigns; they can incorporate the use of social media and influencer advertising to reach out to others especially young people who are very vulnerable to change in what they see on the internet. It would also be important for researchers to look at how green value is perceived, along with how online trust plays a role, given that influencers and digital communities influence eco-conscious decisions. Coming up with standards for categorizing products as green or organic helps consumers to make informed decisions and develop trust in green brands. The findings of this research suggest several areas that could be targeted in future research.

This research contributes to the growing field of sustainable consumer behavior by showing that using the Theory of Planned Behavior does not fully explain green purchase decisions. It indicates that previous explanations for attitude-behavior inconsistency may be surpassed by including digital trust, influence from social media, and people's values toward green cosmetics in the discussion. The results from the literature analysis and topic study also suggest an increase in choices influenced by emotions and social cues. As a result, the Value-Belief-Norm, Innovation Diffusion, and Health Belief theories ought to be included in further research. Researchers are encouraged to experiment with longitudinal and experimental approaches because these methods are not frequently used to study evolving eco-conscious actions.

Furthermore, this review also highlights potential policy implications. Industry associations and regulatory bodies may be the key regulators in this regard with clear guidelines (and certification) elucidating what constitutes a green or organic cosmetic and in turn help consumers avoid confusion and shield against deception. These policies would build more consumer confidence and attract more uniform purchase attitudes toward achieving sustainability objectives.

8 Limitations of the work

Some limitations of this particular study include the comprehensiveness of the review of the existing literature. Firstly, the study makes use of secondary research data, hence adopting certain biases from the methodologies used in the source data collection. Further, the review is restricted to a study published in peer-reviewed journals, which might miss out on the findings from other kinds of studies that are not published or are still in progress. Furthermore, the green cosmetics market is growing fast and thus changing, so research may become stale in a short time. However, this paper still offers useful findings regarding the consumers' perceptions and intentions toward green cosmetics and a conceptual foundation for future research. Future studies could specifically investigate how perceptions of greenwashing affect trust and long-term commitment to green cosmetic brands.

9 Potential areas of future study

Future studies should examine how eco-conscious advertising and influencer involvement influence consumers' green buying habits in the long term. It is important to conduct more experiments and studies involving different methods to verify if psychological constructs really influence what people buy. Studies that look at cultural differences can assist in discovering how green consumer behavior varies across regions, especially in fast-developing markets. In addition, there is not enough study on Gen Z and male consumers, which could provide new strategies for widening the brand's reach. Future research could apply integrated models by combining the Theory of Planned Behavior with related theories, such as Value-Belief-Norm and Innovation Diffusion Theory, to understand how sustainable consumer behavior changes in digital spaces.

10 Conclusion

The findings imply that since sustainability remains relevant in both the market and society, it is expected that more research will be conducted on this subject in order to understand consumers' perceptions and attitudes toward green cosmetics. This research shows that awareness of environmentally friendly cosmetics, including natural and organic make-up and skin care products, has grown strongly in India. However, the fact remains that many consumers harbor positive attitudes toward these products, but the split between positive buying intentions and actual purchase decisions represents the so-called "green purchasing gap." While these factors have been identified as potential drivers of positive buying intentions, their impact is often blunted by factors such as price, availability, and packaging, which tend to exacerbate the "green purchasing gap." Taken together, the findings of this analysis not only confirm the growth of green consumerism research but also suggest actionable paths forward.

The authors also highlight that the marketing, regulation, and study of green cosmetics should be reconsidered. Instead of solely educating consumers, future actions should also work to build trust by using clear labels, showing where ingredients are sourced, and connecting with people through digital methods. A brand should regard sustainability as something important, not only an approach for attracting customers. The review, viewed from an academic standpoint, argues that there is little progress in the Theory of Planned Behavior and encourages using modern theories and conducting experiments in future research. It points out that young people use social media and influencers a lot, so trusting digital networks and communities may lead Gen Z to choose more green products. All in all, this review shows the status of green cosmetics today and points to future progress by urging both scholars and industry players to broaden their ideas and turn knowledge into effective behavior from consumers. This analysis accentuates the need for interdisciplinary research, while in unification of insights from environmental psychology, consumer marketing, and digital media studies to identify and address the complicated drivers of green cosmetics approval.

Author contributions

SD: Formal analysis, Writing – review & editing, Methodology, Writing – original draft, Data curation, Resources, Investigation, Visualization, Conceptualization, Validation, Software. AG: Visualization, Formal analysis, Methodology, Supervision, Writing – review & editing, Writing – original draft, Software. AS: Conceptualization, Validation, Investigation, Visualization, Supervision, Writing – review & editing, Writing – original draft, Software.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that no Gen AI was used in the creation of this manuscript.

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