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Packaging That Tempts: How Design Elements Drive Junk Food Purchase Intentions among Malaysian Youth

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ABSTRACT

This study aims to determine the impact of packaging design elements on the purchase intention of junk food among youth consumers at a public university. The study utilized a sample of 263 respondents aged 18 to 30, selected through convenience sampling. Data collection was conducted using structured questionnaires. Descriptive statistics, Pearson correlation analysis, and multiple linear regressions were applied to analyze the relationships between packaging graphics, materials, labels, and purchase intentions. These findings underscore the importance of strategic packaging design in influencing youth purchase behavior. The study offers insights for marketers and policymakers to develop packaging strategies that cater to youth preferences, potentially fostering healthier dietary choices and enhancing market competitiveness. Future research is encouraged to explore the influence of cultural and social factors on consumer behavior to further enrich packaging design strategies.

1. Introduction

Packaging involves the creation, assessment, and manufacturing of containers or wrappers designed for a product [33]. Its primary purposes are to safeguard the product from damage and provide essential information, such as ingredients, usage instructions, and expiration dates. Beyond protection, packaging acts as a powerful tool to attract consumers through visually appealing designs and branding. In a broader sense, packaging encompasses not only the physical containers but also the entire presentation, including labels, graphics, and materials.

Rundh [38] emphasizes that the design and elements of packaging play a pivotal role in shaping consumer perceptions of food products and can significantly influence purchase intentions. Packaging is crucial in logistics, serving as a communication tool that conveys the brand's values,

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benefits, and unique selling propositions [22,23]. This is important when targeting youth, who are drawn to visually striking and innovative designs. For this demographic, packaging becomes a primary differentiator in a crowded market, creating memorable and emotional connections with the product.

While rational factors such as price and content do influence purchase intentions (Weber, 2015), the impact of packaging designs and claims on food products should not be underestimated. In the junk food industry, packaging significantly affects young consumers' purchasing decisions. Junk food, typically high in calories, added sugars, unhealthy fats, and low in nutritional value, is often highly processed and pre-packaged [6]. Despite its well-documented health risks, the consumption of junk food continues to rise, especially among young individuals in Southeast Asia.

This research is guided by the Stimulus-Organism-Response (S-O-R) model, originally proposed by Mehrabian and Russell [31], which elucidates the process by which environmental stimuli influence internal psychological states, subsequently affecting behavioral outcomes. In the context of this study, elements of junk food packaging—such as graphics, materials, and labels—are conceptualized as stimuli. These packaging components have the potential to evoke internal responses among youth, including emotional reactions, perceptions of healthiness, or attitudes toward the product. These internal processes, in turn, influence behavioral intentions, specifically the intention to purchase the product.

The applicability of the S-O-R model is particularly relevant to this investigation, which examines the impact of packaging on purchase intentions among youth at a public university. Given that young consumers often make rapid purchasing decisions and are highly responsive to visual cues and accessible information, understanding how specific packaging elements serve as stimuli and influence internal cognitive and emotional responses is crucial. The S-O-R framework offers a valuable lens for interpreting the findings, emphasizing that effective packaging design extends beyond aesthetic appeal to actively shape consumer perceptions and drive purchasing behavior.

Moreover, some fast food options, although occasionally nutritious, often share similarities with junk food due to their high calorie and fat content [6]. Therefore, understanding these dynamics is essential for developing effective marketing strategies and promoting healthier eating habits among youth.

1.1 Problem Statement

Consumers are naturally drawn to products that are visually appealing particularly within the food industry. The significant role of packaging in branding and marketing with color being a particularly influential as success factor. Studies show that people often make decisions based on color quickly, with 62-90% of these decisions being made within the first 90 seconds of encountering a product or individual. Thus, it is important to examine how these packaging elements are perceived by youth and how they influence their purchasing decisions, offering valuable insights for creating effective marketing strategies.

Malaysia is witnessing a rise in junk food consumption among its younger population, driven by a mix of external and internal factors [8]. These factors include aggressive marketing tactics, the widespread influence of social media, easy availability and affordability, peer pressure, and limited access to healthier choices. A major external factor fueling this trend is the use of attractive junk food packaging, which often features vibrant colors, eye-catching images, and persuasive messages that draw in young consumers and encourage impulsive buying. Internal factors like convenience and peer influence also contribute to the increased consumption of junk food. However, by making

healthier alternatives more accessible and appealing, it is possible to encourage young people to develop healthier snack habits.

The growing trend of junk food consumption among Malaysian youth presents a public health concern due to its association with obesity and other chronic diseases [6,42]. Among the many contributing factors, packaging design has emerged as a powerful marketing tool that captures the attention of young consumers and influences impulsive buying behavior. Although previous studies have explored packaging's influence on consumer behavior, most have focused on children or general populations, with limited attention given to the youth demographic in Malaysia. Furthermore, there is a lack of empirical study that specifically examines how different packaging design elements, such as graphics, materials, and labels, affect purchase intention among youth. This study seeks to address this gap by investigating the role of packaging design in shaping junk food purchase intentions among university students, with the aim of informing more effective public health and marketing strategies.

The increasing reliance on junk food, notably among young adults, is a significant public health concern, affecting roughly 70% of individuals globally [6]. This trend is driven by lifestyle factors: young adults (18-30) often forego regular meals, opting for junk food to maintain energy levels and manage hunger. Additionally, they may consume junk food as a stress reliever in the high-pressure academic environment, leading to increased consumption during periods of intense activity. While the impact of packaging on general consumer behavior has been widely explored, there is a noticeable lack of research that isolates and analyzes the effects of individual packaging elements—such as graphics, materials, and labels—on the purchasing decisions of Malaysian youth. Unlike children or the general population, young adults aged 18–30 are more independent in their food choices, yet are highly responsive to visual marketing and lifestyle-driven consumption. Given their growing reliance on junk food and susceptibility to impulsive buying, it is essential to understand how specific packaging cues influence their decisions. Addressing this overlooked area, the present study focuses on university students as a representative youth demographic, aiming to uncover how packaging elements shape their junk food purchase intentions.

Therefore, this study aims to address this gap by investigating the influence of packaging graphics, materials, and labels on junk food purchase intention among university students in Malaysia. The findings will provide insights for marketers aiming to design youth-targeted packaging and help policymakers develop strategies to reduce unhealthy food consumption among young adults.

2. Literature Review

2.1 Packaging Graphic

Packaging graphic design strategically arranges visual elements on a product's exterior to convey information, capture attention, and influence purchasing decisions. This includes typography, imagery, color schemes, branding, and layout considerations. According to Amin *et al.*, [2], visual components significantly enhance packaging's aesthetic, helping consumers, especially youth, understand the contents. Design elements like colors, pictures, structure, and logos shape packaging identity and effectiveness [1]. Packaging color significantly influences consumers' emotional responses, which in turn impact purchase intention. This suggests that visual packaging design plays a critical role in shaping consumer behavior.

Visual elements on food packaging strongly influence youth purchase intentions and perceptions [13]. University students, known for their responsiveness to eye-catching and innovative designs, are particularly affected. Goyal [17] found that young consumers in India

prioritize taste and quality, emphasizing the role of appealing visuals in attracting them. Recent studies indicate that university students are increasingly drawn to junk food due to visually engaging packaging. Vibrant colors and striking imagery effectively capture attention, encouraging impulsive purchases. With their fast-paced lifestyles, students often make quick decisions, making them especially susceptible to these visual influences.

Silayoi and Speece [12] highlighted that packaging design plays a crucial role in impulse purchases, particularly among younger consumers who are naturally drawn to visually appealing products. Similarly, Sukri *et al.*, [16] found that packaging elements significantly influence students' purchasing decisions, emphasizing the power of visual appeal in shaping consumer behavior. Huang *et al.*, [9] reported that 22% of students frequently skipped breakfast, 8% skipped lunch, and 5% missed dinner, while 80% admitted to snacking at least once a day. This high prevalence of snacking among students positions them as a key demographic for junk food consumption, with their eating patterns reflecting a preference for convenient and accessible food options, often influenced by attractive packaging.

Smith *et al.*, [30] further explored the high consumption rates of junk food among university students, attributing this trend to lifestyle factors, convenience, and marketing strategies. Their reliance on junk food, including instant noodles and energy drinks, is often linked to time constraints and busy schedules, limiting their ability to prepare proper meals. Packaging design elements play a vital role in enhancing the appeal and functionality of products, particularly for young consumers. These elements are essential in capturing attention, communicating product information, and strengthening brand identity.

The combined elements of packaging graphics impact junk food purchase intentions among youth. Attractive and engaging graphics can enhance perceived taste, quality, and appeal, leading to higher purchase intentions. Studies such as those by Prendergast and Pitt [35] provide empirical evidence of the influence of packaging graphics on consumer behavior, particularly in the context of junk food. Youth are particularly responsive to visually appealing graphics that align with their preferences and lifestyle. Despite extensive research on packaging design, studies specifically examining its impact on youth are relatively limited. Most existing research tends to focus on children, overlooking the unique preferences and behaviors of youth. Future research should investigate how different graphic styles, such as realistic images versus abstract designs, influence youth perceptions and purchasing decisions.

In summary, packaging graphics are a crucial element in producing high-quality products, especially junk food, as most consumers observe the product externally before deciding to buy it. The design elements can also convey brand identity and differentiate products in a competitive market, making them more appealing to target demographics. Understanding the psychological impact of these visual elements can help marketers create more effective packaging that resonates with consumers and drives purchase intention. In short, packaging graphics are an important element in producing good quality products, especially junk food since most consumers will observe the product externally before deciding to purchase it.

2.2 Packaging Material

Packaging material encompasses the substances or combination of materials employed to enclose, protect, and transport products. These materials serve as the outer covering or wrapping of goods, providing physical protection, barrier properties, and often aesthetic appeal. Packaging materials can vary widely in composition, depending on factors such as the type of product being packaged, the intended use, and environmental considerations. According to Lee [27] the sole

purpose of packaging is to shield and maintain food products against potential risks, such as physical damage, chemical contamination, microbial growth, or other factors, which may adversely affect their quality and safety.

Packaging materials play a vital role in shaping a product brand that attracts consumers, especially in the junk food industry. Although some studies suggest that the material type may not significantly impact purchase intention, the growing environmental awareness among youth is increasingly influencing their purchase decisions. Kingston and Paulraj [24] attribute this trend to young consumers, particularly university students, recognizing the environmental benefits of eco-friendly packaging. Sustainable materials, such as recycled paper, biodegradable plastics, and compostable packaging, can notably enhance purchase intention among environmentally conscious youth. This heightened awareness offers brands an opportunity to stand out by adopting eco-friendly packaging practices and appealing to this expanding segment of eco-conscious consumers.

Selecting packaging materials for junk food is critical, considering environmental sustainability and design aesthetics, which directly influence consumer perception and purchase intention [7]. Numerous food safety incidents have led consumers to prefer visually inspectable packaging. According to Sofia *et al.*, [18], certain packaging materials significantly impact perceived healthiness, brand trust, attitude towards the product, and purchase intention. For instance, transparent packaging's effect on purchase intention is mediated by perceived healthiness, quality, and trust. While Waheed *et al.*, [3] suggest packaging materials influence purchase intention, there is no strong evidence that young consumers are solely attracted to packaging material before purchasing junk food. Instead, youth often make impulsive purchases based on product attributes such as colors, designs and other factors. In addition, Muratore [40] found that teens are more likely to make impulsive purchases, influenced by price perception.

Although some argue that material type alone is not decisive, when combined with design elements like color and graphics, it significantly impacts purchasing decisions. Youth may initially be drawn to a product's visual appeal, flavor, or brand recognition, with packaging material playing a subtle yet important role. Sustainable packaging materials, such as recycled paper or biodegradable plastics, can enhance perceived value and appeal to environmentally conscious youth. Packaging material choice can also influence perceptions of product quality and healthfulness. For example, glass is often associated with premium products and perceived as more hygienic and eco-friendly, while paper-based packaging conveys naturalness and sustainability. Attractive junk food packaging can positively influence children's perceptions and purchasing decisions [34]. These insights underscore the importance of packaging design in marketing strategies, particularly for promoting healthier food choices among youth. Environmentally sustainable materials are increasingly important as consumers seek products aligned with their values [7].

In conclusion, packaging material significantly influences junk food purchase intentions, particularly among environmentally conscious youth. Factors like sustainability, aesthetics, and functionality all play crucial roles. While some studies suggest a moderate impact, others highlight its significance in shaping consumer perceptions and driving purchasing decisions [1,7]. To effectively influence consumer choices, packaging design must prioritize sustainability and align with consumer values. This approach not only promotes healthier food choices but also strengthens brand identity and enhances market competitiveness.

2.3 Packaging Label

Packaging labels provide essential information about a product, including its contents, specifications, contact information for the manufacturer, safety warnings, usage instructions, and

additional details related to marketing and pricing. Labels affixed to packaging convey vital information regarding nutritional facts, ingredients, health and safety advisories, and usage guidelines, alongside additional marketing, branding, or pricing details applicable to the product. Legal regulations mandate specific information to be included on labels for certain product categories. Retailers must display prices and quantities, while manufacturers or distributors must include health and safety warnings for hazardous products or allergens.

The information provided on packaging labels, including nutritional details and health-related claims, significantly impacts consumer purchase intention. Studies by Wansink [47] and Cowburn and Stockley [48] suggest that clear and accurate information can lead to healthier food choices. Labels that highlight health benefits or nutritional value can enhance the perceived healthiness of the product, thereby increasing its attractiveness to consumers. Research by Drichoutis *et al.*, [49] shows that health claims can significantly impact purchase intentions. This can significantly influence the youth who follow strict dietary restrictions hence the label can be one of the factors that influences youth purchase intention of junk food.

Many studies on packaging labels and consumer behavior tend to generalize their findings across different age groups. However, youth, especially those aged 18 to 30 years old, exhibit unique behaviors and preferences that differ from other age groups. These differences are crucial for understanding how packaging labels influence their purchase intentions. There is a need for studies specifically focused on youth to understand how they interpret different elements on packaging. While some research has explored the impact of nutritional labels on consumer choices, there is limited knowledge about how youth perceive promotional labels compared to nutritional information. Understanding the relative influence of these different types of labels can help in designing more effective packaging strategies. Future research should examine the individual and cumulative effects of different elements on food labels, including health claims, ingredient lists, and promotional messages, on young people's purchasing decisions. According to Grunert and Wills [50], this study empirically validates that packaging labels significantly impact consumer behavior, particularly among young consumers. In short, the findings show that labels which effectively communicate health benefits and align with lifestyle preferences are more likely to influence purchase intentions.

To conclude, packaging labels play a crucial role in shaping consumer behavior, particularly among youth, by providing essential information such as nutritional details, health claims, and ingredient lists. Research noted that clear and accurate labeling can influence purchasing decisions, especially for individuals following dietary restrictions. While some youth rely on labels to assess product suitability, others are influenced by emotional and psychological factors, leading to impulsive buying behaviors. Additionally, promotional strategies and attractive packaging can influence rational considerations. While nutritional information is crucial for those following dietary restrictions [25], emotional and psychological factors also drive impulsive buying behaviors among youth [14,32]. To effectively target this demographic with packaging strategies, manufacturers must balance clear labeling with appealing design elements that resonate with young consumers' preferences for healthiness and sustainability.

2.4 Purchase Intention

Purchase intention refers to the likelihood of buying a product at a future time, reflecting a consumer's planned buying behavior contingent on their willingness to make the purchase [29]. In the context of junk food, it denotes the likelihood of young consumers purchasing specific products based on attitudes, preferences, and packaging design. Youth purchase intention is triggered by

specific needs or desires within a certain timeframe, influenced by openness to new experiences, peer influence, and digital media usage. Consequently, youth prioritize convenience and taste over nutritional value when selecting junk food [26].

Purchase intention involves a proactive decision-making process where an individual is prepared to engage in a transaction to acquire the desired item. In essence, purchase intention reflects a person's premeditated goal or aspiration to make a purchase based on their planned actions and timeline for acquisition [36]. Hussain *et al.*, [44] stated that purchase intention is generally understood as a consumer's probability of buying a product or service, influenced by their purchasing ability. On the other hand, a buyer's purchase intention denotes a scenario where the buyer intends to acquire a specific item under specific circumstances [36]. The actions, perceptions, and attitudes of consumers are often associated with their purchase intentions.

It is an important concept in consumer behavior and marketing research as it reflects the likelihood that a consumer will make a purchase based on their attitudes, preferences, and perceptions towards a product or brand especially in junk food consumption, youth tend to make impulse buying on junk food. In the context of the research study on the effect of packaging design elements on youth purchase intention of junk food, purchase intention specifically pertains to the inclination of young consumers to buy junk food products based on various factors related to packaging design, such as graphics, material, and label. Moreover, informational elements on packaging, such as nutritional labeling and ingredient lists, cater to the cognitive aspects of decision-making. Clear and informative labels provide young consumers with essential information about calorie counts, nutritional content, and potential health impacts, which they may consider before making a purchase [4]. This combination of visual appeal and informational clarity not only attracts attention but also guides youth in evaluating the suitability of junk food products based on their dietary preferences and health considerations.

In short, the packaging of junk food products plays a crucial role in influencing purchase intention among youth. Visual elements appeal to emotional triggers and impulse buying behaviors, and material of the packaging is considered as important as it is to protect the product and provide convenience, while informational elements provide necessary details that align with cognitive decision-making processes. Purchase intention reflects a consumer's likelihood of buying a product, influenced by attitudes, preferences, and perceptions. Among youth, junk food purchase intentions are shaped by packaging design, peer influence, digital media exposure, and a preference for convenience and taste over nutritional value. While some consider health implications and rely on packaging labels for nutritional information, impulsive buying and emotional factors also play a role. Effective packaging combining visual appeal with clear nutritional details can influence youth purchasing behavior. Understanding these factors is crucial for developing targeted marketing strategies that align with youth preferences and health considerations.

3. Methodology

The research methodology explains the procedures used to conduct the study, including how data was collected, analyzed, and validated to ensure the accuracy and reliability of the findings. It encompasses the reliability test, research design, research instruments, study location, sampling technique, sample size, and target population. The study adhered to ethical standards and received approval from the Ethics Committee of Universiti Putra Malaysia (Jawatankuasa Etika Universiti Penyelidikan UPM – JKEUPM), with the reference number JKEUPM-2024-515.

This study employed quantitative methods to examine the level of preference, the influence, and the relationship between packaging graphics, packaging materials, and packaging labels on

young consumers' preferences for junk food, aligned with the objective of the research, the convenience sampling method was used. Convenience sampling is a non-probability sampling technique where respondents are selected based on their accessibility and willingness to participate. According to Patton [45], convenience sampling is widely used in quantitative research due to its efficiency in data collection.

The study targeted youth consumers aged 18 to 30 years old from five faculties at Universiti Putra Malaysia, UPM: Economics and Management, Human Ecology, Food Science and Technology, Science, and Forestry. Data collection focused on undergraduate students actively involved in purchasing and consuming junk food, aligning with the study's context [34]. Data collection was conducted using an online questionnaire administered via Google Forms. The self-administered questionnaire included items addressing packaging graphics, materials, labels, and purchase intention. Respondents were asked to rate their perceptions and behaviors on a likert scale, providing data for descriptive, correlation, and regression analysis to achieve the research objectives effectively. The questionnaire consisted of three (3) sections, as follows:

Section 1: Sociodemographic details

Section 2: Independent variables:

- a) Packaging Graphics
- b) Packaging Materials
- c) Packaging Labels

Section 3: Purchase Intention

4. Results

4.1 Reliability Analysis for Actual Test

Table 1 presents the results of the reliability analysis for the actual test. The primary focus of this analysis was the Cronbach Alpha value, which indicates the reliability of the question sets for each variable. Based on the table, the variable with the highest Cronbach Alpha value is packaging material (0.848), followed by packaging graphic (0.829). Both variables demonstrate strong reliability within the acceptable range of 0.7 to 0.95. The packaging label (0.796) and purchase intention (0.793) also exhibit acceptable reliability values, indicating that the questionnaire is consistent across all variables.

In conclusion, the Cronbach Alpha values for the independent variables and dependent variable, purchase intention value indicates that respondents consistently understood and engaged with the questions related to this variable. Generally, these results highlight the effectiveness of the questionnaire in capturing reliable data on youth perceptions related to packaging and its influence on purchase intentions. This strong reliability underscores the validity of subsequent analyses and conclusions drawn from this study, providing a solid foundation for understanding how packaging elements impact youth purchase intention in the context of junk food purchases.

Table 1
Reliability analysis for the actual test

Variables	Total Item	Cronbach Alpha
Packaging graphic	7	0.829
Packaging material	7	0.848
Packaging label	6	0.796
Purchase intention	5	0.793

4.2 Descriptive Finding of Respondent Demographic

Table 2 shows the demographic profile of respondents, including their age, gender, ethnicity, faculty, monthly allowance, monthly spending on junk food, and frequency of junk food consumption. Based on the descriptive analysis conducted involving a total of 263 respondents from five different faculties. The age group distribution is notably diverse, with respondents aged 22 to 25 years old representing the largest segment at 40.3%, or 106 individuals. In contrast, the youngest group, aged 18 to 22 years old, constitutes the smallest portion of the study at 28.1%, with 74 individuals. This distribution suggests that most respondents fall within the typical university student age range, highlighting a significant focus on young adults in their early twenties.

Gender analysis indicates a notable disparity, with female respondents accounting for 53.2% (140 individuals) and male respondents comprising 46.8% (123 individuals). Ethnicity demographics within the respondent pool reveal a diverse landscape, with Malays making up the highest proportion at 39.9% (105 individuals), while the lowest respondents' categories were classified as 'other,' which may include various minority ethnicities from Sabah and Sarawak, representing 16.0% (43 individuals). Gender analysis indicates a notable disparity, with female respondents accounting for 53.2% (140 individuals) and male respondents comprising 46.8% (123 individuals). Ethnicity demographics within the respondent pool reveal a diverse landscape, with Malays making up the highest proportion at 39.9% (105 individuals), while the lowest respondent's categories were classified as 'other,' which may include various minority ethnicities from Sabah and Sarawak, representing 16.0% (43 individuals).

Besides that, in terms of faculties, it was divided into five categories. The highest participation is from the Faculty of Science with 25.1% (66 respondents) followed by the School of Business and Economics at 21.7% (57 respondents). The Faculty of Forestry contributed 20.9% (56 respondents), while the Faculty of Food Science and Technology accounted for 17.1% (45 respondents). The Faculty of Human Ecology had the smallest representation, with 14.8% (39 respondents). The distribution of respondents' monthly allowances reveals significant financial diversity. Specifically, the largest group, comprising 98 respondents (37.3% of the sample), reported a monthly allowance exceeding RM600. This indicates that a substantial portion of the participants receive relatively high financial support, potentially affording them greater purchasing power and influencing their spending habits, including impulsive junk food purchases. Conversely, a significant portion, 81 respondents (30.8%), reported a monthly allowance of less than RM300. This suggests that a considerable segment of the population experiences financial limitations, which could directly impact on their lifestyle and spending patterns, including potential constraints on junk food consumption.

Furthermore, the monthly expenditure analysis on junk food among the youth highlights a significant pattern. The majority, totaling 128 respondents (47.5% of the sample), allocate over RM20 monthly towards junk food purchases, reflecting a consistent tendency for frequent consumption that raises alarms about the possible negative health effects tied to prolonged unhealthy eating practices. In contrast, the smallest segment, consist of 58 respondents (22.1% of the sample), spends less than RM10 monthly on junk food. This group indicates lower consumption levels, pointing to either healthier dietary choices or constrained financial resources dedicated to such items. This monthly expenditure could be an indicator of their conscious effort to maintain a healthier diet, suggesting a lower preference for processed snacks and fast food and direct result of their financial priorities, where healthier food options or other necessities take precedence.

Table 2
Demographic profile of respondents

Component/Item	Frequency	Percentage (%)
Age		
18-22 years old	74	28.1
22-25 years old	106	40.3
25-30 years old	83	31.6
Gender		
Male	123	46.8
Female	140	53.2
Ethnic		
Malay	105	39.9
Chinese	52	19.8
Indian	63	24.0
Other	43	16.0
Faculty		
Forestry	56	20.9
Science	66	25.1
Food Science and Technology	45	17.1
Human Ecology	39	14.8
School of Business and Economic	57	21.7
Monthly Allowance		
Below RM300	81	30.8
RM30 - RM 600	84	31.9
Above RM 600	98	37.3
Monthly Spending on Junk Food		
Below RM10	58	22.1
RM11 - RM20	79	30.1
Above RM20	128	47.5
Frequency of Junk Food Consumption		
Never	2	0.8
Less than 3 times a week	88	33.5
3-5 times a week	56	21.3
5-7 times a week	33	12.5
More than 7 times	84	31.9

In conclusion, the descriptive findings of the respondent demographics at University Putra Malaysia provide a comprehensive overview of age, gender, ethnicity, faculty distribution, financial circumstances, and junk food consumption habits. These insights highlight the diverse and dynamic nature of the student population, emphasizing the importance of targeted strategies to address health and nutritional concerns, especially in the context of rising junk food consumption.

4.3 Relationship between Packaging Design Elements on Purchase Intention

Table 3 shows the coefficient correlation analysis of packaging graphics, materials, and labels in relation to purchase intention. The data indicate significant positive correlations between purchase intention and the packaging attributes, with all p-values below 0.05. The analysis reveals a correlation coefficient of 0.298 between packaging graphics and youth purchase intention, with a

significance level of <0.001 . These findings suggest that aesthetic quality and the external appearance of junk food products influence youth purchase intention. This is supported by prior research from Silayoi and Speece [12], which highlights the significant role of visual elements in packaging graphics, such as color, image, and shape, in shaping consumer perception and initial attraction to food products.

Based on the S-O-R model, the vibrant graphics likely elicited positive emotional responses, such as excitement and desire, which influenced the positive emotional reactions of consumers. Within the Stimulus-Organism-Response (S-O-R) framework, this approach involves carefully selecting packaging colors (Stimulus) to trigger desired internal responses (Organism) in young consumers. Raghunathan *et al.*, [41] found that people often perceive a trade-off between taste and healthiness in food. Consumers tend to believe that healthy food is less tasty, while unhealthy foods are seen as more delicious. To address this, marketers and manufacturers can make healthy food more appealing by using packaging colors strategically. For example, bright red and orange tones on the packaging of fruits, vegetables, or whole-grain products can leverage the common perception that these colors signal sweetness and tastiness. This type of visual stimulus can trigger positive emotional reactions (Organism), such as excitement and anticipation, while also shaping how consumers cognitively evaluate the product, making healthy foods seem more enjoyable. As a result, this may encourage a positive behavioral response (Response), such as a greater intention to choose and consume nutritious items.

Table 3

Correlation coefficient analysis of packaging graphic, material, and label in relation to purchase intention

Independent Variables	Purchase Intention	
	Pearson Correlation r-value	Sig (2 tailed) p-value
Packaging Graphic	0.298	0.000
Packaging Material	0.276	0.000
Packaging Label	0.363	0.000

This study also found a statistically significant correlation ($r = 0.276$, $p < 0.01$) between packaging material and youth purchase intention. While the relationship is positive, packaging material has a minimal influence on purchase intention. This may be due to the nature of junk food consumption, where youth, especially students, are often driven by impulse buying. Visual elements like color and graphics typically have a more immediate impact on consumer perception than packaging materials. Packaging materials are less important for junk food, as these products are consumed quickly and discarded. Youth may associate the importance of packaging material with products meant for long-term storage or premium goods, not disposable snacks.

However, if the consumer is environmentally conscious, packaging material may carry greater importance in their decision-making. Sioutis suggests that packaging material can influence consumer choices, as materials and wrappers play a significant role. Nguyen *et al.*, [43] also found that environmentally conscious youth may view packaging material as important because it reflects a brand's commitment to sustainability, influences their perception of product responsibility, and aligns with their personal values toward reducing environmental harm. This is supported by findings that individuals with strong environmental concerns and positive attitudes toward eco-friendly products are more likely to consider sustainability in their purchasing decisions [42]. Their awareness of environmental issues influences them to favor products with eco-friendly packaging, as part of a broader intention to support sustainable consumption. Hussain *et al.*, [44] also note

that while consumers may be attracted to visually appealing packaging, they are unlikely to repurchase if the product does not meet expectations in terms of quantity, quality, or value. Therefore, some young consumers might not spend much time considering packaging material, already aware that the product may not fulfill their expectations.

According to the analysis, the relationship between packaging labels and purchase intention reveals a positive correlation ($r = 0.363$, $p < 0.01$). These results suggest that well-designed and clear labels have a significant impact on youth purchase intention towards junk food products. Since the relationship is both moderate and significant, this highlights the crucial role of well-designed labels in influencing youth purchase intention. Rahman [46] stated that nutrition labels help consumers make informed decisions when purchasing products. Packaging labels are an important element that affects consumer preferences. Studies by Wansink [47] and Cowburn and Stockley [48] suggest that clear and accurate information can lead to healthier food choices. Labels that highlight health benefits or nutritional value can enhance the perceived healthiness of the product, thereby increasing its attractiveness to consumers.

Nevertheless, some studies claim that label information such as composition, nutritional information and claims does not really give a big impact on consumer purchase intention because consumers do not spend much time on food labels due to time pressure [10]. According to Van and Trijp [51], front-of-pack nutrition labels, logos and claims demonstrate greater effectiveness in guiding healthy food choices, even in time-pressured situations. In contrast, detailed nutrition tables, despite their potential value, often receive limited attention from consumers. On the other hand, purchase intention also depends on the individuals that are making a purchase. It could be argued that consumers who are health conscious or have dietary restrictions will prioritize labeling information when selecting food products and this will influence their purchase intention.

Kelly *et al.*, [25] found that how well young people understand ingredient lists on junk food packaging significantly affects their perception of the product's healthiness, which then influences their purchasing choices. This is especially true for those with dietary restrictions or sensitivities. On the other hand, Roberto *et al.*, [39] found that only a small number of youths typically notice nutritional information on food packaging. However, when they do take notice, these labels can greatly influence how they perceive the product and affect their purchase decisions, especially in relation to health and dietary considerations.

In conclusion, the study identifies key associations between packaging design elements and young consumers' junk food purchases. Packaging graphics have a strong positive correlation with purchase intention, highlighting the importance of visual appeal (H1). Though H2 found a significant link between packaging material and purchase intention, the correlation was weak, suggesting visual cues are more impactful. H3 shows that well-designed labels significantly affect purchase intentions by helping consumers make informed choices. These findings emphasize the importance of effective packaging strategies to promote healthier eating behaviors among young consumers.

4.4 Factors Influencing Packaging Design Element on Junk Food Purchase Intention

Table 4 shows the results of a multiple linear regression analysis of packaging graphic, material, and label in relation to purchase intentions. According to the regression analysis, packaging graphics (PG) have a statistically significant relationship with purchase intention ($p < 0.01$). This result indicates that visually appealing packaging graphics significantly influence consumer choices. The moderate effect size suggests that enhancements in packaging graphics, such as vibrant colors, engaging imagery, and creative designs, can significantly increase consumer interest in the product. This aligns with existing literature that emphasizes the role of visual cues in capturing attention and

influencing consumer behavior [12]. Other research has similarly demonstrated the significant influence of packaging design on consumer purchase intention, as consumers frequently rely on visual cues and emotional responses in their purchasing decisions. These findings are supported by Bone and France [5], who emphasized the crucial role of graphical components, including color and imagery, in shaping consumer beliefs and influencing their purchasing intentions.

Table 4

Multiple linear regression analysis of packaging graphic, material, and label in relation to purchase intention

Variables	Unstandardised Coefficient		Standardised Coefficient	t-value	Sig.
	B	Std Error	Beta		
Constant	10.343	1.565		6.609	0.000
Packaging Graphic	0.143	0.043	0.206	3.286	0.001
Packaging Material	0.032	0.045	0.048	0.700	0.485
Packaging Label	0.244	0.054	0.289	3.286	0.001

On the other hand, the analysis revealed that packaging material (PM) had a negligible impact on youth junk food purchase intentions, as the relationship between packaging material and purchase intention was statistically insignificant ($p = 0.485$), with a very weak effect size ($\text{Beta} = 0.048$). This suggests that packaging material has limited influence on purchasing decisions, particularly among youth. This finding aligns with previous research that has yielded mixed results regarding the relationship between packaging and purchase intention. Recent studies have demonstrated that packaging material can significantly influence consumer perceptions and purchase decisions [3,15]. Petkowicz *et al.*, [37] further note that younger consumers are more frequently exposed to and aware of sustainable packaging. This suggests that environmentally conscious youth may consider the type of packaging material such as whether it is eco-friendly when deciding whether to purchase a product, including junk food. For these consumers, sustainable packaging may serve as an important factor in their decision-making process, reflecting their environmental values and potentially enhancing their perception of product quality.

While some studies, such as those by Lita *et al.*, [28], have found packaging material to be insignificant compared to other product attributes, particularly in contexts where impulsive buying behavior prevails, other research highlights a more nuanced picture. Some study previously emphasize that the importance of packaging varies depending on the type and features of the product [19]. Notably, environmentally conscious youth are more likely to prioritize sustainable packaging options when making purchasing decisions. For many consumers, hygiene and food safety remain top priorities, often leading to preferences for packaging materials perceived as safer, such as glass or paper, over plastics. Additionally, individual psychological processes and situational factors contribute to the complexity of how packaging material influences consumer choice, suggesting that its significance differs across contexts and consumer segments.

The analysis found a significant positive relationship between packaging labels and purchase intention ($\beta = 0.289$, $t = 4.508$, $p < 0.001$), demonstrating the influence of packaging labels on youth purchase intention for junk food products. Among the packaging elements examined, labels indicate a most influential effect, this is most likely because they offer crucial details such as nutritional value and claims, which make this element in packaging labels appealing to health-conscious consumers [20]. This finding highlights the importance of clear and accessible nutrition information on food packaging, especially for health-conscious youth. By providing readily available

information, labels empower consumers to make informed choices that align with their health goals and dietary needs.

Roberto *et al.*, [32] highlighted that youth often pay attention to nutritional information on food packaging, as it can shape their perception of junk food and influence their purchasing decisions, especially when health and dietary concerns are involved. Similarly, Kelly *et al.*, [25] found that the ability of young people and adolescents to understand ingredient lists plays a key role in how they assess a product's healthiness and decide whether to purchase it—particularly for those with dietary restrictions or sensitivities.

Nevertheless, Huseynov and Palma [21] noted that time pressure significantly impacts consumers' food choices and attention to nutrition labels. When under time constraints, individuals tend to process less information and make quicker decisions, although their overall choices remain consistent. Silayoi and Speece [12] also observed that limited time reduces consumer attention to labels, while Clement *et al.*, [11] warned that too much information may confuse or mislead buyers. Additionally, inaccurate or misleading labels can influence consumer preferences, highlighting the importance of clear and truthful labeling in helping consumers make informed decisions.

According to the S-O-R model, the influence of packaging material as a stimulus may depend on whether it triggers a relevant internal evaluation such as perceived safety, hygiene, or sustainability concern (organism). In this study, the lack of significant response suggests that packaging material did not strongly activate any internal processing among youth, possibly due to low environmental awareness or because visual and informational aspects are more influential in quick purchasing decisions. This outcome aligns with the model's assumption that not all stimuli lead to a behavioral response unless the organism stage is meaningfully activated.

In conclusion, the regression analysis reveals that packaging label (PL) is the most influential factor, exerting the strongest positive effect on purchase intention. This underscores the importance of clear, informative, and visually appealing labels in shaping consumer choices. While packaging graphics (PG) also contribute positively, their impact is comparatively weaker. On the other hand, packaging material (PM) does not show a significant effect on purchase intention.

5. Conclusions

This study successfully achieved its objectives by examining the influence of packaging design elements, graphics, materials, and labels, on junk food purchase intention among youth. Descriptive analysis revealed a high preference for visually appealing graphics and informative labels, highlighting their role in shaping consumer preferences. The correlation and regression analyses showed that while packaging graphics had a weak but positive relationship with purchase intention, it remained a significant predictor. Among all elements, packaging labels exerted the strongest influence, underscoring the importance of clear and informative content. Conversely, packaging materials had a minimal impact, suggesting a lesser role in driving immediate purchasing decisions.

These findings offer practical insights into how specific packaging features affect youth consumer behavior, with implications for marketing and public health strategies. For future research, it is recommended to expand the sample beyond university students to improve generalizability. Employing a more representative sampling method and exploring other product categories or demographic groups would further enrich understanding of the relationship between packaging design and purchase intention.

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