

Assessing the Relationship between Packaging Quality and Brand Preference among Consumers of Ghanaian Food and Pharmaceutical Products



Adam Rahman¹ , Ralitsa Diana Debrah¹  & Ginn Bonsu Assibey¹ 

¹ Department of Communication Design, Faculty of Art, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

ABSTRACT

Product packaging, a key factor in consumer decision-making, serves as the first point of contact between the consumer and the product. It communicates essential information, such as features, usage instructions, and ingredients, that can significantly shape perception and influence purchasing choices. User-friendly packaging enhances satisfaction, encourages repeat purchases, and serves as a powerful communication tool in the purchase decision-making process. High-quality packaging design enhances product recognition and brand loyalty, positioning it as a strategic asset in competitive markets. This article examined the relationship between packaging quality and brand preference among consumers of Ghanaian food and pharmaceutical products. The study employed primary data collected through a questionnaire-based survey administered to 200 consumers in Ayeduase, Kotei, and the Kwame Nkrumah University of Science and Technology (KNUST) Campus between 6–18 July 2023. Data were analysed using Principal Component Analysis (PCA). The findings revealed that visual appeal, packaging material, information clarity and packaging functionality strongly influence consumer brand preference. These attributes were found to be interrelated, suggesting that improving one can positively affect others. Demographic factors such as age, gender, and education had minimal effect on consumer preferences, reinforcing the universal importance of packaging quality. The study concludes that enhancing packaging design can improve consumer trust, satisfaction, and brand loyalty. It recommends investment in high-quality, user-friendly, and informative packaging, alongside collaboration between designers and producers to improve local product presentation. This research contributes empirical insight from Ghana and proposes a framework linking packaging to brand preference, supporting innovative design for improved competitiveness in emerging markets.

Correspondence

Adam Rahman

Email:

radam.cass@knu.edu.gh

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INTRODUCTION

Packaging design encompasses the integration of form, structure, materials, colour, imagery, typography, and regulatory information, alongside supplementary design elements, to produce a market-ready product.¹ Its ultimate aim is to achieve marketing objectives by effectively communicating the

¹ Pinya Silayoi and Mark Speece, "The Importance of Packaging Attributes: A Conjoint Analysis Approach," *European Journal of Marketing* 41, no. 11/12 (2007): 1495–1517; Chang Liu, Mat Redhuan Samsudin, and Yuwen Zou, "The Impact of Visual Elements of

product's identity or function and stimulating sales.² Historically, packaging dates back to ancient civilisations, where natural materials such as leaves and wood were used for storage, protection, and transport. In contemporary commerce, packaging has evolved into a potent promotional tool.³ The evolution of packaging parallels industrial development, transitioning from basic protection to serving as a medium for consumer engagement and branding.

Many companies recognise packaging as a confirmation factor that influences consumer perception at the point of purchase. Well-designed, visually appealing packaging often creates a favourable first impression and fosters product interest.⁴ Hitesh et al., argue that companies invest significantly in packaging because of its ability to capture consumer attention and sway purchasing decisions.⁵ Beyond aesthetics, packaging conveys key product details—such as pricing, contents, ingredients, nutritional value, preparation guidelines, and expiry dates.

In the globalised marketplace, packaging has become a strategic element of the marketing mix, directly affecting consumer behaviour. Both material and design influence consumers' perceptions of value and quality.⁶ As Lee and MacLachlan observe, packaging is often the first point of contact between a consumer and a brand.⁷ As such, it functions as a silent yet powerful tool of communication and differentiation, requiring detailed examination of its components and their influence on consumer choices.⁸ It also helps to shape the brand's image, whether to convey luxury, affordability, or eco-consciousness.⁹

In the Ghanaian context, the comparatively low patronage of locally made products is often attributed to subpar packaging standards. Jewel, Shikatse, and Anning argue that made-in-Ghana products lack market competitiveness due to inadequate packaging design and implementation.¹⁰ They further note that the scarcity of specialised packaging design professionals has constrained the growth of packaging innovation for local SMEs. Nonetheless, consumers' purchase decisions in Ghana remain heavily influenced by packaging quality.¹¹ Local producers often focus primarily on product content while neglecting packaging design. Many fail to conduct sufficient audience research regarding demographic, geographic, psychographic, or cultural variables, which could otherwise guide design decisions. Consequently, the packaging does not resonate with consumers and is perceived as low-quality. This perception causes consumers to favour foreign brands, leading to diminished brand performance and business sustainability.¹²

This study aims to evaluate the relationship between packaging quality and brand preference among consumers of Ghanaian food and pharmaceutical products.

The specific objectives are:

1. To investigate the extent to which packaging quality affects consumers' brand preference.
2. To identify the key elements of packaging that influence consumer preference.
3. To examine how packaging material and design affect consumer perception of quality.

Packaging Design on Purchase Intention: Brand Experience as a Mediator in the Tea Bag Product Category," *Behavioral Sciences* 15, no. 2 (2025): 181.

² Marianne R. Klimchuk and Sandra A. Krasovec, "Packaging Design: Successful Product Branding from Concept to Shelf," 2013, <https://www.oreilly.com/library/view/packaging-design-successful/9781118358603/chap02sec001.html>.

³ Robert L. Underwood, "The Communicative Power of Product Packaging: Creating Brand Identity via Lived and Mediated Experience," *Journal of Marketing Theory and Practice* 11, no. 1 (2003): 62–76.

⁴ Alice Louw, *The Power of Packaging* (United States of America, 2006).

⁵ Hitesh Sharma et al., "The Role of Packaging in Brand Communication," *International Journal of Scientific and Engineering Research* 3, no. 2 (December 17, 2012).

⁶ C. Delgado and J. Fernandes, "Packaging Design as an Investment in Brand Equity Creation," *Journal of Visual Languages & Computing* 42 (2017): 58–64.

⁷ J. Lee and D. L. MacLachlan, "The Effects of Package Design on Perceptions of Luxury: A Comparison of Haute Couture and Pret-a-Porter Brands," *Journal of Business Research* 69, no. 1 (2016): 325–33.

⁸ Ahmed Rizwan Raheem, Parmar Vishnu, and Amin Muhammad Ahmed, "Impact of Product Packaging on Consumer's Buying Behavior," *European Journal of Scientific Research* 122, no. 2 (2014): 125–34.

⁹ Ulrich Enneking, Claudia Neumann, and Sven Henneberg, "How Important Intrinsic and Extrinsic Product Attributes Affect Purchase Decision," *Food Quality and Preference* 18, no. 1 (2007): 133–38.

¹⁰ Jewel Dela Novioxoxo, Nii Adjebu Shikatse Mills, and Lucy Anning, "The Effect of Packaging on Perceived Quality and Purchase Intention of Made-In-Ghana Brands," *European Journal of Business and Management* 11, no. 5 (2019): 74–88.

¹¹ Joseph Amankwah-Amoah, "An Integrative Process Model of Organisational Failure," *Journal of Business Research* 69, no. 9 (2016): 3388–97.

¹² Agnes Decardi-Nelson, Adam Rahman, and Ebenezer Mante, "Perceptions of Shop Operators on Packaging of Made-in-Ghana Products," *Journal of Applied Packaging Research* 11, no. 1 (2019): 3.

The study addresses the following research questions: How does packaging quality influence consumer brand preference in Ghana's food and pharmaceutical sectors? What are the essential packaging elements that shape consumer preferences? How do materials and design affect perceived packaging quality and brand preference?

Understanding the packaging-brand preference relationship can promote the local and international competitiveness of Ghanaian products, with implications for economic growth. The findings will also guide local producers and designers in refining their packaging strategies to meet consumer expectations and enhance brand loyalty. This research is limited to assessing the key packaging attributes—visual appeal, material, clarity of information, and functionality—and their influence on brand preference among consumers in Ghana. It seeks to expand existing knowledge on the strategic value of packaging, particularly in emerging markets.

LITERATURE REVIEW

Lee and Maclachlan found that packaging is often the first point of contact between a consumer and a brand.¹³ High-quality packaging design enhances brand recognition and fosters brand loyalty. Packaging is not only a means of product protection but also an influential tool for promoting products and stimulating purchase intentions.¹⁴ Enneking, Neumann, and Henneberg emphasise the post-purchase phase in consumer behaviour, noting that attributes evaluated by consumers may differ from those considered prior to purchase.¹⁵ Thus, packaging influences both initial purchase and long-term brand retention. Ahmed, Parmar, and Amin argue that although a well-designed package does not guarantee product quality, there is a positive correlation.¹⁶ Elements such as layout, typography, and colour contribute to consumer perception and brand identity.¹⁷ Löfgren et al. note that consumers value packaging attributes differently depending on the stage in the decision-making process—visual cues such as colour and size are more influential at the point of purchase.¹⁸

Raheem et al. and Kamaruddin and Kamarulzaman observe that consumer demographics, emotions, and product type further influence how packaging elements shape purchase behaviour.¹⁹ Packaging can convey brand personality and attributes, as some scholars found, leading to deeper consumer-brand relationships.²⁰ Rundh emphasises packaging's role in attracting consumer attention, improving brand image, and facilitating product differentiation.²¹ Packaging influences impulsive purchases, particularly in low-involvement product categories, where consumers may not thoroughly evaluate product attributes.²² According to Vieira et al., roughly one-third of consumer purchase decisions are influenced by packaging.²³ Ampuero-Canellas and Vila support this, highlighting the emotional responses packaging can elicit.²⁴ Orth and Malkewitz show that packaging shape affects

¹³ Lee and Maclachlan, "The Effects of Package Design on Perceptions of Luxury: A Comparison of Haute Couture and Pret-a-Porter Brands."

¹⁴ Bo Rundh, "The Multi-faceted Dimension of Packaging: Marketing Logistic or Marketing Tool?," *British Food Journal* 107, no. 9 (2005): 670–84.

¹⁵ Enneking, Neumann, and Henneberg, "How Important Intrinsic and Extrinsic Product Attributes Affect Purchase Decision."

¹⁶ Raheem, Vishnu, and Ahmed, "Impact of Product Packaging on Consumer's Buying Behavior."

¹⁷ R.P. Grossman and J. Z. Wisenblit, "What We Know about Consumers' Colour Choices," *Journal of Marketing Practice: Applied Marketing Science* 5, no. 3 (1999): 78–88.

¹⁸ M. Löfgren and L. Witell, "Two Decades of Using Kano's Theory of Attractive Quality: A Literature Review," *Quality Management Journal* 15 (2008): 59–75.

¹⁹ Raheem, Vishnu, and Ahmed, "Impact of Product Packaging on Consumer's Buying Behavior"; Abdul Razak Kamaruddin and Kamarulzaman Kamaruddin, "Malay Culture and Consumer Decision-Making Styles: An Investigation on Religious and Ethnic Dimensions," *Jurnal Kemanusiaan* 7, no. 2 (2009).

²⁰ Mijka Ghorbani and Arne Westermann, "Exploring the Role of Packaging in the Formation of Brand Images: A Mixed Methods Investigation of Consumer Perspectives," *Journal of Product & Brand Management* 34, no. 2 (2025): 186–202; Jianan Wang, Normah Binti Mustaffa, and Maizatul Haizan Binti Mahbob, "The Impact of Visual Communication in Packaging Design on Consumer Purchase Behaviour: A Case-Based Analysis," *International Journal of Instructional Cases* 9, no. 1 (2025): 1–24.

²¹ Rundh, "The Multi-faceted Dimension of Packaging: Marketing Logistic or Marketing Tool?"

²² A. Hausman, "A Multi-method Investigation of Consumer Motivations in Impulse Buying Behaviour," *Journal of Consumer Marketing* 17, no. 5 (2000): 403–26.

²³ Kelly Carvalho Vieira et al., "How Does Packaging Influence Consumer Behavior? A Multidisciplinary Bibliometric Study," *International Business Research* 8, no. 5 (April 25, 2015): 66–80, <https://doi.org/10.5539/ibr.v8n5p66>.

²⁴ Olga Ampuero-Canellas and Natalia Vila, "Consumer Perceptions of Product Packaging," *Journal of Consumer Marketing*, 2006.

consumer perceptions of quality and value.²⁵ Simplicity in design, as shown by a Siegel+Gale survey, improves consumer confidence.²⁶ Feber et al. report that 67% of consumers prioritise sustainability, linking eco-friendly packaging with positive brand perception.²⁷

Impact of Packaging Materials on Consumers' Perception of Packaging Quality

Delgado and Fernandes state that packaging material and design play a pivotal role in shaping consumer perceptions.²⁸ Sustainable packaging is increasingly prioritised by consumers, with Trivium noting that 72% of consumers are willing to pay more for eco-friendly packaging.²⁹ Rundh asserts that packaging serves functions beyond containment, including communication, convenience, and marketing.³⁰

Cultural context influences preferences: European consumers value minimalist packaging, while Asian consumers appreciate detailed designs.³¹ Companies like Coca-Cola have personalised packaging to enhance engagement. A consumer poll survey by Ipsos found that 72% of American consumers are influenced by packaging design,³² and Nielsen reports that 66% consider social and environmental impact in purchasing decisions.³³ Materials such as bioplastics and bamboo influence perceptions of sustainability. Transparency in packaging (e.g., glass) increases trust. According to Mintel, 46% of US consumers favour packaging that facilitates transport, highlighting the need for functional design.³⁴

The Impact of Packaging Materials and Design on Consumers' Perception in Africa

Yang and Nielsen affirm that packaging materials and designs significantly impact African consumer markets.³⁵ Over 50% of African consumers are willing to pay more for well-packaged goods. In Nigeria, Grand View Research reveals that 68% of consumers would switch brands due to packaging quality.³⁶ South African data shows 60% of consumers favour sustainable packaging.³⁷ Underwood et al., argue that consumers interpret packaging quality as a proxy for product quality.³⁸ In culturally vibrant African markets, brands use durable, sustainable packaging to attract attention. Silayoi and Speece emphasise the value of incorporating cultural elements.³⁹

Aesthetic appeal significantly affects consumer choice. A Kenyan survey reports 70% of consumers are influenced by packaging design. Environmental concerns are also increasing, making sustainable designs desirable.⁴⁰ Deliza and MacFie note that packaging can drive spontaneous buying decisions at the point of sale.⁴¹

²⁵ Ulrich R. Orth and Keven Malkewitz, "Holistic Package Design and Consumer Brand Impressions," *Journal of Marketing* 72, no. 3 (2008): 64–81.

²⁶ Siegel+Gale, "Global Brand Simplicity Index," RankingtheBrands, 2015, <https://www.rankingthebrands.com/PDF/Global Brand Simplicity Index 2015, Siegel plus Gale.pdf>.

²⁷ David Feber et al., "Sustainability in Packaging: Inside the Minds of US Consumers," *McKinsey & Company*. Available Online: <https://www.mckinsey.com/industries/paper-forest-products-and-packaging/our-insights/sustainability-in-packaging-inside-the-minds-of-us-consumers> (Accessed on 21 October 2020), 2020.

²⁸ Delgado and Fernandes, "Packaging Design as an Investment in Brand Equity Creation."

²⁹ Trivium Packaging, "2020 Global Buying Green Report," 2020, <https://triviumpackaging.com/sustainability/2020-global-buying-green-report>.

³⁰ Rundh, "The Multi-faceted Dimension of Packaging: Marketing Logistic or Marketing Tool?"

³¹ Rundh, "The Multi-faceted Dimension of Packaging: Marketing Logistic or Marketing Tool?"

³² N Gil, "New Survey Unveils 7 in 10 Consumers Agree Packaging Design Can Influence Purchasing Decisions," *Paper and Packaging Board, Ipsos*. Available Online: <https://www.globenewswire.com/News-Release/2018/05/04/1496881/0/En/New-Survey-Unveils-7-in-10-Consumers-Agree-Packaging-Design-Can-Influence-Purchasing-Decisions>. Html (Accessed on 11 July 2024), 2018.

³³ Cabinet Nielsen, "The Sustainability Imperative: New Insights on Consumer Expectations," *Nielsen Company New York*, 2015.

³⁴ Mintel, "Global Packaging Trends," accessed September 30, 2020, <https://www.mintel.com/global-packaging-trends>; Bo Rundh, "Packaging Design: Creating Competitive Advantage with Product Packaging," *British Food Journal* 111, no. 9 (2009): 988–1002.

³⁵ Q. Yang and A. Nielsen, "The Impact of Online Information on the Purchase of Trusted Brands: Evidence from an Online Shopping Environment," *Journal of Retailing and Consumer Services* 31 (2016): 217–25.

³⁶ Grand View Research, *Africa Consumer Packaging Market Size, Share & Trends Analysis Report.*, 2020.

³⁷ South African Council of Shopping Centers, *The Retail Trends Report*, 2019.

³⁸ Robert L Underwood, Noreen M Klein, and Raymond R Burke, "Packaging Communication: Attentional Effects of Product Imagery," *Journal of Product & Brand Management* 10, no. 7 (2001): 403–22.

³⁹ Silayoi and Speece, "The Importance of Packaging Attributes: A Conjoint Analysis Approach."

⁴⁰ Joonas Rokka and Liisa Uusitalo, "Preference for Green Packaging in Consumer Product Choices—Do Consumers Care?," *International Journal of Consumer Studies* 32, no. 5 (2008): 516–25.

⁴¹ Rosires Deliza and Halliday J. MacFie, "The Generation of Sensory Expectation by External Cues and Its Effect on Sensory Perception and Hedonic Ratings: A Review," *Journal of Sensory Studies* 11, no. 2 (1996): 103–28.

The Influence of Packaging Materials and Design on Consumers in Ghana

Rundh asserts that packaging has evolved into a branding tool. In Ghana, materials like glass and cardboard influence consumer preferences.⁴² Amankwah-Amoah found that quality packaging boosts brand loyalty and repeat purchases.⁴³ Blue Skies (a beverage company), for instance, uses distinctive packaging to stand out. Underwood and Ozanne state that packaging conveys perceived value.⁴⁴ Shirai and Donato add that design elements such as colour and shape influence consumer attitudes.⁴⁵ Amadu highlights the role of pictorial packaging in overcoming literacy barriers.⁴⁶ Plastic waste is a significant issue in Ghana, with the World Bank reporting only 2% recycling.⁴⁷ Nkansah et al. raise health concerns about plastic packaging.⁴⁸ Cultural designs can increase local appeal.⁴⁹

Important Elements of Packaging Quality that Influence Brand Preference

Functionality

Packaging functionality supports marketing and product usability.⁵⁰ It shapes brand identity and differentiates products. Some studies show that food packaging generates expectations,⁵¹ while Shafer highlights its value in commoditised markets. Functionality promotes unique features that attract niche segments.⁵² Creusen and Schoormans found that functionality influences 30% of product appreciation.⁵³ Kusumasondjaja and Shanka establish a link between functionality and purchase decisions.⁵⁴ Sethna and Blythe define it as meeting consumer needs.⁵⁵ Functionality builds trust and strengthens brand identity.⁵⁶

Visual Appeal

Aesthetic attributes such as font, colour, and layout affect perceptions.⁵⁷ Jordan and Martin suggest visual appeal adds long-term value.⁵⁸ Norman associates beauty with positive consumer response.⁵⁹ Ulrich and Orth stress packaging's role in brand recognition.⁶⁰ Researchers suggest children are more

⁴² Rundh, "Packaging Design: Creating Competitive Advantage with Product Packaging."

⁴³ Amankwah-Amoah, "An Integrative Process Model of Organisational Failure."

⁴⁴ Robert L Underwood and Julie L Ozanne, "Is Your Package an Effective Communicator? A Normative Framework for Increasing the Communicative Competence of Packaging," *Journal of Marketing Communications* 4, no. 4 (1998): 207–20.

⁴⁵ Miyuri Shirai, "Combined Effects of Packaging Colour and Shape on Consumers' Sweetness Expectations and Purchase Intentions for Hedonic Foods," *British Food Journal* 127, no. 7 (2025): 2271–85; Carmela Donato, *Eco-Label Visual Design and Sustainability: The Impact on Consumer Perceptions and Market Trends* (Springer, 2025).

⁴⁶ J. Amadu, "Packaging and Consumer Buying Decisions in Ghana: The Case of Food Products," *Global Scientific Journals* 7, no. 8 (2019): 1–20.

⁴⁷ World Bank, *Urban Development Series, Understanding the Costs and Benefits of Plastic Waste*, 2020.

⁴⁸ Marian Asantewah Nkansah, Patrica-Ivy Agorsor, and Francis Opoku, "Heavy Metal Contamination and Health Risk Assessment of Mechanically Milled Delicacy Called Fufu," *International Journal of Food Contamination* 8, no. 1 (December 11, 2021): 6, <https://doi.org/10.1186/s40550-021-00085-y>.

⁴⁹ Ampuero-Canellas and Vila, "Consumer Perceptions of Product Packaging."

⁵⁰ Rundh, "Packaging Design: Creating Competitive Advantage with Product Packaging."

⁵¹ Margaret Bruce and Lucy Daly, "Design and Marketing Connections: Creating Added Value," *Journal of Marketing Management* 23, no. 9–10 (2007): 929–53; M M Gelici-Zeko et al., "Studying the Influence of Packaging Design on Consumer Perceptions (of Dairy Products) Using Categorizing and Perceptual Mapping," *Packaging Technology and Science* 26, no. 4 (2013): 215–28.

⁵² Stuart Shafer, "Where Environmental Policy Is Social Policy: Nature, Food, Society, and Metabolic Processes," in *Environmental Policy Is Social Policy—Social Policy Is Environmental Policy: Toward Sustainability Policy* (Springer, 2013), 11–22.

⁵³ Marielle E H Creusen and Jan P L Schoormans, "The Different Roles of Product Appearance in Consumer Choice," *Journal of Product Innovation Management* 22, no. 1 (2005): 63–81.

⁵⁴ S. Kusumasondjaja and T. Shanka, "Product Functionality and Uniqueness: Their Relationships with Online Content Originality and Influence on Market Performance," *Marketing Review* 12, no. 1 (2012): 23–38.

⁵⁵ Z. Sethna and J. Blythe, *Consumer Behaviour* (Sage, 2016).

⁵⁶ Pavan Mishra and Payal Sharma, "Green Marketing in India: Emerging Opportunities and Challenges," *Journal of Engineering, Science and Management Education* 3, no. 1 (2010): 9–14; Dipayan Biswas et al., "Making Choices While Smelling, Tasting, and Listening: The Role of Sensory (Dis) Similarity When Sequentially Sampling Products," *Journal of Marketing*, 2019.

⁵⁷ Peter Bloch, "Seeking the Ideal Form: Product Design and Consumer Response," *Journal of Mark* 59 (1995): 16–29.

⁵⁸ Patrick W Jordan, "Human Factors for Pleasure in Product Use," *Applied Ergonomics* 29, no. 1 (1998): 25–33; M. Martin, "Aesthetics in Products and Services," *International Journal of Platform Strategy* 4, no. 1 (1998): 45–58.

⁵⁹ Don Norman, *Emotional Design: Why We Love (or Hate) Everyday Things* (Basic books, 2007).

⁶⁰ Orth and Malkewitz, "Holistic Package Design and Consumer Brand Impressions."

influenced by visual design.⁶¹ Silayoi and Speece assert that strong design evokes emotion and loyalty. Packaging is thus a silent salesman.⁶²

Information Clarity

Information clarity eliminates consumer doubt.⁶³ Sharp and Scriven, and Ehrenberg argue that clear labelling aids brand recognition.⁶⁴ Saeed et al. and Coulson note rising consumer awareness of nutrition and labelling.⁶⁵ Keller links information clarity to consumer trust and satisfaction.⁶⁶ Yang and Nielsen find that trustworthy brands present clear information.⁶⁷ Transparency boosts purchasing confidence.⁶⁸

Packaging Material Quality

Packaging materials shape the tactile and visual consumer experience. Underwood, Klien and Burke found that consumers associate low-quality packaging with low product value.⁶⁹ Holt, Quelch and Taylor state that perceived quality influences intention to purchase.⁷⁰ Wiese et al. argue that quality materials instil trust.⁷¹ Eco-packaging reinforces brand responsibility. Incongruent packaging diminishes brand credibility.⁷²

METHODOLOGY

This study was conducted using a quantitative method for data collection and analysis. The data collected comprised primary data, directly obtained from the targeted population. It adopted a correlational design to examine the relationship between packaging quality and brand preference among consumers of Ghanaian food and pharmaceutical products. This design was appropriate for exploring associations between the study variables.

Population and Sampling Description

The study population consisted of Ghanaian product consumers located within Kumasi, specifically Ayeduase, Kotei, and the KNUST Campus. Participants held primary, secondary, or tertiary levels of education. Their occupations, gender, and age were considered. The age group selected was 18 years and above, as individuals in this category are presumed to be highly exposed to Ghanaian products, making them suitable for providing reliable and effective data. The sampling technique employed was probability sampling. Pett, Lackey and Sullivan recommend a sample size of 10 to 15 times the number of questionnaire items for statistical methods such as multiple regression or factor analysis.⁷³ Based on

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- ⁶¹ Oi-Wah Lau and Siu-Kay Wong, "Contamination in Food from Packaging Material," *Journal of Chromatography* 882, no. 1–2 (2000): 255–70; Monali Hota and Karine Charry, "The Impact of Visual and Child-Oriented Packaging Elements versus Information on Children's Purchase Influence across Various Age Groups," *International Journal of Retail & Distribution Management* 42, no. 11/12 (2014): 1069–82.
- ⁶² Pinya Silayoi and Mark Speece, "Packaging and Purchase Decisions: An Exploratory Study on the Impact of Involvement Level and Time Pressure," *British Food Journal* 106, no. 8 (2004): 607–28; A. Wilson, "Packaging Is Your Brand's Best Friend. Packaging World," 2010, <https://www.packworld.com/issues/trends-amp-issues/article/1335533/packaging-is-your-brands-best-friend>.
- ⁶³ Silayoi and Speece, "Packaging and Purchase Decisions: An Exploratory Study on the Impact of Involvement Level and Time Pressure."
- ⁶⁴ B. Sharp, "Loyalty Marketing: The Role of Commitment," *Journal of Targeting, Measurement and Analysis for Marketing* 14, no. 3 (2006): 241–53; John Scriven and Andrew Ehrenberg, "Consistent Consumer Responses to Price Changes," *Australasian Marketing Journal* 12, no. 3 (2004): 21–39.
- ⁶⁵ R. Saeed et al., "Factors Affecting Consumer Behavior," *International Journal of Scientific and Research Publications* 3, no. 11 (2013): 1–10; Neil S. Coulson, "An Application of the Stages of Change Model to Consumer Use of Food Labels," *British Food Journal* 102, no. 9 (2000): 661–68.
- ⁶⁶ K.L. Keller, *Marketing Management* (Upper Saddle River, N.J: Prentice Hall, 2011).
- ⁶⁷ Yang and Nielsen, "The Impact of Online Information on the Purchase of Trusted Brands: Evidence from an Online Shopping Environment."
- ⁶⁸ Orth and Malkewitz, "Holistic Package Design and Consumer Brand Impressions."
- ⁶⁹ Underwood, Klein, and Burke, "Packaging Communication: Attentional Effects of Product Imagery."
- ⁷⁰ Douglas B. Holt, John A. Quelch, and Earl L. Taylor, "How Global Brands Compete," *Harvard Business Review* 82, no. 9 (2004): 68–75.
- ⁷¹ Anne Wiese et al., "Communicating Packaging Eco-Friendliness: An Exploration of Consumers' Perceptions of Eco-Designed Packaging," *International Journal of Retail & Distribution Management* 43, no. 4–5 (2015): 350–66.
- ⁷² B. Piqueras-Fiszman, C. Velasco, and C. Spence, "Exploratory Study on the Effect of Extrinsic Cues on the Evaluation of Chocolate," *Food Quality and Preference* 28, no. 1 (2013): 28–33.
- ⁷³ Marjorie A Pett, Nancy R Lackey, and John J Sullivan, *Making Sense of Factor Analysis: The Use of Factor Analysis for Instrument Development in Health Care Research* (sage, 2003).

this guideline, and with 20 questions in the questionnaire, a sample size between 200 and 300 participants was deemed appropriate. Consequently, 200 participants were sampled for this study.

Data Collection Procedure

According to Bhandari, data collection involves a systematic approach to obtaining observations or measurements.⁷⁴ This study utilised an online questionnaire to collect data. The use of an online format allowed the researchers to reach participants without requiring physical presence. The questionnaire was administered via a Google Forms link and comprised 20 questions—10 multiple-choice and 10 using a 5-point Likert scale. Data collection occurred between 6 and 18 July 2023. Participants completed the survey anonymously. In this context, a consumer was defined as an individual who had purchased a Ghana-made product. All 200 completed survey responses were included in the analysis.

Tools of Data Analysis

To begin the analysis, data was collected through surveys from consumers of Ghanaian products. The data focused on their perceptions of packaging quality and how it affects their brand preferences. For instance, respondents were asked to rate the importance of packaging material quality when considering their brand preference for Ghanaian products on a scale of 1 to 5, and how important the visual appeal of product packaging is when making purchase decisions. The data collected was entered into The Unscrambler X 10.4 software, where the analytical techniques of Principal Component Analysis (PCA) and Partial Least Squares (PLS) were employed to evaluate the impact of specific packaging features on purchasing behaviour. Principal Component Analysis is a valuable analytical method used to uncover underlying patterns, generate consumer perception maps, and extract themes from the data.⁷⁵

Ethical Considerations

This study was conducted in line with the ethical standards of KNUST. Participation was entirely voluntary, and informed consent was obtained from all respondents. The survey was administered anonymously via Google Forms, with no personal identifiers collected. Participants were assured of confidentiality, and all responses were used exclusively for academic purposes. The study maintained integrity, transparency, and respect for participants throughout the research process.

PRESENTATION OF RESULTS AND DISCUSSION

All 200 questionnaire responses were reviewed and confirmed as valid for analysis. The data were processed using *The Unscrambler X 10.4* software, with Principal Component Analysis (PCA) applied to identify patterns and relationships between packaging quality attributes and consumer brand preference as shown in the figures and tables.

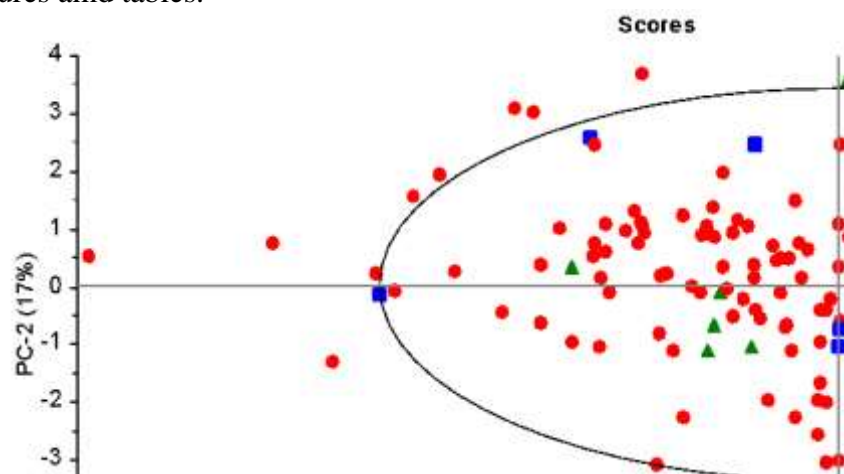


Figure 1: PCA Plot of the Distribution of Respondents Based on Educational Level

⁷⁴ Pritha Bhandari, *Data Collection | Definition, Methods & Examples*, 2020, <http://www.scribbr.com/methodology/data-collection>.

⁷⁵ Ian T Jolliffe and Jorge Cadima, "Principal Component Analysis: A Review and Recent Developments," *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 374, no. 2065 (2016): 20150202.

The PCA distribution plot above presents respondents' data based on their educational levels. The visual representation illustrates how responses are spread across the quadrants, with most responses lying within Hotelling's T2 ellipse and a few falling outside the ellipse. Each dot represents a respondent's data point: blue for secondary education, red for college/university level, and green for postgraduate respondents.

The clustering of responses within the ellipse suggests that most participants' views were consistent and fell within a statistically acceptable range. The educational background shows a differentiated pattern in how respondents perceive packaging quality in relation to brand preference. The green (postgraduate) cluster, for example, demonstrates a higher dispersion, indicating greater variance in their responses. This could be attributed to their broader exposure to branding and packaging nuances. Meanwhile, respondents with secondary and tertiary education display more consolidated response clusters, possibly reflecting more consistent expectations and experiences with local Ghanaian packaging standards. The findings imply a nuanced relationship between education and perception of packaging quality and its influence on brand preference, affirming that consumer background significantly informs expectations and valuation of packaging features.

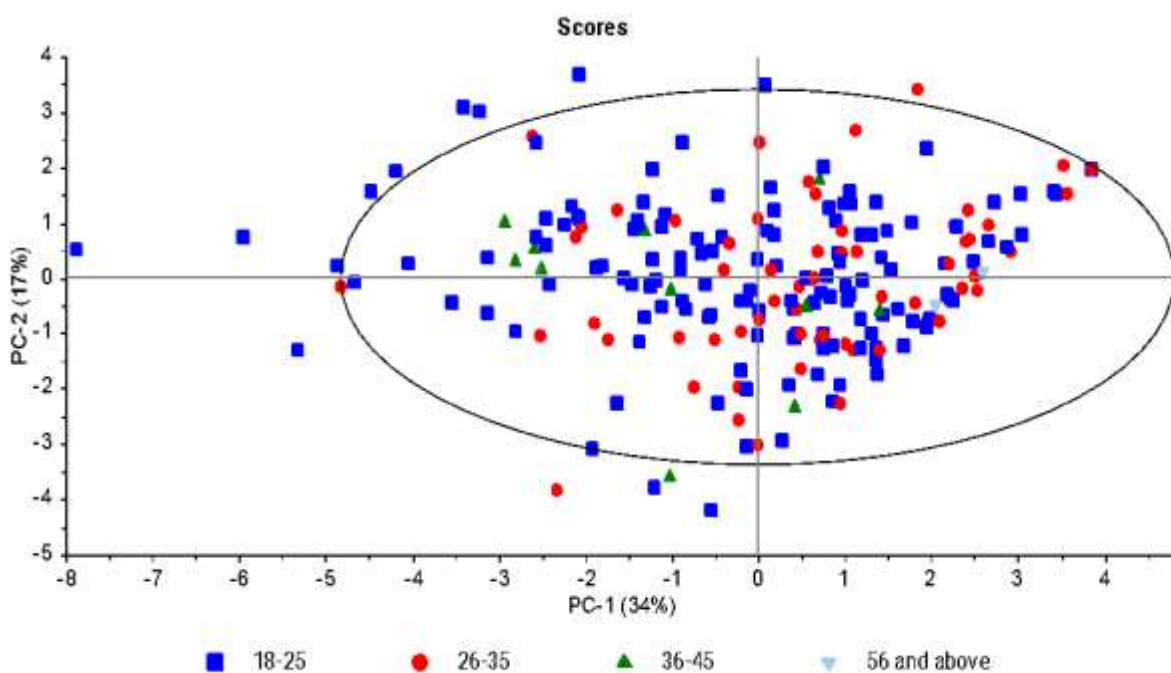


Figure 2: PCA Plot of the Distribution of Respondents Based on Age Group

The PCA distribution plot illustrates how respondents' opinions, grouped by age, are dispersed across the quadrants of the figure. The majority of responses fall within Hotelling's T2 ellipse, indicating that most opinions are statistically consistent, while a few lie outside this range. Each dot colour represents an age group: blue for ages 18–25, red for 26–35, green for 36–45, and light blue for respondents aged 56 and above. The clustering pattern reveals that younger respondents (18–25 years) tend to exhibit similar perceptions about packaging quality and brand preference, as reflected in their tight clustering. In contrast, older age groups, particularly those between 36–45 and those aged 56 and above, show a broader scatter of data points. This wider dispersion suggests greater diversity in perceptions and evaluations among older consumers.

Overall, this pattern indicates that consumer age plays a meaningful role in shaping perceptions of packaging quality. Younger consumers are likely influenced by more uniform media and peer exposure, while older respondents might rely on broader personal experience and brand interactions in their evaluations. This underscores the importance of considering demographic factors, such as age, in designing packaging strategies that appeal across consumer segments.

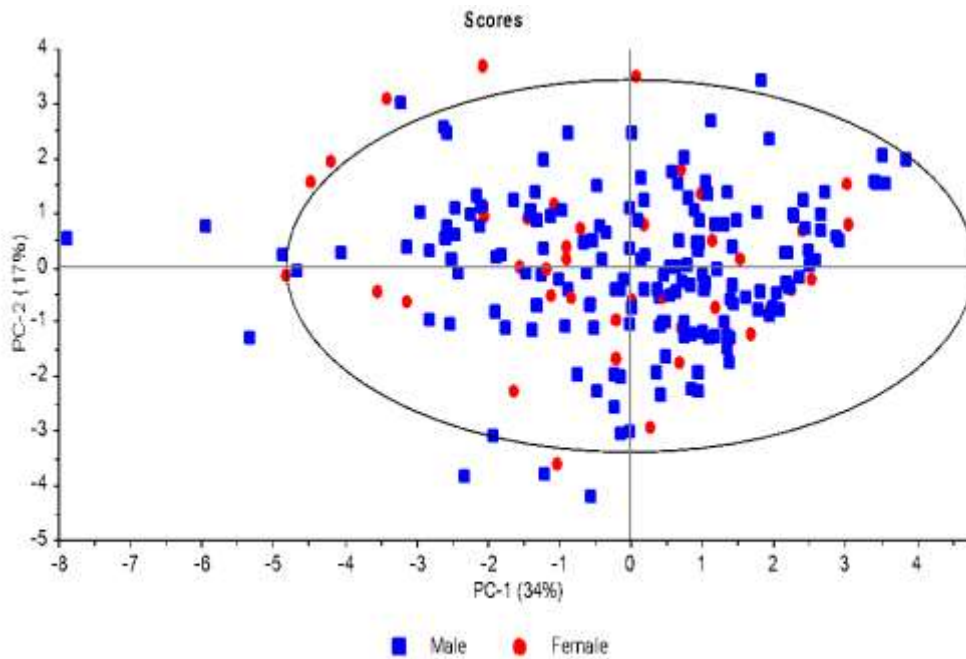


Figure 3: PCA Plot of the Distribution of Respondents Based on Gender

The PCA distribution plot visualizes the respondents' data based on gender, displaying how responses are distributed across the four quadrants of the plot. The majority of responses are located within Hotelling's T2 ellipse, which signifies statistical consistency in the dataset, while a few responses fall outside the ellipse, indicating outlier perceptions. In the figure, blue dots represent male respondents, whereas red dots denote female respondents.

From the visual distribution, it is observed that both male and female respondents exhibit a wide spread of opinions across the principal components, though male responses tend to be more clustered than those of their female counterparts. This suggests that male consumers may share more uniform perceptions regarding packaging quality and its influence on brand preference, whereas female respondents display a slightly broader variance, possibly reflecting differing expectations based on aesthetic preferences, informational clarity, or packaging functionality.

These patterns underscore the relevance of gender-based segmentation in understanding consumer behavior. Product packaging strategies, therefore, should consider gender-specific tendencies in order to better appeal to the varying priorities and perceptions among male and female consumers.

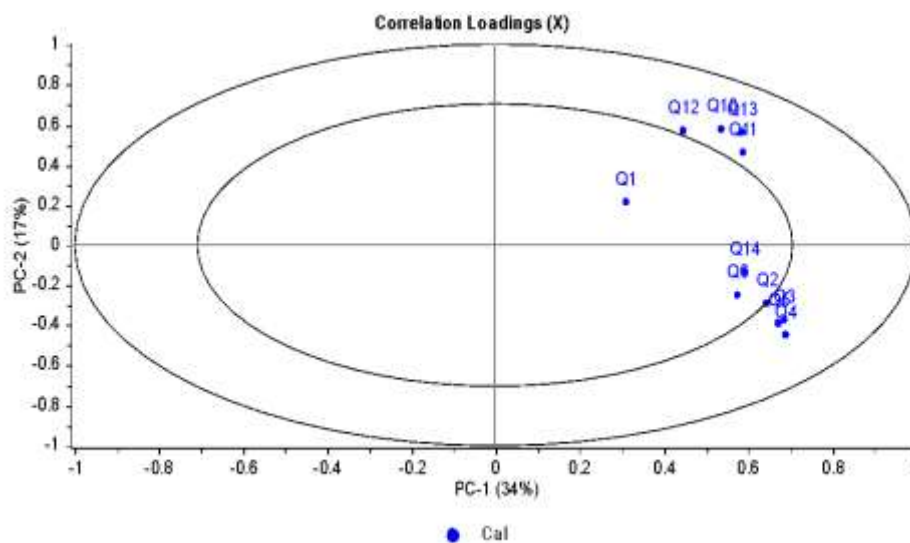


Figure 4:PCA:Perception Map Bi-plot Showing Relationship Between Packaging Quality and Brand Preference

The PCA bi-plot provides a comprehensive visual representation of the relationship between packaging quality and brand preference among consumers of Ghanaian food and pharmaceutical products. The distribution of the data along the first two principal components reveals clear clustering of consumer perceptions, suggesting key associations between specific packaging features—such as material quality, visual appeal, and informational clarity—and consumer brand preferences. Vectors representing the various packaging attributes indicate the direction and strength of their influence, while the positioning of respondent data points relative to these vectors highlights the degree of alignment with particular packaging features. This map allows for the identification of packaging elements most influential in shaping consumer preferences, providing empirical grounding for targeted packaging strategies in the Ghanaian market.

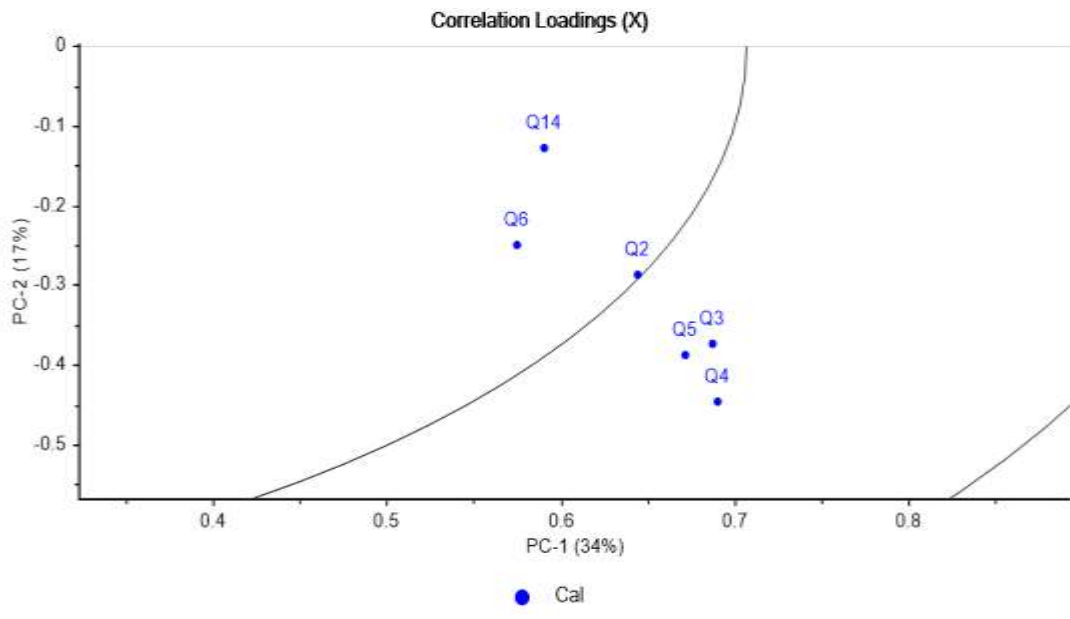


Figure 5: PCA Loadings Plot of data assessing the relationship between packaging quality and Brand preference among consumers of Ghanaian food and pharmaceutical products

Table 1: PCA Loadings Plot for Packaging Quality and Brand Preference

	Q1	Q2	Q3	Q4	Q5	Q6	Q10	Q11	Q12	Q13	Q14
PC-1	0.309	0.645	0.687	0.691	0.671	0.575	0.536	0.589	0.447	0.584	0.590
PC-2	0.218	-0.288	-0.374	-0.446	-0.387	-0.249	0.577	0.463	0.568	0.560	-0.129
PC-3	0.488225	0.261814	0.077484	0.063122	-0.24628	-0.59014	0.009634	0.017198	-0.4084	0.084428	0.349682

Table 1 presents the PCA loadings from the analysis of the relationship between packaging quality and brand preference among consumers of Ghanaian food and pharmaceutical products. The analysis was conducted on 11 key survey questions. For example, Q1 (frequency of purchasing Ghanaian products) shows a moderate correlation on PC-1 and PC-2, while Q2 (importance of packaging material quality) exhibits a strong positive correlation on PC-1. Similarly, Q3 to Q6 show consistently high positive loadings on PC-1, suggesting that visual appeal, product information clarity, packaging functionality, and environmental sustainability significantly align with the primary dimension of consumer evaluation. The correlation values also demonstrate the joint influence of variables such as Q10 to Q14, which relate to consumer choice, satisfaction, repurchase intent, and perception of

packaging improvement on brand competitiveness. These results validate the central role of packaging attributes in shaping brand preference.

Figure 5 presents the PCA loadings plot, based on responses to 11 survey items, designed to assess the relationship between packaging quality and brand preference among consumers of Ghanaian food and pharmaceutical products.

Q1 ("How often do you purchase Ghanaian products?") shows relatively lower correlational values on PC-1 and PC-2 (0.309 and 0.218, respectively), suggesting a limited association with the principal components used in the analysis. In contrast, Q2 ("Importance of packaging material quality when considering your brand preference for Ghanaian products") demonstrates a strong loading on PC-1 (0.645), indicating a significant influence on brand preference perceptions, despite its negative correlation on PC-2 (-0.288).

Likewise, Q3 ("Importance of visual appeal of product packaging"), Q4 ("Importance of product information clarity"), and Q5 ("Importance of packaging functionality") show high correlations on PC-1—0.687, 0.691, and 0.671, respectively—signifying their strong influence on consumers' brand choices. Q6 ("Importance of environmental sustainability") also contributes notably to PC-1 with a loading of 0.575 and has a moderate negative correlation on PC-2 (-0.249). Q14 ("Belief that improving packaging quality can enhance product image and competitiveness") aligns closely with Q6, scoring 0.590 on PC-1 and -0.129 on PC-2. This suggests a shared influence of sustainability and brand image enhancement factors on consumer preferences. Furthermore, Q10 ("Likelihood of choosing a Ghanaian product over an imported product"), Q11 ("Influence of packaging quality in choosing Ghanaian products over foreign brands"), Q12 ("Satisfaction with Ghanaian packaging compared to foreign brands"), and Q13 ("Likelihood of repurchase based on packaging experience") also demonstrate strong loadings on both PC-1 and PC-2—values ranging from 0.447 to 0.589 on PC-1 and 0.463 to 0.577 on PC-2.

These findings confirm that consumer brand preference is strongly influenced by key packaging features such as material quality, clarity, functionality, and perceived sustainability. High loadings across these variables highlight their collective impact and interrelated nature in driving consumer decisions in the Ghanaian market.

DISCUSSION

Principal Component Analysis (PCA) was used to assess the relationship between packaging quality and brand preference among consumers of Ghanaian products. PC-1 and PC-2 accounted for 51% of the variability in the data—PC-1 contributing 34% and PC-2 contributing 17%. The correlation coefficient in PCA ranges from -1 to $+1$, where 0 indicates no linear association. According to McLeod, correlations above 0.4 are highly significant, whereas correlations below this threshold are considered weak and may not represent the data effectively.⁷⁶ A statistically significant correlation is typically far from zero—either close to $+1$ or -1 —while values nearer to zero suggest weak or insignificant relationships.⁷⁷ A positive correlation suggests a direct relationship between variables, with both moving in the same direction.⁷⁸

Important Elements of Packaging Quality Influencing Brand Preference

As seen in Table 1, Q1, which assesses how often consumers purchase Ghanaian products, shows low positive values (0.309 and 0.218 for PC-1 and PC-2, respectively). Its central proximity on the PCA bi-plot indicates limited representation in the data, suggesting a minimal explanatory effect. In contrast, Q2 (packaging material quality) has a strong PC-1 correlation (0.645), indicating a significant influence on consumer preference. This aligns with previous findings that packaging material directly and indirectly affects consumer buying intentions through perceived quality.⁷⁹ Q3 (visual appeal of packaging) also shows high significance (0.687), reinforcing claims that visual aesthetics heavily impact

⁷⁶ S. McLeod, "Correlation in Statistics: Meaning, Types, Examples & Coefficient," 2023.

⁷⁷ N.J. Salkind, *Statistics for People Who (Think They) Hate Statistics*, 4th ed. (Sage Publications, Inc., 2011).

⁷⁸ Robinhood, "What Is a Positive Correlation?," 2023.

⁷⁹ Holt, Quelch, and Taylor, "How Global Brands Compete."

purchasing decisions.⁸⁰ Q4, which evaluates the clarity of product information, exhibits the highest correlation (0.691), confirming its pivotal role in shaping brand preference. Q5 (packaging functionality) is likewise significant, further validating that consumers prioritise ease of use and practicality in packaging.

Impact of Packaging Materials and Design on Consumer Perception

Figure 4, a PCA perception map, shows that Q2, Q3, Q4, and Q5 are closely related. This indicates that these elements work synergistically to influence consumer brand preference. A positive correlation implies that improvements in one aspect (e.g., material quality) may enhance others (e.g., visual appeal and functionality). Rundh supports this notion, noting that high-quality packaging materials contribute directly to visual appeal.⁸¹ Interestingly, Q6 (environmental sustainability) presents moderate significance (0.575), but shows no strong correlation with other packaging quality attributes. This suggests that while consumers express positive attitudes towards sustainability, it ranks lower compared to practical and aesthetic packaging features.⁸²

Extent of Packaging Quality's Influence on Brand Preference

Analysis of Figure 4 reveals that Q10, Q11, Q12, and Q13—all addressing consumer loyalty, satisfaction, and preference—show strong positive correlations on both PC-1 and PC-2. Their interrelatedness indicates that satisfaction with packaging quality enhances the likelihood of choosing local over imported products and influences repurchase behaviour. This mirrors findings by Wells, Farley and Armstrong, and Silayoi and Speece, who concluded that up to 60% of purchase decisions are influenced by packaging quality.⁸³ Moreover, Q14 (belief in the competitive advantage of improved packaging scores significantly (0.590), supporting the idea that upgrading packaging design can enhance brand image and increase consumer preference.⁸⁴

Figures 1 through 3—PCA perception maps based on demographic characteristics—show that age, education level, and gender do not significantly alter consumer preferences for Ghanaian food and pharmaceutical products. Responses are widely distributed across quadrants, with only a few outside the 5% confidence level Hotelling's T2 ellipse, indicating minimal outliers and little demographic convergence in perception.

In summary, the discussion highlights that visual appeal, packaging material, information clarity, and functionality significantly shape consumer brand preference. These attributes do not operate in isolation; rather, they interact to influence perception and purchasing decisions. The minimal impact of demographic factors suggests that packaging quality resonates broadly across consumer groups. These findings reinforce the strategic importance of packaging in enhancing brand competitiveness, particularly for Ghanaian products.

RECOMMENDATIONS

Clearly conveying product information on packaging can lead to higher brand preference. Manufacturers should ensure that essential details, such as ingredients, usage instructions, and benefits, are easily accessible to consumers. This transparency can build trust and credibility. By improving packaging quality, businesses can differentiate themselves from competitors in the market. Packaging that resonates with consumers can become a unique selling point, leading to increased brand loyalty and a competitive edge. Moreover, manufacturers can prioritise the use of high-quality materials that not only protect the product but also convey a sense of value and reliability to consumers.

⁸⁰ Rundh, "Packaging Design: Creating Competitive Advantage with Product Packaging."

⁸¹ Rundh, "Packaging Design: Creating Competitive Advantage with Product Packaging."

⁸² Heather Barnes Truelove et al., "Positive and Negative Spillover of Pro-Environmental Behavior: An Integrative Review and Theoretical Framework," *Global Environmental Change* 29 (2014): 127–38.

⁸³ Levi E Wells, Heather Farley, and Gillian A Armstrong, "The Importance of Packaging Design for Own-label Food Brands," *International Journal of Retail & Distribution Management* 35, no. 9 (2007): 677–90; Silayoi and Speece, "Packaging and Purchase Decisions: An Exploratory Study on the Impact of Involvement Level and Time Pressure."

⁸⁴ Pragya Srivastava et al., "Package Design as a Branding Tool in the Cosmetic Industry: Consumers' Perception vs. Reality," *SN Business & Economics* 2, no. 6 (2022): 58.

Findings from the study can enable businesses and designers to render visually appealing and well-designed packaging for their products. By focusing on elements such as colours, typography, and layout, companies can create packaging that captures consumers' attention and conveys a positive brand image.

The insights can inform educational initiatives aimed at training packaging designers, marketers, and entrepreneurs on the principles of effective packaging design. This can contribute to the overall improvement of product presentation and branding.

Businesses are encouraged to collaborate with packaging designers and experts to create packaging that aligns with consumer preferences and current industry trends. Design professionals can provide valuable insights into incorporating aesthetics and functionality effectively.

Researchers are encouraged to conduct similar studies in different cultural contexts or regions. This will allow for a comparative analysis of how packaging quality influences brand preference across diverse consumer groups. Additionally, researchers can undertake comparative studies across various industries to determine if the impact of packaging quality on brand preference varies depending on the product category being studied.

CONCLUSION

The study aimed to investigate how packaging quality affects brand preference among consumers of Ghanaian products and to identify the most important elements of packaging quality that influence consumer brand preference. Based on a quantitative analysis using PCA, the findings offer significant insights. The results indicate that visual appeal, packaging material, information clarity, and packaging functionality all have a strong influence on consumers' preference for a brand. These findings directly respond to the second research question, confirming that these elements are critical to shaping consumer preferences for Ghanaian products. Additionally, the study reveals that these elements are interrelated; visual appeal, material quality, clarity, and functionality work in tandem to shape consumers' preferences. This reinforces the view that improvements in one attribute may positively impact others. It was also found that consumers' preference for Ghanaian products is not significantly affected by demographic variables such as age group, gender, or level of education. The wide distribution of responses in the PCA maps supports this finding, indicating diverse perspectives across demographic categories. Further, the study demonstrates that consumers are more likely to choose Ghanaian brands over imported ones if they are satisfied with the packaging quality. Likewise, positive packaging experiences increase the likelihood of repeat purchases. These observations address the first research objective, which sought to explore the extent to which packaging quality influences brand preference. Overall, the study concludes that enhancing the quality of packaging for Ghanaian products can significantly improve consumer perception, boost market competitiveness, and foster brand loyalty in a highly competitive environment.

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ABOUT AUTHORS

Dr. Adam Rahman is a Senior Lecturer and the Head of the Department of Communication Design at the Kwame Nkrumah University of Science and Technology (KNUST), Ghana. With over 16 years of experience in higher education, he coordinates the technical production of Open Educational Resources (OER) at KNUST and plays a key role in advancing design-led education in Ghana. Dr. Rahman’s research focuses on packaging design, interaction design, and visual culture, particularly in the context of consumer behavior and sustainable branding. He has published widely in peer-reviewed journals and presented at both local and international conferences. He was a recipient of the University of Michigan African Presidential Scholarship (UMAPS) and has earned several awards from academia and industry. Dr. Rahman is the Ghana Chapter Leader of the Interaction Design Association (IXDA) and a member of the Institute of Packaging, Ghana (IOPG), DesignGhana, and the Ghana Design Network (GDN). He serves on multiple academic and industry-related boards and has extensive experience collaborating with international agencies, design professionals, and packaging experts.

Dr. Ralitsa Diana Debrah is a designer and educator with over a decade of local and international consulting experience. She lectures at Kwame Nkrumah University of Science and Technology (KNUST), Ghana, where she serves as the Lab Operations Manager and International Coordinator for the Design for Social Innovation and Sustainability (DESIS) Network. She is a member of the e/merge Africa Network at the University of Cape Town (UCT), South Africa, and actively participates in organisations such as Open Design Afrika, DesignGhana, the Pan African Design Institute, and the World Design Organization (WDO). As co-founder of Inclusive-Tech-Group (ITG), a Ghanaian not-for-profit, she works with differently-abled persons in local communities. Ralitsa is a lifelong learner, futurist, and advocate for people-centred design.

Dr. Ginn Bonsu Assibey is a Lecturer in the Department of Communication Design at the Kwame Nkrumah University of Science and Technology (KNUST), Ghana and holds a Doctor of Technology in Design from the Cape Peninsula University of Technology, South Africa. His teaching and research focus on sustainable graphic design, social innovation through design, advertising, and cultural identity in visual communication. Dr. Assibey supervises student design projects that explore design thinking as a tool for addressing environmental and societal challenges, particularly through upcycling and inclusive visual narratives. He has published in peer-reviewed journals on topics ranging from Adinkra symbolism and cultural sustainability to the role of design in public policy and education. He also serves as Examinations Officer and Short Courses Coordinator in his department. He is a visiting lecturer at international institutions and contributes to global research collaborations, including SANCOOP and DesignBrics.