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Green Communication and Purchase Intention for Organic Rice: The Mediating Role of Perceived Environmental Value

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ABSTRACT:

Organic rice is a credence good in which environmental attributes remain unverifiable by consumers, creating persistent information asymmetry. The present study investigates how green claim credibility and green information transparency shape consumers' intention to purchase organic rice, with perceived environmental value as a mediator, using PLS-SEM on 150 consumers in Semarang City. Both green communication dimensions positively and significantly influence perceived environmental value, which proves to be a robust determinant of consumers' purchase intention. Green claim credibility operates exclusively through perceived environmental value, while green information transparency exerts dual pathways of influence on purchase intention, encompassing both a direct route and an indirect route through perceived environmental value. Perceived environmental value is found to partially mediate the pathway from green information transparency to purchase intention, whereas its mediating role in the relationship between green claim credibility and purchase intention does not reach statistical significance. These findings advance Signaling Theory by demonstrating that disclosure-based signals may generate more direct behavioral effects in credence good markets, operating through dual pathways that credibility-based signals do not exhibit. Producers are advised to prioritize verifiable environmental information disclosure to effectively drive purchase intention.

Keywords:

Green Claim Credibility, Green Information Transparency, Perceived Environmental Value, Purchase Intention, Organic Rice

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1. INTRODUCTION

Organic rice has emerged as one of the most strategically significant local food products in Indonesia, combining nutritional superiority, local agricultural identity, and explicit environmental attributes under a single product category. As consumer demand for health-conscious and environmentally responsible food products continues to grow, organic rice therefore represents a unique product category that simultaneously reflects the growing demand for environmentally responsible food and the development of locally produced food. Central Java is among Indonesia's principal rice-producing provinces, accounting for 16.73% of national rice production in 2024, with an output of approximately 8.89 million tonnes (BPS Jawa Tengah, 2025), and has seen a growing number of small and medium scale producers transitioning toward organic cultivation and marketing their products under environmental claims such as “pesticide-free”, “chemical-free”, and “environmentally friendly.” Despite this expanding supply, the capacity of these producers to communicate their products’ environmental value effectively to consumers remains a critical and underexplored challenge.

Consumer orientation toward environmentally responsible food consumption has accelerated in recent years. Evidence from a survey involving more than 19,000 consumers in 17 markets indicates that 53% are prepared to pay a premium of up to 10% for more sustainable packaged food and beverage alternatives (Simeon, 2024). In Indonesia, studies on young consumers indicate that lifestyle orientation toward sustainability and health consciousness are significant drivers of environmentally responsible food consumption among Millennials and Generation Z (Vironika & Maulida, 2025). Halal, environmentally friendly, and sustainable products are increasingly becoming global market preferences, creating strategic opportunities for Indonesian local food producers (Kemendag RI, 2024). Urban consumers demonstrate heightened sensitivity to environmental product attributes, supported by greater exposure to green marketing information through digital channels and more frequent engagement with modern retail environments where organic food products are actively positioned (Alkhatib et al., 2023). This consumer landscape creates a substantial market opportunity for organic rice producers in Central Java to leverage green communication as a key competitive strategy.

However, a fundamental problem persists: the weak effectiveness of environmental communication for organic rice in translating consumer awareness into actual purchase intention. Organic rice is a credence good as its environmental attributes, such as pesticide-free cultivation and chemical-free processing, cannot be independently verified by consumers either before or after purchase (Eyinade et al., 2021). Consequently, consumers must largely depend on producer-provided information when assessing the environmental characteristics of organic rice. Yet several studies have demonstrated that consumers continue to doubt the credibility of environmental claims when the underlying information is unclear, unverifiable, or inconsistently communicated, and the proliferation of green claims has not consistently driven purchase intentions (Judijanto & Putra, 2025). The growing phenomenon of greenwashing has further eroded consumer trust in environmental communications (Persakis et al., 2025), creating a widening gap between producers' communication intentions and consumers' purchasing responses that can only be bridged through stronger communication integrity.

Existing green marketing research has explored several communication mechanisms, particularly eco-labels, environmental advertising, and green trust, in explaining consumers' purchasing responses (Panopoulos et al., 2022). Collectively, prior findings suggest that trustworthy environmental signals can strengthen consumers' value evaluations and subsequently encourage purchasing responses. Previous studies further indicate that perceived environmental value can transmit the influence of green communication stimuli to consumers' purchase intentions across different contexts (Li & Shan, 2025). However, existing studies predominantly examine a single dimension of green communication in isolation and have not integrated multiple dimensions into a unified construct. This study addresses this gap by jointly examining green claim credibility and green information transparency and comparing how each dimension influences purchase intention through perceived environmental value in the context of organic rice consumption in Indonesia. This gap constitutes the primary novelty and theoretical contribution of the present study.

This research examines two complementary dimensions of green communication — green claim credibility and green information transparency — grounded in Signaling Theory. This framework provides the theoretical basis for explaining how environmental information communicated by producers can lessen the information imbalance faced by consumers. Credible and transparent signals are more effective in forming positive consumer responses than ambiguous or inconsistent ones.

This study positions perceived environmental value as the mechanism through which consumers transform environmental communication into value judgments that may subsequently shape their intention to purchase, consistent with the argument that purchasing decisions are shaped not only by direct communication stimuli but also through the formation of environmental value perceptions in consumers' minds. Accordingly, the study examines how GCC and GIT shape PEV, assesses the effect of PEV on purchase intention, evaluates the direct effects of both communication dimensions on purchase intention, and tests PEV as a mediating mechanism.

This study was conducted among consumers in Semarang City, the provincial capital of Central Java, selected as a representative urban consumer context. Urban consumers in Semarang City are characterized by higher environmental awareness, greater access to green product information through digital channels, and more frequent engagement with modern retail environments where organic rice is actively marketed.

This research contributes theoretically by integrating Signaling Theory within the green communication framework in the context of organic staple food products, an approach that has not been widely explored in the Indonesian local food marketing literature. Empirically, this study provides evidence that the mediating mechanism of perceived environmental value operates differently for the two dimensions of green communication, with findings that carry direct practical implications for organic rice producers seeking to design more effective and credible green communication strategies in urban markets.

Based on the above outlined theoretical framework outlined, seven hypotheses are proposed in this study. H1 through H5 examine the direct relationships among green claim credibility, green information transparency, perceived environmental value, and purchase

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intention. H6 and H7 propose that perceived environmental value mediates the relationship between each green communication dimension and purchase intention.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Signaling Theory as a Theoretical Foundation

Originating from Spence's (1973) work on information asymmetry, Signaling Theory has subsequently been applied extensively to explain information exchange in marketing and consumer decision-making. The theory proposes that better-informed parties communicate observable cues that allow less-informed parties to infer otherwise difficult-to-observe characteristics such as quality, commitment, or value (Williams & Hodges, 2022). An effective signal must be both observable by the recipient and costly to fake, conditions that ensure only genuinely high-quality producers will credibly send it.

Applied to green marketing, environmental claims and sustainability disclosures provide consumers with cues for judging product attributes that they cannot readily verify themselves. This signaling function is particularly relevant to credence goods because some environmental characteristics remain difficult for consumers to verify even after consumption (Ikhsan et al., 2024). Local food products with environmentally friendly claims fall squarely into this category, making the quality of communication signals particularly consequential for consumer evaluation.

Within this research framework, Signaling Theory predicts that both dimensions of green communication: green claim credibility and green information transparency, will determine how strongly consumers form perceived environmental value, which subsequently influences purchase intention. These two dimensions are complementary: credibility without transparency makes it difficult for consumers to verify claims, while transparency without credibility exposes inconsistencies that undermine trust (Fu et al., 2025).

2.2 Green Claim Credibility and Perceived Environmental Value

Green claim credibility captures the extent to which consumers regard a product's environmental assertions as truthful, dependable, and believable (Carrete et al., 2023). This construct emphasizes the evaluative dimension of consumers, distinguishing it from mere green awareness or passive exposure to green claims. Consumer confidence that environmental claims are accurate, not exaggerated, and consistent with actual product quality is central to this construct.

Within the Signaling Theory framework, credible environmental claims function as quality signals that help consumers reduce uncertainty in evaluating sustainability attributes that are not directly observable. Empirical studies confirm this relationship: Thakur et al. (2023) found consumer trust in product quality to be a significant antecedent of green perceived value, while Carrete et al. (2023) showed that consumers who doubt the credibility of green signals tend to discount the environmental benefits communicated by manufacturers. However, most of these studies examined credibility in the context of branded products with established certification systems, limiting their applicability to informal local food markets where independent claim verification mechanisms are largely absent. Building on the evidence from Thakur et al. (2023) and Carrete et al. (2023), and grounded in the Signaling Theory framework, this study proposes:

H_1: GCC positively and significantly influences PEV.

2.3 Green Information Transparency and Perceived Environmental Value

Green information transparency is defined as consumer perception of the extent to which product environmental information is conveyed openly, clearly, and in a manner that is easily accessed and understood (Fu et al., 2025). Unlike green claim credibility, which operates at the level of message believability, green information transparency operates at the level of accessibility and clarity, reflecting a producer's commitment not merely to claim, but to explain and substantiate the sustainability attributes of its products.

Within the Signaling Theory framework, environmental information transparency actively reduces information asymmetry between producers and consumers (Mardenli et al., 2025). When producers provide detailed and easily verifiable environmental information, consumers gain greater evaluative capacity to independently assess a product's environmental benefits without relying solely on trust in the manufacturer (Ge et al., 2022). Empirical support is consistent: Fu et al., (2025) found that consumers receiving more transparent environmental information formed more positive product evaluations, while Ge et al. (2022) demonstrated that information transparency on product origin significantly increased perceived value and purchasing decisions. Nevertheless, most of these studies were conducted in online retail settings with digitally literate consumer populations, which may not fully reflect the information processing conditions of urban consumers in developing country contexts such as Indonesia. Based on these arguments, the second hypothesis is formulated as follows:

H_2: GIT positively and significantly influences PEV.

2.4 Perceived Environmental Value and Purchase Intention

Perceived environmental value represents consumers' evaluation of the environmental benefits associated with using a product, including its perceived contribution to reducing environmental harm and supporting ecological sustainability (Murgado-Armenteros et al., 2026).

PEV may encourage purchase intention through both evaluative and identity-related processes. Consumers who recognize stronger environmental benefits may evaluate the product more favorably as a responsible choice, while purchasing such products can also express their environmental consciousness (Hassan et al., 2022; Laheri et al., 2024). Empirical evidence is consistent across contexts: Ghanem et al. (2026) found green perceived value to mediate the relationship between environmental concern and purchasing behavior, while Wang et al., (2023) confirmed that consumers perceiving higher environmental value tend to have stronger purchase intentions regardless of distribution platform. However, these studies predominantly focused on single regional or demographic contexts, leaving open the question of whether the PEV-PI relationship holds consistently across consumers with varying socio-economic characteristics and geographic settings. Based on these arguments, the third hypothesis is formulated as follows:

H_3: PEV positively and significantly influences PI.

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2.5 Green Claim Credibility and Purchase Intention

Green claim credibility may also influence purchase intention directly because trustworthy environmental claims reduce consumers' perceived risk of being misled. Under Signaling Theory, credible claims provide dependable cues about otherwise difficult-to-verify environmental attributes, thereby reducing uncertainty during purchase evaluation (Tolegenov et al., 2024). This reduction in perceived risk increases psychological comfort in purchasing decisions, potentially bypassing the more effortful process of environmental value evaluation. Empirical evidence supports this direct relationship in various contexts. Mai et al. (2026) found that credibly perceived eco-labels positively influenced green purchase behavior among Indonesian consumers, while de Sio et al. (2022) reported that credible eco-labels, trusted environmental claims, and perceptions of authentic green marketing are positively associated with consumers' green purchasing responses. Hussain & Ehsan (2026) further showed that green marketing practices perceived as authentic and credible directly influenced purchase intention. Despite these findings, the boundary conditions of this direct effect remain underexplored, particularly in markets characterized by low consumer trust and high greenwashing prevalence such as Indonesia. This empirical question is one of the focal points of this study. Based on these arguments, the fourth hypothesis is formulated as follows:

H_4: GCC positively and significantly influences PI.

2.6 Green Information Transparency and Purchase Intention

Not only does green information transparency contribute to the formation of perceived environmental value, but it can also directly influence purchase intention through a distinct mechanism. When environmental information is transparently available, consumers can proceed toward purchase more directly, as the uncertainty that would otherwise inhibit decision-making is preemptively resolved by accessible information without requiring the more cognitively demanding process of environmental value formation (Chang & Chen, 2026).

Empirical support for this direct influence is consistent. Isac et al. (2024) found that access to transparent environmental information can strengthen purchase intention even when other environmental evaluations are considered. Sun & Yu (2025) demonstrated that agricultural product information transparency directly influenced online purchasing decisions. However, these studies are rarely distinguished between the direct and indirect pathways through which transparency influences purchase intention, nor examined whether this effect varies across urban consumer segments. Based on these arguments, the fifth hypothesis is formulated as follows:

H_5: GIT positively and significantly influences PI.

2.7 The Mediating Role of Perceived Environmental Value

Signaling Theory further implies an indirect process in which consumers interpret credible or transparent environmental signals, convert this information into an assessment of environmental benefits, and subsequently form purchase intentions. PEV therefore

represents the cognitive link connecting green communication with behavioral intention. Specifically, when consumers receive high-integrity green communication signals, they first internalize these signals into an assessment of environmental benefits, which subsequently translates into purchase intention. This sequential process implies that perceived environmental value functions as a mediating mechanism connecting green communication to consumer behavioral outcomes.

Empirical evidence supports this mediating role. Srivastava & Mittal (2025) demonstrated that green perceived value mediated the relationship between environmental communication and purchasing behavior, while Gupta et al. (2024) showed that the pathway from credibility signals to behavioral intention was substantially channeled through value perception formation. Similarly, Shi et al. (2025) found that consumers' environmental value assessments served as a cognitive bridge between green information exposure and purchase decisions. These findings suggest that the direct effects of GCC and GIT on purchase intention, as hypothesized in H4 and H5, may be partially or fully contingent on the degree to which consumers first form environmental value perceptions from the signals they receive. Within the context of organic rice in urban Indonesian markets, where consumers are increasingly exposed to environmental claims but remain selective in their trust, the mediating role of perceived environmental value is particularly relevant. Consumers who find green communication credible and transparent are likely to consolidate these perceptions into a meaningful environmental value judgment before committing to a purchase decision. Based on these arguments, the following mediation hypotheses are formulated:

H_6: PEV mediates the effect of GCC on PI.

2.8 Conceptual Framework

Figure 1 summarizes the proposed structural relationships and the hypothesized directions examined in the empirical model.

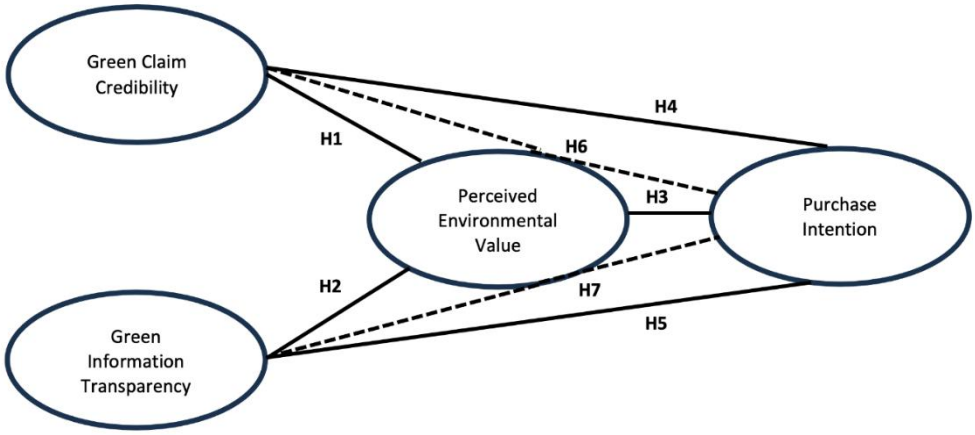

Figure 1. Research Model

The hypotheses developed in this section collectively reflect the theoretical expectation that green communication, operationalized through green claim credibility and green information transparency, drives purchase intention for local food products both directly and

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through the mediation of perceived environmental value. The structural model presented in Figure 1 provides the empirical basis for testing these propositions, with the Signaling Theory serving as the overarching theoretical lens. The findings derived from testing this model are discussed in the subsequent sections.

3. METHODS

3.1 Research Design and Approach

This study employs an explanatory research design with a quantitative approach, aimed at examining the causal relationships among the variables under investigation. A quantitative approach was selected to enable structured measurement of consumer perceptions and to produce generalizable parameter estimates through statistical testing (Ghanad, 2023).

3.2 Population, Sample, and Sampling Techniques

The study population comprised consumers in Semarang City who had purchased or were familiar with organic rice with environmentally friendly claims. Respondents were selected purposively from Semarang City using eligibility requirements aligned with the study context. Inclusion criteria were: (1) aged 17 years or older; (2) Indonesian citizens; and (3) familiar with or having purchased organic rice with environmental or sustainability claims. Participants were recruited online through WhatsApp groups, Instagram, and academic community networks, with a screening question used to exclude respondents residing outside Semarang City. Domicile verification was conducted through a screening question at the opening of the questionnaire; responses from individuals residing outside Semarang City were excluded from analysis.

Following Kock & Hadaya's (2018) inverse square root approach, the model required at least 100 observations under the specified significance level and minimum path coefficient. The final analysis used 150 valid responses. Of the total responses collected, 134 were disqualified due to not meeting the inclusion criteria, yielding 150 usable observations for analysis. To maintain the quality and reliability of survey responses, two attention-check items were incorporated into the questionnaire instrument. Participation was anonymous and voluntary, and respondents provided informed consent before completing the questionnaire. Primary data were gathered over the period from May through August 2026 via a self-administered online questionnaire deployed through the Google Forms platform.

3.3 Instruments and Measurements

All constructs were measured on a five-point agreement scale ranging from 1 (strongly disagree) to 5 (strongly agree). English-language measures were translated into Indonesian and independently back-translated to preserve their intended meaning. Content validity was assessed by three expert validators, yielding an I-CVI of 1.00 for most items (threshold ≥ 0.78; Lynn, 1986). Two items were removed following validation: PI5 ("willing to recommend") was flagged as reflecting word-of-mouth rather than purchase intention, and PEV3 ("worth the price") was removed due to conceptual overlap with price perception. A pilot test with 30 respondents confirmed satisfactory outer loadings (> 0.60) and Cronbach's alpha (> 0.70) across all constructs. Following content validation and pilot testing, the final questionnaire contained 16 indicators distributed equally across GCC, GIT, PEV, and PI, all contextualized to the organic rice product category. The operationalization is presented in Table 1.

Table 1. Operational Definitions of Variables and Measurement Instruments

Variables	Operational Definition	Code	Measurement	Reference
Green Claim Credibility (GCC)	Consumer perceptions of the level of trust, truth, and credibility of environmentally friendly claims on local food products.	GCC1	I believe the eco-friendly claims on the product are true.	(Matthes & Wonneberger, 2014; Newell & Goldsmith, 2001)
		GCC2	The product's eco-friendly claims are not exaggerated.	(Matthes & Wonneberger, 2014; Newell & Goldsmith, 2001)
		GCC3	Environmentally friendly claims are in accordance with the information provided.	(Matthes & Wonneberger, 2014; Newell & Goldsmith, 2001)
		GCC4	I feel the eco-friendly claims on the product are credible.	(Matthes & Wonneberger, 2014; Newell & Goldsmith, 2001)
Green Information Transparency (GIT)	Consumer perceptions of the extent to which environmental information is conveyed openly, clearly, and easily understood.	GIT1	Information about the environmental impact of the product is clearly explained.	(Atkinson & Rosenthal, 2014; Nyilasy et al., 2014)
		GIT2	The information about the product is easy for me to understand.	(Atkinson & Rosenthal, 2014; Nyilasy et al., 2014)
		GIT3	Manufacturers convey information openly	(Atkinson & Rosenthal, 2014; Nyilasy et al., 2014)
		GIT4	I got enough information before considering buying the product.	(Atkinson & Rosenthal, 2014; Nyilasy et al., 2014)
Perceived Environmental Value (PEV)	Consumer perceptions of the environmental benefits obtained from consuming local food products with environmentally friendly claims.	PEV1	The product provides benefits to the environment	(C. Chang & Chen, 2012)
		PEV2	Buying the product feels better for the environment	(C. Chang & Chen, 2012)
		PEV3	The product helps reduce the negative impact on the environment.	(C. Chang & Chen, 2012)
		PEV4	Overall, the product has good value for the environment.	(C. Chang & Chen, 2012)
Purchase Intention (PI)	Consumer intention to purchase and choose local food products with environmentally friendly claims.	PI1	I am interested in purchasing the product	(Yadav & Pathak, 2016)
		PI2	I will consider these products when choosing food products.	(Yadav & Pathak, 2016)

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Variables	Operational Definition	Code	Measurement	Reference
		PI3	I prefer this product over other products.	(Yadav & Pathak, 2016)
		PI4	I will likely purchase this product in the future	(Yadav & Pathak, 2016)

Note: *All items use a 5-point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree). The instrument has undergone content validation (expert judgment) by three expert validators.*

3.4 Data Analysis Techniques

The proposed model was estimated in SmartPLS 4 using PLS-SEM, an approach suitable for prediction-oriented structural models and not dependent on multivariate normality (Hair et al., 2021). Analysis proceeded from measurement-model assessment to structural-model evaluation, followed by hypothesis testing using 5,000 bootstrap resamples to obtain path significance estimates (Sarstedt et al., 2022).

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4. RESULTS AND DISCUSSION

4.1 Respondent Profile

After the screening stage, 150 eligible responses were included in the analysis, with respondent characteristics reported in Table 2. The respondent profile was predominantly female (64.7%) and skewed toward the younger age group, with 81.3% falling within the 17–25-year range. All participants were domiciled within Semarang City.

Table 2. The Demographic of Respondents

Characteristic	Category	n	%
Gender	Female	97	64.7%
	Male	53	35.3%
	Total	**150**	**100%**
Age	17 – 25 years	122	81.3%
	26 – 35 years	17	11.3%
	36 – 45 years	10	6.7%
	46 – 55 years	1	0.7%
	Total	**150**	**100%**

4.2 Descriptive Statistics

Descriptive statistics about all 16 measurement items are reported in Table 3. Overall, respondents reported moderately high agreement across all constructs, with Perceived Environmental Value (PEV) items yielding the highest mean scores (3.98–4.26), followed by Purchase Intention (PI; 3.91–4.00) and Green Claim Credibility (GCC; 3.86–4.00), while Green Information Transparency (GIT) items showed the broadest response range (3.83–3.93) with

the highest standard deviations (up to 0.937), indicating slightly greater variance in respondent assessments of producer information disclosure practices.

Table 3. Descriptive Statistics

Item	N	Min	Max	Mean	SD
GCC.1	150	1	5	4.00	0.786
GCC.2	150	2	5	3.90	0.775
GCC.3	150	1	5	3.91	0.814
GCC.4	150	2	5	3.86	0.890
GIT.1	150	2	5	3.83	0.849
GIT.2	150	2	5	3.93	0.825
GIT.3	150	1	5	3.84	0.868
GIT.4	150	1	5	3.85	0.937
PEV.1	150	2	5	4.26	0.709
PEV.2	150	1	5	4.19	0.711
PEV.3	150	1	5	4.08	0.848
PEV.4	150	2	5	3.98	0.755
PI.1	150	2	5	3.97	0.772
PI.2	150	2	5	3.91	0.785
PI.3	150	2	5	3.91	0.859
PI.4	150	1	5	4.00	0.786

4.3 Common Method Bias Assessment

Potential common method bias was examined before assessing the structural model using Harman's single-factor procedure (Sarstedt et al., 2022). The analysis evaluated whether one dominant factor accounted for most of the variance across the 16 indicators.

Table 4. Harman's Single-Factor Test (All 16 Items)

Component	Eigenvalue	Variance Explained (%)	Cumulative Variance (%)
1	7.591	47.44	47.44
2	1.531	9.57	57.01
3	0.983	6.14	63.16
4	0.786	4.91	68.07
5–16	< 0.726	< 4.54 each	—

Table 5. Kaiser-Meyer-Olkin (KMO) Measure

Item	MSA	Item	MSA
GCC.1	0.932	PEV.1	0.914
GCC.2	0.911	PEV.2	0.911
GCC.3	0.914	PEV.3	0.852
GCC.4	0.907	PEV.4	0.927
GIT.1	0.926	PI.1	0.891
GIT.2	0.929	PI.2	0.934
GIT.3	0.884	PI.3	0.906
GIT.4	0.935	PI.4	0.900

4.4 Measurement Model Evaluation

Measurement quality was examined according to established PLS-SEM criteria, covering indicator reliability, convergent validity, and discriminant validity. All analyses were conducted using SmartPLS 4 with a sample of n = 150 organic rice consumers in Semarang City.

Indicator Reliability and Convergent Validity

Indicator loadings ranged from 0.735 to 0.850, while every construct exceeded the 0.50 AVE criterion and the recommended reliability thresholds, supporting convergent validity and internal consistency. Internal consistency across all constructs was confirmed, with composite reliability (CR) ranging from 0.868 to 0.898 and Cronbach's alpha coefficients spanning 0.797 to 0.849, each exceeding the minimum acceptable threshold of 0.70 (Fornell & Larcker, 1981). Collinearity among indicators within each latent variable was assessed using outer variance inflation factor (VIF) scores, all of which remained under 3.3, indicating no problematic multicollinearity (Kock & Hadaya, 2018).

Table 6. Outer Loadings, AVE, Composite Reliability, and Cronbach's Alpha

Item	Loading	Outer VIF	AVE	CR (ρc)	α
GCC			0.651	0.882	0.821
GCC.1	0.762	1.495			
GCC.2	0.837	1.982			
GCC.3	0.843	1.882			
GCC.4	0.783	1.723			
GIT			0.688	0.898	0.849
GIT.1	0.829	1.924			
GIT.2	0.833	1.935			
GIT.3	0.828	2.009			
GIT.4	0.827	1.787			
PEV			0.623	0.868	0.797
PEV.1	0.775	1.572			
PEV.2	0.809	1.822			
PEV.3	0.834	1.956			
PEV.4	0.735	1.405			
PI			0.689	0.898	0.849
PI.1	0.823	1.891			
PI.2	0.850	2.032			
PI.3	0.818	1.940			
PI.4	0.828	1.927			

Discriminant Validity

Table 7. Fornell-Larcker Criterion (diagonal) and HTMT Ratio (above diagonal)

	GCC	GIT	PEV	PI
GCC	**0.807**	0.891	0.672	0.674
GIT	0.697	**0.830**	0.696	0.738
PEV	0.516	0.551	**0.789**	0.802
PI	0.514	0.591	0.611	**0.830**

Discriminant validity was evaluated using two complementary criteria. Under the Fornell-Larcker criterion, the square root of the average variance extracted (AVE) for each construct exceeded its bivariate correlations with all remaining constructs, satisfying the conventional standard. Heterotrait-monotrait (HTMT) ratios were additionally computed, with all values falling below the stringent 0.90 boundary recommended by (Henseler et al., 2015). The highest HTMT ratio was recorded between GCC and GIT at 0.891, confirming that the two green communication dimensions retain empirical distinctiveness despite their conceptual relatedness.

Table 8. Cross-Loadings

	GCC	GIT	PEV	PI
GCC.1	**0.762**	0.533	0.450	0.444
GCC.2	**0.837**	0.626	0.424	0.477
GCC.3	**0.843**	0.624	0.456	0.526
GCC.4	**0.783**	0.623	0.423	0.370
GIT.1	0.614	**0.829**	0.497	0.511
GIT.2	0.599	**0.833**	0.471	0.521
GIT.3	0.604	**0.828**	0.430	0.456
GIT.4	0.649	**0.827**	0.506	0.595
PEV.1	0.476	0.474	**0.775**	0.457
PEV.2	0.413	0.447	**0.809**	0.563
PEV.3	0.382	0.417	**0.834**	0.535
PEV.4	0.443	0.477	**0.735**	0.538
PI.1	0.498	0.542	0.542	**0.823**
PI.2	0.503	0.547	0.616	**0.850**
PI.3	0.475	0.508	0.460	**0.818**
PI.4	0.406	0.500	0.579	**0.828**

Each indicator loads highest on its intended construct, with no cross-loading exceeding its primary loading, confirming indicator-level discriminant validity.

4.5 Structural Model Evaluation

Collinearity, Effect Sizes, and Explained Variance

Table 9. Inner Model: VIF, f^2, and R^2

Path	Inner VIF	f^2	Interpretation
GCC → PEV	2.244	0.046	Small
GIT → PEV	2.244	0.103	Small-moderate
GCC → PI	2.348	0.010	Negligible
GIT → PI	2.476	0.082	Small-moderate
PEV → PI	1.567	0.260	Moderate
R^2 (PEV)		**0.362**	Moderate (Chin, 1998)
R^2 (PI)		**0.540**	Substantial (Chin, 1998)

Note: f^2 benchmarks: ≥0.02 small, ≥0.15 medium, ≥0.35 large (Chin, 1998). R^2 benchmarks: 0.19 weak, 0.33 moderate, 0.67 substantial (Chin, 1998). Inner VIF < 3.3 for all paths (Kock & Hadaya, 2018).

All structural VIF estimates remained below 3.3, providing no indication of problematic collinearity. (Kock & Hadaya, 2018). The structural model demonstrated satisfactory explanatory capacity. Variance in perceived environmental value was explained at 36.2% (R^2 = 0.362; adjusted R^2 = 0.353), while the model accounted for 54.0% of variance in purchase intention (R^2 = 0.540; adjusted R^2 = 0.531). Both figures surpass the moderate benchmark of 0.33 proposed by Chin (1998).

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Model Fit

Table 10. Model Fit Indices

Index	Value	Threshold	Assessment
SRMR	0.068	< 0.08	Acceptable
d_ULS	0.634	—	Reference
NFI	0.807	> 0.90 (indicative)	Acceptable for PLS

The SRMR of 0.068 was below the commonly applied 0.08 benchmark, indicating an acceptable discrepancy between the observed and model-implied correlations (Henseler et al., 2015). NFI values in PLS-SEM are not subject to the same threshold criteria as CB-SEM, and a value of 0.807 is acceptable for exploratory structural models with this sample size (Lohmöller, 1989).

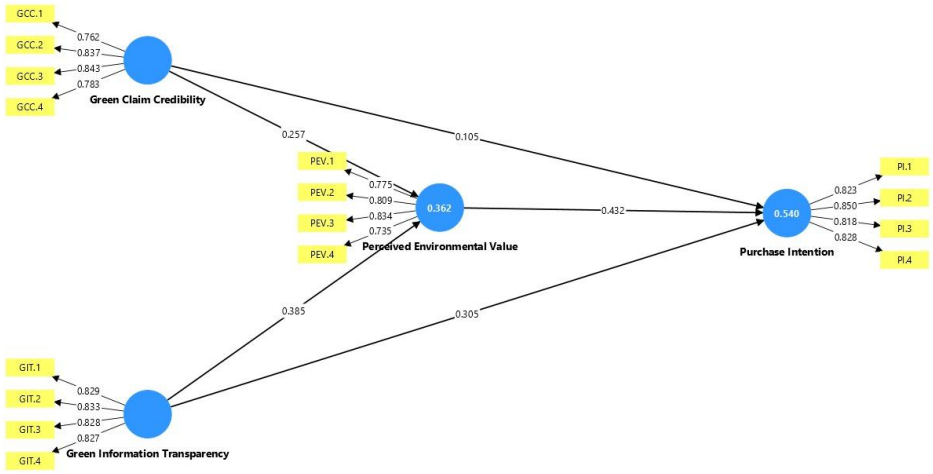

Figure 2. SmartPLS 4 path diagram showing standardized outer loadings and path coefficients with coefficient of determination (R^2) for endogenous constructs (n = 150).

Predictive Relevance (PLSpredict)

Table 11. PLSpredict Q^2 Values and CVPAT Results

Construct	Q^2predict (LV)	CVPAT vs. IA (p)	CVPAT vs. LM (p)	Assessment
PEV	0.326	0.003	0.000	Medium predictive relevance
PI	0.396	< 0.001	0.354	Medium predictive relevance

Note: Q^2predict > 0 indicates predictive relevance (Shmueli et al., 2019). CVPAT: Cross-Validated Predictive Ability Test; IA = Indicator Average benchmark; LM = Linear Model benchmark.

At the manifest variable level, Q^2predict values for all endogenous indicators are positive (PEV items: 0.151–0.236; PI items: 0.226–0.296), confirming out-of-sample predictive relevance for all indicators. Cross-validated predictive ability test (CVPAT) results indicated that the PLS-SEM model outperformed both the naïve indicator average (IA) and linear model (LM) benchmarks for perceived environmental value ($p < 0.01$ for both comparisons). With respect to purchase intention, the model demonstrated superiority over the IA benchmark ($p < 0.001$); however, it did not significantly exceed the linear model benchmark ($p = 0.354$),

suggesting medium-level predictive accuracy for this endogenous construct. Overall CVPAT results ($p < 0.001$ vs. IA; $p = 0.014$ vs. LM) confirm adequate predictive relevance at the model level.

4.6 Hypothesis Testing

Direct Effects

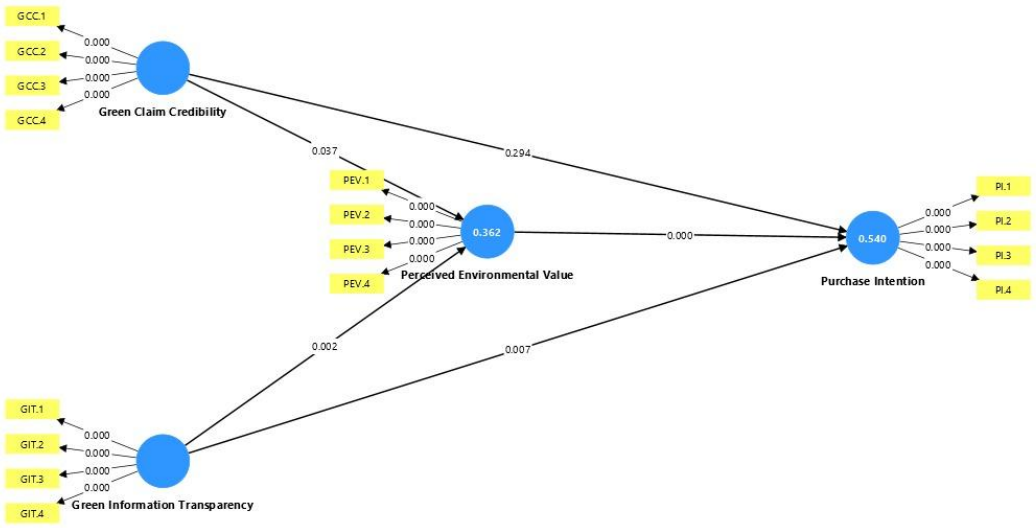

Figure 3. SmartPLS 4 bootstrapping results showing p-values for path coefficients and outer loadings (5,000 subsamples, two-tailed, bias-corrected)

Table 12. Direct Effect Hypotheses (H1–H5)

Hyp.	Path	β	T-stat	p-value	95% CI	f^2	Decision
H1	GCC → PEV	0.257	2.082	0.037	[0.019; 0.503]	0.046	Supported
H2	GIT → PEV	0.385	3.034	0.002	[0.132; 0.624]	0.103	Supported
H3	PEV → PI	0.432	4.871	< 0.001	[0.249; 0.603]	0.260	Supported
H4	GCC → PI	0.105	1.049	0.294	[-0.093; 0.304]	0.010	Not Supported
H5	GIT → PI	0.305	2.716	0.007	[0.077; 0.515]	0.082	Supported

Note: Bootstrapping with 5,000 subsamples, two-tailed, bias-corrected confidence intervals (Ringle et al., 2024).

Of the five direct hypotheses, four are supported. H1 confirms that green claim credibility positively influences perceived environmental value ($\beta = 0.257$, $p = 0.037$), with a small effect size ($f^2 = 0.046$) indicating a meaningful though moderate contribution. H2 demonstrates that green information transparency exerts a stronger effect on perceived environmental value ($\beta = 0.385$, $p = 0.002$, $f^2 = 0.103$). Among the direct path estimates, perceived environmental value emerged as the most influential predictor of purchase intention (H3: $\beta = 0.432$, $p < 0.001$, $f^2 = 0.260$), yielding a moderate-to-large effect size that exceeded the combined contributions of the two green communication dimensions. Green information transparency demonstrated a statistically significant direct effect on purchase intention (H5: $\beta = 0.305$, $p = 0.007$), operating independently of the mediated pathway through perceived environmental value. In contrast, green claim credibility did not produce a significant direct effect on

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purchase intention (H4: β = 0.105, p = 0.294, f^2 = 0.010), with a confidence interval inclusive of zero, suggesting that its contribution to purchase intention is channeled entirely through indirect mechanisms.

Indirect Effects (Mediation)

Table 13. Mediation Hypotheses (H6–H7)

Hyp.	Indirect Path	β	T-stat	p-value	95% CI	Decision
H6	GCC → PEV → PI	0.111	1.881	0.060	[0.008; 0.237]	Not Supported
H7	GIT → PEV → PI	0.166	2.535	0.011	[0.049; 0.309]	Supported

Note: H6 does not reach significance (p > 0.05, two-tailed). CI excludes zero but p-value criterion not met.

H7 is supported, constituting partial mediation given that the GIT → PI direct path (H5) also remains significant. H6 is not supported under the two-tailed criterion; the CI excludes zero but the effect falls short of the conventional 0.05 threshold.

Total Effects

Table 14. Total Effects

Path	β (total)	T-stat	p-value	95% CI
GCC → PI	0.216	2.131	0.033	[0.017; 0.422]
GIT → PI	0.471	4.361	< 0.001	[0.249; 0.670]

The total effect of GIT on PI (β = 0.471) substantially exceeds that of GCC (β = 0.216), reflecting the combined direct and indirect contributions of both green communication dimensions examined in this study.

4.7 DISCUSSION

The Influence of Green Claim Credibility on Perceived Environmental Value

The results confirm that green claim credibility positively and significantly influences perceived environmental value, supporting H1. This finding is grounded in Signaling Theory: when producers of organic rice transmit environmental claims that consumers perceive as honest, consistent, and non-exaggerated, they effectively reduce the information asymmetry inherent in credence goods markets (Spence, 1973). Organic rice attributes are unverifiable through sensory inspection before or after purchase; credible claims therefore serve as the primary cognitive signal through which consumers begin constructing environmental value assessments (Choubey et al., 2025).

The moderate path coefficient and small effect size suggest that while GCC contributes meaningfully to perceived environmental value, its influence is constrained by the evaluative limitations consumers face when assessing abstract environmental claims without corroborating evidence. Studies on organic food markets have consistently shown that credibility alone provides a weak foundation for value formation when verification mechanisms are absent (Schrobback et al., 2023). This finding aligns with Murgado-Armenteros et al. (2026), who demonstrated that credible sustainability signals generate moderate rather than strong value perceptions in food markets characterized by low

certification visibility. The small-to-moderate effect indicates that GCC establishes a necessary credibility threshold but does not independently produce strong environmental value perceptions.

Theoretically, H1 positions GCC as the foundational prerequisite in green communication: without baseline credibility, subsequent informational disclosures will be received with heightened skepticism, reducing their capacity to generate perceived environmental value. The implication for signal design is that credibility and transparency are complementary rather than substitutable.

The Influence of Green Information Transparency on Perceived Environmental Value

Green information transparency positively and significantly influences perceived environmental value, with a notable path coefficient and effect size. Within Signaling Theory, this difference reflects a fundamental distinction between signal types: transparency constitutes a more informationally complete signal than credibility, as it provides consumers with specific, independently accessible, and verifiable content rather than requiring them to rely primarily on trust in the producer's assertions (Fu et al., 2023).

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The Influence of Perceived Environmental Value on Purchase Intention

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Among the examined predictors, PEV showed the strongest relationship with purchase intention. The moderate-to-large effect size confirms that PEV is the primary value-to-behavior conversion mechanism: once consumers form sufficient environmental value perceptions, these perceptions translate with high reliability into purchase intention.

This relationship suggests that consumers become more willing to purchase when the environmental benefits of organic rice are perceived as meaningful rather than merely communicated as promotional claims. The model demonstrates substantial explanatory power for purchase intention, consistent with expectations for this type of green marketing model (Gupta et al., 2024). In the organic rice context, where purchase decisions are influenced by both the functional attributes of the product (health, safety) and its environmental dimensions, consumers who perceive strong environmental value are activating attribute-based motivations for purchase (Babu et al., 2026).

This finding is consistent with a robust cross-cultural literature confirming PEV as a reliable predictor of green purchase intention (Van Hoang & Le Thanh, 2024). The model explains substantially more variance in PI than in PEV, reflecting that purchase intention in this sample is more tightly determined by the model's constructs than is environmental value formation.

Green Claim Credibility Does Not Directly Affect Purchase Intention (H4 Rejected)

Contrary to H4, GCC did not show a statistically significant direct relationship with purchase intention. The negligible effect size confirms that this non-significance is substantive rather than a power issue. However, GCC's total effect on PI reaches a meaningful total effect, indicating that GCC does contribute to purchase intention.

This full mediation pattern aligns with Signaling Theory's proposition that signal effectiveness depends on the cognitive evaluation it elicits, not merely on its transmission (Connelly et al., 2011). Credibility signals do not directly produce purchase responses; they first generate value assessments that then drive behavioral intentions. In credence good markets such as organic rice, where consumers cannot directly verify environmental claims, the evaluative stage is a necessary cognitive intermediary before purchase intention can be generated. Studies that found direct claim credibility effects on purchase intention (Kim & Song, 2020) predominantly examined branded products with established third-party certification systems that provide consumers with a pre-built frame for translating credibility directly into behavioral responses.

The role of growing consumer awareness about greenwashing in the Indonesian market may also contribute to this pattern (Persakis et al., 2025), though this interpretation remains speculative and was not directly measured in the present study. What the data confirm is that GCC's contribution to purchase intention operates primarily through the formation of perceived environmental value: improving claim credibility without ensuring that consumers develop concrete environmental value perceptions is unlikely to translate into meaningful behavioral change.

The Influence of Green Information Transparency on Purchase Intention

Green information transparency has been proven to have a direct and significant impact on purchase intention, in contrast to green claim credibility, whose influence is entirely

mediated by perceived environmental value. This difference in mechanism is an important comparative finding not widely explored in previous literature. Theoretically, green claim credibility is more evaluative and abstract; consumers need to trust the claim as a prerequisite, which is a longer cognitive process requiring value mediation before driving purchase intention. Green information transparency, by contrast, has a more direct and concrete utilitarian dimension: when consumers feel they have sufficient and clear information, they can use it directly in purchasing decisions without first going through the more abstract stages of environmental value evaluation (Asif et al., 2022). Transparency thus functions both as a facilitator of environmental value formation and as a direct driver of purchase intention.

Green information transparency significantly influences purchase intention through a direct pathway, in addition to its indirect contribution through PEV (H7). GIT operates through dual mechanisms: it simultaneously builds perceived environmental value (H2) and directly facilitates purchase intention through the informational clarity it provides.

This dual-mechanism structure is grounded in the distinction between evaluative and informational functions of environmental signals. GCC primarily serves an evaluative function, which must then generate value perceptions before influencing behavior. GIT serves both an evaluative function (by enabling environmental value construction) and an informational utility function: consumers who feel adequately informed about a product's environmental profile can integrate that information directly into their purchase decision without completing the more cognitively demanding process of formal environmental value construction (Nygaard, 2023). Transparency reduces decision uncertainty directly and thereby generates a shorter, more direct path to purchase intention.

This finding is consistent with (Jung et al., 2024), who found that agricultural product information transparency directly influences purchase decisions even after controlling for environmental attitudes. Taken together, these results suggest that the two green communication dimensions examined in this study may operate through distinct mechanisms, a distinction that warrants further investigation in future research.

Mediation Effects of Perceived Environmental Value (H6 and H7)

The mediation analyses reveal a theoretically illuminating asymmetry. H7 is supported: perceived environmental value partially mediates the GIT → PI relationship. Because GIT's direct path to PI remains significant (H5), this constitutes partial mediation — PEV channels a meaningful portion of GIT's effect on purchase intention while leaving a substantial direct component intact. This partial mediation structure is consistent with GIT's dual-mechanism operation described above.

H6 is not supported: the indirect effect of GCC on PI through PEV yields a borderline indirect effect that does not meet the conventional significance threshold. While the confidence interval excludes zero, the p-value does not meet the 0.05 threshold under two-tailed bootstrapping with 5,000 subsamples. The non-significant mediation of GCC (H6), combined with the non-significant direct effect (H4) but significant total effect, indicates that GCC's overall contribution to purchase intention, while present, is diffuse and statistically fragile at the component level.

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The asymmetry between H6 and H7 reflects the fundamental signal quality difference identified throughout this study: transparency-based signals appear more informationally complete, generate stronger value perceptions, and produce more reliable mediated behavioral effects than credibility-based signals, though the formal comparison of these two dimensions falls outside the scope of the hypotheses tested. Within Signaling Theory, the effectiveness of a signal in generating downstream outcomes depends on its observability, verifiability, and informational completeness (Bergh et al., 2014). Transparency disclosures may score relatively higher on these dimensions, which could contribute to more consistent signal-to-behavior pathways.

Collectively, the mediation results confirm perceived environmental value as the central value-conversion mechanism in this model, while revealing that the efficiency of this conversion depends fundamentally on the type of environmental signal being processed.

5. CONCLUSION

This study investigated the influence of green claim credibility (GCC) and green information transparency (GIT) on purchase intention for organic rice in Semarang City, with perceived environmental value (PEV) as a mediator, using PLS-SEM on 150 respondents.

The findings confirm that both GCC and GIT positively and significantly influence perceived environmental value. Perceived environmental value emerges as a strong predictor of purchase intention, confirming its role as the primary value-to-behavior conversion mechanism. GCC does not directly affect purchase intention, while GIT exerts both direct and indirect effects, reflecting a fundamental asymmetry between the two communication dimensions: GCC operates exclusively through value mediation, whereas GIT generates behavioral effects through dual pathways. The mediation analysis further shows that perceived environmental value significantly mediates the GIT–PI relationship (H7 supported), while the mediation of the GCC–PI relationship does not reach statistical significance (H6 not supported).

These findings contribute to the green marketing literature by demonstrating that the two dimensions of green communication are not behaviorally interchangeable, and that disclosure-based signals may generate more direct behavioral effects than credibility-based signals in credence good markets. Practically, organic rice producers should prioritize verifiable environmental information disclosure over claim-based messaging, while ensuring that perceived environmental value is made tangible to consumers through concrete and experiential communication strategies.

Several limitations should be considered. First, the cross-sectional design captures relationships at a single point in time and therefore does not establish how consumer responses develop over time. Second, because the sample was limited to consumers in Semarang City, the findings should not be assumed to represent consumers in other geographic or socio-economic settings. Respondents may have rated green communication attributes and purchase intention more favorably than their actual behavior would reflect. Third, the sample is predominantly young and was recruited through an online survey, which may overrepresent digitally active consumers with higher environmental awareness relative to the broader population of organic rice consumers in Semarang City. Fourth, the descriptive

statistics reveal relatively high mean scores across all constructs, suggesting a potential ceiling effect that may have compressed variance and attenuated the magnitude of some path coefficients, particularly for GCC. Future research could test the model across broader consumer populations and examine additional boundary conditions, including environmental knowledge, green skepticism, and other factors that may alter consumers' responses to environmental communication.

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AUTHOR'S CONTRIBUTION

M.H.L.: Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review and editing, Project administration. A.G.: Supervision, Writing – review and editing, Validation. S.P.: Resources, Data curation, Investigation. W.M.: Formal analysis, Writing – review and editing, Validation. N.F.: Data curation, Software, Visualization. B.K.M.: Supervision, Writing – review and editing, Funding acquisition. All authors have read and approved the final manuscript.

ETHICS STATEMENT

This study was conducted in accordance with ethical standards for research involving human participants. All respondents provided informed consent prior to participation, and participation was entirely voluntary. The anonymity and confidentiality of all participants and their data were strictly maintained throughout the study. As this research involved an anonymous online survey with no sensitive or personal identifying information collected, formal ethical committee review was not required.

THE USE OF AI

The authors declare that generative AI tools were used in the preparation of this manuscript solely for the purposes of language editing and paraphrasing assistance. All AI-generated output was carefully reviewed, edited, and validated by the authors. The authors remain fully responsible for the accuracy, originality, and integrity of all content presented in this manuscript.

CONFLICT OF 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 article.

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