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Article

Accept or Reject? Investigating Customers' Attitudes Toward Green Cosmetics in Bangladesh

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ABSTRACT

Background: The extant literature is unclear regarding the predictors preventing customers from purchasing green cosmetics in developing countries. The present study seeks to enrich the existing literature using the innovation resistance theory (IRT). Hence, the study unveils how functional barriers and psychological barriers hinder customers' attitudes toward green cosmetics, affecting their intentions to use and recommend.

Methods: The proposed conceptual framework was validated using a structured questionnaire with primary data from 355 Bangladeshi customers. Then, we used the partial least square-based structural equation modeling (PLS-SEM) technique to test the proposed hypotheses.

Results: The results show that the tradition barrier (β = −0.36; t = −4.286) and the usage barrier (β = −0.16; t = −2.159) persuasively inhibit customers' attitudes towards green cosmetics. The findings also reveal a strong influence of use intention (β = 0.60; t = 6.872) on recommendation intention to other customers. Nevertheless, attitudes (β = −0.07; t = −0.862) have an insignificant effect on recommendation intentions.

Conclusions: This research offers valuable insights for academia, industry practitioners, cosmetic manufacturers, and retailers to understand the determinants that impede customers from developing favorable attitudes toward green cosmetics. The study's insights will aid marketers in formulating customer-centric marketing strategies and promoting sustainable use of green cosmetics. In addition, this study extends the IRT to gauge customer attitudes, uncovering novel insights into use and recommendation intention from two under-explored contexts: country (Bangladesh) and industry (cosmetics).

KEYWORDS: innovation resistance theory; green cosmetics; customers' attitudes; use and recommendation intentions; Bangladesh; PLS

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ABBREVIATIONS

CAGR, compound annual growth rate; IRT, innovation resistance theory; TPB, theory of planned behavior; PLS-SEM, partial least square-based structural equation modeling; WoM, word of mouth

INTRODUCTION

Scholars worldwide have focused on assessing consumers' preference for "green" products over traditional ones [1]. Green products are environmentally friendly items with less or no harmful impact on ecology and human health [2]. Recently, the skincare industry has seen a notable transformation, with green cosmetics being adopted over synthetic ingredient-based alternatives [3,4]. As a result, globally, male and female customers have favored purchasing green cosmetics and beauty care items [5]. Research has shown that women increasingly opt for sustainable lifestyles, viewing green cosmetics as aligning with their self-image, health values, and feminist beliefs, driving the demand for eco-friendly cosmetics [6]. However, previous studies have proved that many customers are still in a behavioral dilemma, claiming its effectiveness on the skin [3,7]. In this scenario, it is essential to draw a comprehensive and empirically supported conclusion on which functional and psychological barriers influence customer attitudes.

Research has shown that allocating funds for cosmetics for all genders is one of the major driving forces of increasing green cosmetic consumption [3]. For example, American women spend an average of $3756 for beauty products per year, while men spend an average of $2928 annually [8]. Alexander [9] predicted the worldwide cosmetics industry would reach $457.8 billion from 2020 to 2027. The Asia-Pacific cosmetics market is projected to reach a value of $181.3 billion, exhibiting a compound annual growth rate (CAGR) of 6.3% [10]. The prevalence of this tendency is also observed in Bangladesh (the world's 8th most populous country) [11]. According to Stastia [12], Bangladeshi beauty and personal care market volumes would reach US$10.83 billion in 2023 and are expected to grow annually by 3.46% (CAGR 2023–2028). Notably, Bangladesh is the sixth-largest cosmetics purchaser in the Muslim world [13]. Such a noticeable increase in cosmetic consumption indicates research gaps in assessing the context through the lens of green consumption.

Nevertheless, globally, the use rate of green cosmetics remains nascent. According to Ali, Javed [14], the worldwide revenue generated by green cosmetics sales is expected to reach USD 54.5 billion by 2027. The current market value of green cosmetics in the global cosmetic sector is less than 15% [15]. This implies that customers face substantial barriers when buying green cosmetics, which, in turn, necessitates more empirical investigation.

Research has shown that customers' purchasing of green cosmetics is steady but increasing gradually [16]. Nevertheless, the research on customer attitudes to green cosmetics and their overall green behavior is still scant [17] despite increasing popularity [16,18,19]. Besides, the incongruity between individuals' attitudes and their corresponding actions may be primarily attributed to social mechanisms, such as subjective standards and perceived behavioral control. These mechanisms might vary and influence customer purchasing behavior. Still, no studies have investigated customers' behavioral deviations in green cosmetics from a developing country perspective. This is essential because Jaini, Quoquab [20] noted that country background might lead to consumers' behavioral distinction. Hence, the lack of scholarly inquiry investigating barriers impacting consumer attitudes following their use and recommendation intentions of green cosmetics emphasizes the need for further study.

The present research incorporates the innovation resistance theory (IRT) to explore the primary barriers from two aspects: functional (usage, value, and risk) and psychological (tradition and image). The existing research has proved that an innovation's functional barriers and customers' psychological barriers regarding that innovation significantly impact behavioral outcomes (e.g., resistance). For instance ,Chen, Tsai [21] assessed consumer behavioral intention to explore how usage, value, risk, tradition, and price barriers impact adopting hydrogen-electric motorcycles. Similarly, with the lens of IRT, Szaban and Stefańska [7] explored how consumers' green consumption is affected by these impeding factors. In the context of green cosmetics, Sadiq, Adil [3] conceptualized ecofriendly cosmetics as innovative items due to their recent emergence in developing economies. More specifically, they argued that the adoption of eco-friendly cosmetics is still nascent in developing countries, urging researchers to deploy the IRT to determine customer behavioral resistance. This might not be exceptional in Bangladesh, although there is a paucity of research on green cosmetics. Aligning with these scholarly insights, the proposed research model links these barriers to customer attitudes, extending use and recommendation intentions. The primary objective of this research is to examine the barriers contributing to customer attitudinal resistance to green cosmetics in Bangladesh. In doing so, first, this study aims to investigate the possible impact of functional barriers (i.e., usage, value, and risk) and psychological barriers (i.e., tradition and image barriers) on the adoption of green cosmetics (RO1). The study's second objective is to elucidate theoretical and practical implications, enhance current knowledge, and provide policy guidelines for policymakers (RO2).

This study has multiple insights into for scholars, marketers, and policymakers. Firstly, the study's findings contribute to identifying barriers impacting customers' attitudes toward green cosmetics in contrast to conventional beauty products, hence deviating from

established norms and beliefs. Secondly, this research presents the emergence of the traditional barriers (functional and psychological) attributed to a paradox between established values and beliefs. This offers an opportunity for marketers to develop promotional activities, highlighting the advantages of green cosmetic products compared to traditional alternatives. Promoting behavioral modifications may contribute to environmental preservation and society's well-being. Thirdly, the research assists social influencers or opinion leaders in promoting the adoption of green cosmetics among customers, mitigating doubts or reservations, reducing customer skepticism, and addressing negative perceptions of green cosmetics.

The following section comprises a literature review exploring green cosmetics and IRT, followed by hypothesis development. Subsequently, we show the research methodology and the analysis and results section. Then, we present the discussion section, followed by the conclusion.

LITERATURE REVIEW

Understanding Green Cosmetics

Previous studies have used diverse terminologies to define green cosmetics. The majority have conceptualized green cosmetics as eco-friendly or environment-friendly beauty products [16,18,22]. For instance, Shimul, Cheah [22] conceptualized green cosmetics as beauty items manufactured using natural and renewable ingredients and having less or no impact on human skin. Green cosmetics prioritize the skin's health using natural ingredients, including herbs, roots, oils, and flowers. These ingredients blend organic agents, preservatives, surfactants, moisturizers, and emulsifiers [16,17,22]. Green cosmetics employ natural ingredients instead of synthetic chemicals, which can affect the skin adversely. The production process of green cosmetics uses technology that safeguards the effectiveness and functionality of these organically derived components.

Innovation Resistance Theory (IRT)

The IRT paradigm explains why customers hesitate to adopt an innovation. According to Hew, Leong [23], innovation resistance manifests as a behavioral response among customers when they engage in rational thinking to evaluate a new invention that may disrupt the current status quo and deviate from their existing beliefs. Customer resistance significantly influences an invention's adoption or rejection [24]. Customers may have a greater propensity to oppose the adoption of a new invention if it poses a potential threat to their lifestyle and social status.

Ram and Sheth [24] modified the IRT, classifying barriers into two primary categories: functional barriers and psychological barriers. The functional barriers comprise value, risk, and use, which are related to adopting the innovation. The psychological barriers comprise two subtypes: image and tradition. Heidenreich and Handrich [25] also defined

this classification by differentiating active and passive forms of resistance. Active form follows the functional barriers outlined in the IRT since it originates from the inherent properties of the invention [26]. In contrast, passive resistance pertains to the psychological barriers that emerge due to conflicts within the existing belief systems held by customers [26].

Functional barriers are linked to the invention's perceived practical limitations or disadvantages. Customers encounter these barriers when they express skepticism over the perceived value or advantages of the innovation. They have apprehensions about possible hazards or adverse outcomes or face challenges in using the innovation [24].

On the other hand, psychological barriers, such as the influence of image and tradition, pertain to cognitive and emotional aspects of customer resistance. Image barriers arise when customers connect the innovation with a negative perception or regard it as incongruent with their self-identity or prevailing societal standards [24]. On the contrary, customers face tradition barriers while confronting long-established beliefs, conventions, or cultural practices [26].

This study underpins the IRT due to its comprehensive effectiveness in providing valuable insights into customers' resistance to innovation. The study examines the variables that contribute to forming negative attitudes, resulting in the relatively low adoption of green cosmetic products. In prior studies, IRT has been used to find innovation resistance in various industries, including hotels [27], organic food [28], and cryptocurrency [29]. Nevertheless, the use of IRT in examining customer attitudes following their use and recommendation intentions has yet to be investigated in the beauty care industry. Importantly, relevant studies have not been conducted on the aspects of developing countries. More specifically, with the integration of IRT and attitudes, no research has been undertaken in the context of green cosmetic adoption and post-adoption intentions (i.e., use intention and recommendation intention). Therefore, this research is a pioneer in addressing this gap using IRT, examining Bangladeshi customers' behavioral resistance toward green cosmetics.

Conceptual Framework and Hypothesis Development

This research investigates the role of functional barriers (i.e., use, value, and risk) and psychological barriers (i.e., tradition and image) in influencing customer attitudinal resistance toward green cosmetics in Bangladesh. Studies have shown that use, value, and risk barriers influence customer resistance to adopt a novel and unfamiliar item. For instance, Tandon, Dhir [30] emphasized the significance of the use barrier in hindering the adoption of unfamiliar goods, such as organic products. In another study, Tandon, Jabeen [31] proposed that customers assess the value of organic products by considering financial attributes and performance relative to other alternatives available in the markets. Moreover, Teng and Wang [32] posited that customers possess less confidence in organic goods' certification and production procedures,

which significantly impacts purchase choices and creates perceived threats to green products.

Furthermore, evidence suggests that customers exhibit psychological barriers, i.e., tradition and image, which impact their attitudes and actions towards green goods. For instance, Akter, Ali [33] found that customers encounter tradition barriers regarding organic products due to their shorter shelf life. Besides, customers mistrust green products, possibly due to lacking faith in their functionality [28].

The usage barrier pertains to how customers perceive the necessary adjustments to accommodate a new invention [34]. It impedes customers' acceptance of a novel invention and may disturb their behaviors [24]. Research has shown a sluggish adoption of green cosmetics, indicating a delay in transforming consumption patterns [3]. Limited availability [18] and less uniformity [35] cause disturbances in customers' state of balance. Consequently, consumers' purchase frequency of green products is less consistent than that of conventional cosmetics [28]. This inconsistency may be attributed to customers' attitudes, leading to reluctance towards adopting green cosmetics as alternatives. This postulates the following hypothesis;

H1. Usage barriers negatively and significantly impact customers' attitudes toward green cosmetics.

The value barrier refers to how customers perceive an innovation's value they get in exchange for its price, compared to other available alternatives [34]. A new product's values and the replacement of existing ones are also considered value barriers [28]. The value barrier is linked to a product's performance and financial value concerning its competitors [24]. Existing literature has shown that the value barrier impedes customer acceptance of novel items or innovations related to green products. For instance, Kushwah, Dhir [28] identified the value barrier as a solid barrier to people's adoption of organic food. Similarly, Talwar, Dhir [27] observed that customers perceive the value barrier as the primary obstacle when they purchase a new product. As there is a paucity of customer attitude-based research, there is a pressing demand to explore the impact of value barriers in the context of green cosmetics. This gap calls for proposing the following hypothesis;

H2. Value barriers negatively and significantly impact customers' attitudes toward green cosmetics.

The risk barrier shows how customers see innovation as more threatening than accessible alternatives [34]. Chen and Kuo [36] noted that customers' risk perception is attributed to innovation by increased uncertainty, creating a barrier to adoption. Adopting a novel product is resisted until the perceived risk decreases [37], resulting in a decelerated pace of adoption [24]. In the case of green products, scholarly research indicates risk arises when manufacturers and marketers deceive consumers with false claims about product environmental attributes [38]. This finding underscores green product adoption due to a trust deficit [39].

In a study, Sadiq, Adil [3] noted that the acceptance rates of green products, such as organic food, are hindered by financial risk and trust concerns. Thus, it would be noteworthy to investigate how the risk barrier negatively impacts customers' attitudes toward green cosmetics. So, we can propose a hypothesis;

H3. The risk barrier negatively and significantly impacts customers' attitudes toward green cosmetics.

The tradition barrier impacts customers' impressions that adopting a novel invention necessitates a modification of their established habits and lifestyle in contrast to using already available alternatives [34]. Customers perceive that alterations linked to implementing a novel product can potentially distort existing societal norms and consumer values [24]. Customers' emotions significantly influence the traditional barrier associated with green products due to their shorter life span and lower satisfaction levels than conventional products [28]. Chen, Tsai [21] demonstrated a positive correlation between traditional barriers and resistance to innovation. Yet, no previous studies have explored the association between traditional barriers and customers' attitudes in the context of green cosmetics. This gap underpins to postulate the following hypothesis;

H4. Tradition barriers negatively and significantly impact customers' attitudes toward green cosmetics.

The image barrier illustrates how customers perceive the ease or difficulty of adopting a new product or invention[34]. Consumer comparison of new products with existing products in terms of ease or difficulty drives to select easy ones [24]. Lesschaeve and Bruwer [40] posited that product category, brand name, and place of origin might affect consumers' perceived image regarding the innovation or new product. Customer skepticism increases image barriers due to the quality and legitimacy of green products [41]. Customers' decision to abstain from buying green cosmetics may also be attributed to attitudes-related concerns. This might afterward contribute to a pessimistic evaluation of the products' assertions [28]. This confirms a hidden link between image barriers and customers' attitudes toward green cosmetics, which posits the following hypothesis:

H5. Image barriers negatively and significantly impact customers' attitudes towards green cosmetics.

Attitude, a core component of the theory of planned behavior (TPB), is related to the positive or negative behavioral assessment or judgment of a phenomenon (e.g., person, object, and event) [42]. Similarly, Fisher [43] conceptualized attitude as a cognitive state that directly or indirectly impacts an individual's reaction to various stimuli. The interaction between a person and stimuli significantly alters attitudes and buying intentions [44]. Integrating this notion may provide insight into how customers' attitudes toward a product can influence the formation of certain behaviors, i.e., use and recommendation intentions.

Many studies have shown a favorable association between attitudes and use intentions of green products and services, including green hotels [27], organic yogurt [45], and organic skin/hair care items [22], while no studies have been conducted exploring the association between attitudes and use intention in green cosmetics perspectives. However, customers' attitudes are expected to have a substantial effect on intention to use [46]. Based on the above arguments, it can be inferred that customer engagement plays a crucial role in regulating the association between attitude and purchase intention. Therefore, we hypothesize that;

H6. Customers' attitudes negatively and significantly impact their use intention.

Although numerous investigations have been undertaken to examine the attitudes and intentions, a research gap exists in examining the influence of attitudes on recommendation intentions [47]. A few studies have examined the association in various contexts, such as wearable technology by Rahman, Das [47], yet to be investigated in the green cosmetic context. Customers' favorable disposition to using a product will likely encourage others to use it [48]. Furthermore, Venkatesh and Brown [49] posited that consumers will likely communicate via social media with word-of-mouth (WOM) to share their feelings and experiences regarding the products. Hence, investigating the association between attitudes and recommendation intentions would be novel and exciting by positing the following hypothesis;

H7. Customers' attitudes negatively and significantly impact their recommendation intention.

The intention has predictive power over behavior since people are inclined to behave according to their intentions within a particular context [28]. The concept of purchase intention pertains to customers' inclination to buy a product [50]. In the current context, use intention is the inclination or readiness to adopt green cosmetics because it determines reliability in predicting customer behavior [39]. Because of the difficulties in accurately evaluating customers' real-life actions, our primary emphasis is examining the impact of customers' intention to use green cosmetics over their intention to recommend green cosmetics. Nevertheless, customers with little knowledge and unfavorable usage experiences, such as using counterfeit items, are unlikely to discourage others from purchasing. Instead, they prefer to participate in negative WOM communication [51]. To unveil the association between use and recommendation intentions in the context of green cosmetics, we can postulate that:

H8. Customers' use intention significantly impacts their recommendation intention.

Based on the above theoretical foundation, this study proposes the following conceptual framework (see Figure 1).

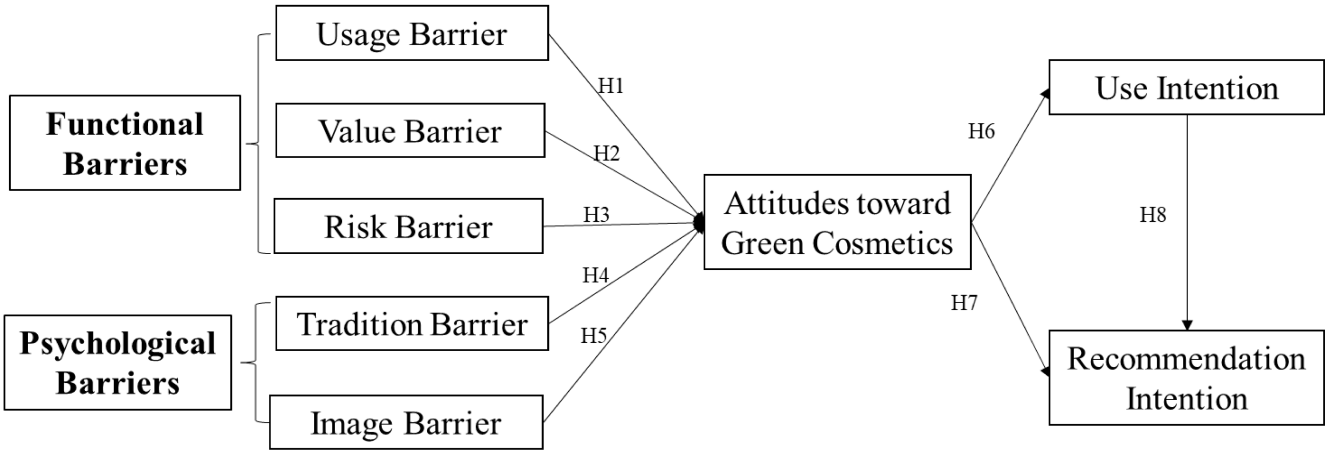

Figure 1. Conceptual framework of the study. Source: Authors' own work.

RESEARCH METHODOLOGY

Study Participants and Data Collections

We used a quantitative and personal survey method to collect participant data. In doing this, the participants were contacted physically to get a high response rate. This enhances the chance to examine and analyze their behaviors carefully. Besides, the present study adhered to the standards proposed by Peer, Vosgerau [52] to ensure data reliability. Before finalizing the questionnaire, two experienced researchers in the relevant field carefully reviewed the wording and phrasing of the questions to ensure they were appropriate and clear. Their valuable feedback resulted in minor adjustments to the questionnaire, ultimately leading to low error rates and high data quality.

The initial page of the questionnaire comprised a definition of green cosmetics and some examples of popular green cosmetics brands in Bangladesh. We considered all sorts of green cosmetics (e.g., face cosmetics vs. foot cosmetics). Additionally, to understand if participants were known to green cosmetics and actual users, the study included several screening questions such as "Do you know any green cosmetic brand?" and "Could you please mention the green cosmetic brands that you are aware of?". This approach ensured that participants had a clear understanding of green cosmetics and facilitated the recruitment of suitable respondents aligned with the study's objectives.

Following this, a pilot survey involving 25 respondents was conducted, resulting in positive feedback indicating that respondents understood the instructions and statements' wording effectively. This rigorous validation process enhances the reliability and validity of the questionnaire for the study's purposes. For final data collection, three experts with relevant knowledge and experience over 100 surveys were employed. They collected data from September 25, 2023 to January 10, 2024. The study confirmed whether the participants met the specific criteria about their demographic characteristics, such as (i) at least 18 years of age, as the

concept of green behavior is considered emerging and may require a certain maturity level to comprehend [53], and (ii) Bangladeshi citizens and currently residing in Bangladesh.

We collected data from a total of 400 respondents. After excluding the missing values, outliers, and other relevant issues, we finally got 355 responses. The number of total responses in this study surpassed the recommended thresholds for multivariate analyses [54]. The suggested methodology suggests a minimum of 345 respondents is required for a comprehensive study of 23 items. This would include having ten to fifteen occurrences of each parameter or item, as Kline [54] recommended. According to Tandon, Dhir [30], the existing research on green purchase behavior suggests that obtaining data from a sample size of about 300 to 500 respondents is deemed appropriate for accurately representing and generating reliable results. Thus, the responses finalized by the study are satisfactory for future examination.

Measures

A three-item scale based on the study by Nandi, Bokelmann [55] was used to measure the usage barrier. To find the value barrier, we also used a three-item scale from Kushwah, Dhir [28]. A two-item measure from Kushwah, Dhir [28] was used for the risk barrier. Two items from Torres-Ruiz, Vega-Zamora [56] were used to measure the tradition barrier. The measurement of the image barrier was determined using a two-item scale developed by Kushwah, Dhir [28]. Similarly, attitudes toward green cosmetics were evaluated using a three-item scale, modified from Taylor and Todd [57] to align with the current setting. Furthermore, the measurement of use intention using a three-item scale [58] and recommendation intention using a two-item scale [59] was adapted. The responses were documented using a 5-point Likert scale, where 1 to 5 corresponds to “strongly disagree” to “strongly agree” (see Appendix A1 for more information).

Statistical Analysis

The hypothesized relationships were measured using the partial least squares structural equation modeling (PLS-SEM). This is because many researchers find the PLS-SEM method appealing. After all, it allows them to estimate complex models involving numerous constructs, indicator variables, and structural paths without requiring distributional assumptions about the data [60]. Importantly, PLS-SEM is a causal-predictive approach to SEM that prioritizes prediction when estimating statistical models designed to offer causal explanations through their structures. According to Hair Jr, Hult [61], the SEM process should be started by conducting a descriptive analysis that includes examining missing values, assessing data normality, and identifying outliers. The missing values were assessed using a frequency test, while outliers were

identified using Cook's distance. The normal distribution of the data obtained was assessed using skewness and Kurtosis measures. Subsequently, we used a standard bias test to mitigate any bias in the gathered data. Furthermore, we used confirmatory factor analysis (CFA) with the maximum likelihood method to test the measurement model before examining the hypotheses to ascertain the construct validity and reliability, followed by Hair Jr, Hult [61].

RESULTS

Demographic Profile

The data indicates that respondents, 169 individuals, representing 47.6% of the total sample, were male, while 186, accounting for 52.4% of the whole sample, were male. Approximately 62% of the participants had a bachelor's degree, while 53% were private job holders. The average age of the sample was 26.8 years, and the mean family income amounted to 42,500 Bangladeshi Taka (equivalent to 384.49 US dollars) each month.

Descriptive Statistics

Evidence suggests that researchers must conduct data analysis before using more complex statistical methods to find issues, such as missing values, outliers, normality and bias [61]. Similarly, the study used a frequency test to assess missing values in the gathered data. The results show that the dataset excluded all missing values. Then, we excluded the outliers within the dataset based on the recommendation of Stevens [62]. Data normality was assessed by examining the skewness and Kurtosis (see Table 1) using appropriate statistical tests. The findings indicate that all values of Skewness fall between the suggested range of +3 and −3, and all values of Kurtosis ranged between +10 and −10 while using SEM [63], suggesting that the data is approaching a normal distribution. Finally, the study addresses the common method bias (CMB) [64] using Harman's single-factor test. The results are satisfactory, suggesting no CMB issue since the single-factor CFA model accounted for less than 50% of the dependent variable's variation (42%). Based on these findings, the data confirms suitability for further complex investigations like SEM.

Table 1. Data normality tests.

Items	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
UB1	3.9944	0.74786	0.559	−1.254	0.129	3.494	0.258
UB2	4.0873	0.72153	0.521	−1.222	0.129	3.790	0.258
UB3	4.1155	0.71360	0.509	−1.110	0.129	3.313	0.258

Table 1. *Cont.*

Items	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
VB1	3.9577	0.72946	0.532	−1.208	0.129	3.825	0.258
VB2	4.0732	0.73664	0.543	−1.481	0.129	5.023	0.258
VB3	3.9803	0.74573	0.556	−1.078	0.129	3.033	0.258
RB1	4.3070	0.75825	0.575	−1.712	0.129	5.296	0.258
RB2	4.3268	0.73664	0.543	−1.839	0.129	6.312	0.258
TB1	3.935	0.6670	0.445	−1.075	0.129	3.678	0.258
TB2	3.946	0.6929	0.480	−0.902	0.129	2.525	0.258
IB1	3.6704	0.73730	0.544	−0.581	0.129	1.109	0.258
IB2	3.6507	0.73394	0.539	−0.554	0.129	0.831	0.258
AGC1	1.5296	0.74112	0.549	2.222	0.129	7.341	0.258
AGC2	1.5380	0.74074	0.549	2.364	0.129	8.599	0.258
AGC3	1.5775	0.73381	0.538	2.145	0.129	7.585	0.258
UI1	4.0028	0.71108	0.506	−0.952	0.129	2.777	0.258
UI2	3.9803	0.68243	0.466	−1.048	0.129	3.484	0.258
UI3	3.8789	0.69663	0.485	−1.042	0.129	2.901	0.258
RI1	3.7014	0.70179	0.493	−0.496	0.129	0.833	0.258
RI2	3.6338	0.75239	0.566	−0.523	0.129	0.861	0.258

Note*:* UB = Usage Barrier; VB = Value Barrier; RB = Risk Barrier; TB = Tradition Barrier; IB = Image Barrier; AGC = Attitudes toward Green Cosmetics; UI = Use Intention; RI = Recommendation Intention.

Measurement Model

The measurement model facilitates reliability and validity. The results of the model present a satisfactory fit: the chi-square (χ^2) ratio degrees of freedom (χ^2/df) was 1.186, the comparative fit index (CFI) was 0.994, the Tucker-Lewis index (TLI) was 0.992, and the root mean square error of approximation (RMSEA) was 0.023, based on the recommendation of Hu and Bentler [65]. Hence, the model demonstrates adequate content validity. Items derived from the extant literature have already been validated and evaluated by previous research, confirming content validity.

Furthermore, the study shows adequate convergent validity (Table 2). Firstly, the factor loadings and average variance extracted (AVE) for the measures exceeded the threshold of 0.50, as suggested by Fornell and Larcker [66]. Secondly, the composite reliability (CR) for all measures surpassed the minimum requirement of 0.70, as Fornell and Larcker [66] outlined. This finding indicates that the measurements met adequate internal consistency. The coefficient alpha (CA) values ranged from 0.789 to 0.944, indicating an acceptable level of internal reliability. The discriminant validity (see Table 3) was deemed sufficient as the square root of the AVE value surpassed the correlation value between any two measures [66].

Table 2. Reliability and convergent validity.

Constructs	Item codes	Estimate	CR	AVE	CA
Usage Barrier (UB)	UB3	0.770	0.843	0.641	0.841
	UB2	0.850			
	UB1	0.780			
Value Barrier (VB)	VB3	0.761	0.826	0.614	0.824
	VB2	0.855			
	VB1	0.730			
Risk Barrier(RB)	RB2	0.918	0.914	0.841	0.914
	RB1	0.916			
Tradition Barrier (TB)	TB2	0.781	0.791	0.654	0.789
	TB1	0.836			
Image Barrier(IB)	IB2	0.934	0.944	0.893	0.944
	IB1	0.956			
Attitudes toward Green	AGC3	0.821	0.872	0.693	0.872
Cosmetics (AGC)	AGC2	0.843			
	AGC1	0.834			
Use Intention (UI)	UI3	0.761	0.797	0.570	0.789
	UI2	0.839			
	UI1	0.653			
Recommendation Intention (RI)	RI2	0.844	0.821	0.696	0.820
	RI1	0.825			

Table 3. Discriminant validity (Fornell and Larcker criterion).

Constructs	RB	UB	VB	TB	IB	AGC	UI	RI
RB	**0.917**							
UB	0.514	**0.801**						
VB	0.600	0.634	**0.784**					
TB	0.548	0.652	0.595	**0.809**				
IB	0.361	0.380	0.422	0.524	**0.945**			
AGC	−0.531	−0.577	−0.578	−0.647	−0.464	**0.833**		
UI	0.488	0.562	0.517	0.781	0.520	−0.551	**0.755**	
RI	0.342	0.586	0.416	0.586	0.328	−0.368	0.637	**0.835**
R^2						**0.59**	**0.39**	**0.41**

Note: UB = Usage Barrier; VB = Value Barrier; RB = Risk Barrier; TB = Tradition Barrier; IB = Image Barrier; AGC = Attitudes toward Green Cosmetics; UI = Use Intention; RI = Recommendation Intention.

Structural Model and Hypothesis Testing

The structural model is used to analyse and understand the relationships among different components or elements. Similar to the measurement model, we evaluated the structural model, which exhibited favourable outcomes (CMIN/df = 2.062, TLI = 0.952, GFI = 0.922, AGFI = 0.893, CFI = 0.961, RMSEA = 0.055). The findings of the structural model (see Table 4 and Figure 2) show that use, value, and image barriers negatively impact consumers' attitudes toward green cosmetics.

Specifically, usage barrier (H1: β = −0.16, t = −2.159, p < 0.05), value barrier (H2: β = −0.15, t = −2.008, p < 0.05), risk barrier (H3: β = −0.14, t = −2.248, p < 0.05), tradition barrier (H4: β = −0.36, t = −4.286, p < 0.001) and image barrier (H5: β = −0.13, t = −2.489, p < 0.05) significantly and negatively influence customers' attitudes of green cosmetics. Image barrier had the least impact, while tradition barrier had the most substantial impact on attitudes (refer to Table 4). The results indicate that attitudes toward green cosmetics (β = −0.63, t = −9.572, p > 0.05) significantly and negatively impacted use intention. In addition, use intention (β = 0.60, t = 6.872, p > 0.001) significantly and positively influences recommendation intentions. However, attitudes toward green cosmetics (β = −0.07, t = −862, p > 0.05) had a negative but insignificant effect on recommendation intentions. The statistical model accounted for 59 % of the variability in customers' attitudes toward green cosmetics.

Table 4. Results of the hypothesis tests.

Hypothesis	Relationship between constructs			Estimate (Standardized)	*t*-Values	*p*-Values	Decision
H1	UB	→	AGC	−0.161	−2.159	0.031	Yes
H2	VB	→	AGC	−0.150	−2.008	0.045	Yes
H3	RB	→	AGC	−0.138	−2.248	0.025	Yes
H4	TB	→	AGC	−0.362	−4.286	0.000	Yes
H5	IB	→	AGC	−0.133	−2.489	0.013	Yes
H6	AGC	→	UI	−0.625	−9.572	0.000	Yes
H7	AGC	→	RI	−0.065	−0.862	0.389	No
H8	UI	→	RI	0.596	6.872	0.000	Yes

Note: UB = Usage Barrier; VB = Value Barrier; RB = Risk Barrier; TB = Tradition Barrier; IB = Image Barrier; AGC = Attitudes toward Green Cosmetics; UI = Use Intention; RI = Recommendation Intention.

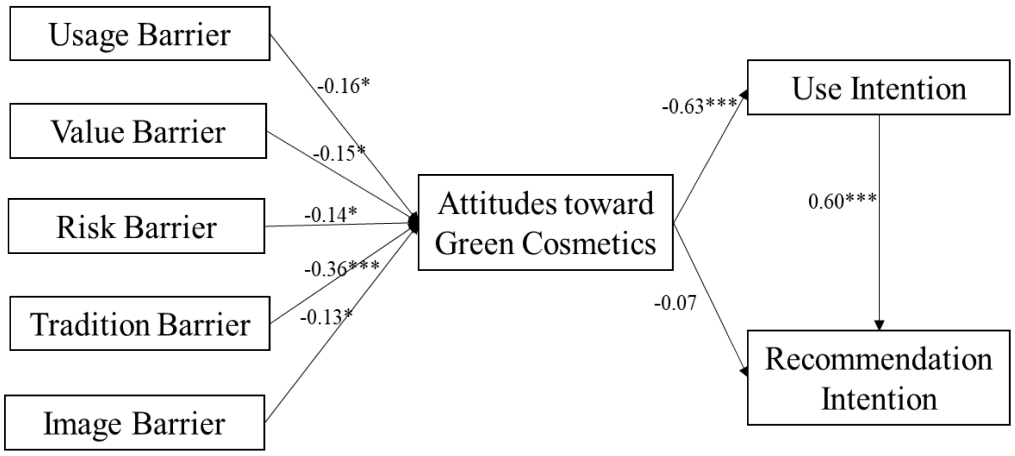

Figure 2. Results of the structural model (Note: *** p < 0.001, ** p < 0.01, *p < 0.05). Source: Authors' own work.

DISCUSSIONS AND IMPLICATIONS

The current study extended the IRT by integrating attitudes, use intention, and recommendation intention of Bangladeshi customers in

green cosmetics. Eight hypotheses were examined, comprising five primary and three subsidiary hypotheses. The first three primary hypotheses (H1, H2, and H3) focused on the functional barriers related to the adoption of green cosmetics. In comparison, the subsequent two (H4 and H5) hypotheses are centred on psychological barriers. As Table 4 shows, the use barrier has a substantial negative impact (β = −0.16) on customers' attitudes. These findings align with Porter and Donthu [67], who also confirmed that usage barriers affect customers' attitudes. This is because customers may feel a usage barrier in green cosmetics, perceiving they must employ a new consumption pattern. They may also perceive much more difficulty using green cosmetics than traditional ones.

Additionally, the findings show that the value barrier has an influential negative impact (β = −0.15) on customers' attitudes toward green cosmetics. This implies that the value barrier arises when customers assess the ecological merits of cosmetic goods based on features and price and perceive inconsistency compared to the available traditional cosmetics in the market. Based on previous research [56], our findings align that customers' value perception hinders the adoption of green products. This might be due to customers' prevailing belief that green products do not exhibit superior quality, durability, and performance compared to traditional products. An unstructured retail sector in Bangladesh contributes to these environmentally misleading and fraudulent organic items [68]. Consequently, such a situation leads to a distorted value perception of customers regarding green cosmetics, resulting in dissociating themselves from consumption. Therefore, to restore customer confidence, marketers must adopt a strategic approach to designing communication channels to raise awareness and prevent other firms' development and sale of counterfeit cosmetic items.

This research presents a negative relationship (β = −0.14) between the risk barrier and customers' attitudes toward green cosmetics. This finding is consistent with Lang [69] and Himel, Ashraf [70]. A possible explanation for this finding might be counterfeit skincare items and customers' limited understanding of eco-labelling, leading to a lack of customer confidence in green cosmetics. Besides, customers lack confidence in certifying organizations, heightening their perception of risk.

This study's findings support H4 (β = −0.36) and H5 (β = −0.13), suggesting that tradition and image barriers are significantly and negatively associated with customers' attitudes to use green cosmetics, aligning with Himel, Ashraf [70]. This finding implies that customers' reluctance to embrace green cosmetics may be due to disapproval or discouragement from family, peer groups, or society. The lack of consideration shown by these close groups may discourage customers from using green cosmetics. Customers' perceived risk or uncertainty also arises due to the lack of recognition from social circles [39], leading to a low acceptance of green cosmetics.

Based on hypothesis H5, the study indicates that Bangladeshi customers do not typically perceive green cosmetic items as better products. The finding of the H5 aligns with the findings of some previous research [70]. The potential rationales for these findings might be attributed to customers perceiving green cosmetics as having a shorter shelf-life than conventional and non-organic items. Customers may also perceive that adopting organic products necessitates modifying their current lifestyle. Such psychological obstacles experienced by customers may stem from the cognitive dissonance and uncertainty associated with purchasing green cosmetic items.

The findings reveal that customers' attitudes toward green cosmetics and their use intention are negatively and significantly associated ($\beta = -0.63$). The potential reasons behind the rationales are when customers encounter several barriers (i.e., usage, value, risk, tradition, and image), they might hold negative attitudes toward green cosmetics. Himel, Ashraf [70] affirmed that negative attitudes significantly impact customers' intention to use a product or service. In the current context, customers are likely to avoid green cosmetics compared to traditional cosmetics and spread negative WOM due to the aforementioned barriers. Likewise, when customers have negative attitudes towards green cosmetics (H7), they may recommend that others not use the product. Hence, the impact of attitudes on recommendation intention was found to be insignificant.

Moreover, the present research identifies a strong tie between customers' use intention and their recommendation intention ($\beta = 0.60$). This is because while consumers' actual use seems optimistic, they like to positively recommend green cosmetics to their peers, friends, family members, colleagues and others. This finding aligns with Rahman, Das [47]. On the other hand, the context becomes reversed when negative information and experiences about the product are involved. However, individuals feel good recommending something positive to others [47].

Theoretical Contributions

This research contributes substantially to the existing body of green purchasing behavior literature, particularly on green cosmetic adoption and post-adoption intention. By examining the barriers (i.e., usage, value, risk, tradition, and image), the study contributes to the IRT extending the impact of customers' attitudes, following use and recommendation intentions. While the theory has been used in other settings, our research is pioneering in investigating its relevance in green cosmetic adoption research.

Besides, the present study expands upon the hypotheses (UB→AGC; VB→AGC; RB→AGC; TB→AGC; IB→AGC) by incorporating them with the functional and psychological barriers to customer attitudes, one of the strong predictors of human behavior [42]. This study is the first to investigate the hypothetical relationships in the context of green cosmetics. In addition, our study extends the findings of previous research conducted by Sadiq, Adil [3] and Kushwah, Dhir [28] on eco-friendly cosmetics. Sadiq, Adil [3] focused on applying the IRT to examine consumers' purchase

intention, ignoring the focus on attitudes and potential post-adoption intentions (i.e., use and recommendation intentions). The current study integrates the functional and psychological barriers recommended by Ram and Sheth [24] with an attitudinal focus on customers' post-adoption intentions in the context of developing countries. Furthermore, the customers' attitudinal focus has received limited attention from researchers in integration with the IRT. Thus, this research makes a noteworthy addition by highlighting customers' attitudes in providing comprehensive knowledge in the existing literature on green cosmetics.

Implications for Managerial Practices

Apart from the aforementioned theoretical contributions, the current research adds value for manufacturers, marketers, and policymakers in the green cosmetic industry. The findings of this research indicate that the tradition barrier is the most significant obstacle imbedding customers' attitudes to form positive perceptions regarding green cosmetics. This suggests that customers' perceived acceptance of green cosmetics goes against established norms and beliefs, particularly when compared to traditional cosmetics. With the insights of this research, marketers can strategically develop their promotional campaigns to prioritize highlighting the advantages of green cosmetics over conventional cosmetics or advocating for a shift in habits.

The usage barrier reveals the second most prominent barrier within the proposed framework. This finding underscores customers' tendency to identify and use green cosmetics due to having a potential sense of distrust and usage disturbance. For instance, while using green cosmetics, customers may perceive difficulty in purchasing and usage frequency. Therefore, marketers, practitioners, manufacturers and other stakeholders must develop marketing campaigns that effectively demonstrate the ease of adopting green cosmetics, emphasizing the positive impact on personal health and overall environmental well-being. Furthermore, marketers can incentivize consumers to adopt green cosmetics through social influencers (e.g., opinion leaders). This strategy can also aid in mitigating the skepticism surrounding the transition from conventional cosmetic products to green cosmetic alternatives, thereby diminishing consumer mistrust and overcoming several barriers.

CONCLUSIONS

Our study aimed to examine the factors contributing to resisting customers' attitudes to adopt green cosmetics, integrating the innovation resistance theory. The study explored three less explored variables: attitudes, use intention and recommendation intention. To the extent of our current knowledge, this research represents consumers' attitudinal resistance towards green cosmetics via the lens of the innovation resistance theory. The results indicate that usage, value, risk, tradition, and image barriers elicit

notable customer attitudinal resistance to green cosmetics in Bangladesh. Additionally, this research posits that customers' cosmetic use intention significantly impacts their recommendation intention. The research provides significant insights for academics, cosmetic makers, and merchants to comprehensively understand customers' obstructing determinants of attitudes toward green cosmetics. This will help them to promote green cosmetics for sustainable usage.

While the current investigation provides substantial contributions, it includes several limitations. Our research was undertaken in Bangladesh, a developing country with a distinct and diverse cultural landscape. As a result, necessary concerns must be addressed while attempting to elaborate the results to other developed and developing countries. Furthermore, the present research used non-probability sampling, which might limit the findings' validity by introducing selection bias. Finally, the present research used a cross-sectional methodology to gather data at a singular moment, thus limiting the applicability of moderators (e.g., environmental concern, level of engagement, personality, etc.) to other temporal contexts, given that customer behavior is subject to temporal fluctuations. We recommend future research in the following aspects to address the abovementioned limitations. Firstly, future research is recommended by conducting empirical investigations of the proposed model in other cultural contexts (e.g., the United States, United Kingdom, China, Vietnam, and Sri Lanka). Secondly, we recommend that future research use a probability sampling technique to mitigate potential selection bias. Thirdly, subsequent studies should use a longitudinal methodology when gathering data, as this would provide a more precise assessment of the impact of consumption barriers on customers' attitudes toward adopting green cosmetics. Fourthly, in ethical marketing, future studies would be beneficial to explore other strategies that might potentially impact the barriers to consumption, both functional and psychological. Finally, future research would be interesting in investigating the impact of societal norms on mitigating the inhibitory effects of consumption barriers of other green products.

DATA AVAILABILITY

The dataset of the study is available from the authors upon reasonable request.

AUTHOR CONTRIBUTIONS

IZ designed and investigated the study. IZ, MAK, and MSR collected and analyzed the data. IZ, MAK, and MSR wrote the paper with input from all authors.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

Technical Appendices

APPENDIX A1. MEASUREMENT ITEMS

Constructs	Item codes	Items	Sources
Usage Barrier (UB)	UB1	There is a minor ability to choose green cosmetic products for consumption.	Nandi, Bokelmann [55]
	UB2	The variety or range of green cosmetic products is poor.	
	UB3	I am not purchasing green cosmetic products because they are unavailable in the shop.	
Value Barrier (VB)	VB1	In my opinion, green cosmetics are healthier than the conventional cosmetic.	Kushwah, Dhir [28]
	VB2	In my view, green cosmetics are free from pesticides and other chemicals.	
	VB3	Green cosmetic contains natural ingredients.	
Risk Barrier (RB)	RB1	I fear that all green cosmetic claiming to be environmentally friendly is not actually an eco-friendly cosmetic.	Kushwah, Dhir [28]
	RB2	I fear that I am paying more money for green cosmetics.	
Tradition Barrier (TB)	TB1	Conventional cosmetic product is enough for me.	Torres-Ruiz, Vega-Zamora [56]
	TB2	It is difficult to tell it apart from other high-quality green cosmetic products.	
Image Barrier (IB)	IB1	I have doubts about the green cosmetic labeling	Kushwah, Dhir [28]
	IB2	I believe that green cosmetics currently sold in the market are not eco-friendly.	
Attitude toward Green Cosmetics (AGC)	AGC1	Purchasing green cosmetics is a good idea.	Taylor and Todd [57]
	AGC2	I like knowing about people who use green cosmetics.	
	AGC3	I believe using green cosmetics would be pleasant.	
Use Intention (UI)	UI1	I am likely to buy green cosmetic products.	Hsu, Chang [58]
	UI2	I will buy green cosmetic products as soon as I run out of the cosmetic products I am currently using.	
	UI3	I will not consider purchasing traditional cosmetic products.	
Recommendation Intention (RI)	RI1	I will recommend green cosmetic products to my friends if the products are available.	Tavares and Oliveira [59]
	RI2	If I have a good experience using green cosmetics, I will recommend friends to use them.	

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