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Research article

Does the purchase intention of green consumers align with their zero-waste buying behaviour? An empirical study on a proactive approach towards embracing waste-free consumption

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ABSTRACT

In recent years, emerging retail markets in cosmetics have transformed into green markets, as consumers demand more eco-friendly products. However, in scholarly literature, limited studies are available where researchers discuss green consumers' purchase intentions towards eco-friendly products and their relationship with zero-waste buying behaviour. This study is conducted to address the existing gap in current literature. An empirical investigation is carried out, focusing on individuals who use cosmetic products and are active followers of zero-waste beauty influencers on social media. Responses are gathered for data analysis with the help of partial least squares structural equation modelling (PLS-SEM). The results indicate that eco-friendly packaging, pro-environmental belief, and para-social interaction positively impact the altruistic motivation and purchase intention of consumers. Ultimately, these factors collectively contribute to the purchase of zero-waste cosmetic products. The findings of this study can provide valuable insights for policymakers and brand managers in the field of herbal cosmetic formulations. These insights can help in understanding the fundamental reasons that drive consumers to buy zero-waste cosmetic items, potentially leading to a decrease in ecological impact. Additionally, the study contributes to the theory of planned behaviour (TPB) by investigating consumers' purchase intention towards eco-friendly products and their zero-waste buying behaviour.

1. Introduction

In the traditional business system, the different stages of the production cycle generate diverse waste materials. Unfortunately, companies are minimally engaged in the existing waste management system [1]. Moreover, it is a challenging task for industries to neutralize these waste materials, as it requires extra costs to deal with products. Meanwhile, climate change and pollution have always been a topic of concern for Western and Asian governments, but in recent times, solid waste management has also emerged as a leading environmental problem [2]. Countries such as the USA, UK, Denmark, and Germany are making efforts to make appropriate policies and procedures for sustainable development while addressing the issue of waste management. In addition, Asian countries such as

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India and China have also included sustainability goals such as reducing poverty, promoting sustainable agriculture, sustainable management of water and sanitation and combating climate change (global warming) in their vision documents [3]. Training individuals to use resources efficiently is now a priority [4]. As a result, different industries are leaning towards the zero-waste concept, where products can be reused, a practice that is consistently valued and appreciated. Interestingly, the "zero waste" concept is widely accepted because it stimulates sustainable manufacturing and consumption [5]. Zero waste is defined as "*the conservation of all resources using responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health*" [6]. The "zero waste" concept has gained significant popularity within the cosmetics industry as well. It aligns with the broader goals of adopting a waste-free lifestyle and a minimalist approach or making personal consumption choices that prioritize waste reduction [4]. This trend is not just about using products that generate less waste, but also about encouraging consumers to make thoughtful choices that have a positive impact on the environment. Embracing the zero-waste philosophy in cosmetics involves selecting products with minimal or recyclable packaging, supporting brands that prioritize sustainable sourcing and production methods, and opting for products that can be repurposed or refilled instead of discarded after use. This shift in mind set and consumer behaviour contributes to the preservation of natural resources, reduction of pollution, and overall ecological well-being. Siita, the world's first zero waste company [7] is being referred to as 'the Apple of cosmetics' and is regarded as a model case for sustainability.

According to Statista [8], the global trade of organic cosmetics will increase to USD 54.5 billion by 2027. India, with sales worth approximately $14 billion in beauty and personal care, rank eighth globally. India's cosmetic market will likely grow threefold by 2025 [9]. Furthermore, to increase the customer base, primarily, cosmetic brands are either going gender-neutral [10] or promoting zero-waste packaging. India is characterized by its rapidly growing economy, with a vast population of young people [11] [12]. These young people are more concerned about their appearance, so they prefer to buy cosmetic products [13]. Secondly, organizations use celebrity endorsements or collaborate with influencers who are active on social media platforms. By associating well-known individuals or popular influencers with their zero-waste cosmetic offerings, companies can tap into the influencer's existing follower base. It is believed that para-social interaction helps consumers feel a personal connection with these influencers through various media channels, meaning that they might be more inclined to trust their recommendations and adopt their preferences [14],15].

Earlier studies advocate that Indian consumers are aware of the benefits of ecological practice and environmentally friendly behaviour [16,17,]. However, there is still significantly less empirical research on the cosmetics/personal care product sector. Relevant factors (such as marketing approaches, cosmetics packaging, and para-social interaction) align with consumer preferences (pro--environmental belief and altruistic motivation) and support the overall trend towards sustainable consumption [15,18,19]. However, there is very limited empirical evidence that investigates the relationships between cosmetic packaging, para-social interaction, pro-environmental belief and altruistic motivation. Additionally, there is a surge of awareness videos and posts featuring zero-waste cosmetic products on social media; these serve as a source of motivation for this research. Considering its importance, the present study discusses the following research question.

RQ1. What is the consumer's awareness of the zero-waste concept in cosmetic products?

RQ2. What factors (antecedents) influence the zero-waste buying behaviour of cosmetic products?

To answer the above research questions, the current study aims to conduct a survey targeting cosmetics consumers who are active followers of zero-waste beauty influencers on social media. The variables used in the study are cosmetic packaging, para-social interaction, pro-environmental belief, and altruistic motivation. The present study aims to contribute to existing literature in the following ways. Firstly, the study aims to contribute to the knowledge of zero-waste buying behaviour in the product category of "cosmetics/personal care products." Secondly, the findings may be helpful to marketers, scholars, and cosmetic manufacturers to incorporate attentive strategies regarding consumer purchase intention towards zero-waste products and inspire them to decrease the global ecological footprint. The uniqueness of the current study lies in the fact that the zero-waste concept in the cosmetics industry encompasses a holistic approach that distinguishes it from the traditional production model; hence, the study focuses on the behaviour shift of consumers, such as their awareness and mindful sourcing of ingredients in their cosmetic products.

The current study is presented in the following manner. Section 2 provides an overview of previous literature on the concept of zero waste. Section 3 discusses the theoretical background concerning all the variables of this study, helping to develop the hypotheses. Section 4 elaborates on the methodology used in the study, with a thorough discussion of the analysis and results in section 5. Section 6 provides theoretical and practical implications, followed by conclusions drawn from the research.

2. Literature review

"Green consumers" [20] purchase eco-friendly products because they are worried about the environment; they are the major motivators for the green industry [21,22 The green consumer trend of buying zero-waste products (such as cosmetics) is increasing, with studies investigating whether there is an urgent need for herbal cosmetics instead of chemical cosmetics [23]. Research explores the factors that influence cosmetic consumers' brand loyalty [24].

In recent times, the "zero waste" concept has touched the heart of the cosmetic industry. Now, consumers demand zero waste or green cosmetic products, which is considered an individual's eco-conscious choice [4]. Zero-waste cosmetic products are designed to generate minimal waste throughout their lifecycle. This involves the reduction or elimination of packaging, utilization of biodegradable or compostable materials, and adoption of eco-friendly manufacturing processes. The concept aligns with the principles of the circular economy, where products are designed to be reused, repaired, or regenerated rather than discarded after a single use [25]. There are several emerging areas in zero-waste cosmetics. To develop environmentally friendly processes that produce zero waste, bio

Table 1
Relevant studies[18,19,37–39,44,45,51,59–63] [61,63,64] showing methodologies related to the zero-waste concept.

Author/s	Year	Country	Methods	Key Findings
Nouri et al.	2023	Iran	Quantitative survey	Green cosmetic consumers have different attitudes and beliefs which influence their choice of buying zero-waste products.
Phogat and Singh	2023	–	Qualitative	People's preferences for buying a product increase if it's endorsed by a celebrity in the cosmetics industry.
Kumar & Pandey	2023	India	Quantitative survey	Highlights the significance of social media concerning altruistic motivation, egoistic motivation and subjective norms. Furthermore, these factors play a role as antecedents to green purchase intention and behaviour.
Alam et al.	2023	Kingdom of Saudi Arabia	Quantitative survey	Social media influences consumer intent and affects both altruistic and egoistic values, both of which contribute positively to the intention to make purchases.
Lavuri et al.	2023	India, China	Quantitative survey	Altruistic values have a positive influence on sustainable consumption behaviour.
Peyton & Purwanegara	2023	Online	Qualitative survey	The study findings identify the customer's obstacles to purchasing sustainable beauty products; these encompass challenges in finding appropriate skincare products, the mismatch between product cost and quality, limited brand trust, low product quality, inadequate product hygiene, and insufficient management of production processes by companies.
Nicolau et al.	2022	US	Quantitative survey	This study analyses consumer reusable products by taking the example of a coffee cup.
Moshood et al.	2022	Malaysia	Quantitative survey	Explains the role of synthetic to biodegradable plastic.
Watanabe et al.	2021	France and USA beauty retailers	Used social media (Twitter) network to examine the activities of Sephora and Ulta beauty using NodeXL Software	Explores the communication flow from social networks. They use social media networks for the investigation of network activities.
Pop et al.,	2020	Romania and Hungary	Quantitative survey	Looks at the influence of social media as a channel for information dissemination, along with the effects of external elements on moulding consumer drive within the realm of developing intentions to buy eco-friendly cosmetics.
Ewadh et al.	2020	Iraq	Three step methodology	Discusses solid waste management, focusing on zero waste products for reduction in solid waste and its implementation in Iraq.
Ceelen Thomas	2020	–	Netnographic study	Mentions the importance of research on zero-waste consumers.
Lee et al.	2019	South Korea	Experimental research, data collected using Amazon's Mechanical Turk (Mturk) services	Authenticity contributes to the formation of social and emotional advantages, which subsequently influence attitudes and intentions regarding purchasing decisions.
Harun et al.,	2019	Malaysia	Qualitative study using interview method	Findings reveal the factors (management, financial, enforcement and social behaviour) that influence the implementation of the zero waste concept.
Liyanage et al.	2019	–	Comprehensive literature review	The findings recognize the approaches and challenges associated with implementing the zero waste concept in the construction sector. The paper also raises concerns about solid waste management.

nanotechnology, an emerging field of science, is dedicated to creating sustainable solutions. It aligns with the pressing need for a cleaner and healthier planet [26]. One noteworthy application of this science is in the realm of nutritional eco-cosmetics. These are products that can be applied externally or ingested orally to enhance personal care. Bio nanotechnology has emerged as a crucial player in this sector, driving innovation and progress. The integration of bio nanotechnology enables the formulation of products that not only cater to cosmetic needs but also adhere to eco-friendly principles [27]. In the pursuit of sustainable cosmetics, researchers are exploring a rich array of natural active ingredients. These elements offer a potent basis for developing nutritional eco-cosmetics that are aligned with environmentally conscious policies. A central tenet of this approach is the promotion of a "green policy of growth," which champions the ideals of zero waste and zero greenhouse gas emissions. By tapping into the potential of these natural ingredients, researchers aim to establish a paradigm shift in the cosmetics industry, redefining success in terms of environmental impact and sustainability [28]. An emphasis on the younger generations is crucial, as they are poised to become the driving force behind future innovations. Their collective desire to effect positive change on a global scale shapes their preferences for products that embody principles of sustainability. The demand for these products aligns with their ideals of zero waste [29]. Additionally, biomaterials play a pivotal role. They contribute to the creation of beauty films, tissues for beauty masks, and biodegradable packaging. These materials not only serve cosmetic purposes but also aid in maintaining a pure environment with minimal waste. By adopting biomaterials, the cosmetic industry can actively contribute to the preservation of a cleaner ecosystem while catering to the demands of environmentally conscious consumers [30,[31,32],].[28]

To reiterate, the individual's awareness of the consequences of using synthetic cosmetics increases their pro-environmental beliefs. In addition to having a personal belief in buying zero-waste cosmetic products or their eco-friendly packaging, social media and other factors also influence buying behaviour, [5], 25 [19],33].[. However, several factors are found to influence purchasing behaviour towards green cosmetics or personal care, such as environmental concerns[34] social factors such as family, friends [35], information, level of confidence and convenience [36]. Ceelen-Thomas [37] emphasizes that there is limited research exclusively on zero-waste consumers. In addition, the relevant literature lacks an exploration of the motivators of zero-waste buying behaviour.

Some studies focus on the zero-waste concept, such as Harun et al. [29]. They study the application challenges of the zero-waste concept in Malaysia, classifying the implementation challenges into four categories: enforcement aspects, management aspects, financial aspects, and behaviour of society. Similarly, Ewadh et al. [38] discuss solid waste management, focusing on zero-waste products for reduction in solid waste and its implementation in Iraq. Liyanage et al. [39] conduct a literature review to delve into the concept of zero waste. Their research primarily centres on reducing waste from construction and demolition activities within a developing construction industry. The study comprehensively outlines the strategies to achieve zero waste, identifying the factors that facilitate its implementation, and discussing the challenges that need to be overcome. Shifting gears to another field, various investigations within the cosmetics product category also extensively examine different facets of the subject matter. Some of the cosmetic product category studies focus on various aspects. For instance, Ajitha and Sivakumar [40] study the value aspects of luxury cosmetic brands and their impact on women's consumer attitudes and usage behaviour. Silhouette-Dercourt[41] investigates the shopping behaviour of ethnic consumers and how second-generation consumers opt for and buy in cosmetic retail outlets. Ghazali et al. [42] study consumer repurchasing habits of organic personal care products. Lee et al. [43] explore the effect of attitude toward the product and authenticity on perceived value and purchase intention in South Korean consumers of cosmetic products. Watanabe et al. [44] use social media (Twitter) networks to investigate network activities to understand the communication flow from social networks.

Hence, a major research gap based on the literature review is clear. Firstly, there are very few studies carried out in the Indian context to study customer zero-waste buying behaviour, especially among the young generation in emerging cosmetics/personal care/skincare hygiene products in retail markets [45,46. Secondly, previous studies in different industries [39,47–50 focus on the challenges of the zero-waste concept and how difficult it is to implement in future studies [51]. Thirdly, there is still a lack of empirical evidence, as zero waste in the cosmetic industry is in the nascent stage. Lastly, previous studies focus on women consumers [40,52,53,54, and not on other genders. Hence, this research uses a gender-neutral concept. Additionally, this study focuses on the awareness of the zero-waste concept among consumers regarding cosmetic products and antecedents of zero-waste buying behaviour of cosmetic products by providing empirical evidence. As discussed in the introductory section, based on the literature review, some of the factors that influence consumer zero-waste buying behaviour in cosmetics are cosmetic packaging, para-social interaction, pro-environmental belief, and altruistic motivation.

Post-COVID-19 consumers have developed a certain kind of mindset due to foreseen trauma in society; consumers now perceive information or their environment in a different way. Many have experienced anxiety and emotional impact [55], while other specific factors are influential. Consumer spending is one of the factors that we have chosen to elucidate our concept of zero waste and consumer demand recovery and trends post-COVID-19. Additionally, how have consumers adapted post-COVID-19 in terms of beauty and personal hygiene? One of the trends is Do it yourself (DIY) beauty and personal care. [56–58]

Those who are aware of DIY are using zero-waste cosmetics. The factors that influence this trend arise from the COVID-19 humanitarian crisis when parlours and salons were closed due to physical contact concerns. Consumers are now concerned about their finances and are reducing the amount they save as a consequence. This has led to a rise in the popularity of do-it-yourself (DIY) practices. Hence, nail care, DIY hair colouring and care in other beauty categories are finding new customers [55] in the US and UK. Another term that is trending post-COVID-19 is frugal beauty, i.e. economical or on budget. In India, several regions and states were using the DIY concept before COVID-19, but post-COVID-19, there is an enormous demand for these DIY kits, frugal beauty products and zero-waste products. Some of the important studies are shown in Table 1.

3. Theoretical framework and hypothesis development

3.1. Pro-environmental belief and zero waste buying behaviour

The behaviour of an individual who is least harmful to the environment or could be advantageous to the environment is regarded as pro-environmental behaviour [65]. On the other hand, Pickett-Baker and Ozaki [66] assert that values are continuing beliefs that specific behaviour is beneficial and involves valuing the environment. These environmental values play a major and foremost role in pro-environmental behaviours, as values influence an individual's belief. As a result, there is an impact on the personal norm that leads to the pro-environmental behaviour of the consumer [18,67]. Similarly, Quoquab et al. [68] confirm that these beliefs directly influence the personal norms of consumers that impact their green purchase behaviours towards cosmetic products. Nouri et al. [62] find that consumers' ecological behaviour (consumer sensitivity, vigilance and responsiveness towards ecological concerns and environmental forces) influences green purchase behaviour and intention. Green cosmetic consumers have different attitudes and beliefs that influence their choice to buy zero-waste products. Additionally, pro-environmental behaviour, which is also known as green behaviour [69], is well defined as "the purchase, use, and disposal of personal and household products that have an environmental impact" [67]. Moreover, these actions of an individual are usually environmentally friendly and can be categorized into behaviours - recycling and reusing, consumer, transportation, and conservation use [70]. Meta-analysis shows that there is an important relationship between green behaviour and green purchase behaviour [71]. A growing body of literature concludes that pro-environmental behaviour influences green purchase behaviour [69,72]. However, Pickett-Baker and Ozaki [66] report that most consumers are unable to identify green products but have faith in those products that are produced by green companies. Therefore, the pro-environmental beliefs of consumers are influenced by their confidence in green products. Thus, the following hypothesis is developed.

H1. Pro-environmental belief positively influences the zero-waste buying behaviour of youth.

3.2. Cosmetic products packaging and altruistic motivation

Packaging choices can influence consumer behaviour based on their environmental and ethical values. In other words, if a person already values altruism, they are more likely to let that value guide their decision to buy eco-friendly products 45,73] and help in sustainable consumption behaviour [46]. Martinho et al. [74] highlight the crucial role of the packaging industry in environmental preservation and the innovation of eco-friendly packaging as a means to achieve a harmonious balance between economic growth and environmental progress. Presently, consumers are embracing sustainable consumption patterns to contribute to environmental conservation [75]. Consistent with this idea, Van Birgelen et al. [76] demonstrate that environmentally friendly packaging exerts a behaviour impact on brand perception and the willingness to make purchases. Contemporary consumers are growing more aware of the packaging used for everyday items and its ecological ramifications[77]. The strategy of a company to introduce sustainable packaging is logically recognized, as consumers are displaying growing concern towards sustainability and environmental problems [78] However, Ceelen-Thomas [37] finds that some buyers face difficulties in finding zero-waste products at retailers and suggest that initially, retailers need to check current packaging of their products and should analyse whether it is appropriate to cater to this market. Subsequently, they should examine how they can make it more zero waste friendly. On the other hand, Amberg and Fogarasy [79] insist that environmentally conscious consumers are more interested in natural ingredients and sustainable packaging while buying cosmetics. Altruism plays an important role in shaping consumer attitudes, which in turn, have an impact on consumer intentions to purchase green products [80]. One such green product is personal care or cosmetics products. Additionally, Lin et al. [81] emphasize that consumers use product attributes such as packaging to influence their purchase behaviour. Yadav [82] reports that altruistic values positively influence consumer purchase intention. Altruistic consumers appreciate brands that transparently convey their commitment to ethical and sustainable practices through packaging. It is considered that altruistic values motivate an individual to purchase green products [83]. Therefore, it is possible that the packaging of products may motivate young people to buy cosmetic products. Hence, the following hypothesis is formulated.

H2. There exists a relationship between cosmetic product packaging and altruistic motivation.

3.3. Para-social interaction and altruistic motivation

The findings confirm that social media has an impact on consumer intent, along with both altruistic and egoistic values. Additionally, both of these value orientations have a notable effect on their green purchase intention [59]. Motivation to share information and assist others on social media is behaviour by altruistic motives [84], [19]. Moreover, research shows that content shared on social media platforms can effectively enhance consumers' inclination to purchase environmentally friendly products. According to Zahid et al. [85], influencers on social media can contribute to the environmentally conscious behaviour of consumers, as positive word of mouth is a crucial non-paid promotional tool to increase environmental consciousness. Para-social interaction describes the relationship between performer and viewer; this is interpreted as a real interpersonal relationship despite its unreal trait [86]. However, it is found that para-social interaction can positively influence the intentions to purchase cosmetic products [14], regarded as one of the most appropriate frameworks for studying the one-sided relationship between celebrities [87] and fans. This has been further extended to YouTube personalities by Lee and Watkins [60]. Furthermore, organizations are also using several methods for zero-waste cosmetics sales promotions. One of these methods is celebrity endorsements or influencers on social media. Phogat and Singh [conduct a descriptive study to examine the effectiveness and usage of celebrity endorsements in the cosmetics industry. As far as altruistic

motivation is concerned, social media has the power to form altruistic motivation [19]. It is found that interaction on social media poses a significant positive influence on the altruistic motivation of consumers and can transform the environmental concern of consumers [19, 85]. Therefore, we propose that with the help of social media, a para-social interaction relationship between influencers and youth is developed. Hence, the following hypothesis is formulated.

H3. There exists a relationship between para-social interaction and altruistic motivation.

3.4. Pro-environmental belief, altruistic motivation, purchase intention and zero waste buying behaviour

In previous literature, some studies [86,88] uncover a positive impact of an individual's values, such as altruism, benevolence, and universalism, on the purchase behaviour of organic products and their actual purchase. Similarly, several theories support consumer green purchase behaviour; for example, the altruistic theory of motivation affects an individual's intention to buy green products [89 [90]. In another study, the "theory of planned behaviour" is applied to evaluate young consumers' purchase intention to buy green products [[91]]. Furthermore, the "motivation–ability–opportunity–behaviour model" [92] is framed for the study of consumer behaviour. The theory further states that motivation leads to essential behaviour if the artist possesses the capabilities and opportunities to express the expected behaviour. Martinho et al. [74] examine the factors affecting consumer purchasing intention and recycling behaviour concerning sustainable packaging. They find that green purchasing and environmental awareness are important attributes in purchasing sustainable packaged products. Green cosmetic consumers have different attitudes and beliefs that influence their choice to buy zero-waste products [62]. Additionally, altruistic motivation is found to be an antecedent to green purchase intention and green behaviour [45].

Kollmus and Agyeman [93] explain that external factors (e.g. social, cultural), demographic factors and internal factors (e.g. values, awareness and knowledge) motivate an individual to act pro-environmentally. Kim [35] reports that ecological belief is exhibited by people who have strong altruistic values, which transform consumers to demonstrating pro-environmental behaviour. Furthermore, Morais et al. [94] examine sustainable consumption behaviour by exploring altruism to provide ecological evidence to environmentally concerned companies that aim to produce less waste. They find that strong altruism enables high engagement in zero-waste buying behaviour. Hence, considering the existing research on zero-waste buying behaviour, the study proposes the following.

H4. There exists a relationship between pro-environmental belief and altruistic motivation.

H5. There exists a relationship between altruistic motivation and zero-waste-buying behaviour of cosmetics.

It is reported that motivation influences an individual's intention to act [95]. However, the willingness to purchase organic products is known as green purchase intention; these intentions represent the factors that affect purchase behaviour [96]. An increasing number of studies show a direct relationship between purchase intentions and buying behaviours [11,97,98][99], [17,82, 100,101]. According to the motivation-opportunity-behaviour model, if consumers have the motivation and required resources to conduct the desired behaviour, then they are likely to show the expected behaviour. Additionally, Ali et al. [102] report a strong positive relationship between food labels, organic food and purchase intention for sustainable waste-to-value foods, promoting a circular economy. Hence, considering the above arguments, the following hypotheses are devised.

H6. There exists a relationship between the altruistic motivation of youth and purchase intentions of zero-waste cosmetics.

H7. There exists a relationship between purchase intentions and zero-waste buying behaviour of cosmetics.

Fig. 1 shows the proposed conceptual model for the study.

4. Research methodology

To accomplish the stated research objectives and to test the conceptual model, pilot testing ($n = 35$) is performed in which data collection from young people in India is conducted by using a structured questionnaire. For the sample size estimation, a G*power

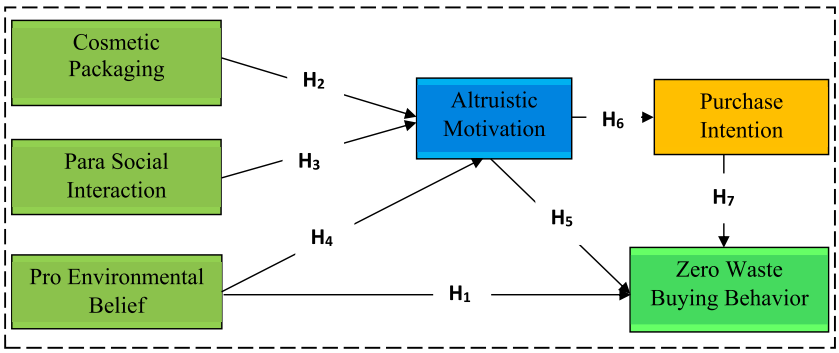

Fig. 1. Conceptual model.

analysis is conducted. Those young people who showed awareness of zero-waste cosmetics are included in the data analysis. The measurement and structural model validation are checked, and hypothesis testing is performed. The following research framework is used in the study (shown in Fig. 2).

4.1. Questionnaire design

To collect the final data for the current study, a structured questionnaire is designed that encompasses two sections. Section A comprises demographic details such as age, gender, marital status, awareness of zero-waste cosmetics and employment status. Section B comprises the measure of the construct used in the study. The final questionnaire is used for data analysis based on the suggestions received from respondents regarding language and constructs.

4.2. Variables and measurement

Para-social interaction is measured using the four-item scales of Sokolova and Kefi [15]. A three-item scale by Kim et al. [103]is used to analyse pro-environmental beliefs. The altruistic motivation is assessed using four items from Goldsmith et al. [104]. Cosmetics packaging is estimated by utilizing three items used in the study conducted by Prakash et al. [105]. Purchase intention is analysed by using three items from Chin et al. [106]. Zero-waste cosmetic buying behaviour is quantified by employing five items from the scale suggested by Khare [107] after some modifications suggested by an expert in the field. Additionally, a five-point Likert scale is applied to measure these items, ranging from 1 to 5, representing "strongly disagree" to "strongly agree". Table 2 exhibits all the constructs along with their respective items.

4.3. Sampling and sample size

Data is collected between February 2022 and April 2022, with a total of 426 completed responses received. The response rate is 60.8 %. A total of 378 completed questionnaires are used for the analysis, with the remaining 48 discarded due to incomplete information or because participants were not aware of the zero-waste cosmetics. 378 is an acceptable sample as per the PLS-SEM's "10 times rule" method [109]. Furthermore, the suggested minimum requirement of sample size is also estimated using Chin's [110] suggested rule of thumb, i.e. power analysis by G*Power software version 3.1.9.7 [111]. The output of the analysis suggests a sample size of 363; as the study uses a sample size of 378, this satisfies the minimum sample size requirement.

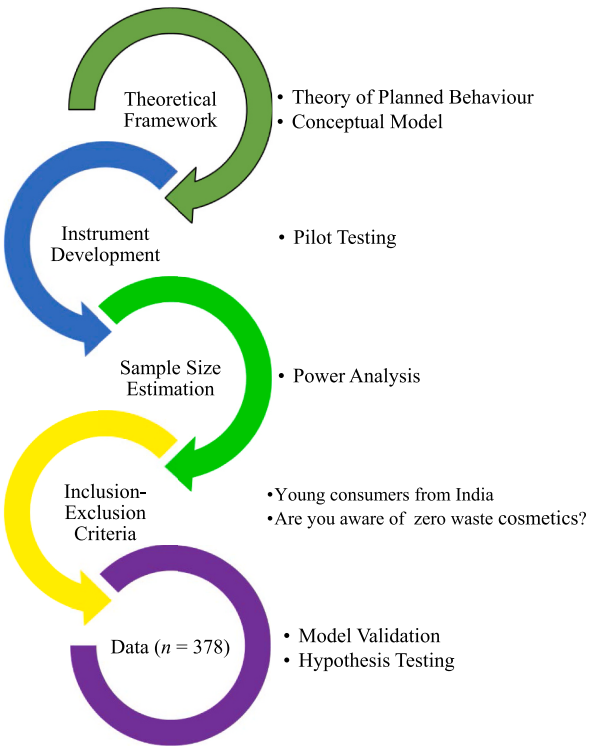

Fig. 2. Research framework.

Table 2
Constructs and respective indicators, loadings, convergent validity, and reliability estimates.

Constructs	Item	Measure	Item loading	Alpha	CR	AVE
Cosmetic Packaging (CP)	CP1	"It's easy to find plastic package-free cosmetics products"	0.95	0.797	0.90	0.82
	CP2	"It's easy to find eco-friendly packaged cosmetic products"	0.863			
Para-social Interaction (PSI)	SM1	"My favourite YouTube beauty influencer makes me feel comfortable as if I am with my friends"	0.926	0.908	0.94	0.79
	SM2	"I miss watching my favourite beauty influencer on YouTube when she or he is not uploading videos"	0.926			
	SM3	"I would like to meet my favourite YouTube beauty influencer in person"	0.796			
	SM4	"When the YouTube beauty influencer shares a viewpoint about a sustainable cosmetic product, it helps me make up my mind about the brand"	0.889			
Altruistic Motivation (AM)	AM1	"I buy products that have been ecologically produced because of ethical interest"	0.89	0.886	0.921	0.744
	AM2	"My ethical values match with the environmental preservation of green cosmetic brand"	0.797			
	AM3	"I consider that humans must maintain a balance with nature to survive"	0.875			
	AM4	"While purchasing cosmetics products, I focus on environmentally friendly or natural cosmetics"	0.884			
Pro-environmental Belief (PB)	PB1	"I am willing to participate in events that promote the environment"	0.89	0.89	0.937	0.831
	PB2	"I believe that having a sense of responsibility towards environmental problems is crucial"	0.894			
	PB3	"I believe that the moral obligation to preserve and care about the environment is important"	0.951			
Purchase Intentions (PI)	PI1	"I feel happy in purchasing zero waste cosmetic products"	0.81	0.774	0.885	0.795
	PI2	"I always intended to buy green cosmetics"	0.966			
Zero Waste Buying Behaviour (ZB)	ZB1	"I prefer to buy cosmetic products with reusable packaging"	0.691	0.884	0.917	0.690
	ZB2	"I always try to buy products with less chemical ingredients"	0.762			
	ZB3	"I try to buy cosmetic products that are free from chemicals or have less chemicals even though they are more expensive"	0.832			
	ZB4	"I always buy biodegradable cosmetic products"	0.933			
	ZB5	"I always refrain from buying cosmetic products with chemical ingredients"	0.911			

Note*: "For reliability (CR > 0.70), discriminant validity (MSV < AVE), and convergent validity (CR > AVE>0.50)". * [108].

4.4. Respondent profile

Out of 378 respondents, 181 (48 %) are between the ages of 15 and 21, with 197 (52 %) between the ages of 22 and 29. A total of 216 (57 %) of the respondents are female, while 162 (43 %) are male. A total of 302 (80 %) are unmarried, 76 (20 %) are married. A total of 222 (59 %) of the respondents are unemployed, while 156 (41 %) are employed. 42 (11 %) are not sure about zero-waste cosmetics, while 336 (89 %) are aware. A total of 107 (28 %) are from rural areas of India, while 271 (72 %) are from urban areas. Further gender-based area wise analysis shows that most respondents (men) from rural areas are not sure of the zero-waste cosmetics they are using.

5. Analysis

The partial least square equation modelling technique is applied by using SmartPLS 3.3.2. PLS, a variance-based method, is used for complex models and smaller samples. Firstly, exploratory factor analysis is conducted to check unidimensionality for measurement model assessment. Then, a reliability test is performed to check the internal consistency of the dimensions of the study by using Cronbach's alpha and composite reliability tests. To check the validity of the variables, factor loading is used to ascertain variable reliability. After this, the convergent validity test is performed in which measurements are made by evaluating the "average variance extracted" (AVE). Next, the evaluation of discriminant validity is performed by using the Fornell-Larcker criterion, cross-loadings, and $HTMT_{0.85}$ criterion. The weights of an indicator and variance inflation factor are used to evaluate indicator validity, with construct validity assessed using construct correlations. Tables 2 and 3 show the reliability and validity of the model. Hair et al. [112] recommend that the values of composite reliability must be above 0.7 to be considered reliable. For ZBI, it is 0.691, which is also

Table 3
Discriminant validity (Fornell-Larcker criteria).

	AM	CP	PB	PI	PSI	ZB
AM	**0.862**					
CP	0.447	**0.908**				
PB	−0.320	−0.397	**0.912**			
PI	−0.122	−0.291	0.557	**0.891**		
PSI	0.341	0.252	−0.039	−0.083	**0.886**	
ZB	−0.054	−0.264	0.506	0.482	−0.094	**0.831**

acceptable [98]. The composite reliability value of each construct is presented in Table 2; these are 0.9 for cosmetic packaging, 0.93 for pro-environmental belief, 0.94 for para-social interaction, 0.92 for altruistic motivation, 0.88 for purchase intention and 0.91 for zero waste buying behaviour. The results show that all factors have more value than satisfaction. The AVE value is 0.82 for cosmetic packaging, 0.83 for pro-environmental belief, 0.79 for para-social interaction, 0.74 for altruistic motivation, 0.79 for purchase intention and 0.69 for zero waste buying behaviour. All measures have a high level of convergent validity (above 0.5 [113]). The discriminant validity is checked using the Fornel-Lacker criteria (see Table 2). Additionally, the values of the allheterotrait-monotrait ratio of correlations (HTMT) are found to be lower than 0.85; this is recommended by Henseler et al. [114]to be acceptable. Hence, based on the $HTMT_{0.85}$ criteria, it establishes discriminant validity.

5.1. Structural model evaluation

The structural model assessment is performed by assessing the model (using a coefficient of determination (R^2), effect size (f^2), path coefficients and T value, standardized root mean square residual, predictive relevance (Q^2), and the goodness-of-fit index). Furthermore, collinearity is analysed with the help of variance inflation factor (VIF) values. As per Hair et al. [108], the acceptance value of VIF values should be less than 3. With the help of the results shown in Table 4, the collinearity issues are abdicated for the exogenous constructs, as all its values are below 3. For PLS-SEM, a full collinearity assessment approach is taken into consideration to detect any common method bias [115]. For this, it is verified that all VIF values must be below the threshold of 3.3 [108], indicating that common method bias is not associated with the model [115]. In PLS-SEM, collinearity statistics (VIF) are used to check common method bias (CMB), in which inner VIF values are found to be less than 3.3 (as shown in Table 4). This signifies that the study data does not have collinearity and hence is free from common method bias. Additionally, we check for common method bias through Harman's one-factor test, wherein if the total variance for a single factor is less than 50 %, it suggests that CMB does not affect the data. Hence, there is no issue with common method bias in this dataset because the amount of variance explained by a single factor is only 30.297 %, much less than the recommended threshold of 50 % [116]. Furthermore, the study uses the bootstrapping method (5000 sub-samples) to analyse the model. This method is used to evaluate the significance of the outer loadings of the formulated hypotheses. The outer loadings and their values are greater than 0.7, at a level of significance of $p < 0.001$.

In Table 4, the coefficients of the direct and indirect paths disclose that the relationship of the structural model is statistically significant. Although an *R* square value of more than 0.26 is considered a large effect, if it is above 0.13, then it is taken as a moderate effect; lastly, if the R square value is greater than 0.02, then it is considered a small effect [26]. The structural model consists of two target constructs: altruistic motivation and zero waste buying behaviour; the R square values are 0.285 and 0.324, respectively. This concludes that para-social interaction, pro-environmental belief and cosmetic packaging explain 28.5 % of the variance in altruistic motivation. Pro-environmental belief, purchase intention and altruistic motivation explain 32.4 % of the zero-waste buying behaviour variance. This confirms the model-data fit. Furthermore, Stone-Geisser's *Q2* value is examined to measure the model's predictive relevance by using the blindfolding procedure [112]. This value is greater than zero, indicating predictive relevance. Hence, in this model, *Q2* values of 0.199 and 0.210 for the constructs altruistic motivation and zero waste buying behaviour are obtained, verifying the predictive relevance of the model.

The results of the path coefficient and hypothesis testing are presented in Tables 5 and 6. The path values of PB > ZB, where the *p* value is 0.000 and the t value is 6.009, validate the positive relationship between pro-environmental belief and zero waste buying behaviour; this supports hypothesis 1. Similarly, hypothesis 2 is also supported by values of path CP > AM, where the *p* value is 0.000 and the *t* value of 5.632; this confirms the relationship between cosmetic packaging and altruistic motivation. The relationship between para-social interaction and altruistic motivation is confirmed by the path values of PSI > AM, in which the *p* value is 0.000 and the *t* value is 5.017; this supports hypothesis 3. Hypothesis 4 is also supported by the path values of PB > AM, with a *p* value of 0.000 and a *t* value of 3.788, confirming the relationship between pro-environmental belief and altruistic motivation. The path values of AM > ZB, in which the *p* value is 0.011 and the t value is 2.536, support hypothesis 5 and prove the relationship between altruistic motivation and zero-waste buying behaviour. Similarly, path values of AM > PI, where the value of *p* is 0.012 and the *t* value is 2.523, prove the relationship between altruistic motivation and purchase intention, thus supporting hypothesis 6. Lastly, hypothesis 7 is also supported by the path values of PI > ZB with a *p* value of 0.000 and a *t* value equal to 4.937, proving the relationship between purchase intention and zero waste buying behaviour.

where O is the original sample, M is the sample mean, and STDEV is the standard deviation.

The standardized root mean square residual (SRMR) values of the saturated model are 0.088; this confirms the model goodness of fit with an acceptable threshold limit (between 0 and 1).[112,114] Therefore, it verifies that the model of the current study can be

Table 4
VIFs.

	AM	CP	PB	PI	PSI	ZB
AM				1.000		1.120
CP	1.272					
PB	1.193					1.599
PI						1.457
PSI	1.073					
ZB						

Table 5
Path Coefficients (Mean, SD, *t* value).

Path	O	M	SD	*t* - value	*p* value
PB - > ZB	0.381	0.383	0.063	6.009	0.000
CP - > AM	0.308	0.309	0.055	5.632	0.000
PSI - > AM	0.256	0.258	0.051	5.017	0.000
PB - > AM	−0.188	−0.186	0.050	3.788	0.000
AM - > ZB	0.102	0.102	0.040	2.536	0.011
AM - > PI	−0.122	−0.122	0.048	2.523	0.012
PI - > ZB	0.283	0.284	0.057	4.937	0.000

Table 6
Results of hypotheses tests.

Hypotheses	Path	*P* Values	Decision
H1	PB - > ZB	0.000	Accepted
H2	CP - > AM	0.000	Accepted
H3	PSI - > AM	0.000	Accepted
H4	PB - > AM	0.000	Accepted
H5	AM - > ZB	0.011	Accepted
H6	AM - > PI	0.012	Accepted
H7	PI - > ZB	0.000	Accepted

regarded as a plausible and parsimonious model.[114] Next, the effect size is examined to identify the impact of independent variables on a dependent variable. For this purpose, Cohen f^2 is used, where the values of f^2 signify small, medium, and large effect sizes with values greater than or equal to 0.02, 0.15, and 0.35, respectively [117]. The findings of our study show that f^2 of para-social interaction denotes a large effect on altruistic motivation cosmetic packaging and that pro-environmental belief has a small effect on altruistic motivation. Furthermore, purchase intention represents a large effect on zero-waste-buying behaviour, while both altruistic motivation and pro-environmental belief have a small effect on zero-waste-buying behaviour of cosmetics.

5.2. Discussion

This study aims to explore the motivation behind youth zero-waste buying behaviour for cosmetics. It shows that pro-environmental belief, cosmetic packaging, and para-social interaction are the significant motivators of altruistic motivation. Therefore, H2, H3 and H4 are supported. Furthermore, it is found that pro-environmental belief, altruistic motivation, and purchase intention influence zero-waste buying behaviour of the cosmetic product, supporting hypotheses H1, H5, H6, and H7. The results of

Table 7
Comparison of previous quantitative studies with the present study.

Previous Studies		Present Study	Comparison
Author/s	Key Findings	Key Findings	
Nouri et al. (2023)	Green cosmetic consumers have different attitudes and beliefs which influence their choice of buying zero-waste products.	Pro-environmental belief influences green consumer zero-waste buying behaviour.	Supports
Kumar & Pandey (2023)	Highlights the importance of social media concerning altruistic motivation, egoistic motivation, and subjective norms. Furthermore, these factors play a role as antecedents to the green purchase intention and behaviour.	Para-social interaction influences altruistic motivation that has an impact on purchase intentions and zero-waste buying behaviour.	Supports
Alam et al. (2023)	Social media has an impact on consumer intent, altruistic and egoistic values. Both these values have a significant impact on green purchase intention.	Para-social interaction influences altruistic motivation that has an impact on purchase intentions.	Supports
Lavuri et al. (2023)	Altruistic values have a positive influence on sustainable consumption behaviour.	Altruistic motivation influences purchase intentions that have a significant contribution towards zero waste buying behaviour.	Supports
Nicolau et al. (2022)	This study analyses consumer willingness to bring a reusable coffee cup if a discount is offered; finds that consumers will bring the reusable cup if a discount is offered.	In the present study, we focus on altruistic motivation which is often selfless where individuals engage in actions to help others (environment) without immediate personal gain. Hence, the willingness to zero waste behaviour is due to altruistic motivation.	Contradicts
Moshood et al. (2022)	Environmental and hedonic consumer motivations influence green product purchasing.	Altruistic motivations towards sustainability influence consumer purchase intentions. Hence, consumers search for sustainable packaging.	Supports
Pop et al. (2020)	Social media as an information source and external factors influence consumer motivation formation and green cosmetic purchasing intentions.	A significant positive relationship is found between para-social interaction and altruistic motivation.	Supports

this study reveal a significant relationship between cosmetic packaging and altruistic motivation; this means that if the packaging of the product is eco-friendly, green, sustainable, or involves package-free products, then young people are inspired to buy those products. A positive relationship is observed between para-social interaction and altruistic motivation. This suggests that young people are influenced by social media influencers or vloggers and receive information or reviews about specific products; they are inspired to buy such products because of para-social interaction. Additionally, a significant relationship is found in this study between another two variables - altruistic motivation and pro-environmental belief. Surprisingly, there is a negative relationship between altruistic motivation and pro-environmental belief. This signifies that an individual's values, such as altruistic values, are not an appropriate predictor of pro-environmental behaviour as altruism is more people-oriented than environment-oriented. As noted by Balunde et al. [118], biospheric values (an altruistic values subset) are more closely related to environmentally favourable outcomes. Hence, it can be concluded that our sample consists of people who might have different values that are responsible for a negative relationship between altruistic motivation and pro-environmental belief.

A comparison of earlier quantitative studies with the present study findings is shown in Table 7.

Next, the study's findings reveal a significant positive relation between pro-environmental beliefs and zero-waste-buying behaviour. Youth with pro-environmental beliefs are more likely to show zero-waste-buying behaviour for cosmetics. Moreover, a significant relationship between altruistic motivation and purchase intentions is also found. Interestingly, the study also shows a negative relationship between altruistic motivation and purchase intention, which means that certain other variables affect this relationship; it might be the case that there is high altruistic motivation and low purchase intentions due to the buying capacity of young people. Hence, the ability to pay can be the variable that affects the relationship, while if there is a case where altruistic motivation is low and purchase intentions are high, then it might be related to the youth's high buying capacity or impulsive buying. Moreover, a positive significant relationship is found between purchase intentions and zero-waste buying behaviour of cosmetics. If purchase intentions are high, consumers are likely to buy zero-waste cosmetic products.

6. Implications

6.1. Theoretical implications

The theoretical contributions of the study are as follow. Firstly, the present study uses the theory of planned behaviour (TPB) for the development of the conceptual framework. This paper uses para-social interaction as the subjective norm, cosmetics packaging as perceived behaviour control, and pro-environmental belief as an individual attitude. Therefore, the altruistic motivational theory helps to understand youth behaviour in this product category (cosmetics). Altruism has previously been viewed as a motivational factor in youth purchase intention and buying behaviour. Hence, the altruistic motivation theory of empathy toward the environment encourages young people to buy zero-waste personal care products. Due to this belief and social interaction, they opt for sustainable packaging.

In addition, this study contributes to the knowledge of zero waste buying behaviour in the product category "cosmetics/personal care products". Secondly, the study is gender-neutral and contributes to the nascent body of research on gender-neutral cosmetic brands. Thirdly, the study embraces the youth of both rural and urban areas in India to provide a rationale for the need for separate promotional strategies.

6.2. Practical implications

The present study also has several practical implications. As cosmetic products enhance the appearance of an individual, so does the packaging for the product. The shift towards eco-friendly packaging is driven by changing consumer preferences. Modern consumers, especially the young, are concerned about sustainability and are more likely to support brands that align with their values, supporting the concept of conscious consumerism, wherein buying decisions are influenced by social and environmental considerations. Indian companies opting for eco-friendly packaging can attract potential buyers; for example, Treewear sells natural deodorants in paper containers, Soultree uses paper alternatives while Conscious Chemist uses glass jars, copper lid caps and paper labels. This may increase a young person's motivation to buy the product. However, the present study finds a negative relationship between altruistic motivation and purchase intention; the probable reason for this is the buying capacity of youth. In other words, consumers might feel disconnected between their altruistic motivations (e.g. eco-friendly products) and their actual purchasing behaviour; this may be influenced by factors such as affordability and perceived product value. This highlights the complexity of consumer decision-making and the need for strategies that bridge this gap. Therefore, it is recommended that attractive packaging or package-free products, if not costly, can attract young consumers and may encourage impulsive buying.

Collective responsibility for protecting the environment has become a trend, and companies in the UK [119] and the USA [120] use solid products such as body washes that use sodium stearate to make the product thicker. They realise that it is cheaper for companies to go package-free, as approximately 40–50 % of the product cost is due to packaging. Having now made savings in one area, that money can be used to spend on the ingredients. As a result, the buyer will obtain more of the product that can make a difference. Therefore, companies can not only choose to make eco-friendly packaging but also launch package-less or package-free products that may reduce the cost of the product, ensuring that young people can afford to buy these products.

In line with our study findings, social media and para-social interaction inspire the young generation and motivate them. Therefore, managers can collaborate with influencers to promote their products or provide them with free samples for an unpaid promotion to build trust among the youth regarding their brand. Cosmetic companies in the USA [121] and France [122] often use social media to

interact with their customers. Even the UK [123] is now using male beauty bloggers as a business strategy. The E-commerce market leader in India [124] collaborates with beauty influencers and continuously looks for new faces. Companies can collaborate with influencers who have millions of followers to promote or launch new products. Hence, this area is now emerging as an important contribution to the present study.

Currently, youth consumption patterns and lifestyles are changing, as are their beliefs. Traditional gender lines in cosmetics are blurring as male YouTube influencers teach men how to use makeup and apply it. Companies are even developing unisex packaging, such as Mcaffeine (India). The NPD Group (USA) is also offering a product line that includes tinted lip glosses, balm and moisturizer to cater to the needs of minimalists, as it gives a very light and natural makeup look. The gender-neutral cosmetic brand market is growing, and recently, a few brands have appeared in India, although there is still an enormous scope to enter this market[124]. Managers can redirect their promotional strategies and product packaging to gender-neutral audiences. The highest number of technology users are in rural areas in India, but there are still some subcultures and areas where rigid customs prevail and women in these areas are not allowed to shop, thus making it difficult for companies to reach their target audience.

Conversely, it is observed from the study that 93 % of respondents from rural areas are not sure of the zero-waste cosmetics they are using, and they are men. Most likely, they are either married or the female in the house does the purchasing. Therefore, different awareness strategies for zero-waste cosmetic products can be developed in these areas.

Promotional strategies to make the youth market aware, launching cosmetics with zero-waste packaging or package-free products, collaborating with beauty influencers on YouTube, and encouraging or rewarding young people with pro-environmental beliefs can help companies survive and cater to the needs of the ever-changing buying behaviour of young consumers.

7. Conclusion

The study results provide evidence that cosmetic packaging, pro-environmental beliefs, and para-social interactions motivate young people to buy zero-waste cosmetics. However, the most striking result from the data is the influence of para-social interaction on altruistic motivation. Today, using social media platforms in a technology-driven society can prove a game changer for green cosmetics brands. It is plausible that several factors might influence the model, such as biosphere values and the buying capacity of youth; hence, these variables can be studied in the future. Furthermore, the social media influencer followed by the young audience may have different values and can affect buying behaviour accordingly, although the present study does not focus on this aspect. Future studies can also be conducted in rural areas to understand their buying patterns; studies on awareness related to gender-neutral and package-free products can be conducted. Additionally, one of the interesting aspects to explore in this line of research is whether young people are repurchasing zero-waste cosmetic products.

As discussed in previous studies in different sectors, the major limitation of this study is the challenges of implementing the zero-waste concept. In the cosmetics industry, zero waste is still a challenge. Consumers might opt for herbal products or zero-waste green products for instant results, but these products still contain certain preservatives and synthetic compounds that might react to the consumer's skin. Therefore, rural and certain urban consumers are still opting for food products and ayurvedic natural kitchen products for their skin. How companies following the zero-waste concept can convert this behaviour into their product is still a challenge, considering the shelf life of the zero-waste products.

Furthermore, a large section of Indian consumers prefer herbal cosmetics for their health care[125]. Hence, it can be concluded that young consumers are in favour of eco-friendly products. They are being supported in this behaviour by their friends, family and society in general [16], but a certain section of the consumers in society still prefer luxurious brands for instant and effective results with a sustainable approach. Producing completely eco-friendly products and cosmetics can still be a challenge in emerging markets. Hence, future studies may work on these variables, specifically focusing on the different genders to create a larger green skincare consumer base and make a gender-neutral natural cosmetic market segment. Furthermore, the social interaction of influencers should be kept within the country's cultural limits, as several cultures do not accept certain behaviours. Pro-environmental belief can be encouraged in society by developing promotional strategies to create greater environmental awareness.

Additional information

No additional information is available for this paper.

Data availability

Data will be made available on request.

CRediT authorship contribution statement

Gyan Prakash: Methodology, Formal analysis, Data curation, Conceptualization. **Sahiba Sharma:** Writing – original draft, Methodology, Investigation, Data curation, Conceptualization. **Anil Kumar:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Sunil Luthra:** Writing – review & editing, Supervision, Investigation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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